

# **ICR Treatment Study Summary Report**

Iowa-American Water Company

East River Station

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## **ICR Treatment Study Summary Report**

### **Evaluation of Granular Activated Carbon Adsorption of Disinfection Byproduct Precursors for Compliance with the Information Collection Rule**

Conducted during the period of 3/11/98 through 11/17/98

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Attachment: 1 compact disc containing *Data Collection Spreadsheet*, *Treatment Study Summary Report Spreadsheet*, this report in portable document format (PDF), and laboratory reports listing all analytical results and QC data

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# 3

## *List of Abbreviations*

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### 3 List of Abbreviations

°C	degrees Celsius
µg	microgram
µL	microliter
µm	micrometer
$A_0$	logistic function parameter
$A_f$	logistic function parameter
$B$	logistic function parameter
BCAA	bromochloroacetic acid
BDCM	bromodichloromethane
BMRL	below minimum reporting level
BV	bed volume
BV <sub>50</sub>	bed volumes to 50 percent TOC breakthrough
$C$	concentration
$\bar{C}$	blended effluent concentration
C1	larger of two observed values for RPD calculation
C2	smaller of two observed values for RPD calculation
CCC	continuing calibration check
CCI	construction cost index
CDBAA	chlorodibromoacetic acid
CHBr <sub>3</sub>	bromoform
CHCl <sub>3</sub>	chloroform
Cl <sup>-</sup>	chloride
CLD	chlorine demand
cm	centimeter
cu	cubic
CUR	carbon usage rate
D	column inner diameter
d	day
d	diameter
$D$	logistic function parameter
DBAA	dibromoacetic acid
DBCM	dibromochloromethane
DBP	disinfection byproduct
DCAA	dichloroacetic acid
DCBAA	dichlorobromoacetic acid
DS	distribution system
EBCT	empty-bed contact time
EC	enhanced coagulation
EPA	Environmental Protection Agency
ft	feet
g	gram
GAC	granular activated carbon
gal	gallon

gpm	gallons per minute
HAA	haloacetic acid
HAA5	sum of five haloacetic acids: MCAA, DCAA, TCAA, MBAA, DBAA
HAA6	sum of five haloacetic acids: MCAA, DCAA, TCAA, MBAA, DBAA, BCAA
HAA9	sum of five haloacetic acids: MCAA, DCAA, TCAA, MBAA, DBAA, BCAA, DCBAA, CDBAA, TBAA
hr	hour
<i>i</i>	individual contactor
ICR	Information Collection Rule
in.	inch
inf	influent
l	bed length
L	liter
LC	large column
m	mass
max	maximum
MBAA	monobromoacetic acid
MCAA	monochloroacetic acid
MCL	maximum contaminant level
mg	milligram
MG	million gallons
MGD	million gallons per day
min	minimum
min	minute
mL	milliliter
mm	millimeter
MRL	minimum reporting level
MtBE	methyl tert-butyl ether
<i>n</i>	number of contactors
NA	not applicable
NA	not analyzed
ntu	nephelometric turbidity unit
O&M	operations and maintenance
p	particle
PE	performance evaluation
PPI	Producers Price Index
Q	flow rate
QA/QC	quality assurance/quality control
Re	Reynold's number
RPD	relative percent difference
RSD	relative standard deviation
RSSCT	rapid small-scale column test
RT	run time
sc	small column
SDS	simulated distribution system
sec	second

SF	scaling factor
SM	<i>Standard Methods</i>
SUVA	specific ultraviolet absorbance
$t$	time
T	total
TBAA	tribromoacetic acid
TCAA	trichloroacetic acid
THM	trihalomethane
THM4	sum of four trihalomethanes: $\text{CHCl}_3$ , BDCM, DBCM, and $\text{CHBr}_3$
TOC	total organic carbon
$\text{TOC}_0$	influent total organic carbon
TOX	total organic halide
TSUVA	total specific ultraviolet absorbance
UV	ultraviolet absorbance
$\text{UV}_{254}$	ultraviolet absorbance at 254 nm
$\epsilon$	bed porosity
$\nu$	kinematic viscosity
$\rho$	density



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# **4**

## ***Conclusions and Recommendations***

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## 4 Conclusions and Recommendations

As required by the Information Collection Rule (ICR), a treatment study was conducted by Summers & Hooper, Inc. (S&H) to evaluate the removal of disinfection byproduct (DBP) precursors by granular activated carbon (GAC) for the East River Station, operated by the Iowa-American Water Company. The rapid small-scale column test (RSSCT) was utilized as the bench-scale method to simulate full-scale GAC performance. The treatment study was performed off-site at S&H's laboratory facilities in Cincinnati, Ohio. It was designed and conducted as required by section 141.141(3) of the ICR, published in the May 14, 1996 Federal Register. A bituminous coal-based GAC blend was investigated. The blend included reactivated or virgin F-300, manufactured by Calgon Carbon Corporation, and TC-30, manufactured by ACMS Carbon Services. DBP formation by disinfection with free chlorine was simulated by utilizing site-specific chlorination conditions designed to match distribution system conditions. The procedures followed were those contained in the *GAC Precursor Removal Studies* section of the *ICR Manual for Bench- and Pilot-Scale Treatment Studies* (USEPA, 1996a), and all analyses were conducted following approved methods and as required by the *ICR/DBP Analytical Methods Manual* (USEPA, 1996b).

An electronic deliverable is included at the end of this report. It includes: this report in portable document format along with all data analyzed during this treatment study and all required QA/QC information; the *ICR Treatment Studies Data Collection Spreadsheets*, with all data input as required by EPA; and the *Treatment Study Summary Report Spreadsheet*, with all data input as required by EPA.

Three sessions (March, September, and November) were conducted to evaluate the impact seasonal variability in source water quality on GAC performance for DBP precursor control. During each session, two empty-bed contact times (EBCTs) were evaluated (10 and 20 minutes). During the third session, two additional 10 minute EBCT contactors were operated to evaluate the impact of influent pH on GAC performance. The two contactors were operated at influent pH levels of 6.5 and 7.5, simulating the impact of the use of polyaluminum chloride or ferric chloride as alternative coagulants on settled water pH. Currently, settled water pH is normally about 7.0. The source water to the East River Station during the treatment study was the Mississippi River.

GAC reactivation frequency is typically based on compliance with Stage 1 or the placeholders for Stage 2 DBP maximum contaminant levels (MCLs). During this study, only two of the eight contactors operated exceeded the placeholders for Stage 2 DBP MCL. For these runs, conducted at the highest simulated distribution system (SDS) incubation temperature, during the September session, the total trihalomethane (THM4) MCL was exceeded after 51 and 132 full-scale equivalent days of operation. In practice, multiple contactors are operated in staggered fashion and their effluents are blended prior to chlorination. Therefore, run times to a given effluent criterion are extended as compared to a single contactor, because the poorer quality water from older contactors is blended with water from new contactors. Based on this configuration, the placeholders for Stage 2 DBP MCL were exceeded only during the same two runs (September session), even after an extrapolation procedure was applied to all eight runs. For the runs that did not exceed the placeholder for Stage 2 DBP MCL, the maximum extrapolated run time

ranged from 6.5 to 7.9 months for the 10 minute EBCT contactors, and was 19 months for the 20 minute EBCT contactors.

The total costs for GAC treatment was estimated using an EPA model, which included capital and O&M costs, based on GAC reactivation frequencies. For 10 minute EBCT contactors, the estimate for total costs for GAC treatment, including on-site reactivation, averaged 49 cents/1,000 gal for steel pressure contactors. For 20 minute EBCT contactors, total costs averaged 66 cents/1,000 gal steel pressure contactors. The costs for 20 minute EBCT contactors were higher due to the higher capital costs associated with the larger contactors.

A relative measure of GAC performance is the number of bed volumes to 50 percent total organic carbon (TOC) breakthrough,  $BV_{50}$ . This parameter correlates GAC performance to the influent TOC concentration. Typically, GAC performance improves with decreasing influent TOC concentration, as the loading on the GAC contactor is decreased. The measured  $BV_{50}$  values for GAC runs in this study were compared to the  $BV_{50}$  of average waters, from a correlation to the influent TOC concentration, which is available in the literature. For the 10 minute EBCT contactors, mean GAC performance based on  $BV_{50}$  values were only slightly below that expected for an average water:  $BV_{50}$  values ranged from 9 percent poorer than expected to 6 percent better than expected. For the 20 minute EBCT contactors,  $BV_{50}$  values averaged 30 percent higher than expected.

Influent TOC concentration varied from 2.8 to 3.3 mg/L during the three sessions evaluated for seasonal variability, and bromide concentration varied from BMRL to 34  $\mu\text{g/L}$ . GAC treatment does not remove bromide, while TOC is adsorbed, resulting in higher GAC effluent bromide to TOC ratios as compared to the GAC influent. Due to this increase, GAC effluent formed DBPs may undergo shifts in speciation to higher concentrations of the more brominated DBP species. In some cases, such as for bromodichloromethane, effluent concentrations were measured higher than influent levels. It is important to track the breakthrough behavior of specific DBP species, because some may be of potential health concern and a MCL could be set for a specific DBP species.

By plotting effluent concentrations divided by their respective influent concentrations, a normalized breakthrough evaluation can be performed. This evaluation yields insight into the relative breakthrough patterns of TOC, ultraviolet absorbance at 254 nm ( $UV_{254}$ ), and SDS-DBPs, indicating whether DBP surrogates can serve as direct or conservative indicators of SDS-DBP breakthrough. The evaluation performed during this study showed that TOC usually served as a conservative indicator of SDS-DBP breakthrough. During the March session only, normalized SDS haloacetic acid (HAA) breakthrough occurred earlier than normalized TOC breakthrough. During all sessions, TOC served as a conservative indicator for SDS-THM4 and SDS total organic halide (TOX) breakthrough. Therefore, by monitoring for TOC breakthrough, the relative breakthrough of SDS-THM4 and SDS-TOX would be known.  $UV_{254}$  typically served as an excellent direct indicator of SDS-TOX breakthrough.

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# 5

## *Background Information*

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## 5 Background Information

### 5.1 Treatment Plant Description

The Iowa-American Water Company operates the East River Station, a conventional surface water treatment plant that provides water for a population of 129,516 in the Davenport, Bettendorf, and surrounding Iowa communities. The state approved plant capacity is 30 MGD; average flow during 1998 was 17.8 MGD. The primary source water for the treatment plant is the Mississippi River. The East River Station consists of two main treatment trains, Train #1 and Train #2. Train #1 was selected for ICR monitoring and treatment study sampling. However, the treatment study was conducted using both Train #1 and Train #2 at different times. Train #1 consists of an in-line static mixer, flocculation, sedimentation, chlorination, and filtration. Train #2 consists of rapid mix, superpulsator (upflow solids contact clarification) and filtration.

Figure 1 shows a simple schematic of Train #1 of the East River Station. Train #1 was used as pretreatment for the treatment study water sampled during the first session of testing. Treatment consists of permanganate and cationic polymer addition, followed by poly-aluminum sulfate addition and in-line static mixing. The water then passes through flocculation basins and conventional sedimentation basins. About halfway through the sedimentation basin, chlorine is added. The water is filtered through dual media GAC/sand filters. The filtration rate is 3 gpm/ft<sup>2</sup>, and the GAC EBCT is 10 minutes. The GAC is replaced with a reactivated and virgin GAC blend about every 18 months. After filtration, fluoride, chlorine, and caustic soda are added. The water passes through a clearwell, where zinc orthophosphate is added. After the clearwell, ammonia is added to form combined chlorine to maintain a distribution system residual.

A schematic of the East River Station Train #2 is shown in Figure 2. Train #2 was used as pretreatment for the treatment study water sampled during the second and third sessions of testing. Treatment consists of permanganate and cationic polymer addition, followed by poly-aluminum sulfate addition during rapid mix. The water is then clarified in superpulsators (upflow solids contact clarifiers). After clarification, chlorine and a filter aid polymer are added. Filtration and the remaining treatment steps are identical to those summarized above for Train #1.

#### 5.1.1 Treatment plant design information

Tables 1 and 2 summarize the East River Station design data for Train #1 and Train #2, respectively. The data presented is based on data from report A.2 "Design Plant Parameters" and report A.3 "Design Plant Chemical Parameters," of the *ICR Water Utility Database System*.

#### 5.1.2 Treatment challenges facing plant

East River Station is a conventional surface water treatment plant utilizing sedimentation basins in parallel with upflow, solids contact clarifiers, followed by GAC filter-adsorbers. The

Mississippi River is the plant's sole source of supply. Treatment challenges experienced by this facility are: high concentrations or blooms of algae causing treatment challenges such as short filter runs, and elevated raw water pH (as high as pH 9.2 continuously for several weeks); high raw water turbidity and TOC levels; successful removal or inactivation of microbes such as *Cryptosporidium*, *Giardia lamblia*, bacteria, and viruses; high ammonia-nitrogen concentrations in the raw water during the early spring runoff and ice/snow melt events; occasional chemical spills in the river; agricultural and urban runoff of pesticides and herbicides; cold water clarification treatment challenges; balancing adequate disinfection of the water with limiting the formation of DBPs; complying with the Partnership for Safe Water finished water turbidity goal of  $\leq 0.10$  ntu; and providing drinking water to Iowa-American customers that meets EPA and Iowa Department of Natural Resources Safe Drinking Water Act regulations.

## **5.2 Tabular Summary of Source and Finished Water Quality**

Tables 2 and 3 summarize average source and finished water quality at the East River Station, based on sampling between July 1997 and December 1998. These data constitute preliminary ICR monitoring results and have not necessarily undergone EPA review. The source water was characterized by moderate TOC levels, averaging 4.9 mg/L. Bromide levels were low, averaging 28  $\mu\text{g/L}$ . The source water blend specific UV absorbance (TSUVA, defined as  $\text{UV}_{254}/\text{TOC}$ ) averaged 2.9 L/mg-m. This was reduced to an average of 1.4 L/mg-m after treatment. The East River Station averaged 35 percent TOC removal, yielding an average treated water TOC concentration of 3.2 mg/L.  $\text{UV}_{254}$  removal averaged 61 percent. The average source water  $\text{UV}_{254}$  was 0.142 1/cm, while that for the finished water was 0.043 1/cm. Distribution system THM4 (DS-THM4) levels ranged from 35 to 97  $\mu\text{g/L}$  and averaged 62  $\mu\text{g/L}$ , below Stage 1 but exceeding the placeholder for Stage 2 MCL. DS-HAA5 averaged 18  $\mu\text{g/L}$ , with a wide seasonal variability, but always lower than the Stage 1 MCL and the placeholder for Stage 2 MCL.

Unit Process	Process Description
Rapid Mix	Type of Mixer: Static Baffling Type: Superior (Serpentine) Liquid Volume (gal): 663 Short Circuiting Factor: $NA_V$ Mean Velocity Gradient ( $\text{sec}^{-1}$ ): 900  Coagulant Addition: Aluminum sulfate (alum) + Polymer Measurement Formula: $AL_2(SO_4)_3 \cdot 14H_2O$ + Polymer Coagulant Dose (mg/L): 60
Flocculation	Type of Mixer: Mechanical Liquid Volume (gal): 1,000,600 Short Circuiting Factor: $NA_V$ Baffling Type: Average  Stage Sequence Number: 1 Stage Mean Velocity Gradient ( $\text{sec}^{-1}$ ): 75 Stage Liquid Volume (gal): 1,000,600
Disinfection Addition	Chemical Type: Chlorine gas Measurement Formula: $Cl_2$ Dose Rate (mg/L): 5.00
Sedimentation	Surface Area ( $\text{ft}^2$ ): 25,440 Liquid Volume (gal): 2,799,000 Baffling Type: Poor Short Circuiting Factor: 0.3
Filtration	Surface Area ( $\text{ft}^2$ ): 7,000 Liquid Volume (gal): 474,000 Total Media Depth (in): 36 Depth of GAC (in): 30 Media Type: GAC over sand Type of Activated Carbon: F300 Minimum Water Depth to Top of Media (ft): 3.4 Depth from Top of Media to Top of Backwash Trough (ft): 3.2
Disinfectant Addition	Chemical Type: Chlorine gas Measurement Formula: $Cl_2$ Dose Rate (mg/L): 3.00
Clearwell	Surface Area ( $\text{ft}^2$ ): 5,200 Liquid Volume (gal): 586,000 Minimum Liquid Volume (gal): 400,000 Baffling Type: Poor Short Circuiting Factor: 0.3 Covered Indicator Code: Yes
Disinfectant Addition	Chemical: Anhydrous ammonia Chemical Code: $NH_3A$ Measurement Formula: $NH_3$ Dose rate (mg/L): 0.75

$NA_V$ : Not available

**Table 1 Summary of treatment plant design data: conventional sedimentation basins train (Train #1)**

Unit Process	Process Description
Rapid Mix #1	Type of Mixer: Mechanical Baffling Type: Average Liquid Volume (gal): 22,000 Short Circuiting Factor: NA <sub>v</sub> Mean Velocity Gradient (sec <sup>-1</sup> ): 800 Coagulant Addition: Aluminum sulfate (alum) + Polymer Measurement Formula: AL <sub>2</sub> (SO <sub>4</sub> ) <sub>3</sub> *14H <sub>2</sub> O + Polymer Coagulant Dose (mg/L): 75
Rapid Mix #2	Type of Mixer: Mechanical Baffling Type: Average Liquid Volume (gal): 17,600 Short Circuiting Factor: NA <sub>v</sub> Mean Velocity Gradient (sec <sup>-1</sup> ): 265 Coagulant Addition: Organic polymer - coagulant aid Measurement Formula: Poly Acrylamide, 7% Coagulant Dose (mg/L): 0.9
Solids Contact Clarifier (Superpulsator)	Clarifier Type: Sludge Blanket Clarifier Type: Upflow Clarifier Brand Name: INFILCO DEGREMONT Surface Area (ft <sup>2</sup> ): 3,614 Liquid Volume (gal): 432,524 Short Circuiting Factor: NA <sub>v</sub> Baffling Type: Average Filter Aid Addition: Organic Polymer Measurement Formula: Poly Acrylamide, 30% Dose (mg/L): 0.05
Disinfection Addition	Chemical Type: Chlorine gas Measurement Formula: Cl <sub>2</sub> Dose Rate (mg/L): 5.00
Filtration	Surface Area (ft <sup>2</sup> ): 7,000 Liquid Volume (gal): 474,000 Total Media Depth (in): 36 Depth of GAC (in): 30 Media Type: GAC over sand Type of Activated Carbon: F300 Minimum Water Depth to Top of Media (ft): 3.4 Depth from Top of Media to Top of Backwash Trough (ft): 3.2
Disinfectant Addition	Chemical Type: Chlorine gas Measurement Formula: Cl <sub>2</sub> Dose Rate (mg/L): 3.00
Clearwell	Surface Area (ft <sup>2</sup> ): 5,200 Liquid Volume (gal): 586,000 Minimum Liquid Volume (gal): 400,000 Baffling Type: Poor Short Circuiting Factor: 0.3 Covered Indicator Code: Yes
Disinfectant Addition	Chemical: Anhydrous ammonia Chemical Code: NH3A Measurement Formula: NH <sub>3</sub> Dose rate (mg/L): 0.75

NA<sub>v</sub>: Not available

**Table 2 Summary of treatment plant design data (Train #2)**



Water quality parameter	Mean	Standard deviation	Minimum	Maximum	Count
Temperature (°C)	15	9	3	26	18
pH	8.0	0.3	7.5	8.5	18
Alkalinity (mg/L as CaCO <sub>3</sub> )	161	15	131	180	18
Total hardness (mg/L as CaCO <sub>3</sub> )	207	19	177	233	18
Calcium hardness (mg/L as CaCO <sub>3</sub> )	129	17	108	186	18
TOC (mg/L)	4.9	0.6	4.0	6.0	17
UV <sub>254</sub> (1/cm)	0.142	0.050	0.033	0.206	17
Bromide (µg/L)	28	8	20	40	16
TSUVA (L/mg-m)	2.9	0.9	0.6	3.8	17

**Table 3 Summary of source water quality at the East River Station between July 1997 and December 1998**

Water quality parameter	Mean	Standard deviation	Minimum	Maximum	Count
Temperature (°C)	15	9	3	26	18
pH	7.3	0.1	7.0	7.5	18
Turbidity (ntu)	0.11	0.05	0.03	0.23	18
TOC (mg/L)	3.2	0.4	2.6	3.9	17
UV <sub>254</sub> (1/cm)	0.043	0.010	0.030	0.064	17
TSUVA (L/mg-m)	1.4	0.2	1.0	1.8	17
DS-THM4 (µg/L)	62	24	35	97	24
DS-HAA5 (µg/L)	18	7	9	33	24
DS-HAA6 (µg/L)	20	8	10	35	24

DS: distribution system; average of all distribution system sampling points

**Table 4 Summary of finished water quality at the East River Station between July 1997 and December 1998**

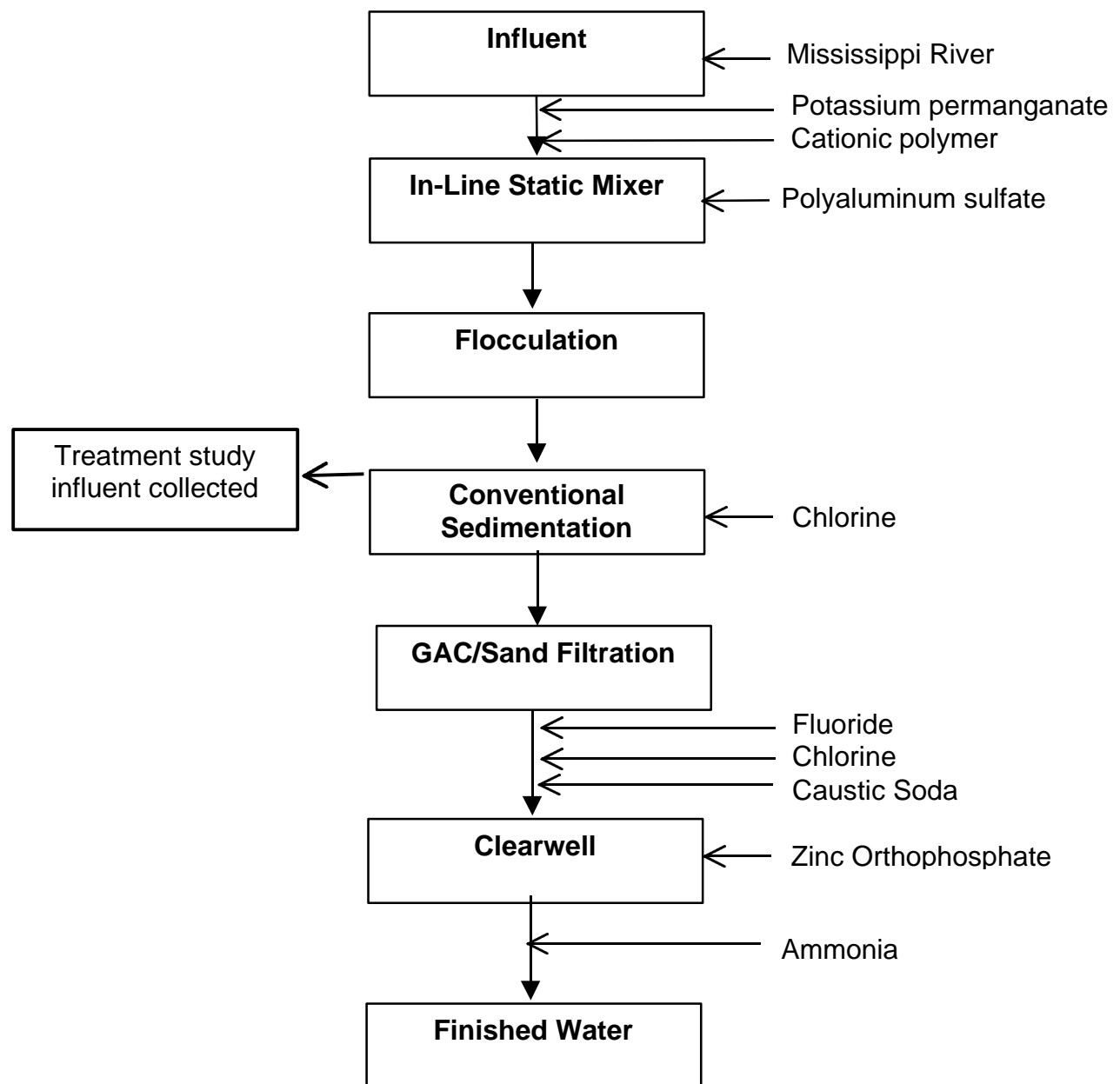


Figure 1 Treatment plant schematic (Train #1)

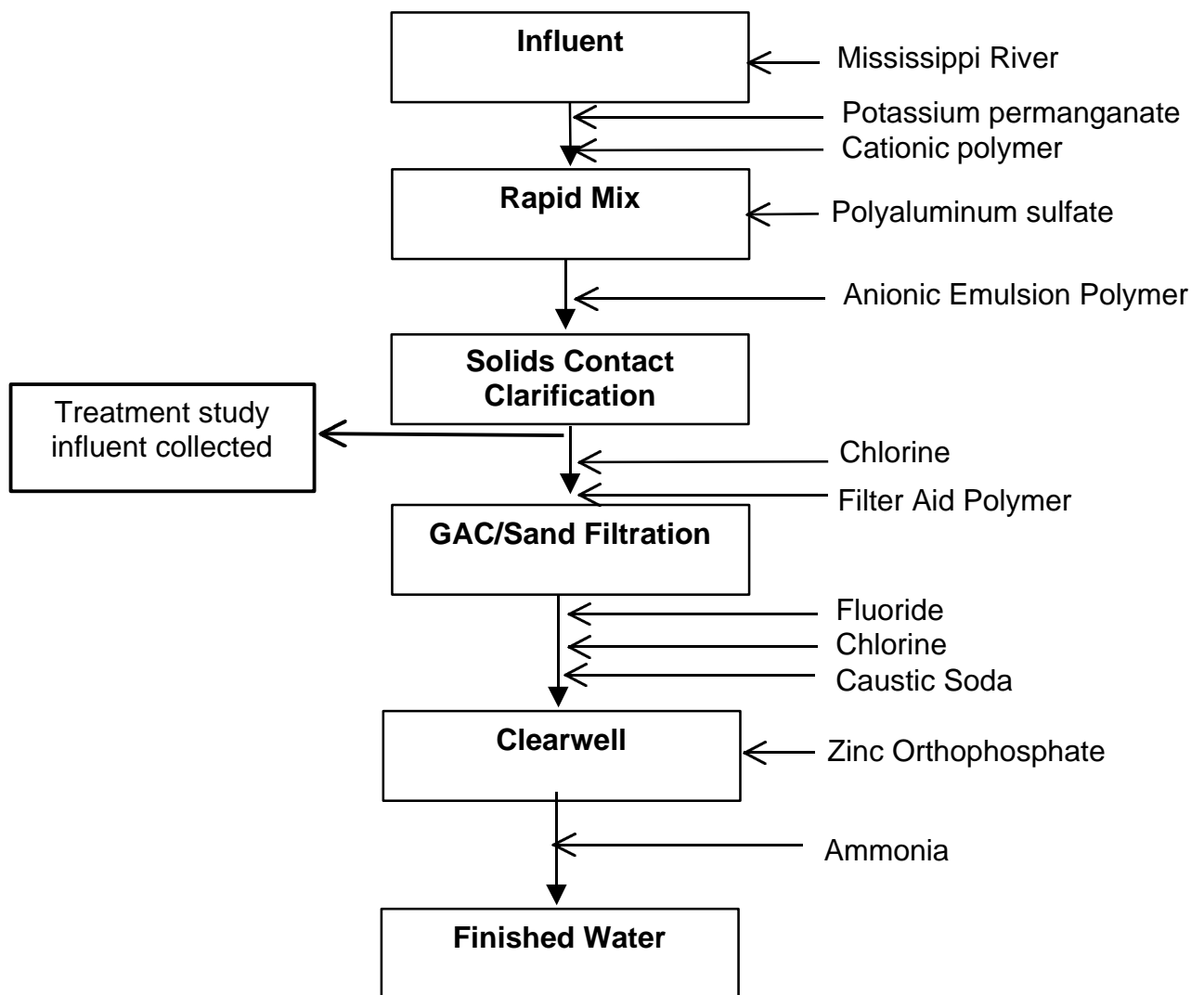


Figure 2 Treatment plant schematic (Train #2)

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# 6

## *Materials and Methods*

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## 6 Materials and Methods

### 6.1 Treatment Study Influent Sampling Procedures

Three sets of samples were taken throughout the year to capture seasonal variability. The sample dates are summarized in Table 5. The three samples represent the winter/spring (March), summer (September), and fall (November) seasons. Water was sampled from Train #1 during the March session. During the September and November sessions, water was sampled from Train #2.

Under normal plant operation, chlorine is added midway through the sedimentation basin of Train #1. Since this chlorine feed could not be shut off for sampling plant settled water, the water was sampled as it entered the sedimentation basin. A chlorine residual check of this water showed that no residual chlorine was present. The water was then allowed to settle for 2 hours in 55-gallon drums, after which the supernatant was pumped into 55-gallon drums for shipping. TOC samples taken before and after drum settling did not show a decrease in TOC concentration after drum sedimentation, and little settled floc was visible. It is possible that the pump action sheared the original floc, resulting in a suspended fine floc. It was decided not to include the drum settling step during future sampling events.

During the second sampling session, a chlorine residual was initially detected at the treatment study sampling point. However, adjusting the point of sampling yielded drum samples with no detectable free chlorine residual. On arrival at S&H's laboratory, a sample of the water was analyzed for THMs, yielding a THM4 concentration of 25 µg/L. Although no free chlorine residual was detected, the water sample may have already been exposed to chlorine, possibly due to short circuiting in the sedimentation basin. It was not determined how the sample became exposed to chlorine or whether the first sample taken in March was also exposed. Due to this problem, water was sampled from the superpulsator. Analysis of this water sampled yielded no detectable concentrations of THMs or HAAs. During the third and last sampling session, in November, the superpulsator effluent was again sampled.

During the day prior to each sampling event, the treatment study influent sampling point was sampled and analyzed at S&H for TOC. The data was compared to historic data to verify the representativeness of plant operation during treatment study influent sampling. Table 6 summarizes the data obtained during each session. Once the representativeness of the water sample was verified by comparison to historic data, sampling into the 55-gallon drums proceeded. Plant operation and treatment parameters (e.g., chemical doses) were confirmed as within acceptable normal variation prior to drum sampling.

The water samples were taken in 55-gallon drums. The 55-gallon drums were of plastic construction and were extensively cleaned at S&H's laboratory facility prior to use. The cleaning process included three 24-hour soaks with hot water, a basic solution, and an acidic solution. Prior to use, the drums were filled with water and TOC samples taken to ensure that no detectable leaching of organic compounds from the inside surface of the drums was occurring (measured as TOC).

For all sessions, the water sampled for the treatment study was shipped the day of sampling and arrived at S&H after two days. The sample was shipped at ambient temperature. Upon arrival, the drums were stored at 4°C. To check for significant biodegradation or other changes during shipment, an aliquot of the treatment study influent water was sampled for TOC approximately half way through each sampling event. The sample was immediately preserved. Upon arrival at S&H's laboratory facilities, a second aliquot was obtained for TOC analysis. Both samples were analyzed, and the results are summarized in Table 7. The two measured values did not differ by more than 0.1 mg/L.

## **6.2 Pretreatment Processes to the Advanced Treatment Processes**

The full-scale and bench-scale pretreatment processes in place prior to bench-scale GAC during the March session are described in Figure 3. The water was sampled after full-scale conventional treatment. Bench-scale filtration through a 1.0-µm glass fiber cartridge filter, which simulates full-scale sand filtration, was performed as a required pretreatment step prior to RSSCT testing. During the September and November sessions, water was sampled after full-scale upflow clarification. The full-scale and bench-scale pretreatment processes in place prior to bench-scale GAC during these sessions are described in Figure 4. Table 7 summarizes the TOC concentration measured before and after bench-scale filtration for all sessions. During the operation of the RSSCT, the pH was maintained within 0.1 pH units of the target GAC influent pH by the addition of dilute solutions of sulfuric acid and sodium hydroxide.

Table 8 summarizes the design data for each pretreatment process prior to GAC adsorption during the March session. During the September and November sessions, the same information is summarized in Table 9. Bench-scale cartridge filtration was employed as bench-scale pretreatment during all sessions. During the November session, influent pH was adjusted to simulate the impact of potential plant coagulant changes on settled water pH.

## **6.3 Advanced Treatment Process Information**

### **6.3.1 Schematics and descriptions of the process equipment used**

Figures 5 and 6 show a schematic of the RSSCT systems. All components were of stainless steel, glass, or Teflon construction. The batch influent water was held in a stainless steel container. The influent water was pumped through each column using a metering diaphragm pump. The wetted parts of the pump were Teflon and glass. The pumps were rated for 1 percent speed control and 75 psi continuous duty. A stainless steel gas sampling cylinder was used as a pulse dampener. Pressure gauges with stainless steel connections were used to monitor the system pressure. The effluent flow rate was monitored constantly. The calibration of the effluent flow rate control system was checked by a manual measurement at least twice daily and adjusted as necessary to maintain it within 3 percent of the design flow rate.

The system configuration for the 10 minute EBCT contactors is shown in Figure 5. For these RSSCTs, the entire GAC bed was packed in a single column. The 20 minute EBCT contactor was packed into two columns in series, as shown in Figure 6. This allowed for backwashing by

mixing the top portion of the GAC bed, if made necessary by high system pressures, without disturbing the remainder of the bed. No backwashing was required during this treatment study. Typically, 90 percent of the GAC bed was packed in the second column. Both columns were of equal inner diameters.

The GAC was packed in chromatography columns with Teflon fittings. The GAC support consisted of appropriately sized stainless steel screens, glass wool, and Teflon beads. The support system differed depending on the column inner diameter. Standard 11.0 mm inner diameter columns required a stainless steel support system as shown in Figure 7 (a). When 10.0 mm inner diameter columns were used, the support system shown in Figure 7 (b) was used so that the GAC was contained within the effective length of the column.

### 6.3.2 Design data for the advanced treatment process

The design data for the RSSCTs conducted during each session are summarized in Table 10. During each session, two RSSCTs were operated to simulate full-scale equivalent EBCTs of 10 and 20 minutes. Other than the EBCT, the design for the RSSCTs operated during each session was identical. The scaling factor used for all sessions, based on the ratio of full-scale to bench-scale GAC particle size, was 13.5. Therefore, 13.5 days of full-scale operation were simulated with each day of RSSCT operation. Columns with inner diameters of 10.0 and 11.0 mm were used. Reynolds numbers used ranged from 0.31 to 0.59.

### 6.3.3 Procedures specific to the treatment study

#### 6.3.3.1 GAC Preparation Procedures

A representative batch of the reactivated and virgin blend of GAC used at the plant to replace their filter media was used for the RSSCTs. The blend is composed of reactivated Filtrasorb 300 (F-300), a bituminous-coal based 8x25 mesh size GAC and virgin F-300 or TC-30 (both 8x30 mesh sizes). The ratio is typically 75 percent reactivated and 25 percent virgin GAC. F-300 is manufactured by Calgon Carbon Corporation, while TC-30 is manufactured by ACMS Carbon Services. The average particle diameter,  $d_p$ , is 1.52 mm. Using a riffle splitter, a small (30-50 g) representative sample of the GAC was obtained. Using a jar mill, the GAC was ground to a 100x200 mesh size, which yielded GAC with average particle diameter,  $d_p$ , of 0.113 mm. Care was taken to frequently remove and sieve the GAC in the jar mill. The GAC was ground until the entire sample passed through the upper mesh size sieve. Usually, a recovery of 25 to 30 percent was obtained, as defined by the amount of GAC retained between the two mesh size sieves and divided by the total amount of GAC prior to grinding.

The ground GAC was transferred to a beaker, and covered with reagent grade (adsorbed-deionized) water. The GAC was washed by repeated additions and decantations of reagent grade water. The reagent grade water was added at a high rate and turbulence, to stir up the GAC and release fines. The supernatant water containing GAC fines was decanted after the GAC was allowed to settle. Towards the end of the cleaning procedure, the sample was sonicated twice for

5 to 10 seconds. The sonication step helped loosen fines that were subsequently removed by the addition and decantation of reagent grade water.

The GAC was dried in an oven at 80 to 90°C for 6 to 12 hours. The temperature was then raised to between 100 and 110°C and the sample was dried until it reached a constant weight. The sample was removed and cooled inside a dessicator. Once cooled, if not immediately used, it was stored in a glass vial sealed with a lid with TFE-lined septum until ready for use.

The dry bed density was measured using a sample of dried and cooled GAC. Stored GAC was dried in an oven as described above prior to the dry bed density measurement. To measure the dry bed density, a sample of the GAC was placed inside a 10-mL glass graduated cylinder to a level of 5 to 9 mL. The cylinder was tapped to pack the GAC. A volume was measured and recorded. This GAC was then weighed on a balance. The volume reading of the graduated cylinder was checked and calibrated if necessary by adding a known volume of water to it using a 10-mL class A graduated pipette. The GAC dry bed density was calculated by dividing the weight by the calibrated volume.

The calculated mass of GAC of each RSSCT was weighed, placed inside a clean beaker, and covered with reagent grade water. The wetted GAC was usually allowed to sit for 12-24 hours, followed by placement in a vacuum for at least 1 hour to displace the air within the pores.

#### 6.3.3.2 RSSCT Column Setup

The GAC support for 10.0 mm inner diameter columns consisted of a stainless steel screen (60 or 100 mesh size), Teflon beads, glass wool, a 200 mesh size stainless steel screen, and a 100 mesh size stainless steel screen. The column support is detailed in Figure 7. The support for 8.0 mm inner diameter columns consisted of a 200 mesh size stainless steel screen and a 100 mesh size stainless steel screen placed on top of the Teflon fitting. For all column inner diameter sizes, a small amount of glass wool was placed inside the Teflon fitting, supported by a 60 mesh size stainless steel screen.

The columns were packed by adding the GAC as a slurry and packing the column by repeatedly tapping the sides. The 20 minute full-scale equivalent EBCT RSSCTs were packed into two columns of the same inner diameter placed in series. Only reagent grade water was used during the packing process.

#### 6.3.3.3 Batch Influent Preparation

Prior to RSSCT testing, all water samples were filtered through a 1.0-µm nominal pore size glass fiber cartridge filter. The cartridge filter was pre-rinsed with deionized water. Dilute solutions of sulfuric acid and sodium hydroxide were used to maintain the influent pH within 0.1 pH units of the target pH during operation of the RSSCTs.



#### 6.3.3.4 RSSCT Monitoring

The effluent flow rates were monitored constantly to ensure that the flow rates were maintained within 5 percent of the design flow rate. The calibration of the effluent flow rate control system was checked at least twice daily and adjusted when a flow rate differed by more than 3 percent from the design flow rate. The system pressure was monitored daily. The effluent TOC concentration was monitored frequently so that samples could be taken at 5 to 8 percent increments of the average influent TOC concentration.

### 6.4 Experimental Design

The treatment study was designed to evaluate the impact of seasonal variability on the performance of bituminous coal-based GAC at two EBCTs, 10 and 20 minutes. The experimental design is summarized in Table 11. Three sessions were conducted to perform this evaluation. During the third session, two additional 10 minute EBCT columns were run at GAC influent pH values above and below 7.0. The Iowa-American Water Company is considering two alternative coagulants: polyaluminum chloride (PACl) and ferric chloride. The use of PACl would yield a settled water pH of about 7.5, while the use of ferric chloride would yield a settled water pH of about 6.5. The influent water pH was adjusted to these target pH values for the two 10 minute EBCT runs.

### 6.5 ICR Treatment Study Protocol

This treatment study was designed and conducted as required by section 141.141(3) of the Information Collection Rule (ICR), published in the May 14, 1996 Federal Register. The procedures contained in the *GAC Precursor Removal Studies* section of the *ICR Manual for Bench- and Pilot-Scale Treatment Studies* were followed. During RSSCT operation, a minimum of 12 effluent samples were taken at target 5 to 8 percent increments of the average influent TOC concentration. Three samples were taken in duplicate. All required analyses were conducted, including pH, temperature, TOC, UV<sub>254</sub>, and SDS chlorination for THMs, HAAs, and TOX.

During each session, both the 10 and 20 minute EBCT RSSCTs were operated in parallel, with a single batch influent container. Therefore, only two influent A (alkalinity, calcium hardness, total hardness, ammonia, and bromide) and three influent B (pH, temperature, turbidity, TOC, UV<sub>254</sub>, SDS chlorination) samples were taken during the course of each study, and the data from these applied to both the 10 and 20 minute EBCT RSSCTs.

The ICR requires that the RSSCTs be operated until the first of three conditions are met:

1. the effluent TOC concentration reaches at least 70 percent of the average influent TOC concentration
2. the effluent TOC concentration reaches a plateau at greater than 50 percent of the influent TOC concentration (a plateau is defined as an increase in TOC concentration of no more than 10 percent over a two-month full-scale equivalent time period)

3. the RSSCT has been operated for the equivalent full-scale of one year

All column runs were terminated based on meeting the first condition: the effluent TOC concentration reached or exceeded 70 percent of the average influent TOC concentration. The twelfth and last RSSCT effluent sample was taken at this point. A thirteenth sample (analyzed for TOC, pH, and temperature only) was taken two full-scale equivalent weeks after the twelfth effluent sample to confirm that 70 percent TOC breakthrough was reached. Table 12 summarizes the run termination criteria used, percent breakthrough reached at the twelfth sample, and the corresponding full-scale equivalent run time.

A tabular summary of the all data analyzed during the treatment study is given in the Appendix. As required by EPA, the data was input into the *ICR Treatment Studies Data Collection Spreadsheets*. These files are included in electronic form at the end of this report.

## 6.6 Simulated Distribution System (SDS) Chlorination Conditions

The target simulated distribution system (SDS) conditions are summarized in Table 13. During the first session, a 3-hour holding time was targeted. During subsequent sessions, the holding time was reevaluated, and a 24 hour hold time was implemented. The samples were buffered at pH 7.35 using a borate/phosphate buffer combination, based on the pH maintained in the distribution system. The target free chlorine residual after the holding time was 0.75 mg/L as Cl<sub>2</sub>. The target incubation temperature varied seasonally, from 5.3 to 20°C, based on average distribution system temperatures. For GAC influent water, during all three sessions, the mean and standard deviation obtained for each parameter are summarized in Table 14. The same data are summarized in Table 15 for the effluent samples from the 10 minute EBCT contactors, and in Table 16 for the effluent samples taken from the 20 minute EBCT contactors.

## 6.7 Analytical Methods

A list of all analytical methods used during the study is shown in Table 17. A summary listing the laboratories involved for analytical support and the period over which analyses were conducted by each laboratory is shown in Table 18. Contact information for the laboratories involved is summarized in Table 19.

Session	Sampling Date
1	March 11, 1998
2	September 23, 1998
3	November 17, 1998

**Table 5 Sampling dates for quarterly GAC bench-scale treatment study sessions**

Sample date	TOC concentration (mg/L)	
	Raw	Settled
March	5.5	3.3
September	4.6*	3.1 <sup>†</sup>
November	3.5*	2.9 <sup>†</sup>

NA: not analyzed

\*Raw water sampled on day of treatment study influent sampling

<sup>†</sup>Superpulsator effluent

**Table 6 Summary of sample representativeness data**

Session	Settled water TOC concentration (mg/L)		Percent change (%)	Cartridge filtered water TOC concentration (mg/L)
	On day of sampling	Upon arrival at S&H		
March	3.9	3.8	-2.6	3.5
September	3.2	3.1	-3.1	3.0
November	2.9	2.8	-3.4	2.8

**Table 7 Summary of TOC sampling before and after water shipment**

Unit Process	Process Description
Rapid Mix (Full-Scale)	Type of Mixer: Static Baffling Type: Superior (Serpentine) Liquid Volume (gal): 663 Short Circuiting Factor: $NA_v$ Mean Velocity Gradient ( $\text{sec}^{-1}$ ): 900  Coagulant Addition: Aluminum sulfate (alum) + Polymer Measurement Formula: $AL_2(SO_4)_3 \cdot 14H_2O$ + Polymer Coagulant Dose (mg/L): 60
Flocculation (Full-Scale)	Type of Mixer: Mechanical Liquid Volume (gal): 1,000,600 Short Circuiting Factor: $NA_v$ Baffling Type: Average  Stage Sequence Number: 1 Stage Mean Velocity Gradient ( $\text{sec}^{-1}$ ): 75 Stage Liquid Volume (gal): 1,000,600
Cartridge Filtration (Bench-Scale)	Surface Area ( $\text{ft}^2$ ): 5.0 Nominal Pore Size ( $\mu\text{m}$ ): 1.0 Filter Material: Glass fiber Filter Life (gallons of processed water): 150- 200

$NA_v$ : Not available

**Table 8 Summary of design data for each pretreatment process prior to GAC during the March Session**

Unit Process	Process Description
Rapid Mix #1 (Full-Scale)	Type of Mixer: Mechanical Baffling Type: Average Liquid Volume (gal): 22,000 Short Circuiting Factor: $NA_v$ Mean Velocity Gradient ( $\text{sec}^{-1}$ ): 800 Coagulant Addition: Aluminum sulfate (alum) + Polymer Measurement Formula: $AL_2(SO_4)_3 \cdot 14H_2O$ + Polymer Coagulant Dose (mg/L): 75
Rapid Mix #2 (Full-Scale)	Type of Mixer: Mechanical Baffling Type: Average Liquid Volume (gal): 17,600 Short Circuiting Factor: $NA_v$ Mean Velocity Gradient ( $\text{sec}^{-1}$ ): 265 Coagulant Addition: Organic polymer - coagulant aid Measurement Formula: Poly Acrylamide, 7% Coagulant Dose (mg/L): 0.9
Solids Contact Clarifier (Superpulsator) (Full-Scale)	Clarifier Type: Sludge Blanket Clarifier Type: Upflow Clarifier Brand Name: INFILCO DEGREMONT Surface Area ( $\text{ft}^2$ ): 3,614 Liquid Volume (gal): 432,524 Short Circuiting Factor: $NA_v$ Baffling Type: Average Filter Aid Addition: Organic Polymer Measurement Formula: Poly Acrylamide, 30% Dose (mg/L): 0.05
Cartridge Filtration (Bench-Scale)	Surface Area ( $\text{ft}^2$ ): 5.0 Nominal Pore Size ( $\mu\text{m}$ ): 1.0 Filter Material: Glass fiber Filter Life (gallons of processed water): 150- 200
pH Adjustment (Bench-Scale, Influent pH Study)	Chemical Type: Sulfuric Acid Adjusted pH: 6.5 Dose Rate (mg/L):
pH Adjustment (Bench-Scale, Influent pH Study)	Chemical Type: Sodium Hydroxide Adjusted pH: 7.5 Dose Rate (mg/L):

**Table 9 Summary of design data for each pretreatment process prior to GAC during the September and November sessions**

Design parameter	Design value during session			
	1 March	2 September	3 November	4 November (Influent pH study)
GAC manufacturer	Reac/virgin blend	Reac/virgin blend	Reac/virgin blend	Reac/virgin blend
GAC brand name	F-300/TC-30	F-300/TC-30	F-300/TC-30	F-300/TC-30
GAC type	Bituminous	Bituminous	Bituminous	Bituminous
GAC mesh size	'5% 8x25 / 25% 8x3'	'5% 8x25 / 25% 8x3'	'5% 8x25 / 25% 8x3'	'5% 8x25 / 25% 8x3'
Average particle diameter, $d_{LC}$ (mm)	1.521	1.521	1.521	1.521
<b>General design parameters</b>				
Minimum Reynold's number, $Re_{SC, min}$ (-)	0.31	0.59	0.33	0.33
Full-scale operating temperature ( $^{\circ}C$ )	3	24	7	7
Kinematic viscosity, $\nu_{LC}$ ( $m^2/s$ )	1.62E-06	9.14E-07	1.43E-06	1.43E-06
Bed porosity, $\epsilon_{LC}$ (-)	0.45	0.45	0.45	0.45
Measured dry bed density, $\rho_{SC}$ ( $g/cm^3$ )	0.476	0.470	0.482	0.482
<b>RSSCT design parameters</b>				
RSSCT mesh size	100x200	100x200	100x200	100x200
Particle diameter, $d_{SC}$ (mm)	0.113	0.113	0.113	0.113
Scaling factor, SF	13.52	13.52	13.52	13.52
Hydraulic loading rate, $\nu_{SC}$ (m/hr)	7.22	7.76	6.79	6.79
Column diameter, $D_{SC}$ (mm)	11.0	10.0	10.0	10.0
Flow rate, $Q_{SC}$ (mL/min)	11.4	10.2	8.9	8.9
<b>Estimated run length</b>				
RSSCT Influent TOC concentration (mg/L)	3.5	3.0	2.8	2.8
Bed volumes to 50% TOC breakthrough, $B'$	4306	5202	5825	5825
Estimated total run time, $BV_T$	15070	18208	20389	20389
<b>RSSCT 1</b>				
Full-scale empty-bed contact time, $EBCT_{LC}$	10	10	10	10
Estimated full-scale run time, $t_{LC}^T$ (days)	105	126	142	142
Estimated RSSCT run time, $t_{SC}^T$ (days)	7.7	9.4	10.5	10.5
Volume water required, $V_{SC}$ (L)	127	137	134	134
Mass GAC required, $m_{SC}$ (g)	4.03	3.53	3.17	3.17
RSSCT empty-bed contact time, $EBCT_{SC}$ (r	0.74	0.74	0.74	0.74
Bed length, $l_{SC}$ (cm)	8.9	9.6	8.4	8.4
<b>RSSCT 2</b>				
Full-scale empty-bed contact time, $EBCT_{LC}$	20	20	20	10
Estimated full-scale run time, $t_{LC}^T$ (days)	209	253	283	142
Estimated RSSCT run time, $t_{SC}^T$ (days)	15.5	18.7	20.9	10.5
Volume water required, $V_{SC}$ (L)	255	274	268	134
Mass GAC required, $m_{SC}$ (g)	8.06	7.06	6.34	3.17
RSSCT empty-bed contact time, $EBCT_{SC}$ (r	1.48	1.48	1.48	0.74
Bed length, $l_{SC}$ (cm)	17.8	19.1	16.7	8.4

**Table 10 Summary of RSSCT design parameters**

Season	Month	Pretreatment	GAC type	EBCT (min)
Winter/Spring	March	Polyaluminum sulfate coagulation	Bituminous	10, 20
Summer	September	Polyaluminum sulfate coagulation and upflow clarification	Bituminous	10, 20
Fall	November	Polyaluminum sulfate coagulation and upflow clarification	Bituminous	10, 20
Fall	November	Polyaluminum sulfate coagulation, upflow clarification, and pH adjustment to 6.5 to simulate impact of use of ferric chloride	Bituminous	10
Fall	November	Polyaluminum sulfate coagulation, upflow clarification, and pH adjustment to 7.5 to simulate impact of use of polyaluminum chloride	Bituminous	10

**Table 11 Experimental design summary**

Session	10 minute EBCT			20 minute EBCT		
	Run termination criteria	Run time (days)	Percent TOC breakthrough	Run termination criteria	Run time (days)	Percent TOC breakthrough
March	1	90	74	1	228	72
September	1	74	73	1	173	72
November	1	96	76	1	229	75
November (influent pH 6.5)	1	91	75			
November (influent pH 7.5)	1	80	73			

\* 1: the effluent TOC concentration reaches at least 70 percent of the average influent TOC concentration

2: the effluent TOC concentration reaches a plateau at greater than 50 percent of the influent TOC concentration (a plateau is defined as an increase in TOC concentration of no more than 10 percent over a two-month full-scale equivalent time period)

3: the RSSCT has been operated for the full-scale equivalent of one year

**Table 12 Summary of RSSCT run termination criteria, run time, and percent TOC breakthrough reached**

Parameter	Session 1 March		Session 2 September		November		Session 3 November-inf pH study	
	Value	Tolerance	Value	Tolerance	Value	Tolerance	Value	Tolerance
Incubation time (hours)	3.0	0.3	24.0	1.0	24.0	1.0	24.0	1.0
Incubation temperature (°C)	5.3	2.0	20.0	2.0	7.0	2.0	7.0	2.0
pH	7.35	0.15	7.35	0.15	7.35	0.15	7.35	0.15
Free chlorine residual (mg/L)	0.75	0.25	0.75	0.25	0.75	0.25	0.75	0.25

**Table 13 Simulated distribution system (SDS) chlorination target conditions**

Parameter	Session 1 March		Session 2 September		November		Session 3 November-inf pH study	
	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation
Incubation time (hours)	3.1	0.0	24.1	0.2	24.2	0.3	24.0	0.1
Incubation temperature (°C)	5.6	1.2	19.9	0.1	7.7	0.3	7.5	0.0
pH	7.29	0.05	7.33	0.03	7.30	0.02	7.32	0.08
Free chlorine residual (mg/L)	0.75	0.15	0.81	0.08	0.89	0.22	0.94	0.34

\*pH is average of analysis at beginning and end of incubation period for each sample.

**Table 14 Summary of experimental SDS chlorination conditions for GAC influent water**



Parameter	Session 1 March		Session 2 September		November - inf pH 7.0		Session 3 November - inf pH 6.5		November - inf pH 7.5	
	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation
Incubation time (hours)	3.2	0.2	23.9	0.1	24.2	0.2	23.9	0.3	23.8	0.1
Incubation temperature (°C)	6.7	0.5	19.9	0.1	7.5	0.3	7.4	0.1	7.4	0.1
pH	7.35	0.03	7.44	0.03	7.38	0.03	7.31	0.02	7.37	0.03
Free chlorine residual (mg/L)	0.77	0.06	0.86	0.10	0.88	0.17	0.53	0.21	0.49	0.30

\*pH is average of analysis at beginning and end of incubation period for each sample.

**Table 15 Summary of experimental SDS chlorination conditions for 10 minute EBCT contactors**

Parameter	Session 1 March		Session 2 September		Session 3 November	
	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation
Incubation time (hours)	3.2	0.1	24.0	0.3	24.1	0.1
Incubation temperature (°C)	6.0	0.8	20.0	0.1	7.6	0.3
pH	7.36	0.03	7.40	0.03	7.37	0.03
Free chlorine residual (mg/L)	0.78	0.10	0.86	0.11	0.89	0.11

\*pH is average of analysis at beginning and end of incubation period for each sample.

**Table 16 Summary of experimental SDS chlorination conditions for 20 minute EBCT contactors**

Analyte	Session	Method	Minimum reporting level (MRL)
Alkalinity	All	SM 2320 B	5 mg/L as CaCO <sub>3</sub>
Ammonia-Nitrogen	All	EPA 350.1	0.05 mg/L as NH <sub>3</sub> -N
Bromide	All	EPA 300.0 A	0.02 mg/L
Calcium hardness	1	SM 3500-Ca D	10 mg/L as CaCO <sub>3</sub>
Calcium hardness	2-3	EPA 200.7	5 mg/L as CaCO <sub>3</sub>
Chlorine dose (solution standardization)	All	SM 4500-Cl B	NA
Chlorine residual	All	SM 4500-Cl F	0.2 mg/L as Cl <sub>2</sub>
HAA (DCAA, TCAA, MBAA, DBAA, BCAA, BDCAA)	All	EPA 552.2	1.0 µg/L (each analyte)
HAA (MCAA, CDBAA)	All	EPA 552.2	2.0 µg/L (each analyte)
HAA (TBAA)	All	EPA 552.2	4.0 µg/L
pH	All	4500-H <sup>+</sup> B	NA
Temperature	All	SM 2550 B	NA
Total hardness	1	SM 2340 C	5 mg/L as CaCO <sub>3</sub>
Total hardness	2-3	SM 2340 B	5 mg/L as CaCO <sub>3</sub>
Total organic carbon (TOC)	All	SM 5310 C	0.50 mg/L
Total organic halide (TOX)	All	SM 5320 B	25 µg/L as Cl <sup>-</sup>
THM (CHCl <sub>3</sub> , BDCM, DBCM, CHBr <sub>3</sub> )	All	EPA 551.1	1.0 µg/L (each analyte)
Turbidity	All	SM 2130 B	0.05 ntu
UV absorbance at 254 nm (UV <sub>254</sub> )	All	SM 5910 B	0.009 cm <sup>-1</sup>

SM: *Standard Methods*

NA: Not applicable

**Table 17 Summary of analytical methods and MRLs**

Analyses performed	Sessions of service	Laboratory
Alkalinity, chlorine dose, chlorine residual, HAA9, pH, temperature, THM4, TOC, TOX, turbidity, UV <sub>254</sub>	All	Summers & Hooper, Inc.
Calcium hardness, total hardness	1	Summers & Hooper, Inc.
Ammonia, bromide	All	Montgomery Watson Laboratories
Calcium hardness, total hardness	2-3	Montgomery Watson Laboratories

**Table 18 Summary of laboratories conducting analyses**

	Summers & Hooper, Inc.	Montgomery Watson Laboratories
ICR lab ID number	ICROH033	ICRCA013
Contact name:	Stuart Hooper	Andrew Eaton
Contact phone number	(513) 679-2200	(626) 568-6400
Contact fax number	(513) 679-2201	(626) 568-6324

**Table 19 Laboratory contact information**

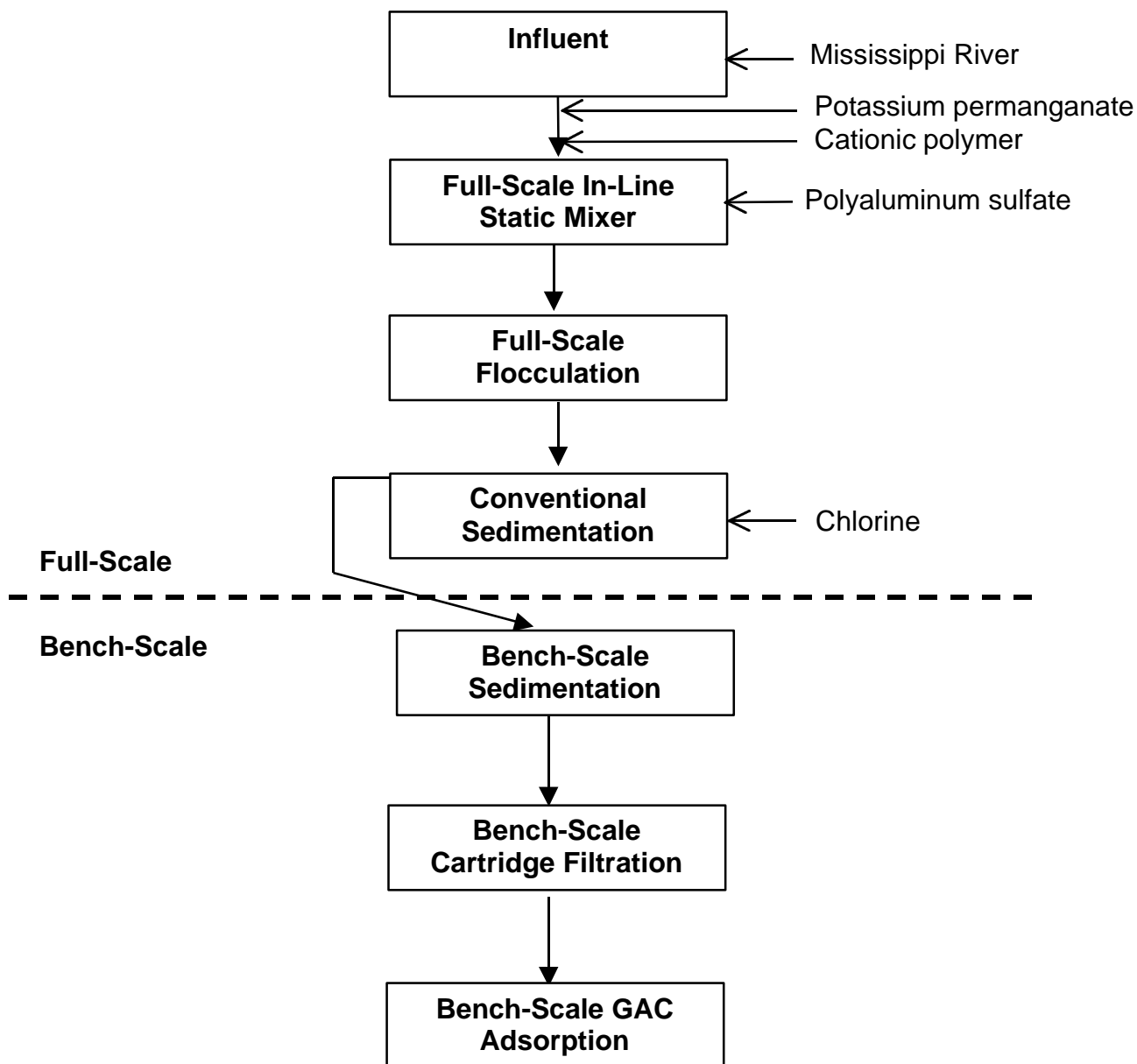
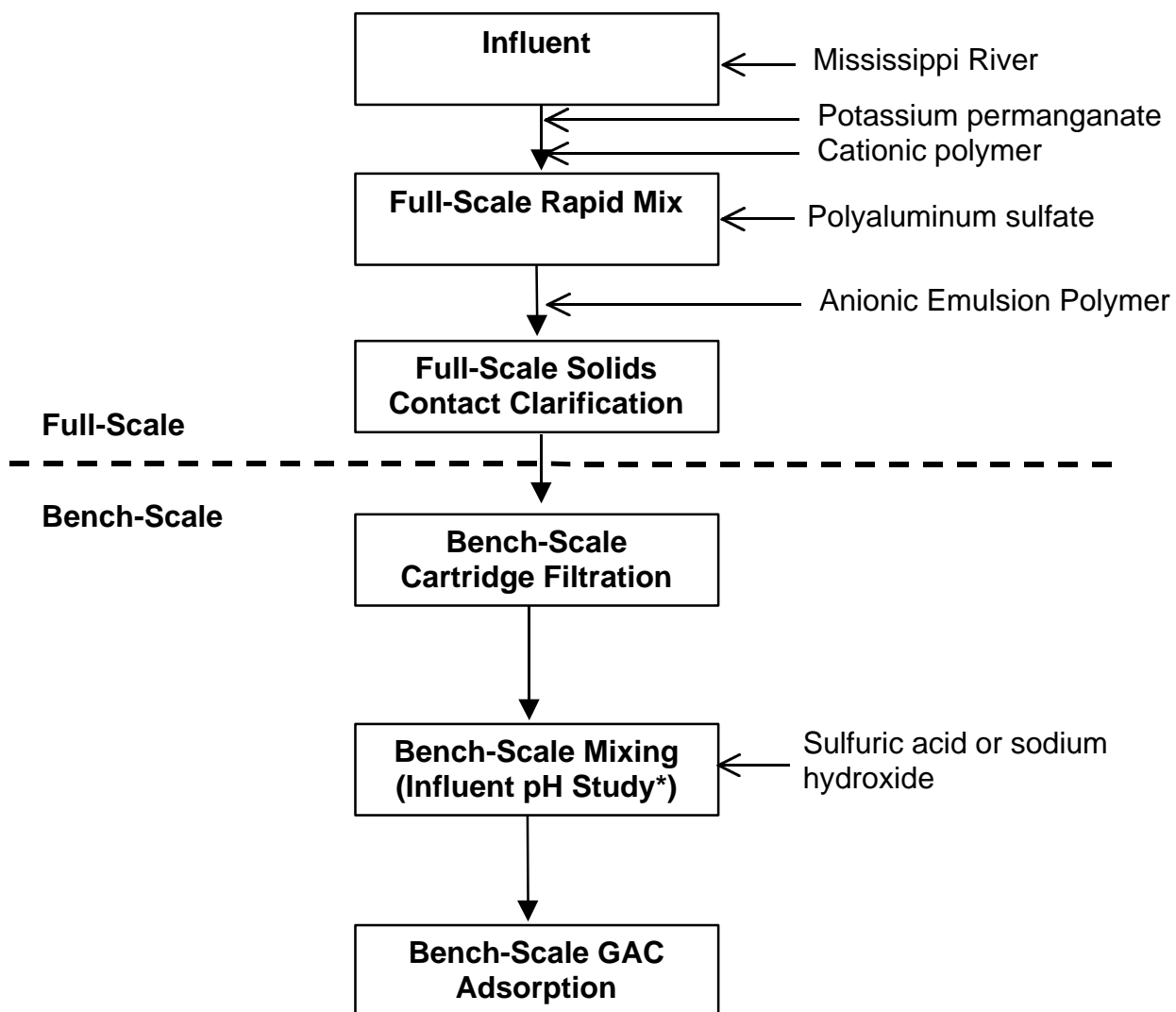
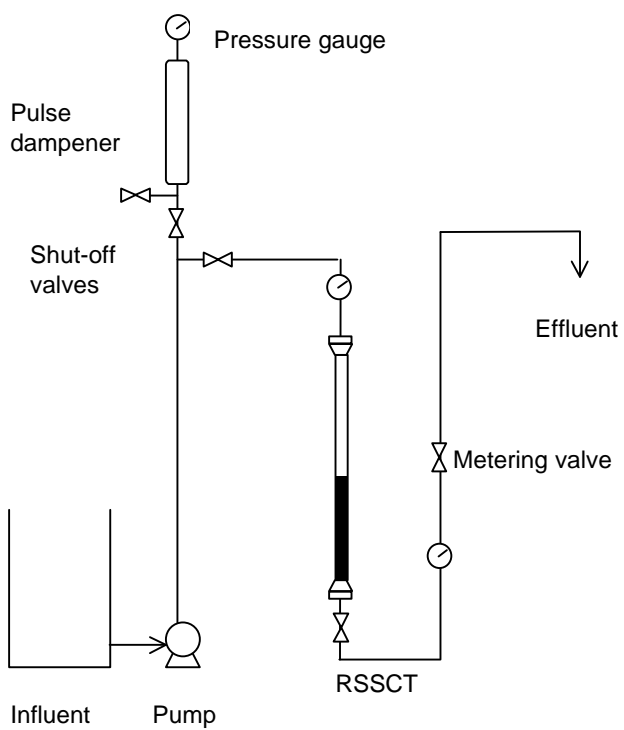


Figure 3 Schematic of pretreatment processes prior to bench-scale GAC during the March session

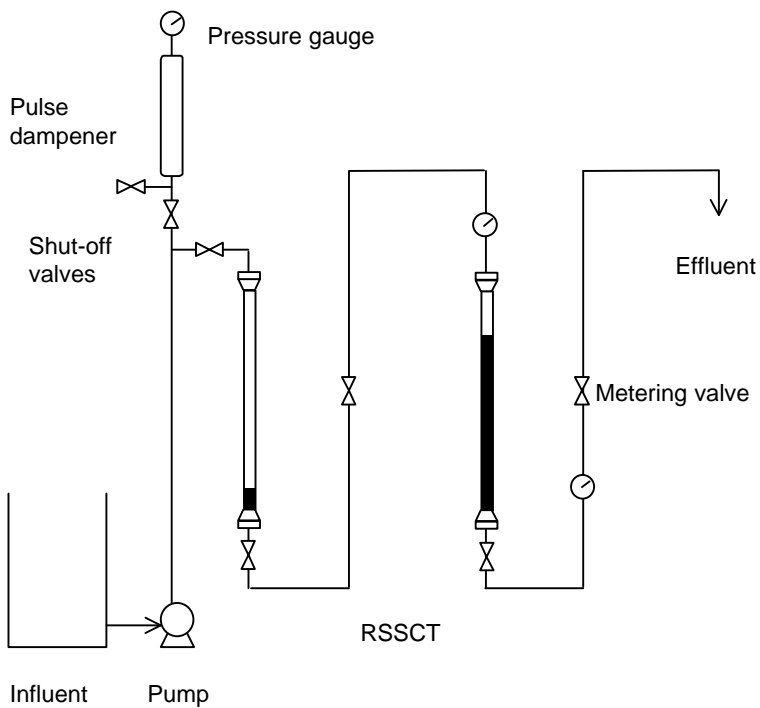


\*Performed during the November session

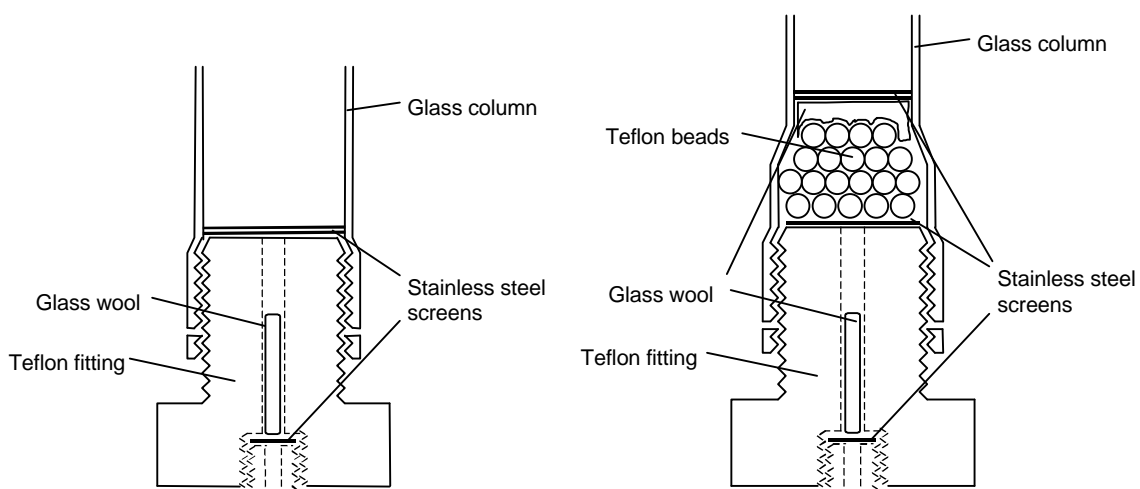
**Figure 4 Schematic of pretreatment processes prior to bench-scale GAC during the September and November sessions**



**Figure 5 RSSCT system schematic for 10 minute EBCT full-scale equivalent contactors**



**Figure 6** RSSCT system schematic for 20 minute EBCT full-scale equivalent contactor



(a) Standard 11.0 mm inner diameter column

(b) 10.0 mm inner diameter column

**Figure 7** RSSCT column GAC support system

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# 7

## *Results and Discussion Overview*



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## **7 Results and Discussion Overview**

### **7.1 Data Analysis**

A significant amount of data was collected during the treatment study. The following chapters summarize various methods of analyzing the data. These include a discussion of the impact of seasonal variability in water quality and contactor EBCT on DBP precursor control. During the November session, three 10 minute EBCT contactors were operated at influent pH values of 6.5, 7.0, and 7.5. The impact of influent pH on DBP precursor control is discussed. Although data for single contactor operation was generated by this treatment study, in practice, multiple GAC contactors in parallel are used, and GAC run times are lengthened significantly by operating the contactors in a staggered mode. GAC run times are estimated based on a model that simulates the operation of multiple GAC contactors in parallel. Breakthrough curve extrapolations were performed: the algorithm used and the results obtained are presented. The extent to which TOC and UV<sub>254</sub> breakthrough served as indicators for DBP precursor breakthrough is analyzed. An evaluation of GAC performance based on TOC breakthrough and compared to other waters is presented. Finally, an EPA cost model is used to estimate the costs for GAC treatment based meeting the placeholders for Stage 2 DBP MCLs.

### **7.2 Problems Encountered**

Under normal plant operation, chlorine is added midway through the sedimentation basin of Train #1. Since this chlorine feed could not be shut off for sampling plant settled water during the first session (March), water was sampled as it entered the sedimentation basin. A chlorine residual check of this water showed that no residual chlorine was present. The water was then allowed to settle for 2 hours in 55-gallon drums, after which the supernatant was pumped into 55-gallon drums for shipping. TOC samples taken before and after drum settling did not show a decrease in TOC concentration after drum sedimentation, and little settled floc was visible. It is possible that the pump action sheared the original floc, resulting in a suspended fine floc. It was decided not to include the drum settling step during future sampling events.

For SDS chlorination, during the first session, a 3-hour holding time was targeted. During subsequent sessions, the holding time was reevaluated, and a 24 hour hold time was implemented. Comparisons between DBP formation during the first session with that of the remaining sessions should be made in light of this difference in chlorination holding time. Furthermore, the 24 hour hold time is closer to a measure of the maximum residence time in the distribution system, while the 3-hour hold time, although very short, is an approximation of the average residence time in the distribution system.

During the second sampling session, a chlorine residual was initially detected at the treatment study sampling point. However, adjusting the point of sampling yielded drum samples with no detectable free chlorine residual. On arrival at S&H's laboratory, a sample of the water was analyzed for THMs (without chlorination), yielding a THM4 concentration of 25 µg/L. Although no free chlorine residual was detected, the water sample may have already been

exposed to chlorine, possibly due to short circuiting in the sedimentation basin. It was not determined how the sample became exposed to chlorine or whether the first sample taken in March was also exposed. Due to this problem, the treatment study sampling point was changed and water was sampled from the superpulsator effluent. Analysis of this water sampled yielded no detectable concentrations of THMs or HAAs. During the third and last sampling session, in November, the superpulsator effluent was again sampled.

### 7.3 Pretreated Influent Water Quality Data

The average pretreated influent to GAC water quality for each sample is summarized in Table 20. During the March session, the water was pretreated by full-scale coagulation, bench-scale sedimentation, and bench-scale cartridge filtration. During the September and November sessions, the water was pretreated by full-scale upflow solids contact clarification, and bench-scale cartridge filtration. For the influent pH study, the pH of the water after cartridge filtration was adjusted to the target pH. TOC and UV<sub>254</sub> showed little variability over the three sampling events. TOC treated TOC concentration ranged from 2.8 to 3.3 mg/L, and the mean TOC concentration for all four sampling events was  $3.0 \pm 0.2$  mg/L (relative standard deviation [RSD] = 8%). The mean UV<sub>254</sub> for the four treated waters was  $0.061 \pm 0.003$  cm<sup>-1</sup> (RSD = 5%). The mean influent pH ranged from 7.1 to 7.2. Alkalinity averaged 124 mg/L as CaCO<sub>3</sub> (RSD = 13%); calcium hardness averaged 132 mg/L as CaCO<sub>3</sub> (RSD = 9%); total hardness averaged 202 mg/L as CaCO<sub>3</sub> (RSD = 12%). Ammonia levels ranged from 0.030 to 0.155 mg/L. Bromide concentrations were relatively low, ranging from BMRL to 34 µg/L. The specific UV absorbance (TSUVA), defined as UV<sub>254</sub>/TOC, averaged 2.0 L/mg-m (RSD = 9.7%).

Seasonal variability in treated water SDS-DBP formation was relatively high. Examining the two sessions in which a 24-hour SDS incubation time was used (September and November), variability in SDS-DBP formation was highest for THM4 formation. SDS-THM4 concentrations averaged 53 µg/L and ranged from 39 to 67 µg/L (relative percent difference [RPD] = 53%); SDS-HAA5, SDS-HAA6, and SDS-HAA9 levels averaged 43, 47, and 53 µg/L, respectively. The SDS-HAA RPDs averaged 34 percent. SDS-TOX levels averaged 247 µg/L as Cl<sup>-</sup> and ranged from 207 to 288, with a RPD of 33 percent. SDS chlorine demand (CLD) averaged 3.1 mg/L (RPD = 52%). SDS-DBPs formed during the March session were lower due to the short incubation time (3 hours) and low SDS incubation temperature (5.3°C).

Water Quality Parameter	Session 1 March		Session 2 September		Session 3 November		Influent pH Study--November			
	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation	Influent pH 6.5		Influent pH 7.5	
							Mean	Standard deviation	Mean	Standard deviation
Temperature (°C)	18	2	18	1	18	1	19	1	20	1
pH	7.09	0.03	7.19	0.04	7.05	0.10	6.54	0.10	7.56	0.05
Turbidity (ntu)	0.10	0.00	0.12	0.03	0.20	0.05	0.18	0.04	0.13	0.04
Alkalinity (mg/L as CaCO <sub>3</sub> )	106	0	127	9	139	17	87	23	161	4
Calcium hardness (mg/L as CaCO <sub>3</sub> )	143	1	120	4	133	4	132	8	135	5
Total hardness (mg/L as CaCO <sub>3</sub> )	174	0	211	9	221	7	216	11	221	5
Ammonia (mg/L)	0.130	0.000	0.155	0.021	0.030	0.042	BMRL	NA	BMRL	NA
Bromide (mg/L)	BMRL	NA	0.029	0.001	0.034	0.001	0.032	0.001	0.031	0.000
TOC (mg/L)	3.28	0.11	2.98	0.02	2.80	0.06	2.78	0.04	2.80	0.01
UV <sub>254</sub> (1/cm)	0.060	NA	0.065	0.001	0.060	0.000	0.060	0.000	0.059	0.000
Specific UV absorbance, SUVA (L/mg-m)	1.8	--	2.2	--	2.1	--	2.2	--	2.1	--
SDS-THM4 (µg/L)	20	2	67	3	39	3	36	1	24	21
SDS-HAA5 (µg/L)	16	2	51	5	35	4	30	2	34	6
SDS-HAA6 (µg/L)	17	2	55	6	39	4	33	2	37	6
SDS-HAA9 (µg/L)	19	3	61	7	45	6	38	2	43	7
SDS-TOX (µg Cl <sup>-</sup> /L)	176	4	288	1	207	6	213	11	207	6
SDS-chlorine demand (mg/L)	2.0	0.1	3.9	0.0	2.3	0.1	2.3	0.1	2.5	0.1

BMRL: below minimum reporting level

NA: not applicable

**Table 20 Summary of GAC influent water quality**

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# 8

## *Impact of Seasonal Variability*

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## 8 Impact of Seasonal Variability

During each three seasonal sessions, both 10 minute and 20 minute full-scale equivalent EBCTs were evaluated using RSSCTs. Table 5 lists the sampling date for each session.

Figure 8 shows the RSSCT effluent TOC breakthrough profiles for the 10 minute EBCT contactors during each of the three seasonal session. The March and September runs showed very similar break patterns, with mean influent TOC concentrations of 3.3 and 3.0 mg/L, respectively. With a mean influent TOC concentration of 2.8 mg/L, the November run TOC breakthrough profile shifted to the right. Run times to an effluent TOC concentration of 2.0 mg/L ranged from 53 to 84 days for the 10 minute EBCT contactors. Run times to 70 percent TOC breakthrough ranged from 68 to 81 days. Similar breakthrough patterns were observed for effluent UV<sub>254</sub> breakthrough profiles, shown in Figure 9.

The GAC effluent breakthrough profiles for SDS-DBPs are plotted in Figures 10 through 14. Influent SDS-THM4 levels were highest during the September session, which utilized the highest SDS incubation temperature (20°C) and longest incubation time (24 hours). The September session also yielded the earliest breakthrough and highest GAC effluent levels of SDS-THM4. The SDS-THM4 breakthrough profile for September was followed by that for November and then March. The March session utilized the lowest incubation temperature (5.3°C), and also used an incubation time of 3 hours, which was increased to 24 hours for the September and November sessions. Figures 11 through 13 show the breakthrough curves for 10 minute EBCT contactors for SDS-HAA5, SDS-HAA6, and SDS-HAA9. Like SDS-THM4, effluent SDS-HAA levels were highest during the September session, which had the highest influent SDS-HAA concentration. The breakthrough profiles for SDS-HAA during the March and November sessions were similar towards the end of the runs, although the March session showed higher levels of breakthrough earlier in the run. The breakthrough behavior of SDS-TOX was similar to that of SDS-HAA. The March and November sessions were also very similar, while earlier higher breakthrough levels were reached during the September session, which also had the highest SDS-TOX influent concentration (Figure 14).

The GAC effluent SDS-CLD, Figure 15, displayed a relatively high immediate breakthrough, which ranged from 0.9 to 1.7 mg/L as Cl<sub>2</sub>. The immediate breakthrough was likely caused by inorganic chlorine demand, which is not adsorbable. Effluent SDS-CLD increased over time, as organic chlorine demand increased due to TOC breakthrough.

The RSSCT effluent TOC breakthrough profiles for the 20 minute EBCT contactors are shown in Figure 16. Run times to an effluent TOC concentration of 1.0 mg/L ranged from 133 to 204 days. Run times to 70 percent TOC breakthrough ranged from 166 to 204 days. As expected, these run times are longer than those observed for the 10 minute EBCT contactor results due to the longer EBCT. The relative order of breakthrough was the same as that observed for the 10 minute EBCT contactors. Results for UV<sub>254</sub> breakthrough are shown in Figure 17. The GAC effluent breakthrough profiles for SDS-DBP formation are plotted in Figures 18 through 22. In general, the breakthrough trends for SDS-DBPs described for the 10 minute EBCT contactor were also evident in the 20 minute EBCT contactor breakthrough profiles. Figure 23 shows the measured GAC effluent SDS chlorine demand.

The effluent pH and temperature for each EBCT during each session were also monitored, and the results, summarized in Tables 21 and 22, were fairly consistent with a RSD ranging from 1 to 6 percent.

Table 23 summarizes run times to various GAC effluent criteria for the 10 minute EBCT contactors. The mean, standard deviation, and RSD of the run times for the three sessions are also tabulated, along with the length of each study. For the 20 minute EBCT contactors, a summary of the same information is given in Table 24. The THM and HAA run time criteria chosen are based on Stage 1 and the placeholder for Stage 2 MCLs, with a 20 percent safety factor. The TOC, UV<sub>254</sub>, and TOX breakthrough criteria were chosen to represent a range of concentrations. A relative performance criteria, 50 percent breakthrough,  $c/c_0$ , was also chosen for TOC and UV<sub>254</sub>. The calculated RSD provides a measure of the degree of seasonal variability evident in GAC performance. For example, the run time to a GAC effluent TOC concentration of 1.0 mg/L for 10 minute EBCT contactors ranged from 28 to 34 days, with a RSD of 12 percent.

For a visual comparison of the impact of seasonal variability on GAC run times, bar graph plots of the data were generated. For a 10 minute EBCT, Figures 24 and 25 summarize run times to effluent TOC and UV<sub>254</sub> criteria, and Figures 26 and 27 summarize run times to effluent SDS-THM4 and SDS-HAA5 criteria. For cases where the effluent concentration did not reach the run time criterion, no bar is shown. Bar graph GAC run time summaries are shown in Figures 28 through 31 for the 20 minute EBCT contactors.

Based on the calculated run times for all four quarters and both EBCTs, the corresponding concentration of other measured parameters (DBP precursor surrogates and SDS-DBPs) at that run time were also calculated. For each session and EBCT, these data are summarized in Tables 25 through 30. For example, Table 25 shows that when a TOC concentration of 2.0 was exceeded, the Stage 1 MCL for THM4 (with a 20 percent safety factor) was 9 µg/L, the SDS-HAA5 concentration was 15 µg/L, and the SDS-TOX concentration was 81 µg Cl<sup>-</sup>/L.

It is important to track the breakthrough behavior of specific DBP species, because some may be of potential health concern and a MCL could be set for a specific DBP constituent. GAC does not remove bromide and this can result in relatively high bromide to TOC ratios in the GAC effluent. Because of the high bromide to TOC ratios, GAC effluent SDS-DBPs may undergo shifts in speciation to more brominated DBP species. In some cases, effluent concentration are measured higher than influent levels.

For both the 10 and 20 minute EBCT contactors and all sessions, Figures 32, 33, 34 and 35 show the breakthrough behavior of formed chloroform (CHCl<sub>3</sub>), bromodichloromethane (BDCM), dibromochloromethane (DBCM), and bromoform (CHBr<sub>3</sub>), respectively. Overall, the greatest contributing species to GAC influent SDS-THM4 was SDS-CHCl<sub>3</sub>, while SDS-CHBr<sub>3</sub> was not detected above the MRL (1 µg/L) in the influent or effluent to GAC, which can be attributed to the low bromide levels measured in the water. GAC effluent levels of SDS-CHCl<sub>3</sub> for all runs reached about 60 percent of the GAC influent formed concentration. Effluent SDS-BDCM exceeded the formed influent concentrations due to the higher bromide to TOC ratio in the GAC effluent. After the initial breakthrough, the curves for SDS-BDCM quickly reached a peak and then remained level or decreased slightly, as the effluent bromide to TOC ratio decreased.

Effluent SDS-DBCM typically reached 70 to 80 percent of formed influent concentrations. The MRL for each analyte is indicated on each plot as a dashed line.

All nine HAA species were analyzed during the study. Plots of the effluent formed breakthrough profiles for the nine HAA species during all seasons and for both EBCTs are shown in Figures 36 through 44. The HAA species are monochloroacetic acid (MCAA), dichloroacetic acid (DCAA), trichloroacetic acid (TCAA), monobromoacetic acid (MBAA), dibromoacetic acid (DBAA), bromochloroacetic acid (BCAA), dichlorobromoacetic acid (DCBAA), chlorodibromoacetic acid (CDBAA), and tribromoacetic acid (TBAA). DCAA, TCAA, BCAA, and DCBAA were formed at significant concentrations in the GAC effluent. Effluent formed levels of DCAA and TCAA usually reached about 50 to 60 percent of formed influent levels. GAC effluent formed concentrations of the BCAA and DCBAA typically reached higher GAC effluent levels: 80 to 150 percent of GAC influent concentrations. Again, the relatively poor control of the brominated HAA species in the GAC effluent can be attributed to the increase in bromide to TOC ratio in the GAC effluent. The three species not included in the summation of SDS-HAA6 (DCBAA, CDBAA, and TBAA) accounted for about 10 percent of SDS-HAA9.

Effluent sample number	Effluent pH			Effluent temperature (°C)		
	March	September	November	March	September	November
1	7.4	7.9	8.0	22	21	25
2	7.7	7.9	7.7	23	22	23
3	7.7	7.9	7.7	21	22	24
4	7.7	7.6	7.7	22	21	23
5	7.8	7.8	7.7	23	22	23
6	7.7		7.6	23	22	23
7	7.7	7.9	7.7	21	22	24
8	7.7	7.9	7.8	22	22	23
9	7.7	7.9	7.7	21	22	24
10	7.7	7.8	7.9	22	22	24
11	7.7	7.9	7.7	22	22	23
12	7.6	7.9	7.8	21	22	25
13	7.9	7.8	7.8	22	21	23
Mean	7.7	7.8	7.8	22	22	24
Standard deviation	±0.1	±0.1	±0.1	±0.8	±0.4	±0.6
Relative percent error	1	1	1	4	2	3

**Table 21 GAC effluent pH and temperature data for 10 minute EBCT contactors**

Effluent sample number	Effluent pH			Effluent temperature (°C)		
	March	September	November	March	September	November
1	8.1	8.0	8.0	23	22	24
2	7.8	7.9	7.8	22	21	22
3	7.6	7.8	7.8	22	22	23
4	7.6	7.9	7.7	22	22	22
5	7.8	7.9	7.9	22	21	23
6	7.6	7.9	7.8	22	21	22
7	7.4	7.8	7.9	21	21	22
8	7.5	7.8	7.9	22	21	23
9	8.0	7.8	7.8	23	21	23
10	8.0	7.9	7.8	25	21	22
11	8.3	7.8	7.7	25	21	23
12	8.8	7.8	7.8	21	21	23
13	8.7	7.8	7.7	22	20	21
Mean	7.9	7.9	7.8	22	21	22
Standard deviation	±0.4	±0.1	±0.1	±1.3	±0.4	±0.7
Relative percent error	5	1	1	6	2	3

**Table 22 GAC effluent pH and temperature data for 20 minute EBCT contactors**



Parameter	Units	Value	Run time (days)			Mean	Standard deviation	Relative standard deviation (%)
			Session					
			1 March	2 September	3 November			
TOC	(mg/L)	2.0	53	61	84	66	±16	24%
		1.0	28	28	34	30	±4	12%
		c/c <sub>0</sub> = 50% <sup>†</sup>	41	38	42	40	±2	5%
UV-254	(1/cm)	0.040	*	87	*	87		
		0.020	39	40	44	41	±3	6%
		c/c <sub>0</sub> = 50% <sup>†</sup>	59	69	69	66	±6	9%
SDS-THM4	(µg/L)	80	*	*	*			
		64	*	*	*			
		32	*	51	*	>51		
SDS-HAA5	(µg/L)	48	*	*	*			
		24	*	72	*	>72		
SDS-HAA6	(µg/L)	48	*	*	*			
		24	*	62	*	>62		
SDS-HAA9	(µg/L)	48	*	*	*			
		24	*	52	86	69	±24	35%
SDS-TOX	(µg Cl <sup>-</sup> /L)	120	*	50	90	70	±28	41%
		70	44	33	47	41	±7	18%
Study length	(days)	--	90	74	96	87	±11	13%

<sup>†</sup>GAC effluent concentration equal to 50 percent of the average influent concentration.

\*Effluent concentration criteria not exceeded during GAC run time, calculated values are left blank.

**Table 23 Run times to selected GAC effluent criteria (10 minute EBCT)**

Parameter	Units	Value	Run time (days)			Mean	Standard deviation	Relative standard deviation (%)
			Session					
			1 March	2 September	3 November			
TOC	(mg/L)	2.0	133	155	204	164	±37	22%
		1.0	68	70	82	73	±7	10%
		c/c <sub>0</sub> = 50% <sup>†</sup>	106	100	117	108	±9	8%
UV-254	(1/cm)	0.040	*	*	*			
		0.020	97	106	124	109	±14	13%
		c/c <sub>0</sub> = 50% <sup>†</sup>	154	173	185	170	±16	9%
SDS-THM4	(µg/L)	80	*	*	*			
		64	*	*	*			
		32	*	132	*	>132		
SDS-HAA5	(µg/L)	48	*	*	*			
		24	*	143	*	>143		
SDS-HAA6	(µg/L)	48	*	*	*			
		24	*	119	*	>119		
SDS-HAA9	(µg/L)	48	*	*	*			
		24	*	113	*	>113		
SDS-TOX	(µg Cl <sup>-</sup> /L)	120	*	120	*	>120		
		70	124	83	147	118	±32	27%
Study length	(days)	--	228	188	229	215	±23	11%

<sup>†</sup>GAC effluent concentration equal to 50 percent of the average influent concentration.

\*Effluent concentration criteria not exceeded during GAC run time, calculated values are left blank.

**Table 24 Run times to selected GAC effluent criteria (20 minute EBCT)**

Parameter	Units	Influent concentration	Breakthrough criterion	Value of listed parameter when breakthrough criterion is met (single contactor)								
				Run time (days)	Throughput (bed volumes)	TOC (mg/L)	UV <sub>254</sub> (1/cm)	SDS-THM4 (µg/L)	SDS-HAA5 (µg/L)	SDS-HAA6 (µg/L)	SDS-HAA9 (µg/L)	SDS-TOX (µg Cl <sup>-</sup> /L)
TOC	(mg/L)	3.3	2.0	53	7,700	2.0	0.027	9	15	16	18	81
			1.0	28	4,050	1.0	0.010	2	7	8	8	30
			1.6†	41	5,840	1.6	0.021	7	11	12	13	61
UV <sub>254</sub>	(1/cm)	0.060	0.040	*	*							
			0.020	39	5,690	1.6	0.020	7	10	11	12	58
			0.030†	59	8,530	2.1	0.030	10	15	16	18	84
SDS-THM4	(µg/L)	20	80	*	*							
			64	*	*							
			32	*	*							
SDS-HAA5	(µg/L)	16	48	*	*							
			24	*	*							
SDS-HAA6	(µg/L)	17	48	*	*							
			24	*	*							
SDS-HAA9	(µg/L)	19	48	*	*							
			24	*	*							
SDS-TOX	(µg Cl <sup>-</sup> /L)	176	120	*	*							
			70	44	6,390	1.7	0.023	8	11	12	13	70

†GAC effluent concentration equal to 50 percent of the average influent concentration.

\*Effluent concentration criteria not exceeded during GAC run time, value of listed parameter is left blank.

#Data not available for listed parameter at given breakthrough criterion.

**Table 25 Run times to selected GAC effluent criteria (10 minute EBCT) during session 1, March**

Parameter	Units	Influent concentration	Breakthrough criterion	Value of listed parameter when breakthrough criterion is met (single contactor)								
				Run time (days)	Throughput (bed volumes)	TOC (mg/L)	UV <sub>254</sub> (1/cm)	SDS-THM4 (µg/L)	SDS-HAA5 (µg/L)	SDS-HAA6 (µg/L)	SDS-HAA9 (µg/L)	SDS-TOX (µg Cl <sup>-</sup> /L)
TOC	(mg/L)	3.3	2.0	133	9,560	2.0	0.029	9	8	8	9	77
			1.0	68	4,910	1.0	0.010	3	4	5	5	28
			1.6†	106	7,660	1.6	0.022	7	7	7	8	62
UV <sub>254</sub>	(1/cm)	0.060	0.040	*	*							
			0.020	97	6,980	1.5	0.020	6	6	6	6	63
			0.030†	154	11,050	2.1	0.030	11	8	8	9	82
SDS-THM4	(µg/L)	20	80	*	*							
			64	*	*							
			32	*	*							
SDS-HAA5	(µg/L)	16	48	*	*							
			24	*	*							
SDS-HAA6	(µg/L)	17	48	*	*							
			24	*	*							
SDS-HAA9	(µg/L)	19	48	*	*							
			24	*	*							
SDS-TOX	(µg Cl <sup>-</sup> /L)	176	120	*	*							
			70	124	8,930	1.9	0.026	8	8	8	9	70

†GAC effluent concentration equal to 50 percent of the average influent concentration.

\*Effluent concentration criteria not exceeded during GAC run time, value of listed parameter is left blank.

#Data not available for listed parameter at given breakthrough criterion.

**Table 26 Run times to selected GAC effluent criteria (20 minute EBCT) during session 1, March**

Parameter	Units	Influent concentration	Breakthrough criterion	Value of listed parameter when breakthrough criterion is met (single contactor)								
				Run time (days)	Throughput (bed volumes)	TOC (mg/L)	UV <sub>254</sub> (1/cm)	SDS-THM4 (µg/L)	SDS-HAA5 (µg/L)	SDS-HAA6 (µg/L)	SDS-HAA9 (µg/L)	SDS-TOX (µg Cl <sup>-</sup> /L)
TOC	(mg/L)	3.0	2.0	61	8,830	2.0	0.030	37	21	24	27	147
			1.0	28	4,020	1.0	0.011	14	8	10	12	50
			1.5†	38	5,480	1.5	0.019	24	14	17	19	94
UV <sub>254</sub>	(1/cm)	0.065	0.040	87	12,540	2.3	0.040	#	#	#	#	#
			0.020	40	5,830	1.5	0.020	26	15	18	20	101
			0.032†	69	9,970	2.1	0.032	40	23	27	30	157
SDS-THM4	(µg/L)	67	80	*	*							
			64	*	*							
			32	51	7,360	1.8	0.025	32	17	20	24	124
SDS-HAA5	(µg/L)	51	48	*	*							
			24	72	10,310	2.1	0.033	41	24	28	31	160
SDS-HAA6	(µg/L)	55	48	*	*							
			24	62	8,920	2.0	0.030	37	21	24	27	148
SDS-HAA9	(µg/L)	61	48	*	*							
			24	52	7,470	1.8	0.026	32	18	21	24	126
SDS-TOX	(µg Cl <sup>-</sup> /L)	288	120	50	7,140	1.7	0.025	31	17	20	23	120
			70	33	4,760	1.3	0.014	17	10	13	15	70

†GAC effluent concentration equal to 50 percent of the average influent concentration.

\*Effluent concentration criteria not exceeded during GAC run time, value of listed parameter is left blank.

#Data not available for listed parameter at given breakthrough criterion.

**Table 27 Run times to selected GAC effluent criteria (10 minute EBCT) during session 2, September**

Parameter	Units	Influent concentration	Breakthrough criterion	Value of listed parameter when breakthrough criterion is met (single contactor)								
				Run time (days)	Throughput (bed volumes)	TOC (mg/L)	UV <sub>254</sub> (1/cm)	SDS-THM4 (µg/L)	SDS-HAA5 (µg/L)	SDS-HAA6 (µg/L)	SDS-HAA9 (µg/L)	SDS-TOX (µg Cl <sup>-</sup> /L)
TOC	(mg/L)	3.0	2.0	155	11,160	2.0	0.030	36	27	30	35	146
			1.0	70	5,030	1.0	0.010	14	8	10	12	48
			1.5†	100	7,200	1.5	0.018	24	13	15	18	97
UV <sub>254</sub>	(1/cm)	0.065	0.040	*	*							
			0.020	106	7,650	1.6	0.020	27	13	16	19	107
			0.032†	173	12,420	2.1	0.032	39	31	35	40	155
SDS-THM4	(µg/L)	67	80	*	*							
			64	*	*							
			32	132	9,510	1.9	0.026	32	23	27	31	130
SDS-HAA5	(µg/L)	51	48	*	*							
			24	143	10,300	1.9	0.028	34	24	27	32	140
SDS-HAA6	(µg/L)	55	48	*	*							
			24	119	8,560	1.8	0.023	29	21	24	28	119
SDS-HAA9	(µg/L)	61	48	*	*							
			24	113	8,170	1.7	0.022	28	18	21	24	113
SDS-TOX	(µg Cl <sup>-</sup> /L)	288	120	120	8,670	1.8	0.023	30	22	25	29	120
			70	83	5,970	1.3	0.014	18	10	13	15	70

†GAC effluent concentration equal to 50 percent of the average influent concentration.

\*Effluent concentration criteria not exceeded during GAC run time, value of listed parameter is left blank.

#Data not available for listed parameter at given breakthrough criterion.

**Table 28 Run times to selected GAC effluent criteria (20 minute EBCT) during session 2, September**

Parameter	Units	Influent concentration	Breakthrough criterion	Value of listed parameter when breakthrough criterion is met (single contactor)								
				Run time (days)	Throughput (bed volumes)	TOC (mg/L)	UV <sub>254</sub> (1/cm)	SDS-THM4 (µg/L)	SDS-HAA5 (µg/L)	SDS-HAA6 (µg/L)	SDS-HAA9 (µg/L)	SDS-TOX (µg Cl <sup>-</sup> /L)
TOC	(mg/L)	2.8		84	12,130	2.0	0.034	25	16	20	23	113
			2.0	34	4,920	1.0	0.012	10	4	5	7	34
			1.4†	42	6,080	1.4	0.019	14	7	9	13	60
UV <sub>254</sub>	(1/cm)	0.060	0.040	*	*							
			0.020	44	6,400	1.4	0.020	15	8	10	14	65
			0.030†	69	9,900	1.8	0.030	23	15	19	24	104
SDS-THM4	(µg/L)	39	80	*	*							
			64	*	*							
			32	*	*							
SDS-HAA5	(µg/L)	35	48	*	*							
			24	*	*							
SDS-HAA6	(µg/L)	39	48	*	*							
			24	*	*							
SDS-HAA9	(µg/L)	45	48	*	*							
			24	86	12,380	2.0	0.035	25	17	20	24	115
SDS-TOX	(µg Cl <sup>-</sup> /L)	207	120	90	12,910	2.1	0.036	25	18	21	25	120
			70	47	6,700	1.5	0.021	16	9	11	14	70

†GAC effluent concentration equal to 50 percent of the average influent concentration.

\*Effluent concentration criteria not exceeded during GAC run time, value of listed parameter is left blank.

#Data not available for listed parameter at given breakthrough criterion.

**Table 29 Run times to selected GAC effluent criteria (10 minute EBCT) during session 3, November**

Parameter	Units	Influent concentration	Breakthrough criterion	Value of listed parameter when breakthrough criterion is met (single contactor)								
				Run time (days)	Throughput (bed volumes)	TOC (mg/L)	UV <sub>254</sub> (1/cm)	SDS-THM4 (µg/L)	SDS-HAA5 (µg/L)	SDS-HAA6 (µg/L)	SDS-HAA9 (µg/L)	SDS-TOX (µg Cl <sup>-</sup> /L)
TOC	(mg/L)	2.8	2.0	204	14,710	2.0	0.032	20	12	16	19	98
			1.0	82	5,890	1.0	0.013	9	3	5	7	37
			1.4†	117	8,440	1.4	0.019	14	7	10	13	57
UV <sub>254</sub>	(1/cm)	0.060	0.040	*	*							
			0.020	124	8,960	1.5	0.020	15	8	11	14	60
			0.030†	185	13,290	1.9	0.030	18	11	14	18	88
SDS-THM4	(µg/L)	39	80	*	*							
			64	*	*							
			32	*	*							
SDS-HAA5	(µg/L)	35	48	*	*							
			24	*	*							
SDS-HAA6	(µg/L)	39	48	*	*							
			24	*	*							
SDS-HAA9	(µg/L)	45	48	*	*							
			24	*	*							
SDS-TOX	(µg Cl <sup>-</sup> /L)	207	120	*	*							
			70	147	10,560	1.6	0.023	17	9	12	15	70

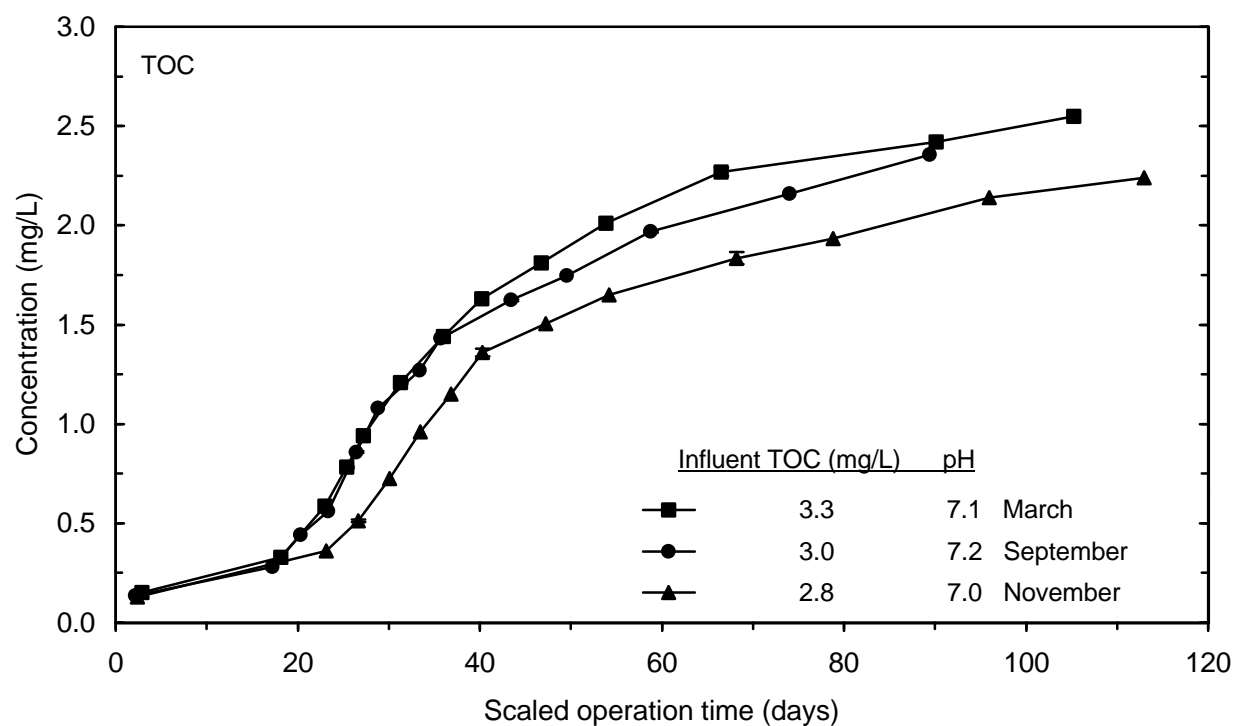
†GAC effluent concentration equal to 50 percent of the average influent concentration.

\*Effluent concentration criteria not exceeded during GAC run time, value of listed parameter is left blank.

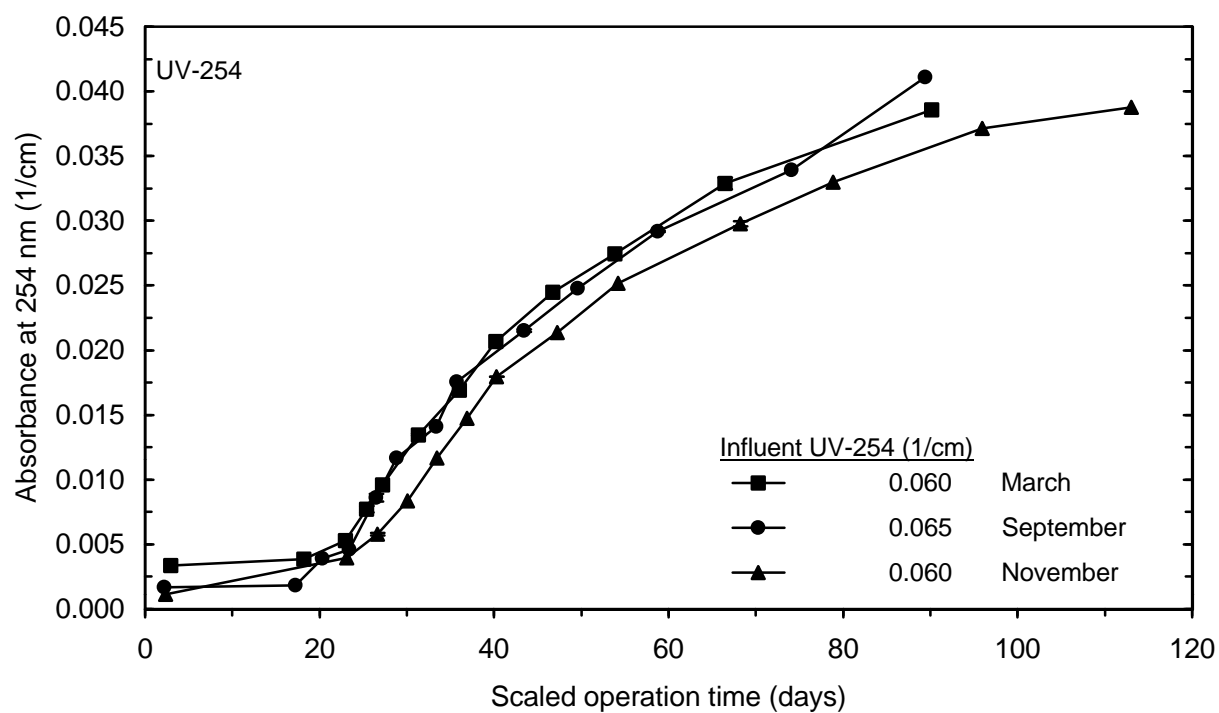
#Data not available for listed parameter at given breakthrough criterion.

**Table 30 Run times to selected GAC effluent criteria (20 minute EBCT) during session 3, November**





**Figure 8 TOC breakthrough for 10 minute EBCT contactors for each session**



**Figure 9 UV-254 breakthrough for 10 minute EBCT contactors for each session**

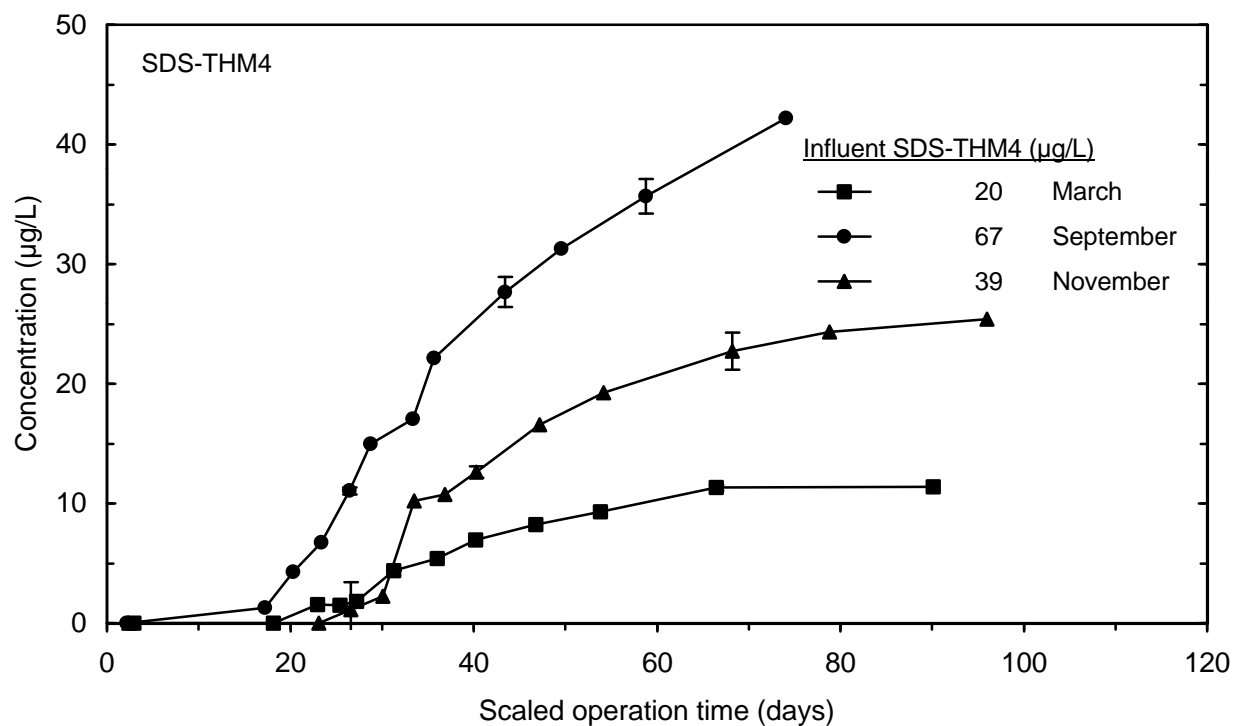


Figure 10 SDS-THM4 breakthrough for 10 minute EBCT contactors for each session

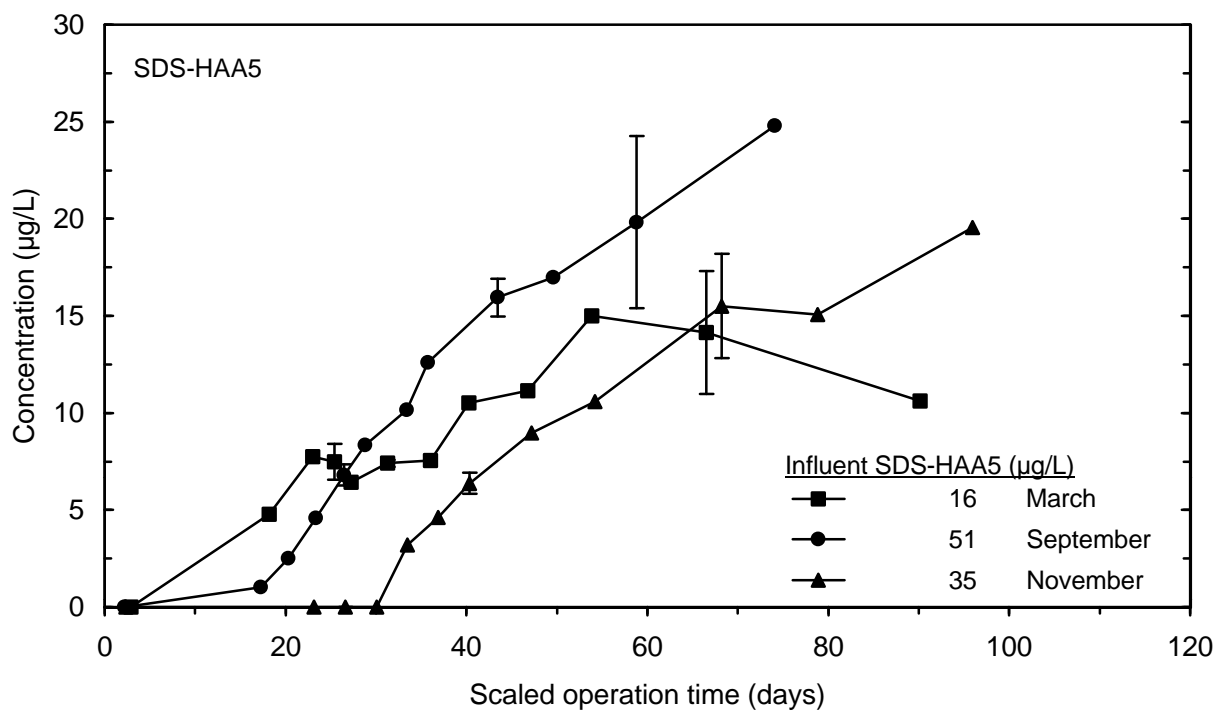


Figure 11 SDS-HAA5 breakthrough for 10 minute EBCT contactors for each session

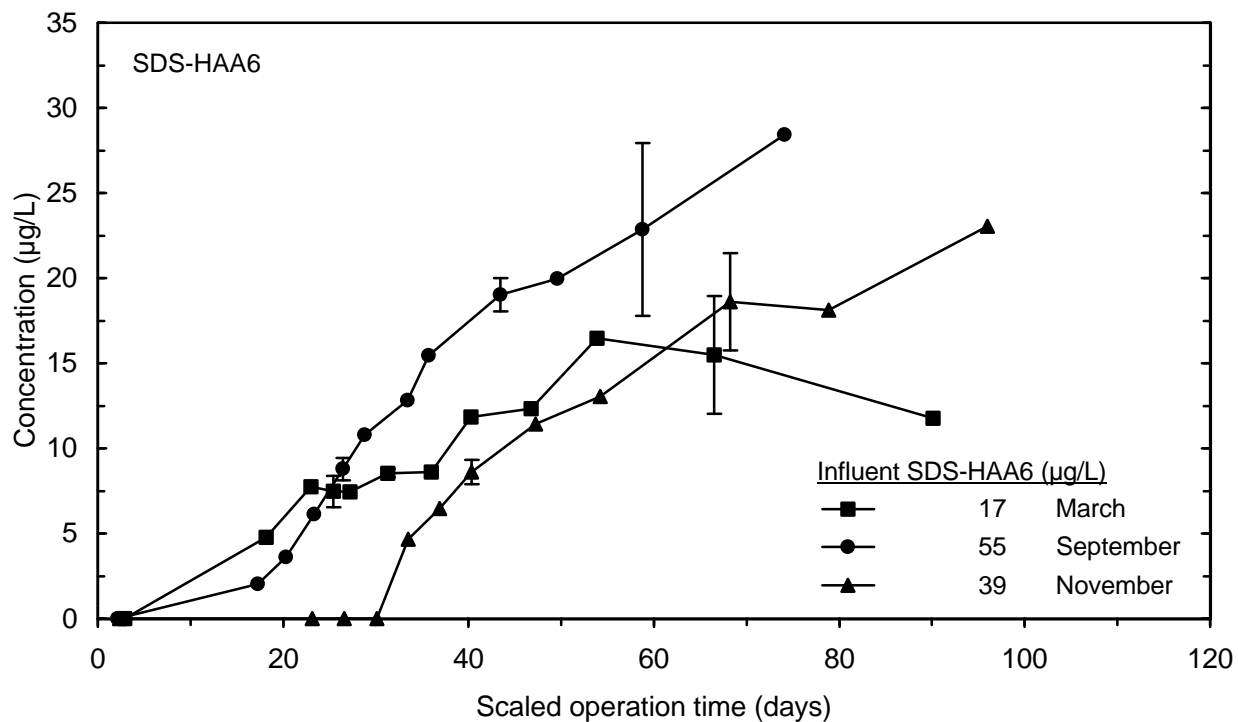


Figure 12 SDS-HAA6 breakthrough for 10 minute EBCT contactors for each session

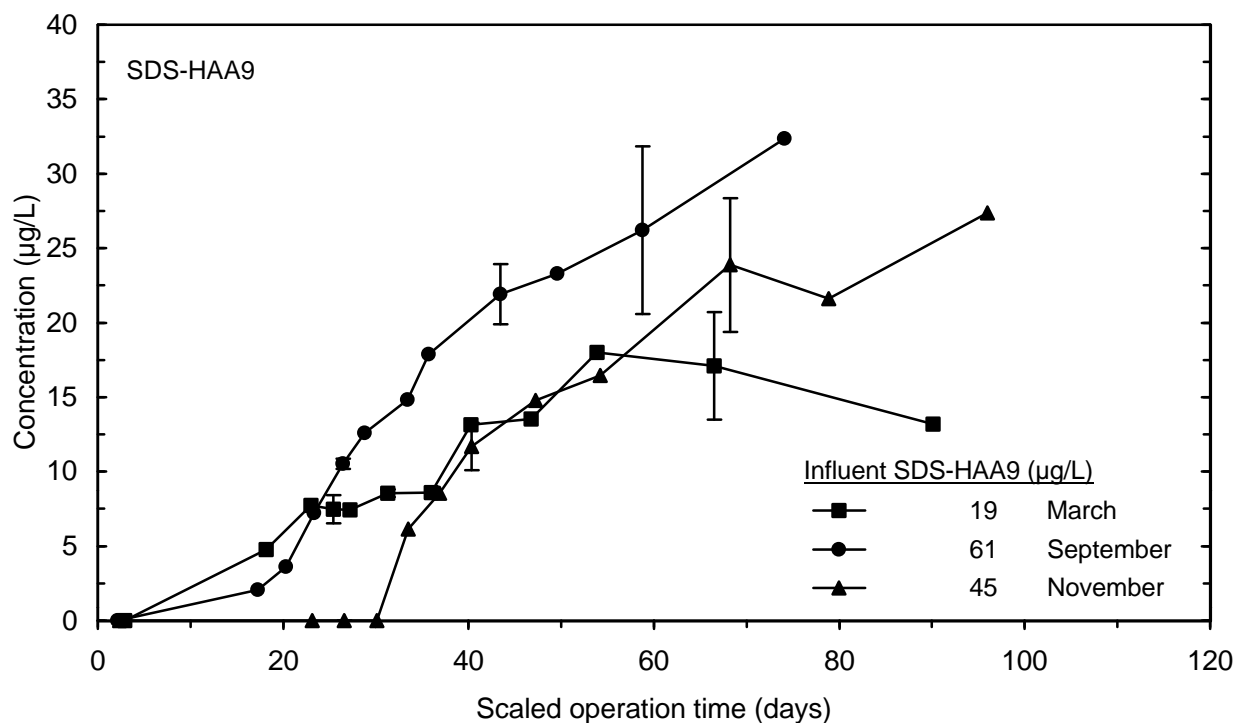
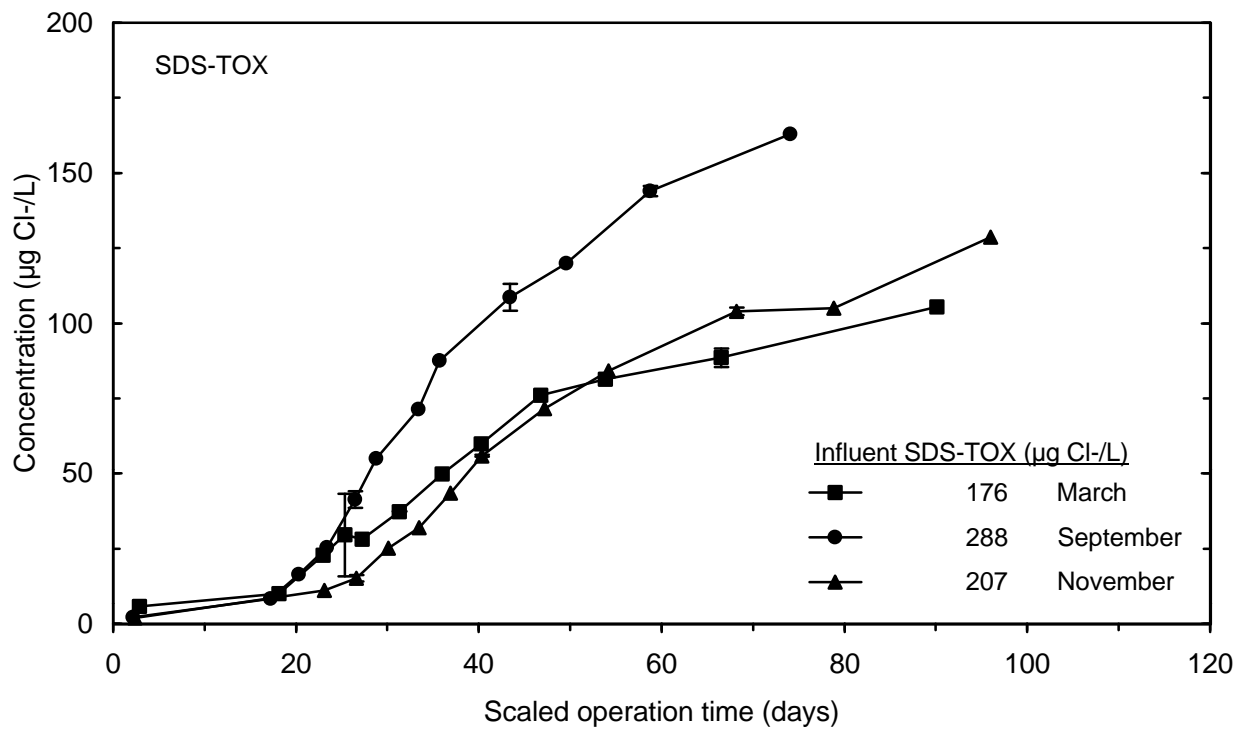
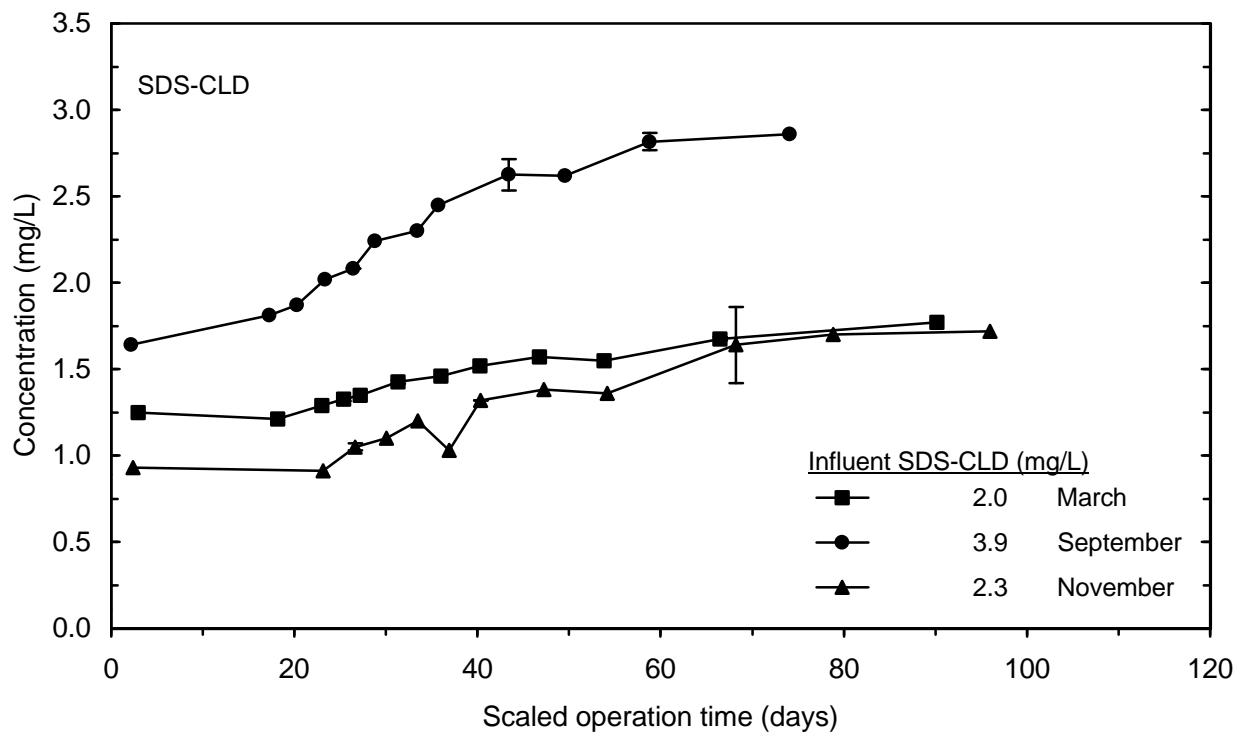


Figure 13 SDS-HAA9 breakthrough for 10 minute EBCT contactors for each session



**Figure 14 SDS-TOX breakthrough for 10 minute EBCT contactors for each session**



**Figure 15 SDS-CLD breakthrough for 10 minute EBCT contactors for each session**

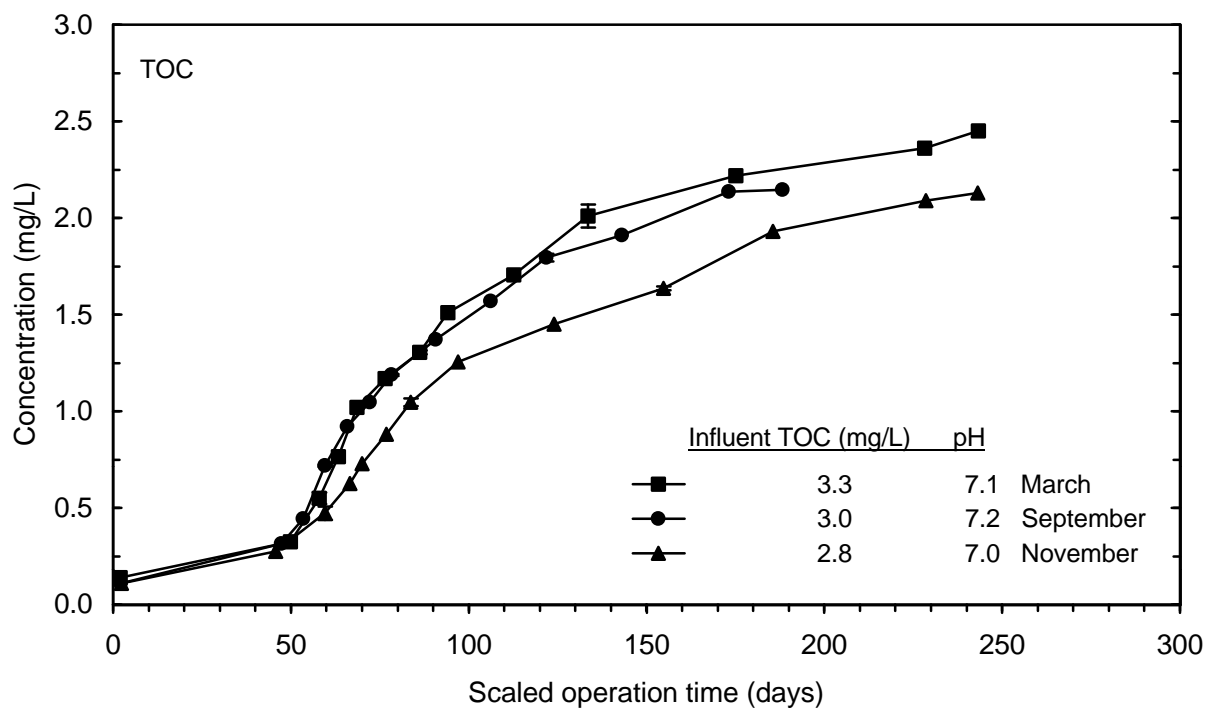


Figure 16 TOC breakthrough for 20 minute EBCT contactors for each session

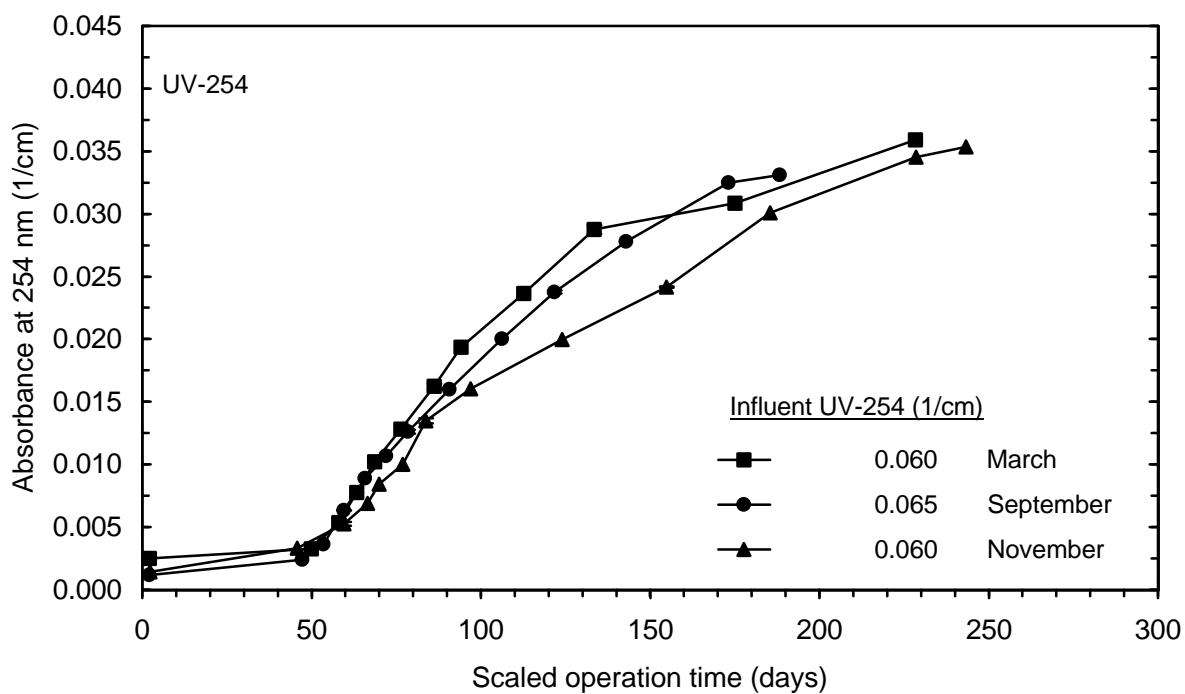


Figure 17 UV-254 breakthrough for 20 minute EBCT contactors for each session

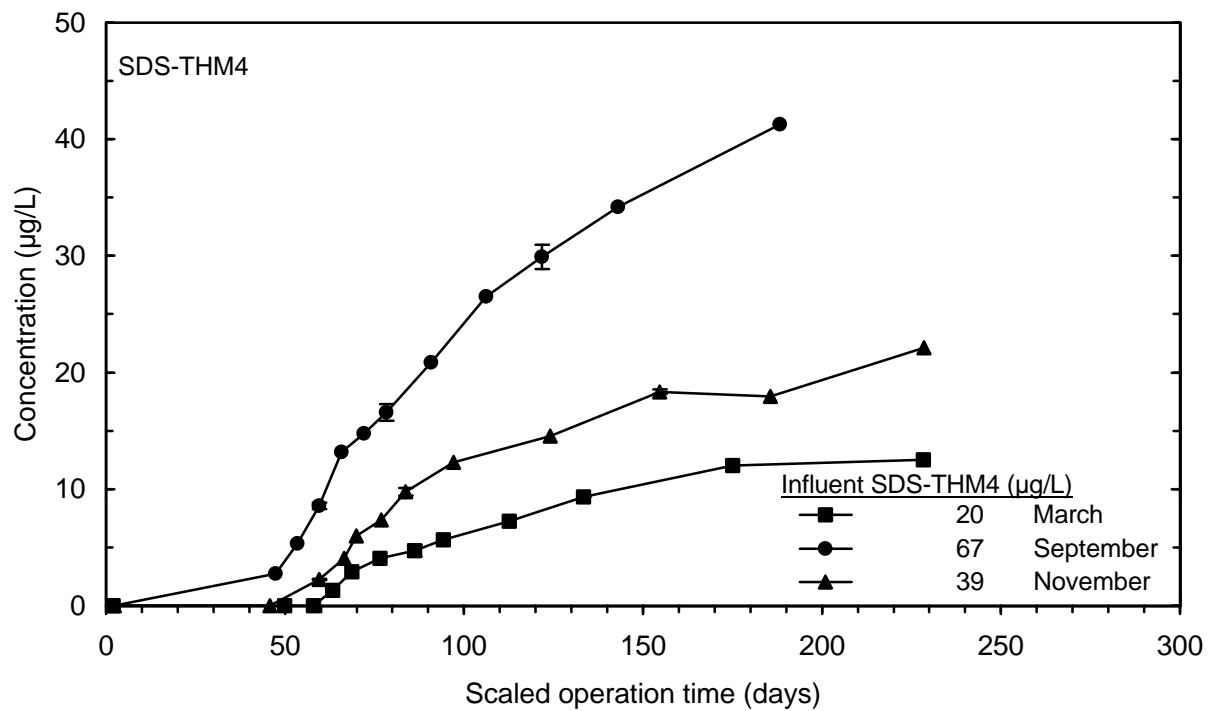


Figure 18 SDS-THM4 breakthrough for 20 minute EBCT contactors for each session

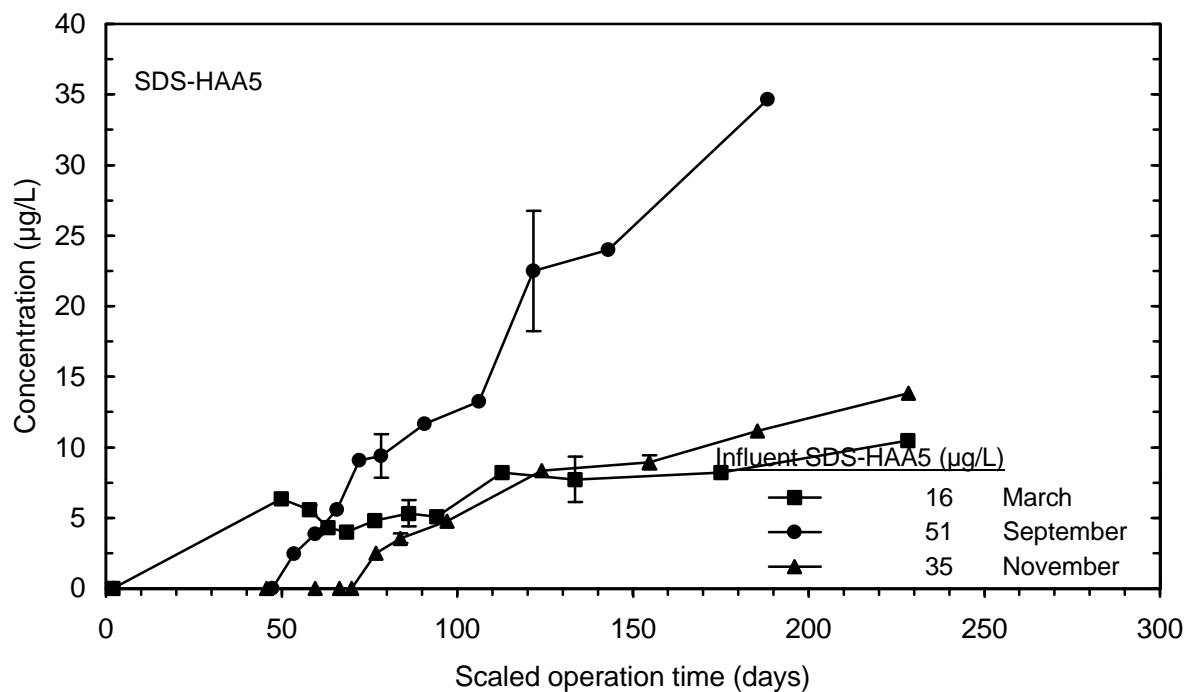


Figure 19 SDS-HAA5 breakthrough for 20 minute EBCT contactors for each session

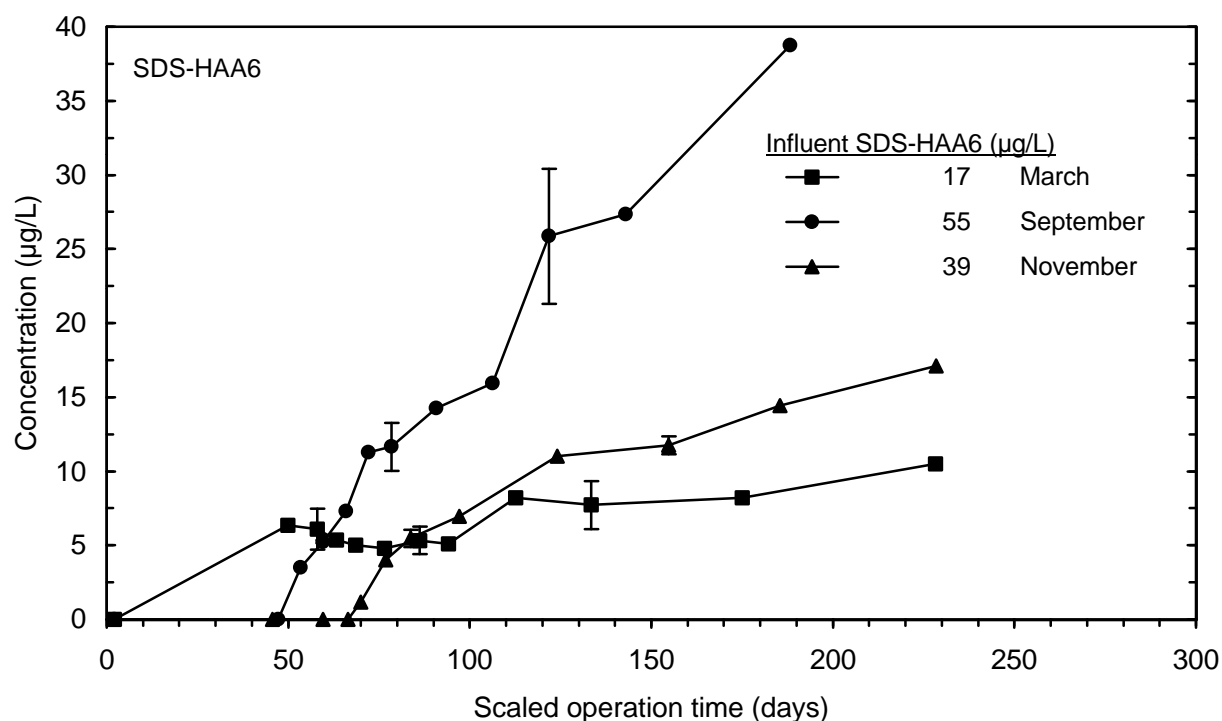


Figure 20 SDS-HAA6 breakthrough for 20 minute EBCT contactors for each session

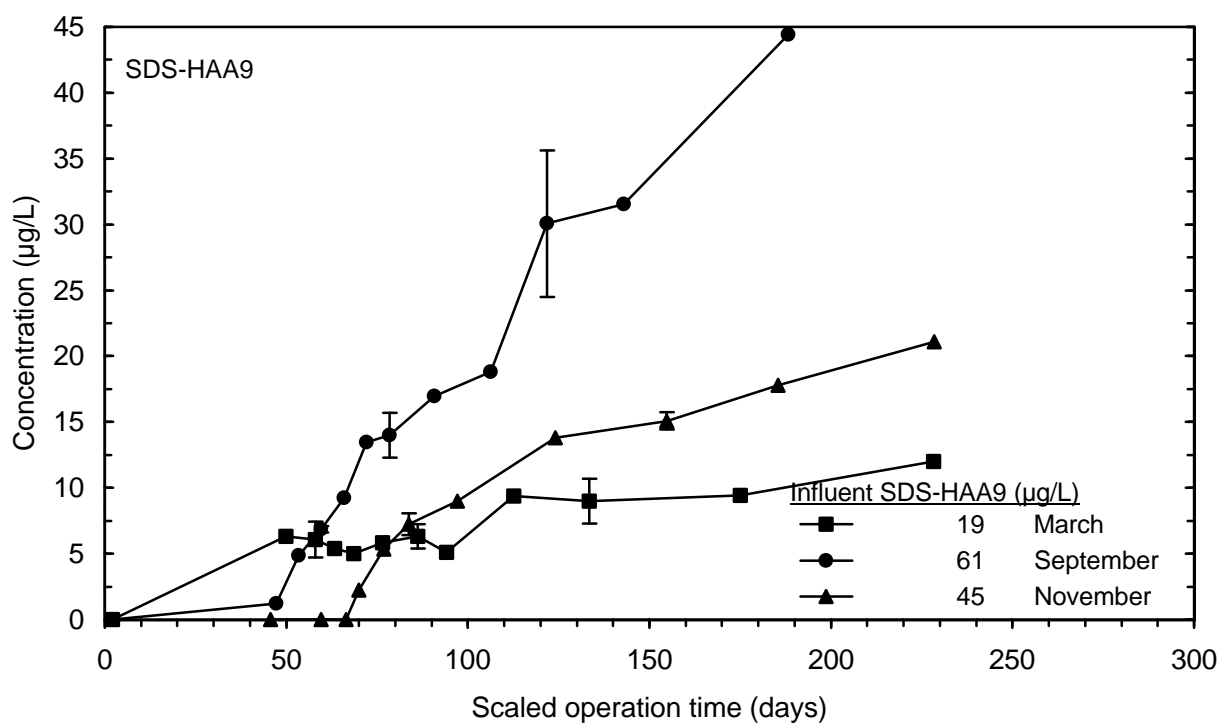
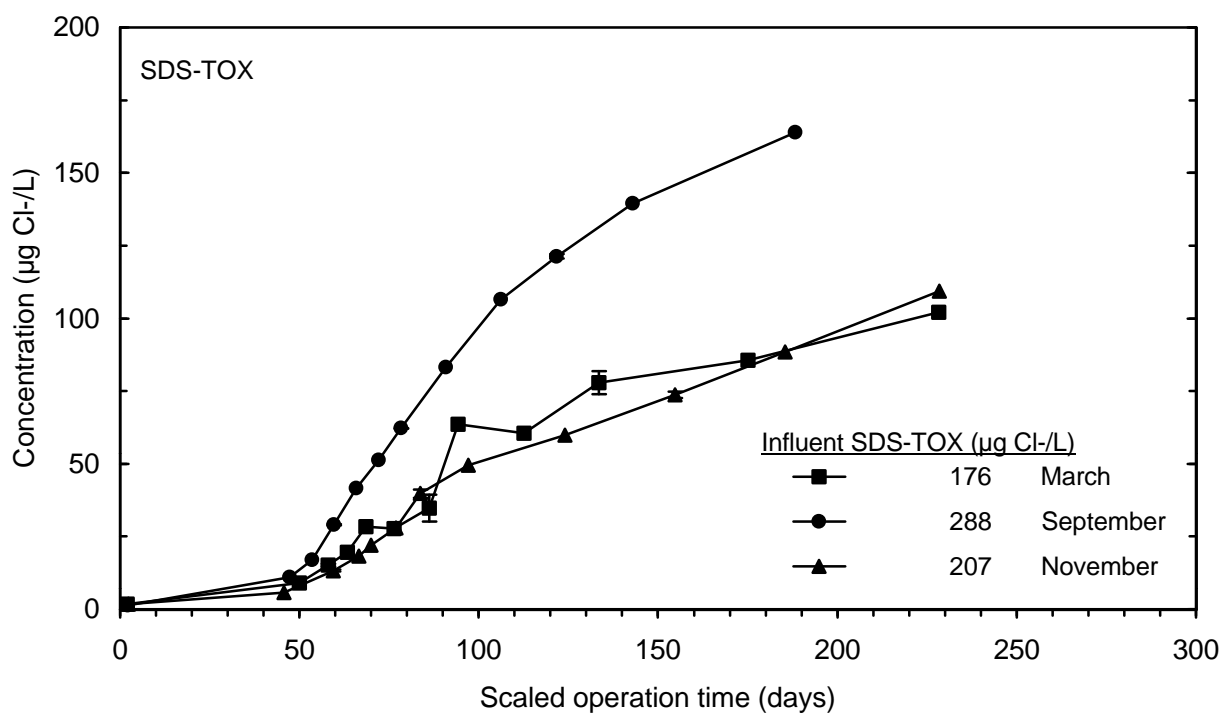
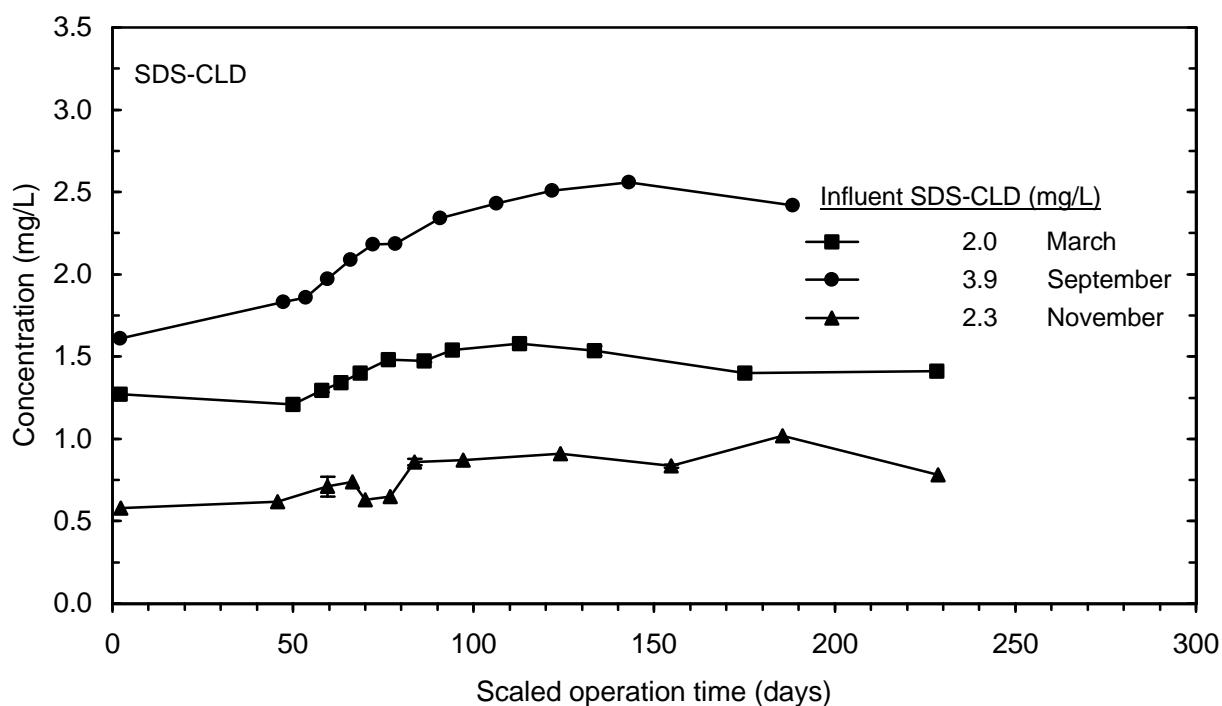


Figure 21 SDS-HAA9 breakthrough for 20 minute EBCT contactors for each session

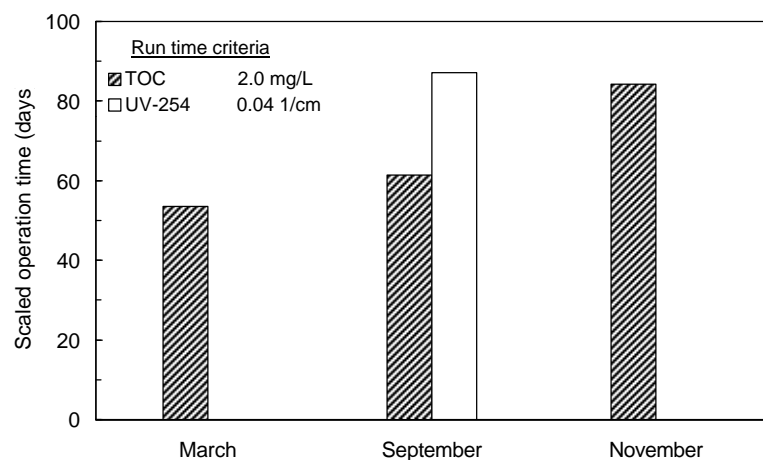


**Figure 22 SDS-TOX breakthrough for 20 minute EBCT contactors for each session**

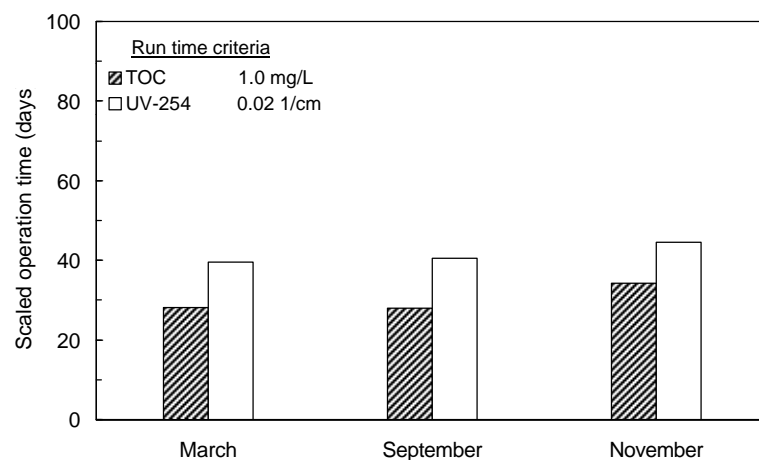


**Figure 23 SDS-CLD breakthrough for 20 minute EBCT contactors for each session**

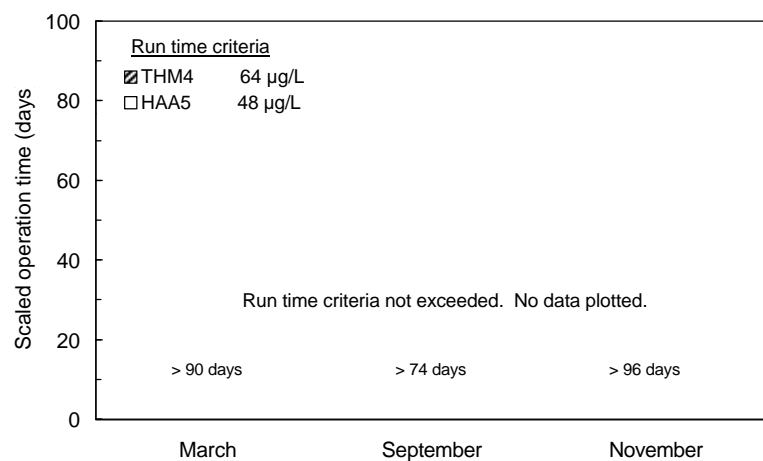




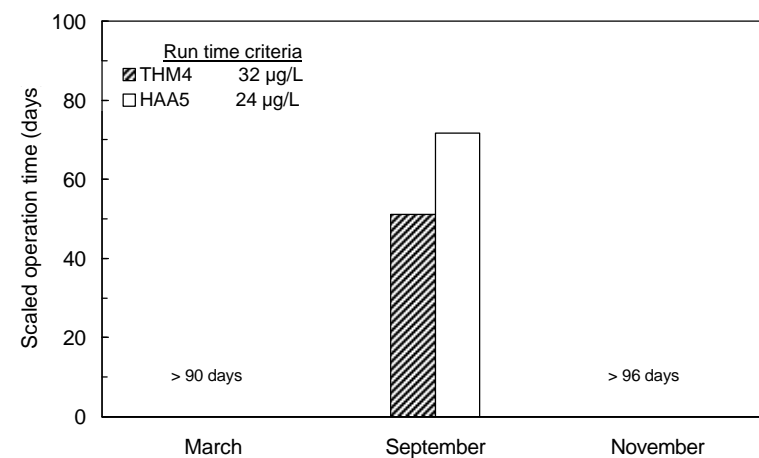
**Figure 24** GAC run times based on single contactor breakthrough curves for TOC and UV-254 effluent criteria (high) for each session (10 minute EBCT)



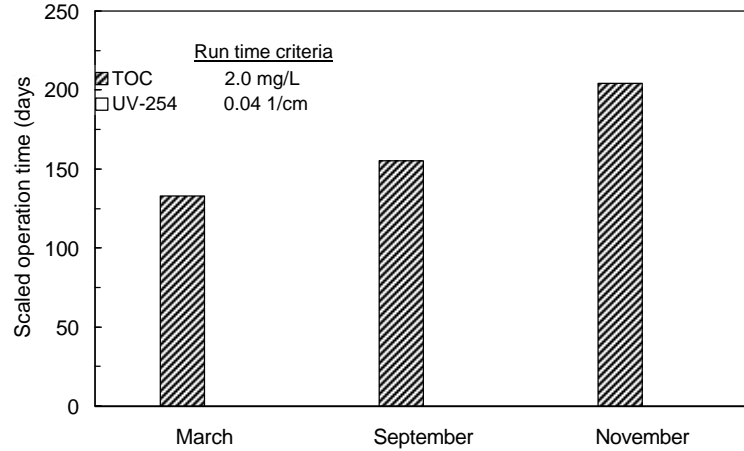
**Figure 25** GAC run times based on single contactor breakthrough curves for TOC and UV-254 effluent criteria (low) for each session (10 minute EBCT)



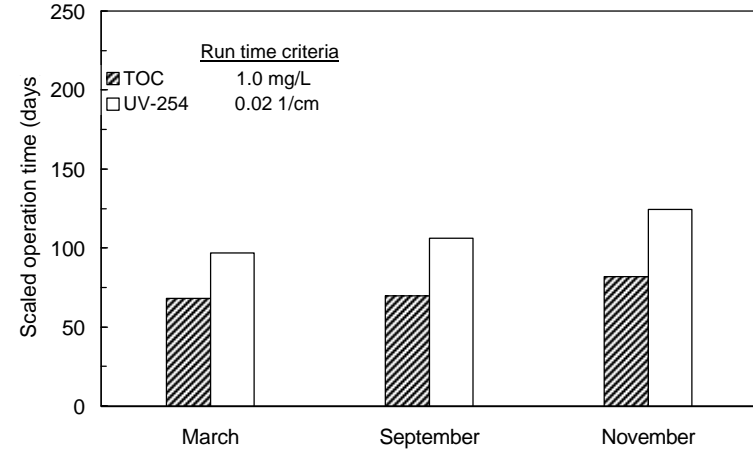
**Figure 26** GAC run times based on single contactor breakthrough curves for Stage 1 THM4 and HAA5 effluent criteria for each session (10 minute EBCT)



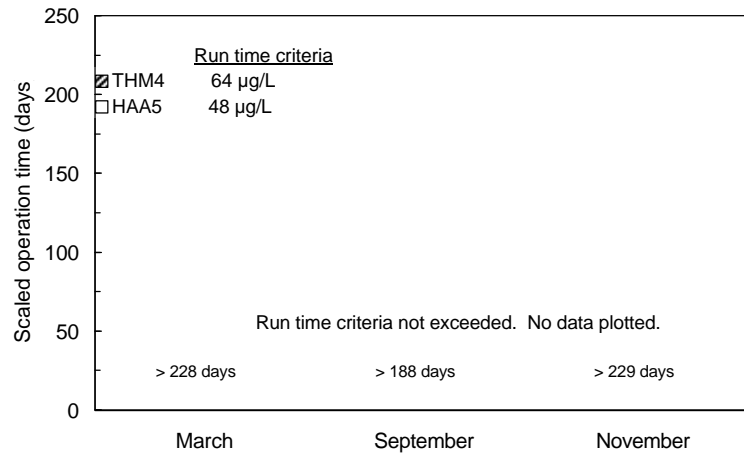
**Figure 27** GAC run times based on single contactor breakthrough curves for Stage 2 THM4 and HAA5 effluent criteria for each session (10 minute EBCT)



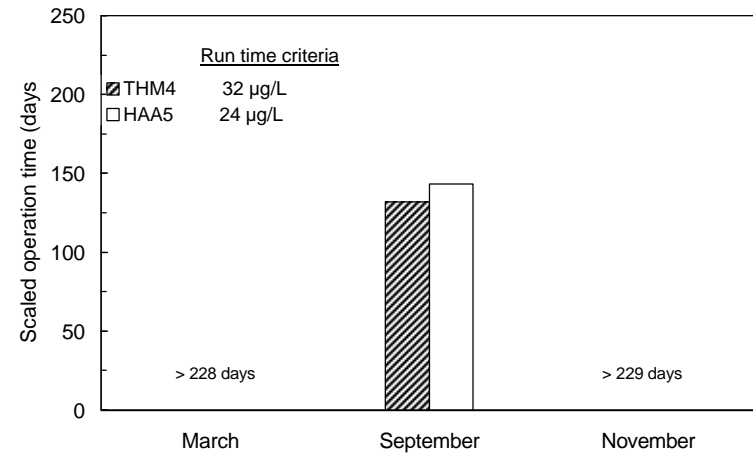
**Figure 28 GAC run times based on single breakthrough curves for TOC and UV-254 effluent criteria for each session (20 minute EBCT)**



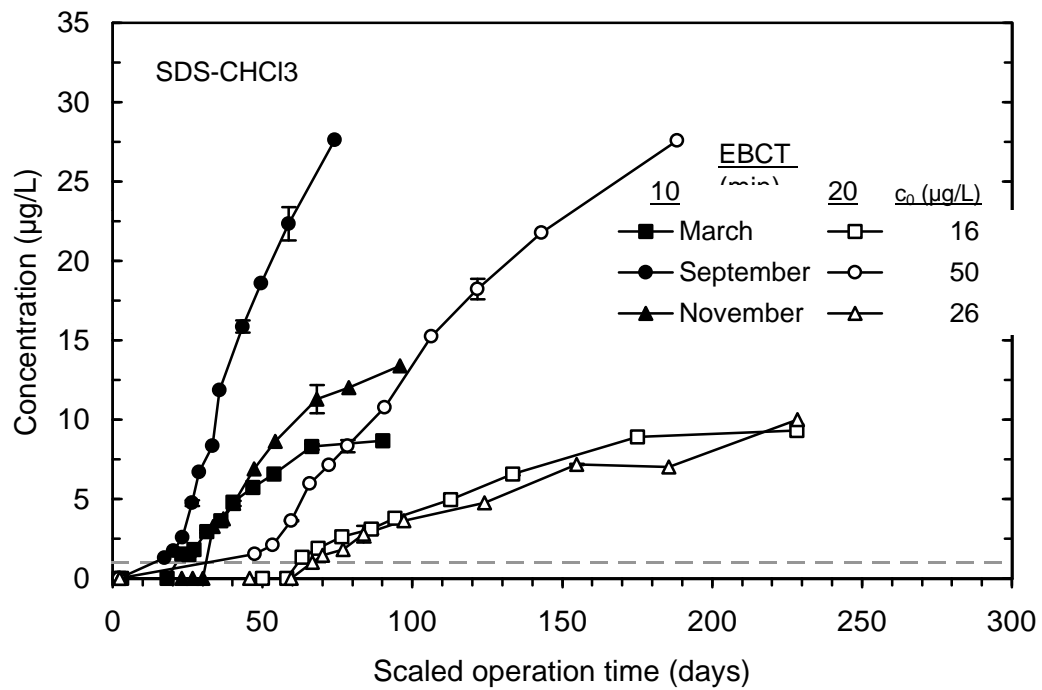
**Figure 29 GAC run times based on single breakthrough curves for TOC and UV-254 effluent criteria (high) for each session (20 minute EBCT)**



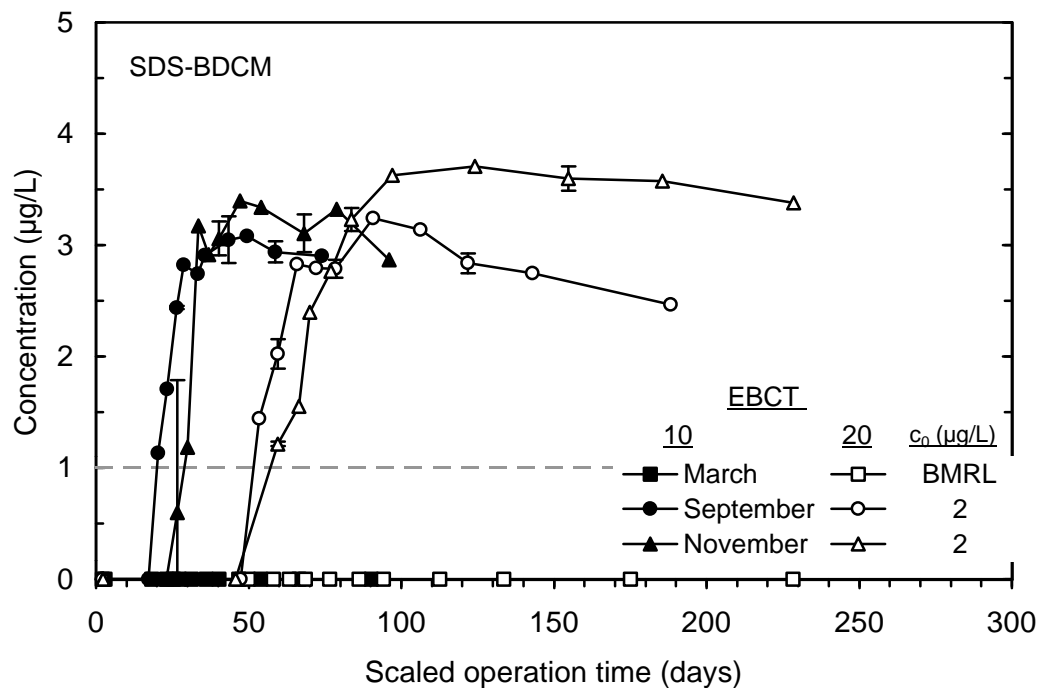
**Figure 30 GAC run times based on single breakthrough curves for Stage 1 THM4 and HAA5 effluent criteria (low) for each session (20 minute EBCT)**



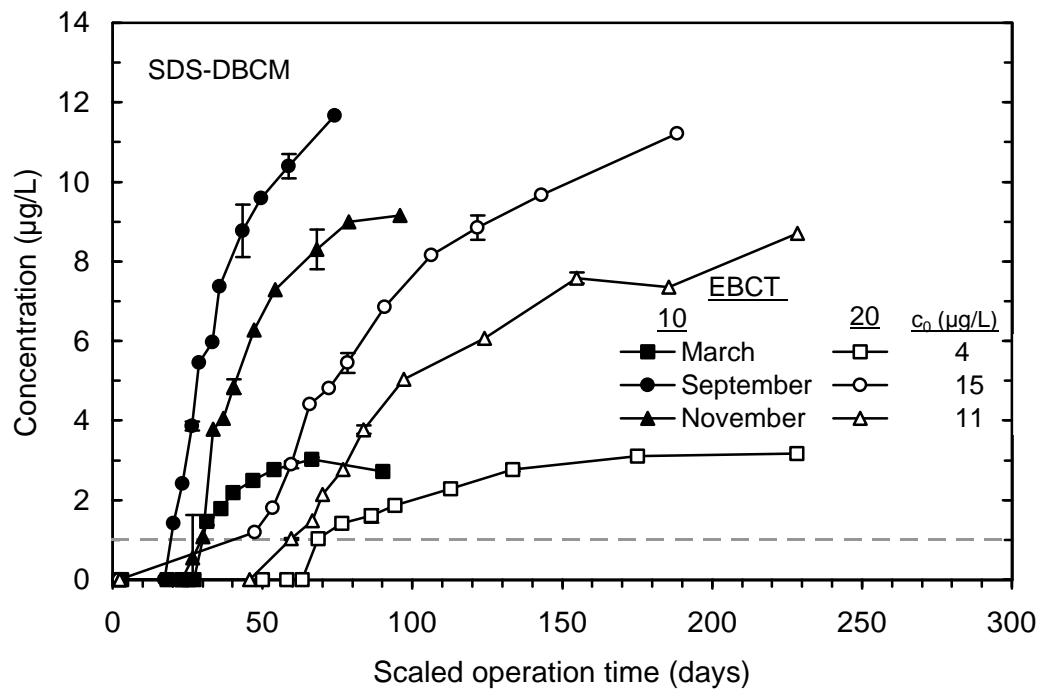
**Figure 31 GAC run times based on single breakthrough curves for Stage 2 THM4 and HAA5 effluent criteria for each session (20 minute EBCT)**



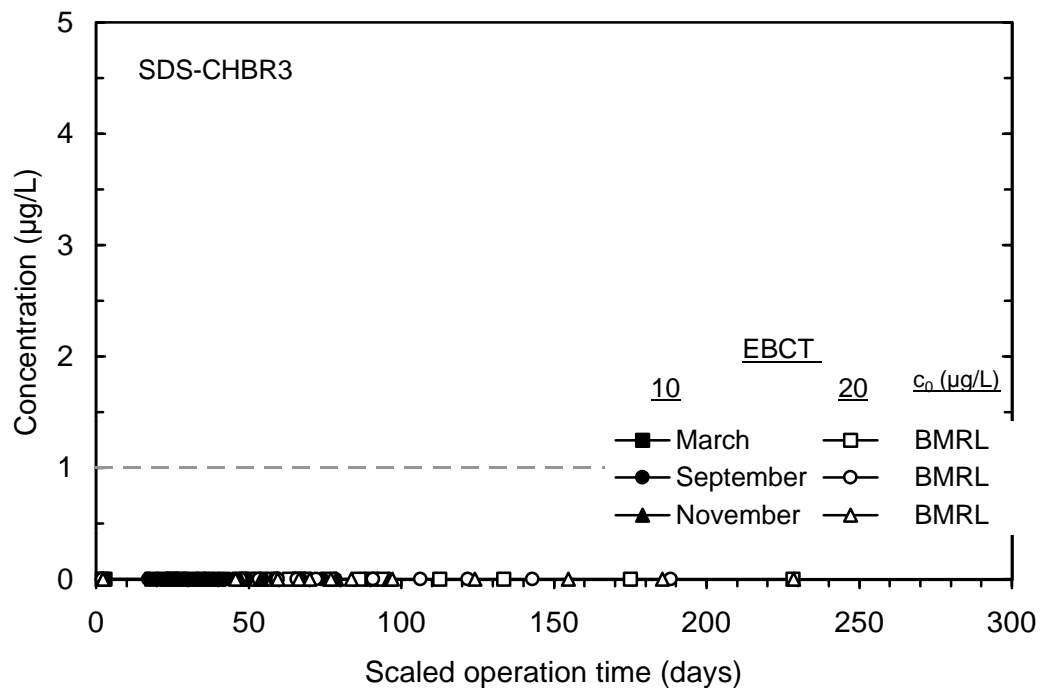
**Figure 32 SDS-CHCl<sub>3</sub> breakthrough for 10 and 20 minute EBCT contactors for each session**



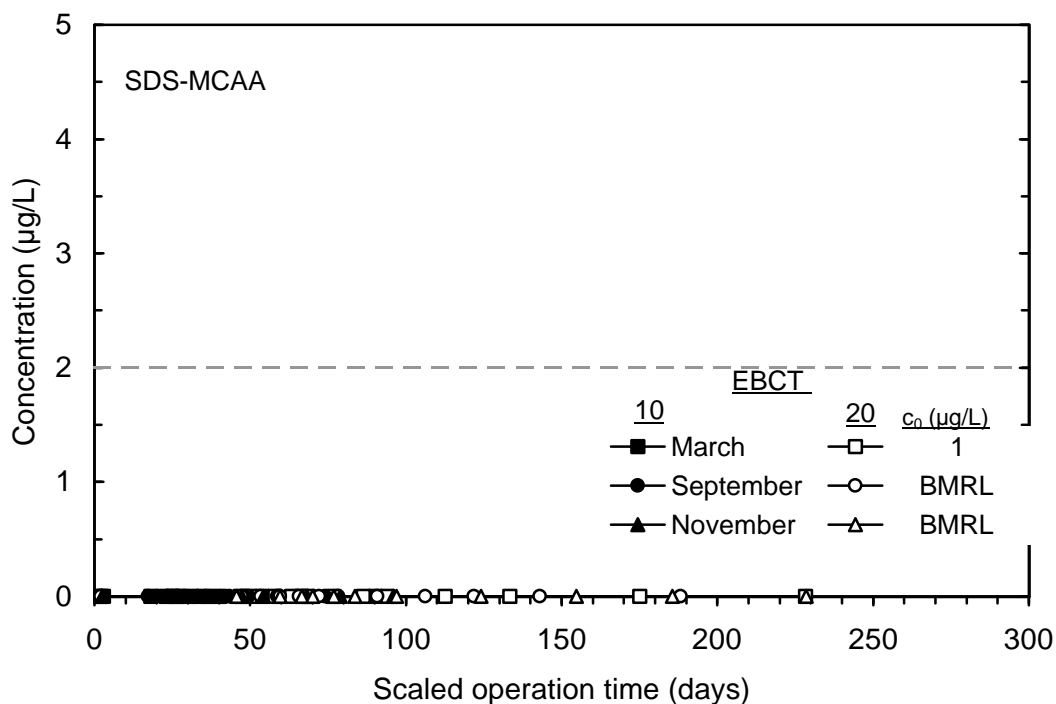
**Figure 33 SDS-BDCM breakthrough for 10 and 20 minute EBCT contactors for each session**



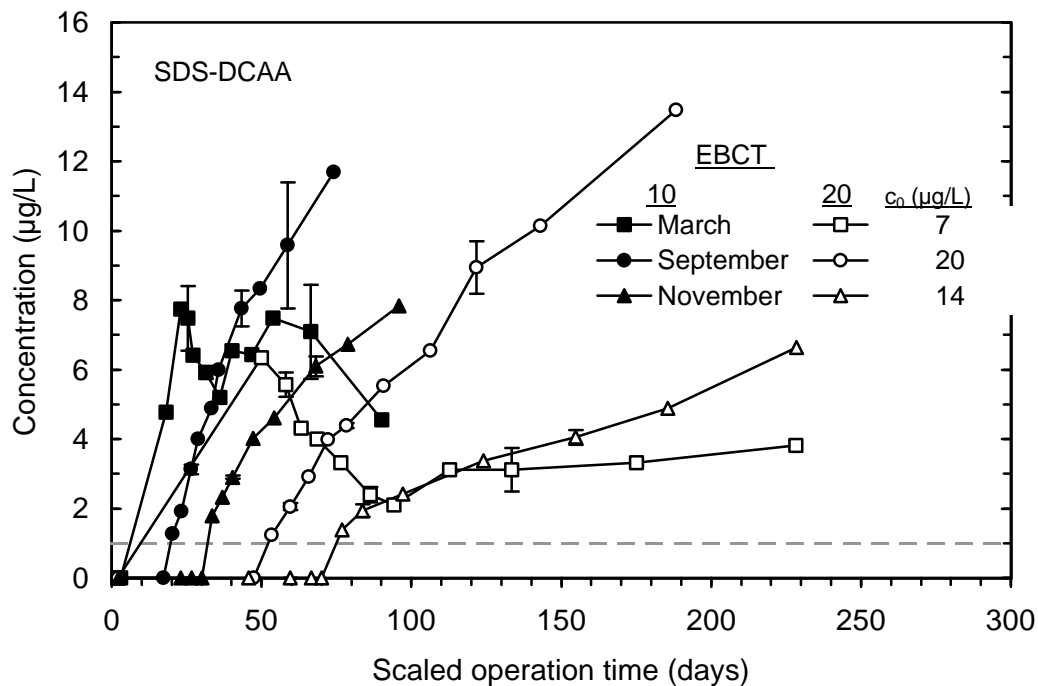
**Figure 34 SDS-DBCM breakthrough for 10 and 20 minute EBCT contactors for each session**



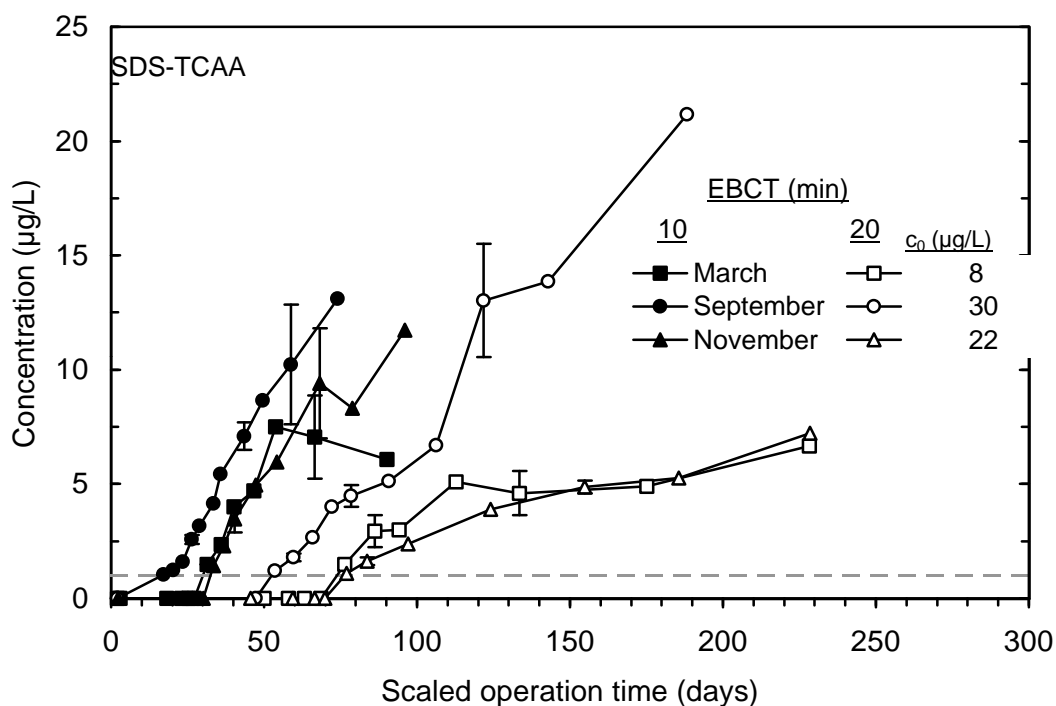
**Figure 35 SDS-CHBR3 breakthrough for 10 and 20 minute EBCT contactors for each session**



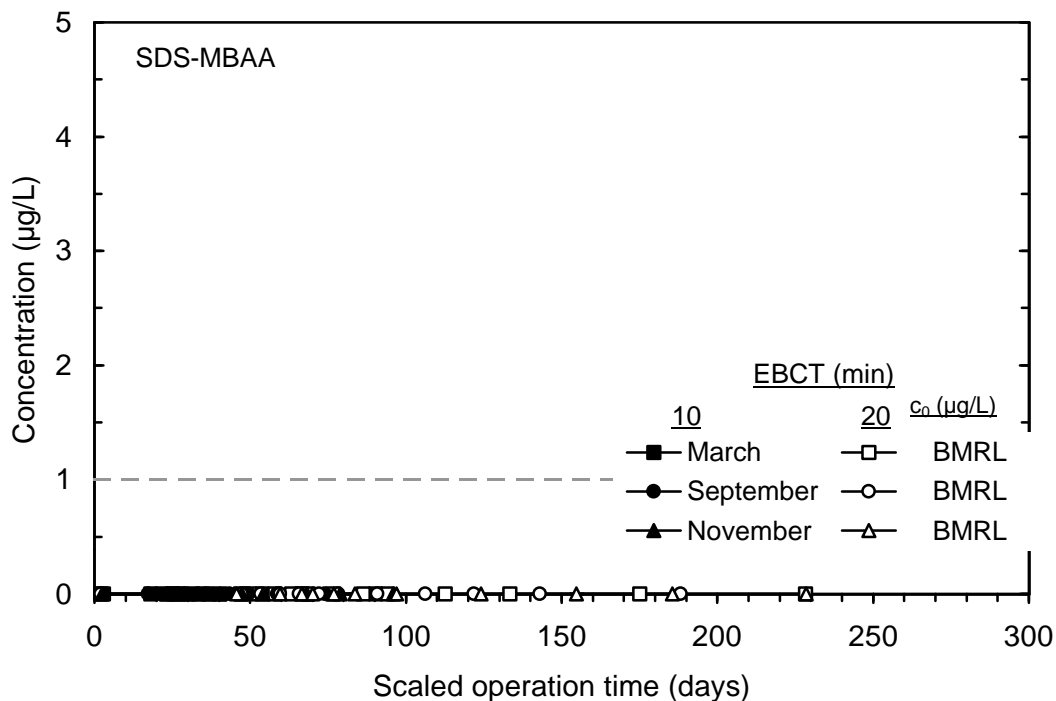
**Figure 36 SDS-MCAA breakthrough for 10 and 20 minute EBCT contactors for each session**



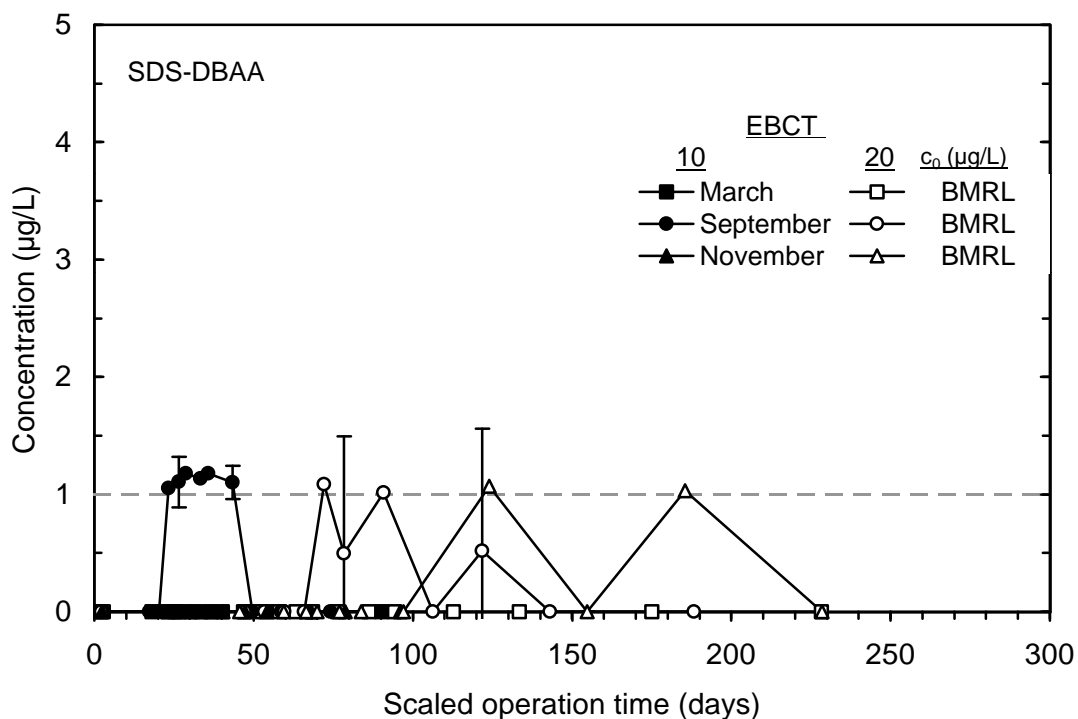
**Figure 37 SDS-DCAA breakthrough for 10 and 20 minute EBCT contactors for each session**



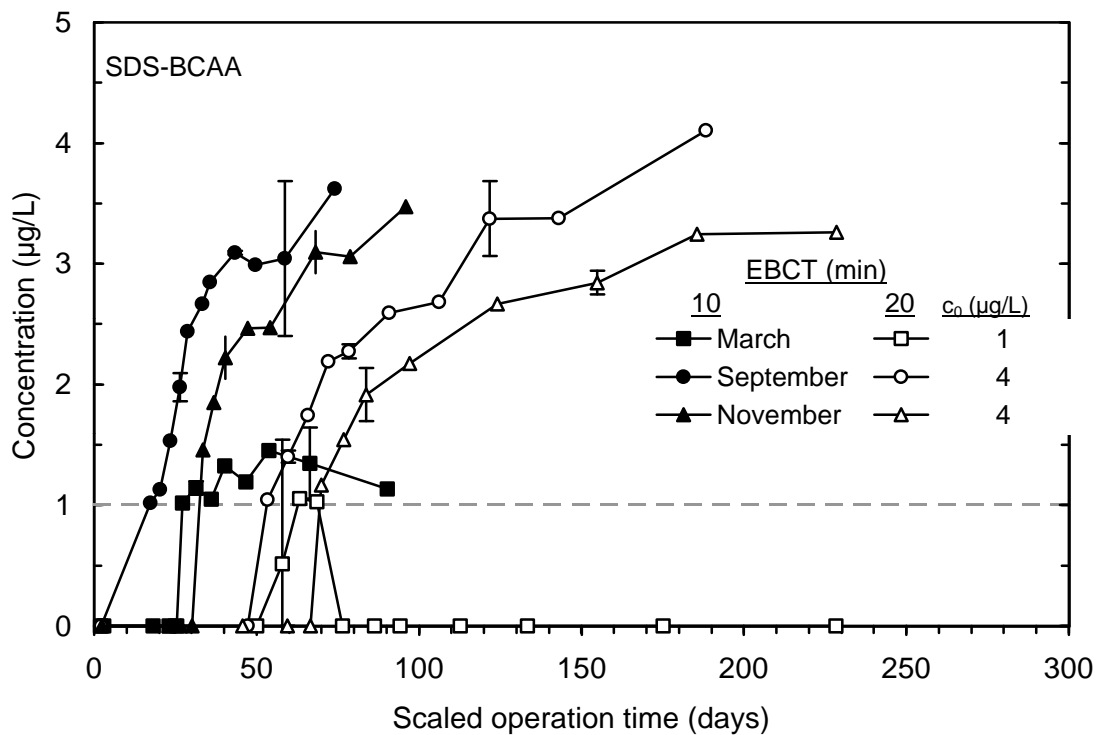
**Figure 38 SDS-TCAA breakthrough for 10 and 20 minute EBCT contactors for each session**



**Figure 39 SDS-MBAA breakthrough for 10 and 20 minute EBCT contactors for each session**



**Figure 40 SDS-DBAA breakthrough for 10 and 20 minute EBCT contactors for session**



**Figure 41 SDS-BCAA breakthrough for 10 and 20 minute EBCT contactors for session**

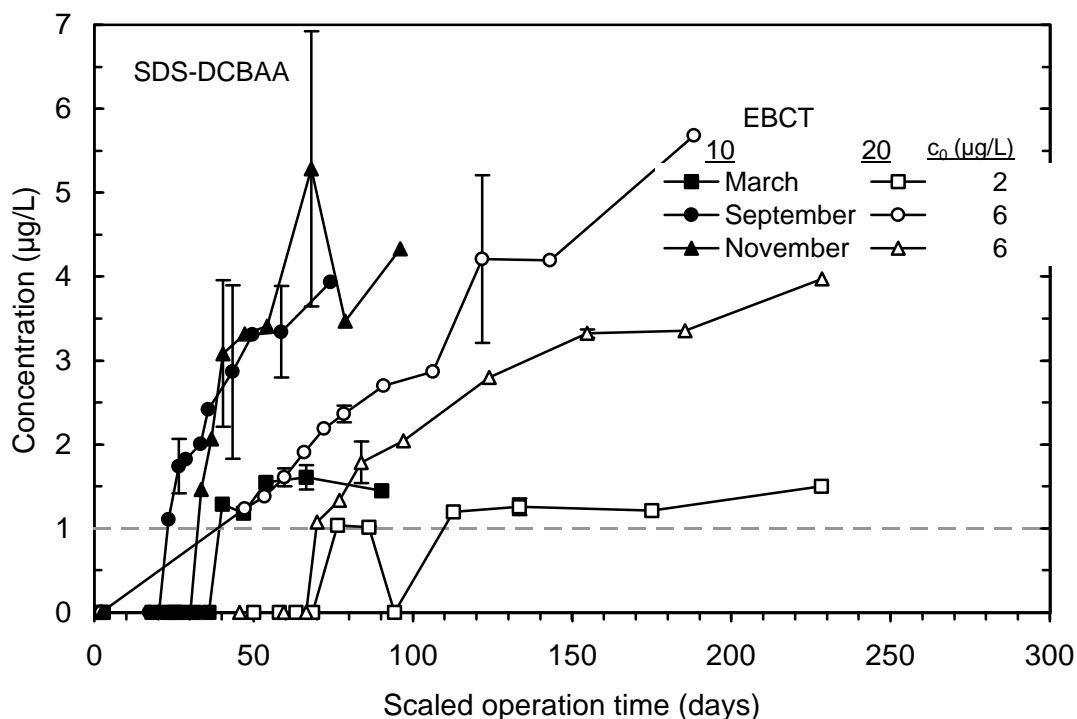


Figure 42 SDS-DCBAA breakthrough for 10 and 20 minute EBCT contactors for each session

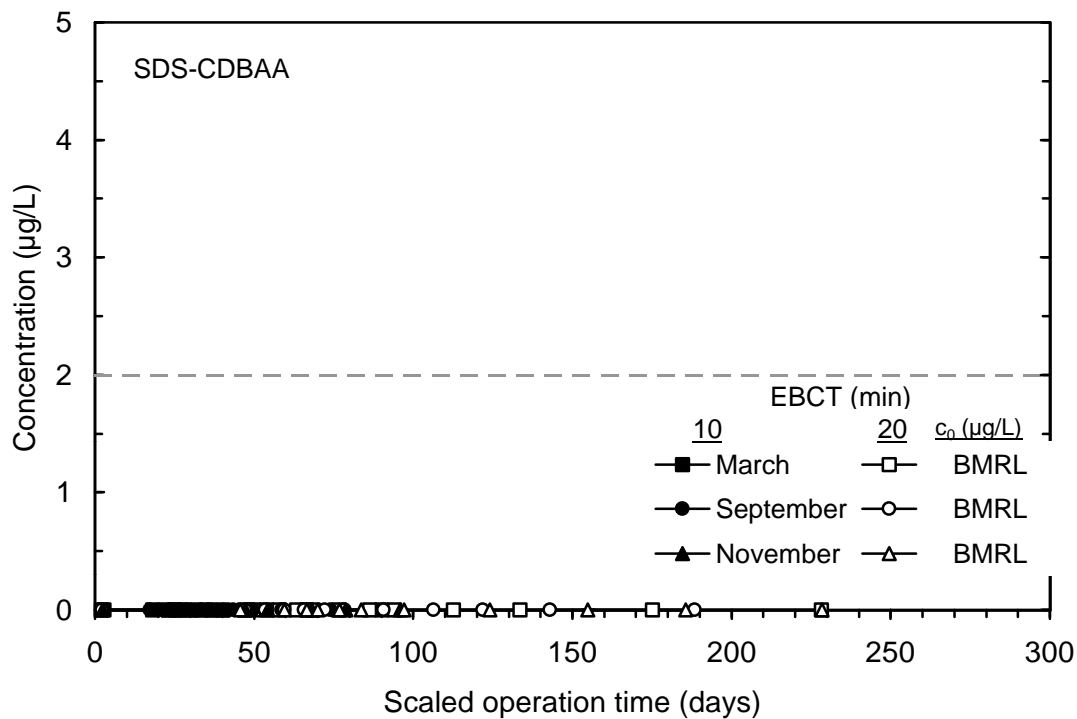
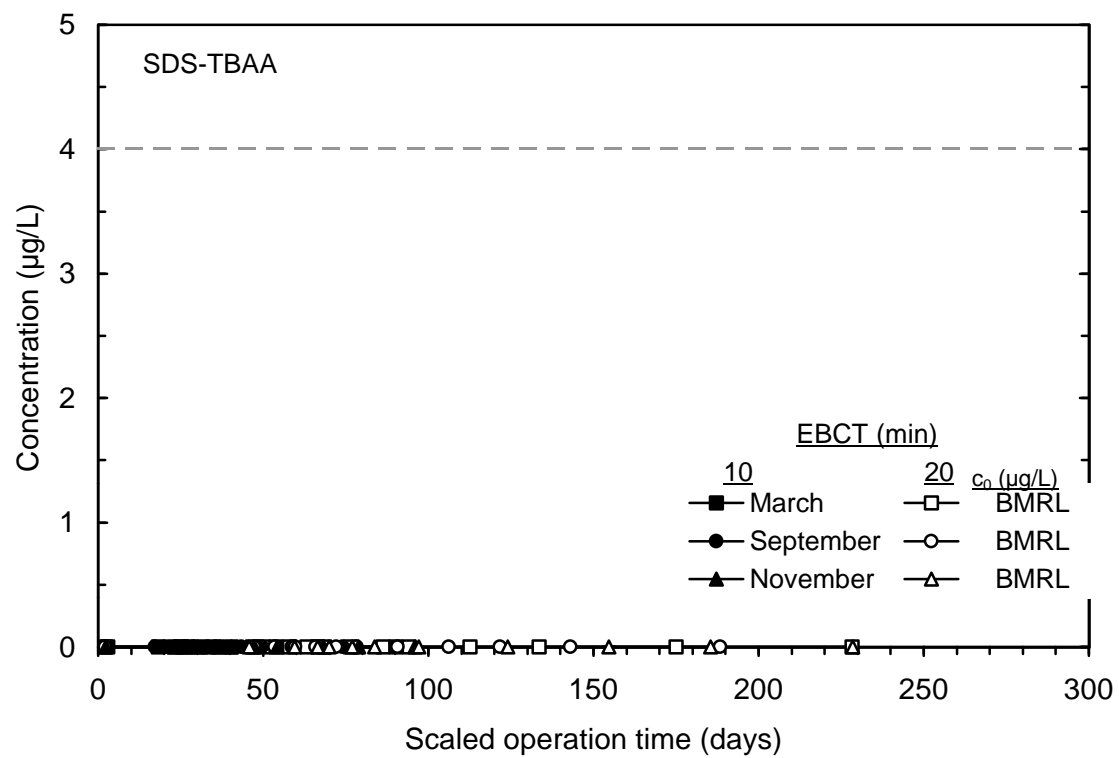


Figure 43 SDS-CDBAA breakthrough for 10 and 20 minute EBCT contactors for each session





**Figure 44 SDS-TBAA breakthrough for 10 and 20 minute EBCT contactors for e session**

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# 9

## *Impact of Empty-Bed Contact Time (EBCT)*

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## 9 Impact of Empty-Bed Contact Time (EBCT)

During all RSSCT sessions, as required by the ICR, two EBCTs were evaluated: 10 and 20 minutes. The breakthrough data generated were then used to evaluate the impact of EBCT on DBP precursor removal by GAC. To do so, the GAC breakthrough curves for each EBCT are plotted on a throughput basis, with units of bed volumes. This transformation normalizes for the difference in amount of EBCT between the two columns to be compared. The following equation is used to convert from run time to throughput in bed volumes:

$$\text{Throughput (bed volumes)} = \frac{\text{Run time}}{\text{EBCT}} \quad (1)$$

For the March session, Figures 45 through 52 compare the 10 and 20 minute EBCT contactor performance for the breakthrough of TOC, UV<sub>254</sub>, SDS-THM4, SDS-HAA5, SDS-HAA6, SDS-HAA9, SDS-TOX, and SDS-CLD. The data for the same parameters are presented for the September and November sessions in Figures 53 through 68. In general, all sessions showed that the 20 minute EBCT contactor outperformed the 10 minute EBCT contactor on a throughput basis, as seen by a shift to the right in the breakthrough curve, although during the November session the difference was slight. Throughput to an effluent TOC concentration of 2.0 mg/L was 20, 19, and 19 percent longer during the March, September, and November sessions, respectively, for the 20 minute EBCT contactor over the 10 minute EBCT contactor.

For all parameters analyzed, the throughput in bed volumes for both EBCTs to various run time criteria are summarized in Tables 31 through 33. These tables also include throughput based on blended effluent of multiple contactors, as explained in Section 11 below.

The throughput comparison data are summarized in graphical format in Figures 69 through 72 for the March session. On a throughput basis and for all run time criteria, the 20 minute EBCT contactor outperformed the 10 minute EBCT contactor. The same data are presented for the September and November sessions in Figures 73 through 80. Also shown in the figures is the throughput based on blended effluent of multiple contactors, which is explained below in Section 11.

Parameter	Units	Influent concen- tration	Value	Throughput (BV) at given EBCT (min)				Throughput change	
				10		20		from 10 to 20 min	
				Contactor configuration				EBCT (%)	
				Single	Multiple	Single	Multiple	Single contactor	Multiple contactors
TOC	(mg/L)	3.3	2.0	7,700	20,260	9,560	26,730	24	32
			1.0	4,050	7,950	4,910	10,070	21	27
			1.6†	5,840	14,930	7,660	17,640	31	18
UV-254	(1/cm)	0.060	0.040	*	*	*	*		
			0.020	5,690	12,240	6,980	16,000	23	31
			0.030†	8,530	18,990	11,050	25,480	30	34
3DS-THM <sub>4</sub>	(µg/L)	20	80	*	*	*	*		
			64	*	*	*	*		
			32	*	*	*	*		
3DS-HAA <sub>5</sub>	(µg/L)	16	48	*	*	*	*		
			24	*	*	*	*		
3DS-HAA <sub>6</sub>	(µg/L)	17	48	*	*	*	*		
			24	*	*	*	*		
3DS-HAA <sub>8</sub>	(µg/L)	19	48	*	*	*	*		
			24	*	*	*	*		
SDS-TOX (µg Cl <sup>-</sup> /L)		176	120	*	*	*	*		
			70	6,390	14,750	8,930	20,320	40	38

†GAC effluent concentration equal to 50 percent of the average influent concentration.

\*Effluent concentration criteria not exceeded during GAC run time, calculated values are left blank.

**Table 31 Summary of throughput to selected GAC effluent criteria during session 1, March**

Parameter	Units	Influent concentra- tion	Value	Throughput (BV) at given EBCT (min)				Throughput change from 10 to 20 min	
				10		20			
				Contactor configuration				EBCT (%)	
				Single	Multiple	Single	Multiple	Single contactor	Multiple contactors
TOC	(mg/L)	3.0	2.0	8,830	25,420	11,160	32,610	26	28
			1.0	4,020	8,290	5,030	10,420	25	26
			1.5†	5,480	13,010	7,200	16,460	31	27
UV-254	(1/cm)	0.065	0.040	12,540	*	*	*		
			0.020	5,830	12,420	7,650	15,840	31	28
			0.032†	9,970	21,230	12,420	27,150	25	28
SDS-THM4	(µg/L)	67	80	*	*	*	*		
			64	*	*	*	*		
			32	7,360	16,230	9,510	20,680	29	27
SDS-HAA5	(µg/L)	51	48	*	*	*	*		
			24	10,310	21,000	10,300	20,990	0	0
SDS-HAA6	(µg/L)	55	48	*	*	*	*		
			24	8,920	17,670	8,560	18,300	-4	4
SDS-HAA9	(µg/L)	61	48	*	*	*	*		
			24	7,470	15,140	8,170	15,930	9	5
SDS-TOX	(µg Cl <sup>-</sup> /L)	288	120	7,140	14,990	8,670	18,780	21	25
			70	4,760	9,230	5,970	11,630	25	26

†GAC effluent concentration equal to 50 percent of the average influent concentration.

\*Effluent concentration criteria not exceeded during GAC run time, calculated values are left blank.

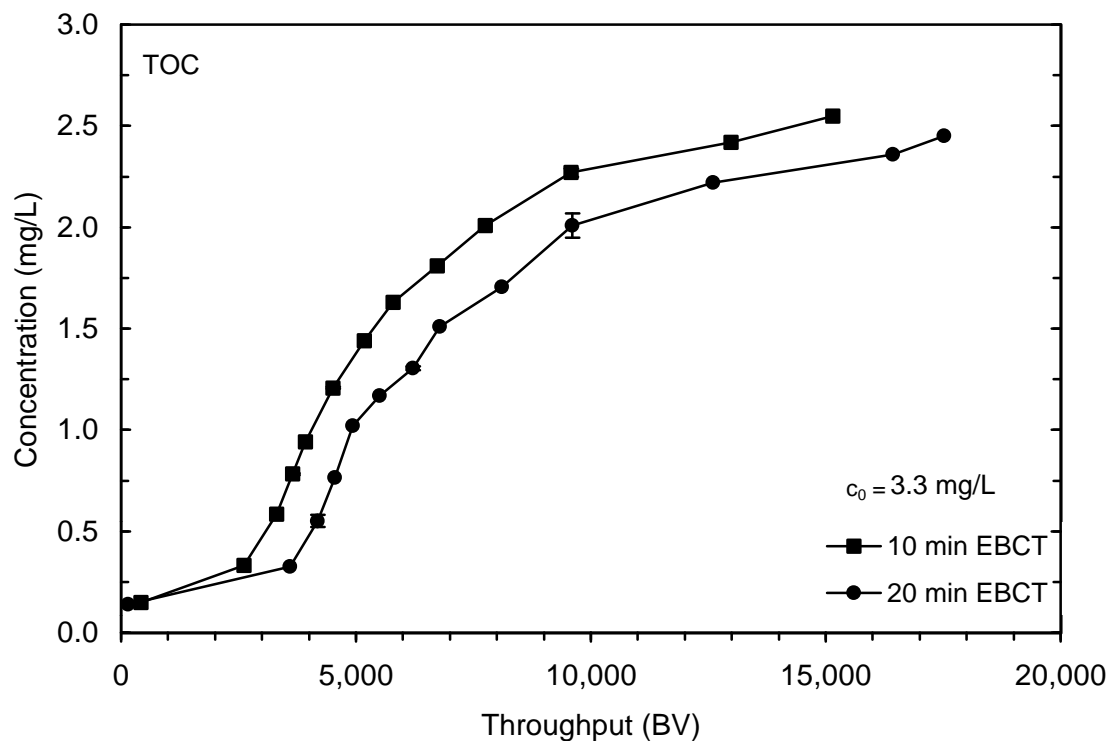
**Table 32 Summary of throughput to selected GAC effluent criteria during session 2, September**

Parameter	Units	Influent concen- tration	Value	Throughput (BV) at given EBCT (min)				Throughput change from 10 to 20 min	
				10		20			
				Contactor configuration				EBCT (%)	
				Single	Multiple	Single	Multiple	Single contactor	Multiple contactors
TOC	(mg/L)	2.8	2.0	12,130	39,070	14,710	*	21	
			1.0	4,920	10,050	5,890	12,640	20	26
			1.4†	6,080	16,210	8,440	19,550	39	21
UV-254	(1/cm)	0.060	0.040	*	*	*	*		
			0.020	6,400	13,910	8,960	18,920	40	36
			0.030†	9,900	22,880	13,290	30,380	34	33
SDS-THM4	(µg/L)	39	80	*	*	*	*		
			64	*	*	*	*		
			32	*	*	*	*		
SDS-HAA5	(µg/L)	35	48	*	*	*	*		
			24	*	*	*	*		
SDS-HAA6	(µg/L)	39	48	*	*	*	*		
			24	*	*	*	*		
SDS-HAA9	(µg/L)	45	48	*	*	*	*		
			24	12,380	27,470	*	*		
SDS-TOX	(µg Cl <sup>-</sup> /L)	207	120	12,910	30,890	*	*		
			70	6,700	14,620	10,560	21,140	58	45

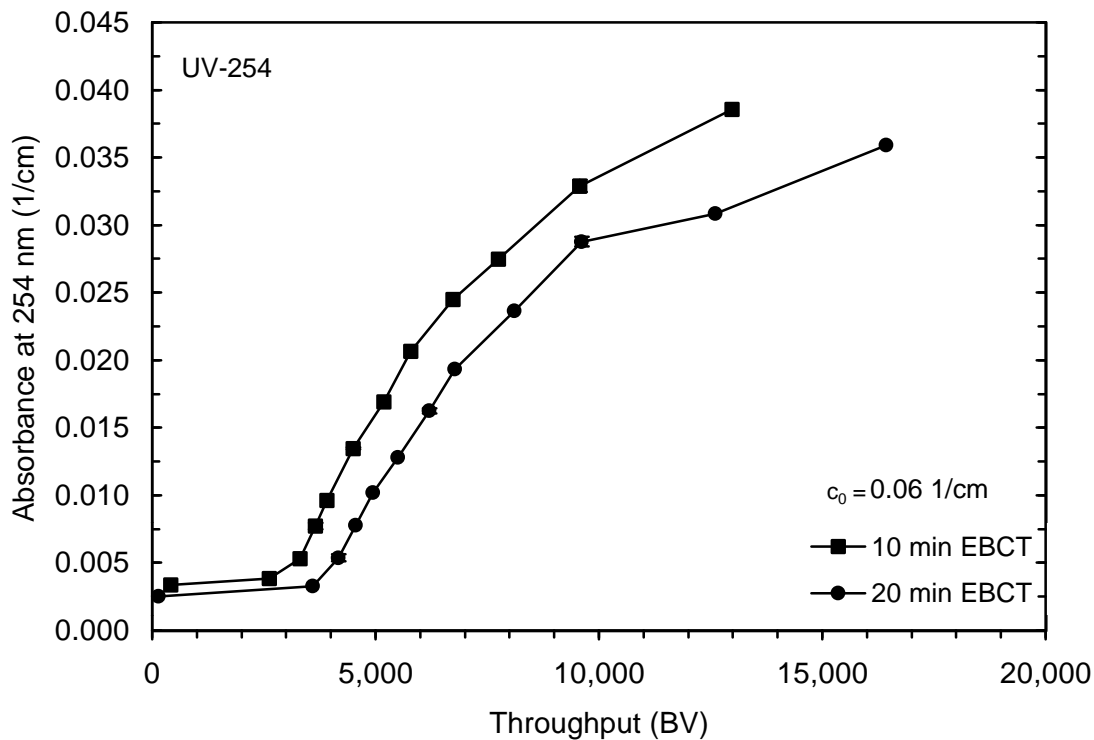
†GAC effluent concentration equal to 50 percent of the average influent concentration.

\*Effluent concentration criteria not exceeded during GAC run time, calculated values are left blank.

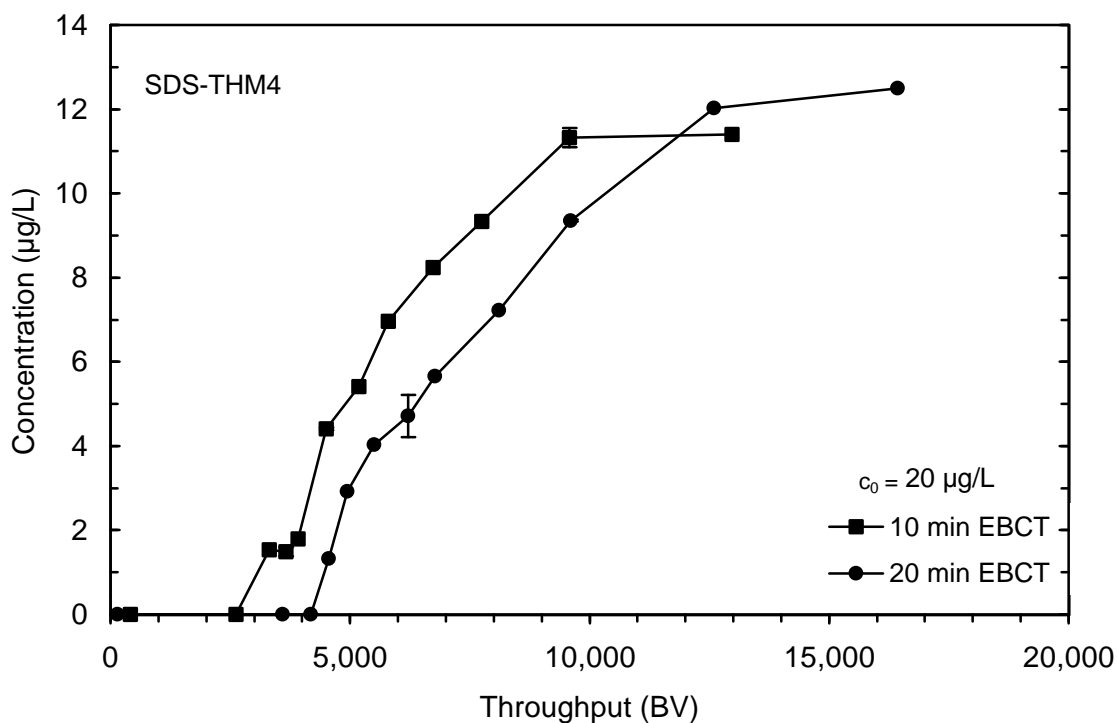
**Table 33 Summary of throughput to selected GAC effluent criteria during session 3, November**



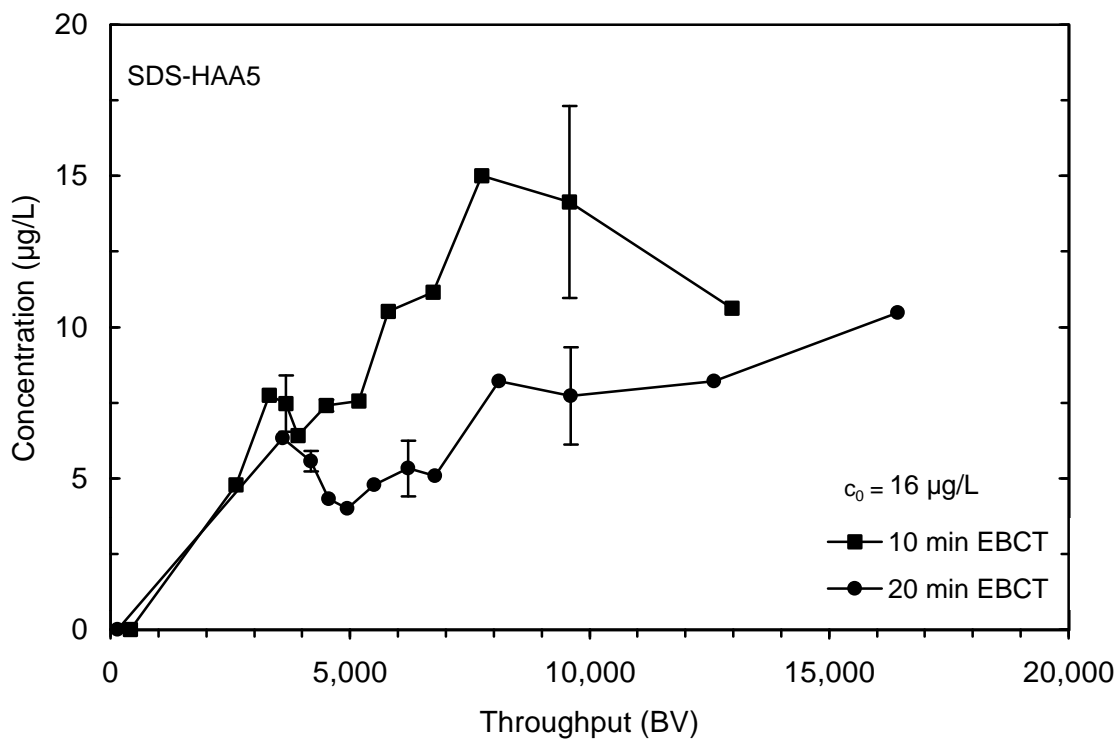
**Figure 45 TOC breakthrough for 10 and 20 minute EBCT contactors during session 1 (March), plotted as throughput in bed volumes treated**



**Figure 46 UV-254 breakthrough for 10 and 20 minute EBCT contactors during session 1 (March), plotted as throughput in bed volumes treated**

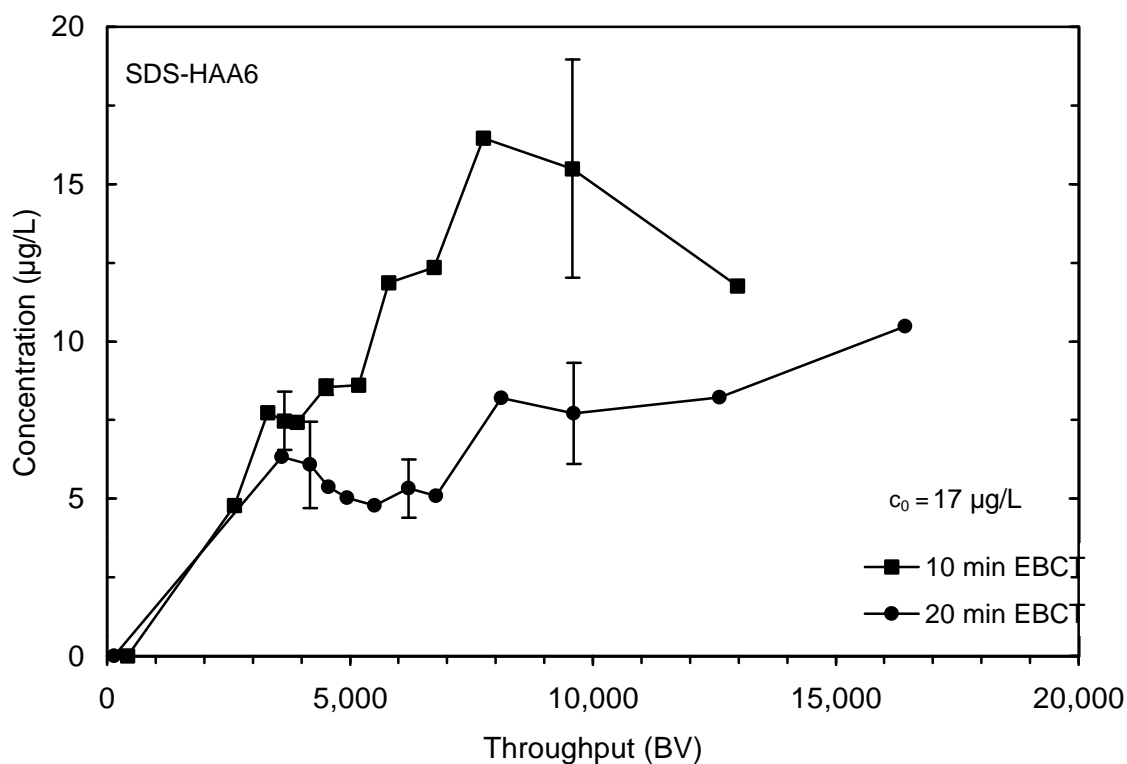


**Figure 47 SDS-THM4 breakthrough for 10 and 20 minute EBCT contactors during session 1 (March), plotted as throughput in bed volumes treated**

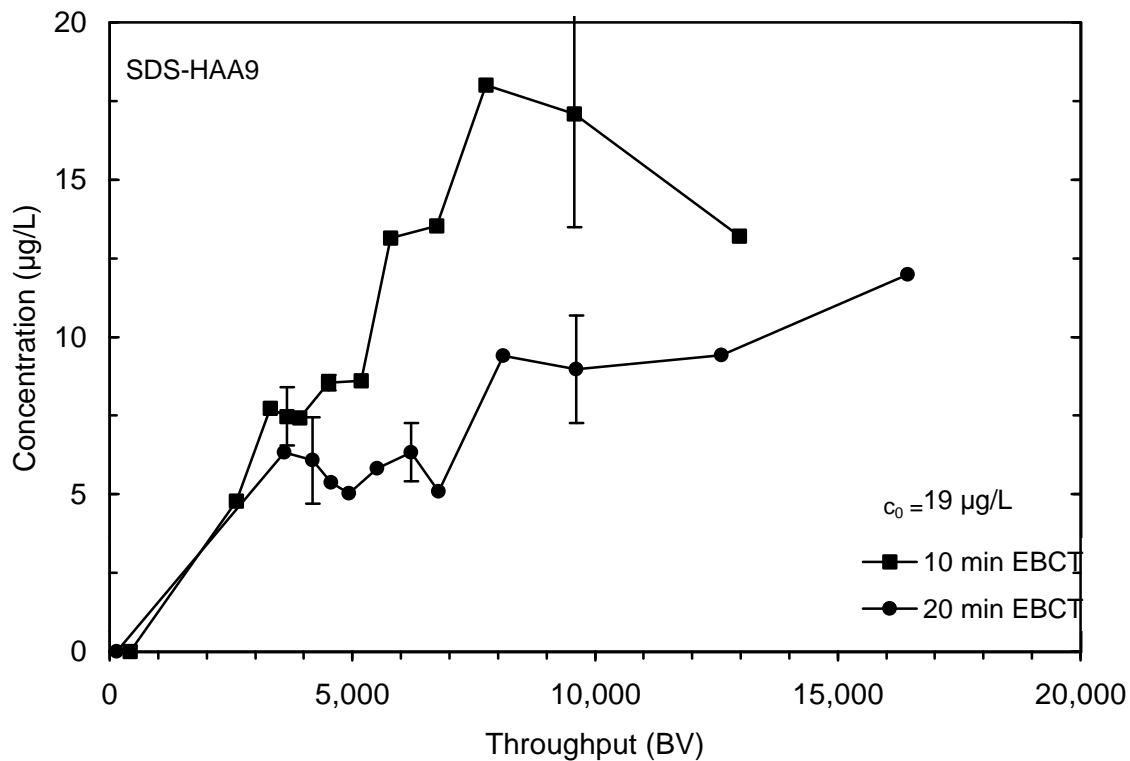


**Figure 48 SDS-HAA5 breakthrough for 10 and 20 minute EBCT contactors during session 1 (March), plotted as throughput in bed volumes treated**

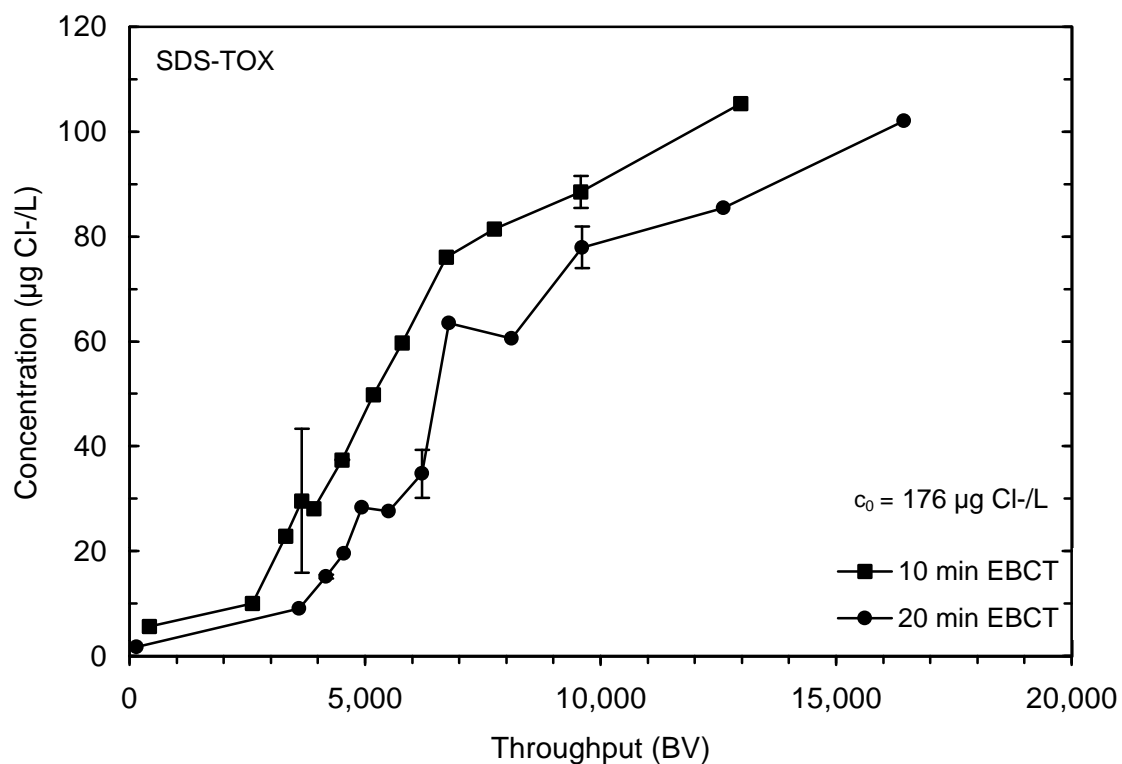




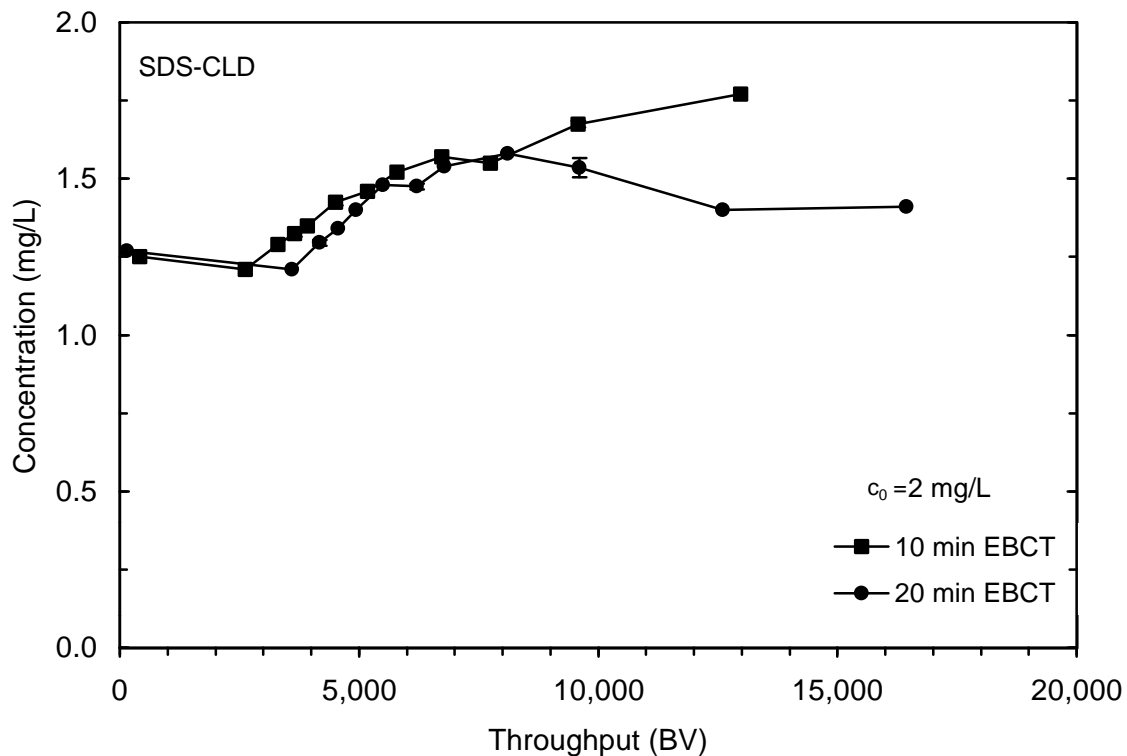
**Figure 49 SDS-HAA6 breakthrough for 10 and 20 minute EBCT contactors during session 1 (March), plotted as throughput in bed volumes treated**



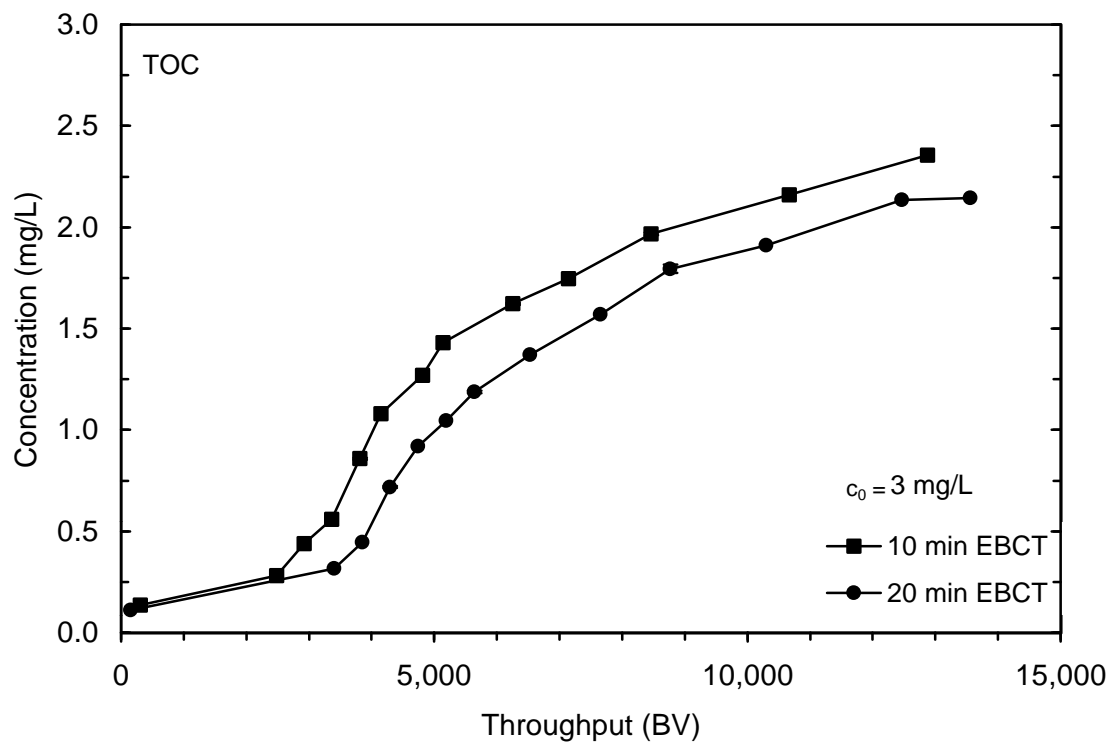
**Figure 50 SDS-HAA9 breakthrough for 10 and 20 minute EBCT contactors during session 1 (March), plotted as throughput in bed volumes treated**



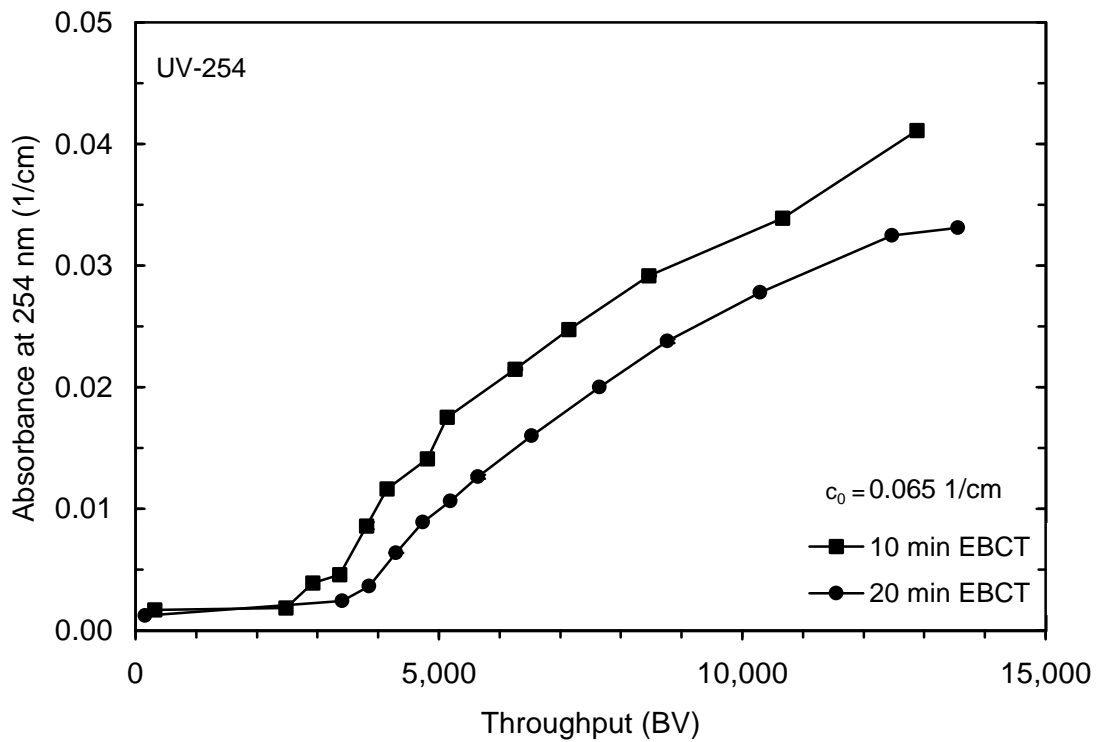
**Figure 51 SDS-TOX breakthrough for 10 and 20 minute EBCT contactors during session 1 (March), plotted as throughput in bed volumes treated**



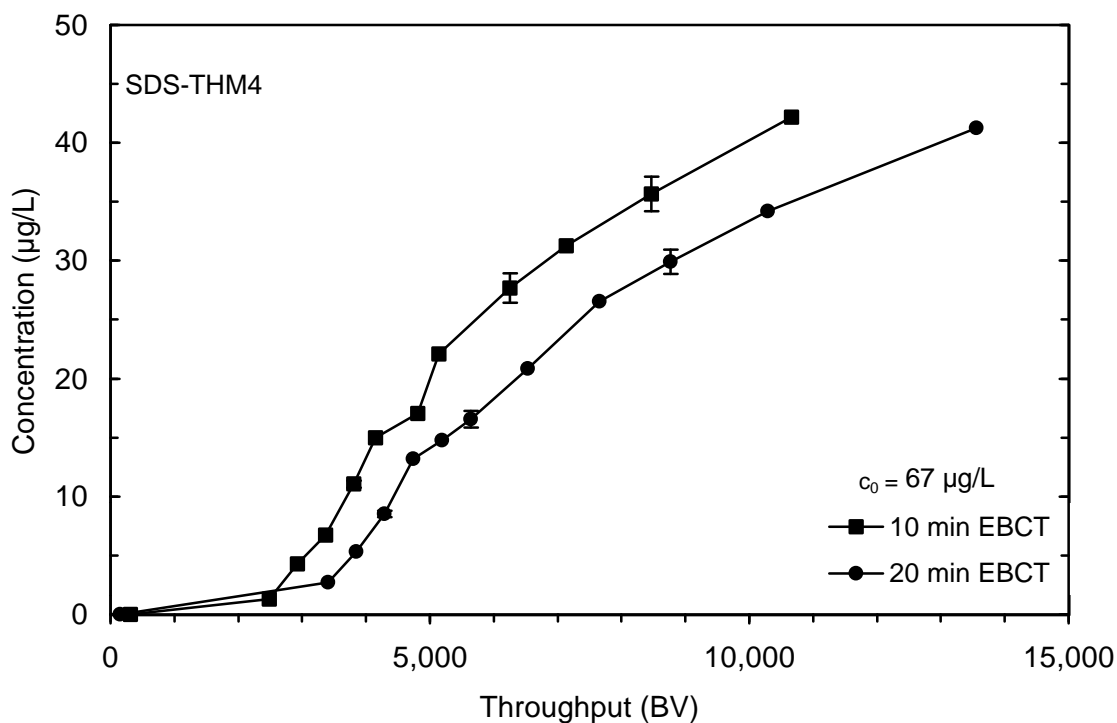
**Figure 52 SDS-CLD breakthrough for 10 and 20 minute EBCT contactors during session 1 (March), plotted as throughput in bed volumes treated**



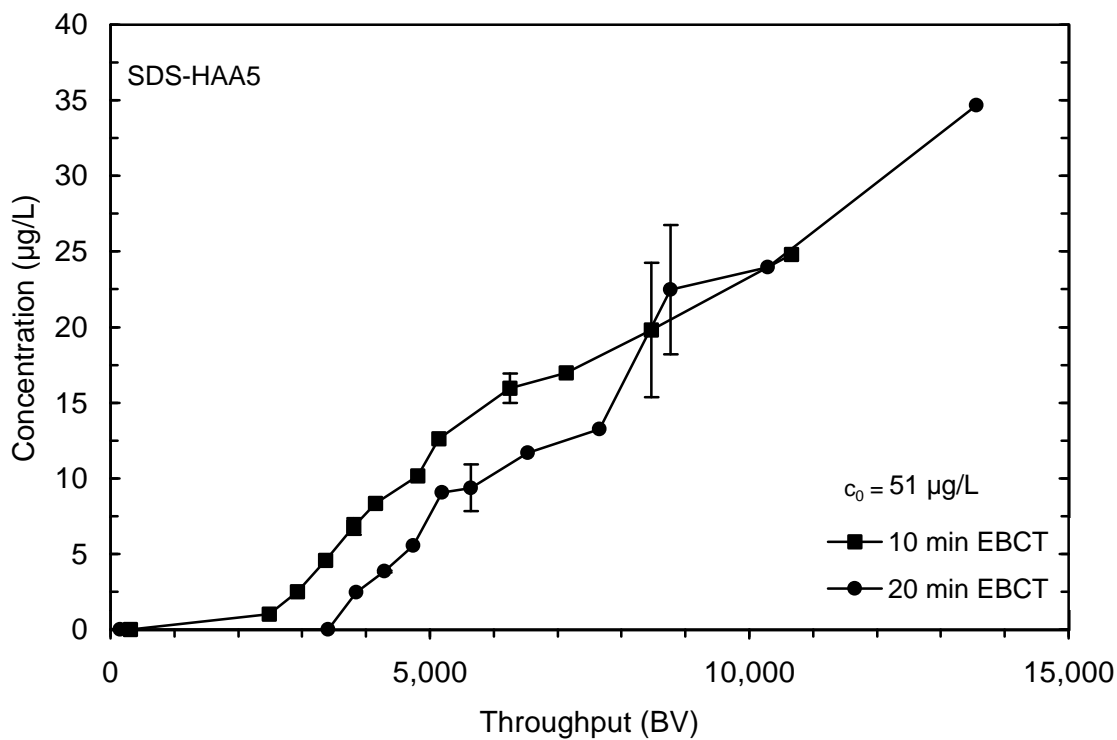
**Figure 53 TOC breakthrough for 10 and 20 minute EBCT contactors during session 1 (September), plotted as throughput in bed volumes treated**



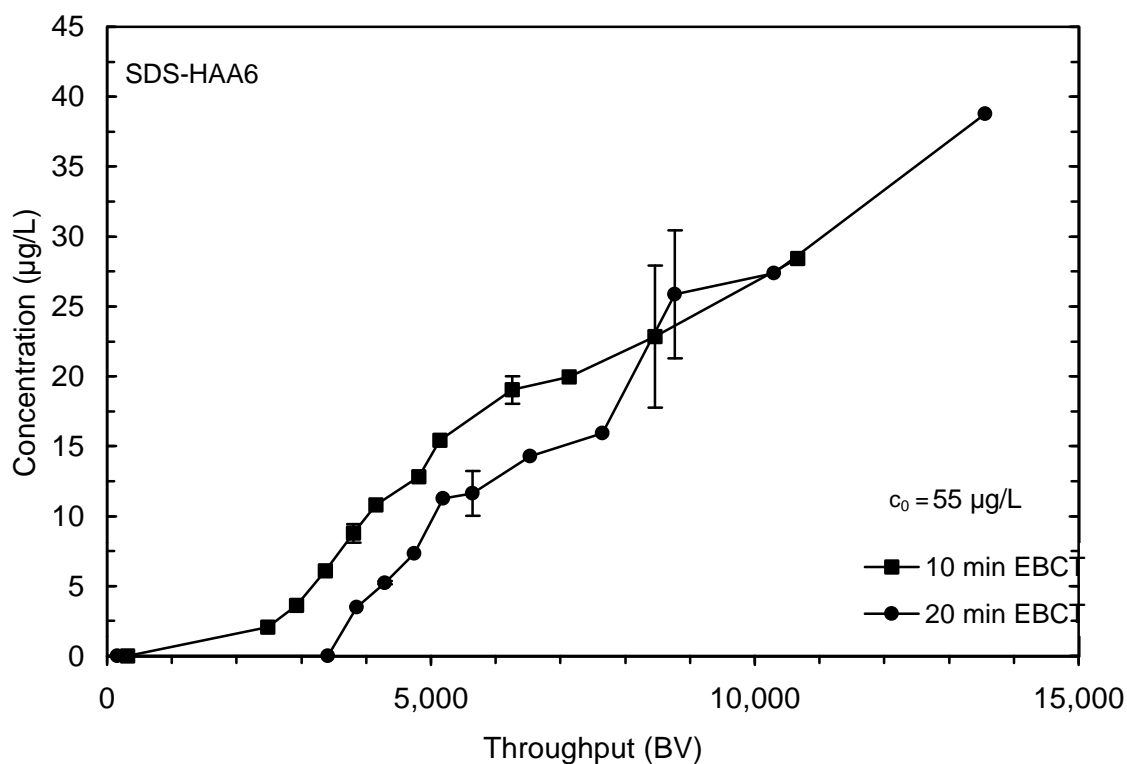
**Figure 54 UV-254 breakthrough for 10 and 20 minute EBCT contactors during session 2 (September), plotted as throughput in bed volumes treated**



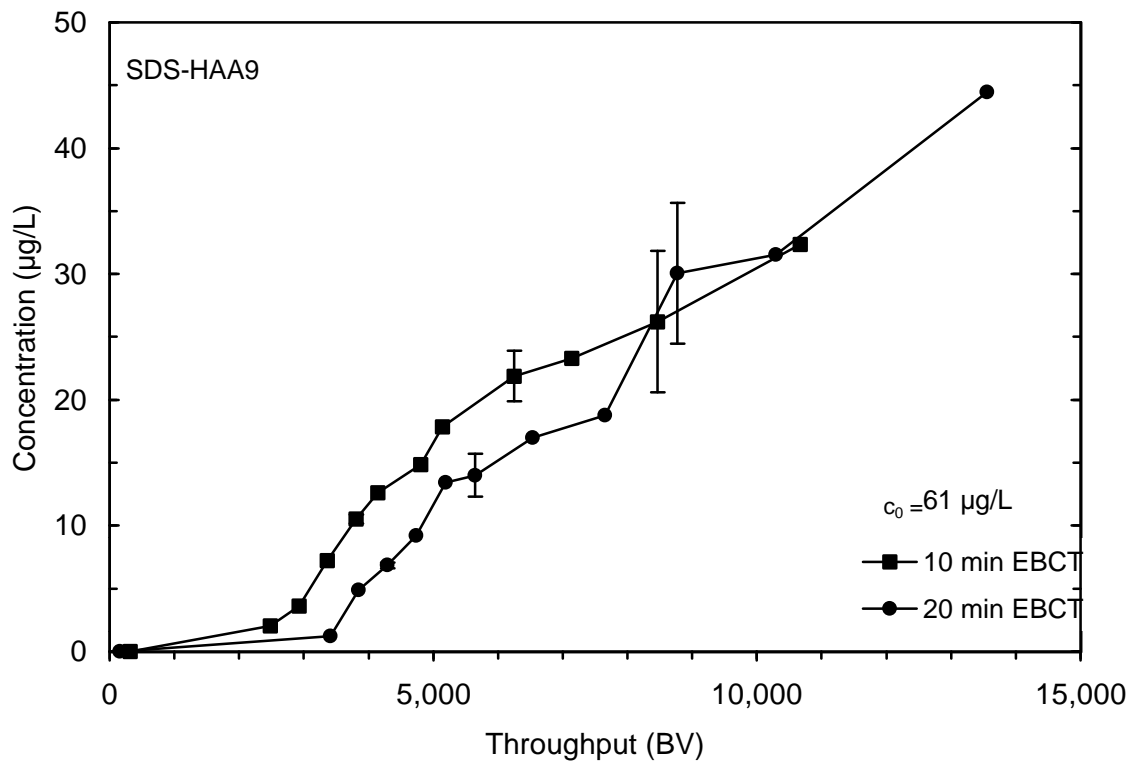
**Figure 55 SDS-THM4 breakthrough for 10 and 20 minute EBCT contactors during session 2 (September), plotted as throughput in bed volumes treated**



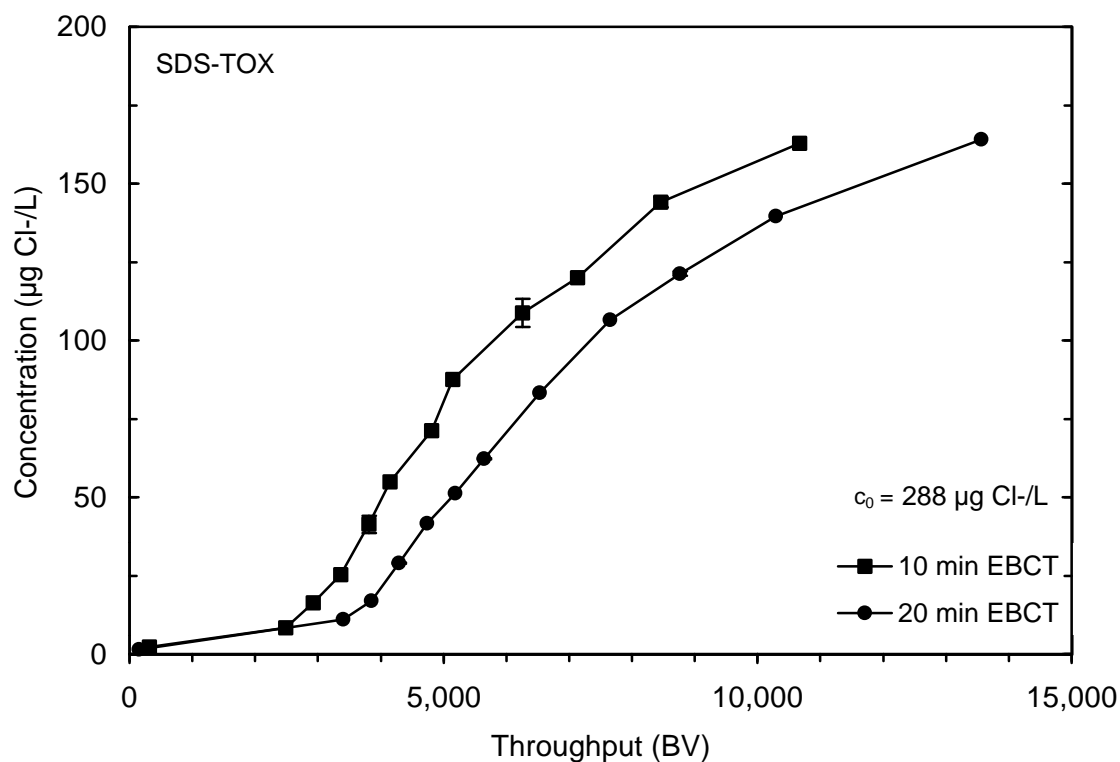
**Figure 56 SDS-HAA5 breakthrough for 10 and 20 minute EBCT contactors during session 2 (September), plotted as throughput in bed volumes treated**



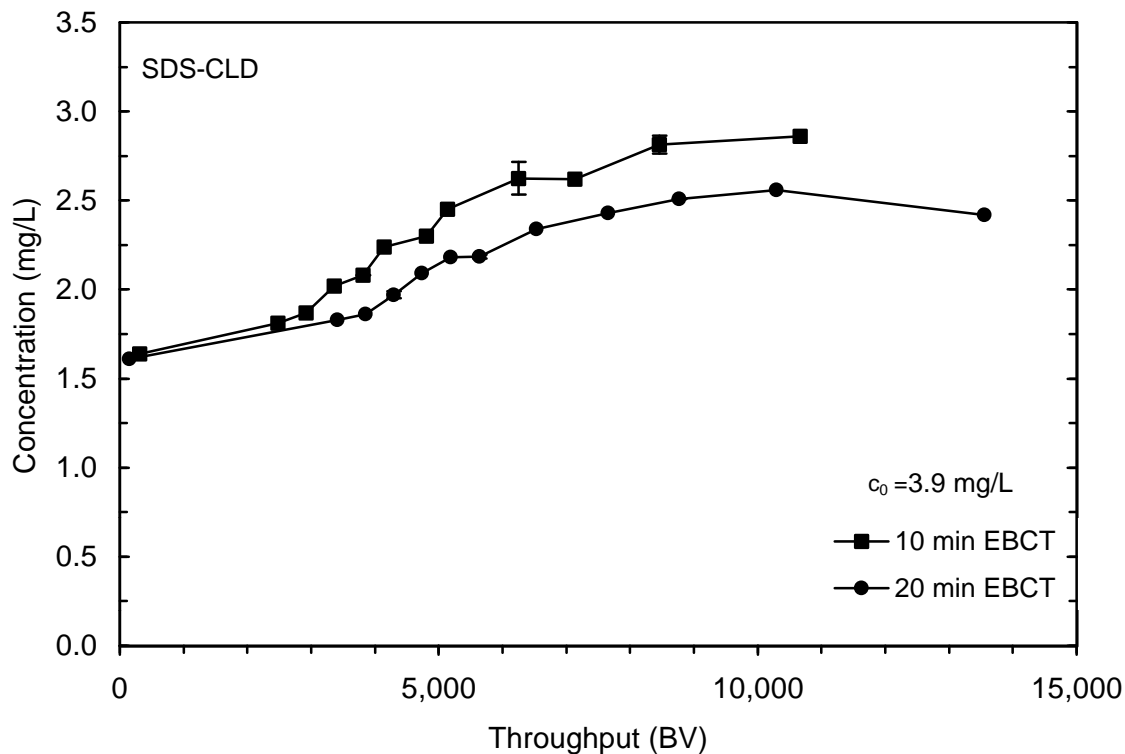
**Figure 57 SDS-HAA6 breakthrough for 10 and 20 minute EBCT contactors during session 2 (September), plotted as throughput in bed volumes treated**



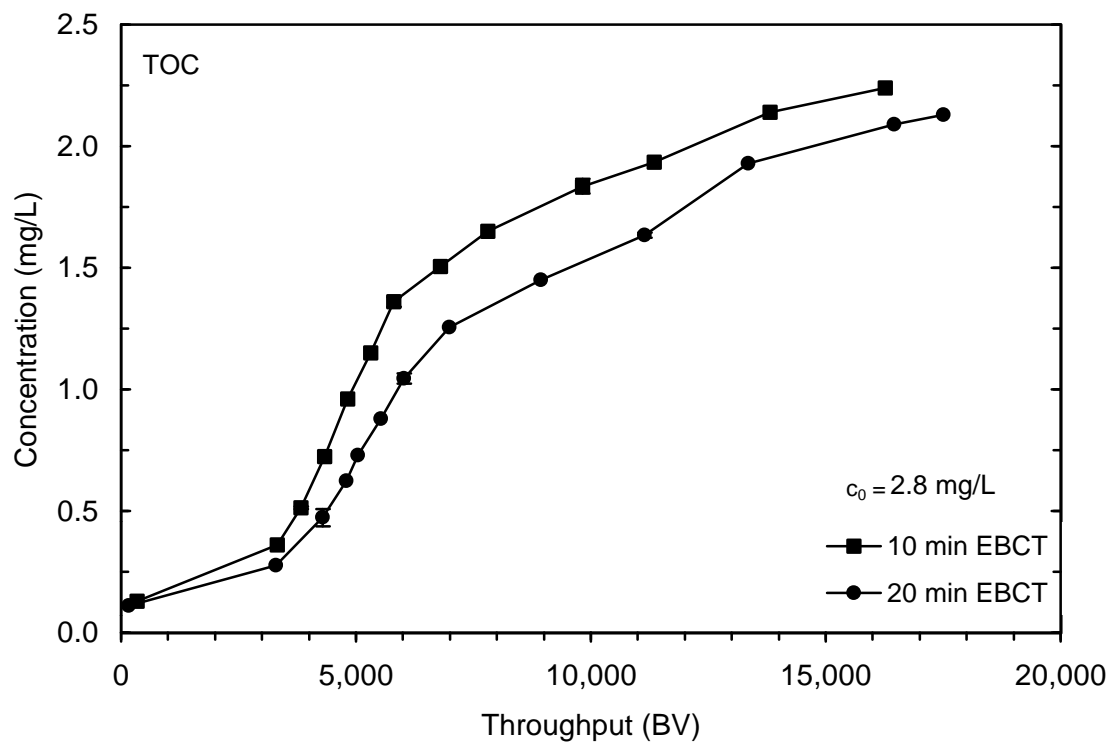
**Figure 58 SDS-HAA9 breakthrough for 10 and 20 minute EBCT contactors during session 2 (September), plotted as throughput in bed volumes treated**



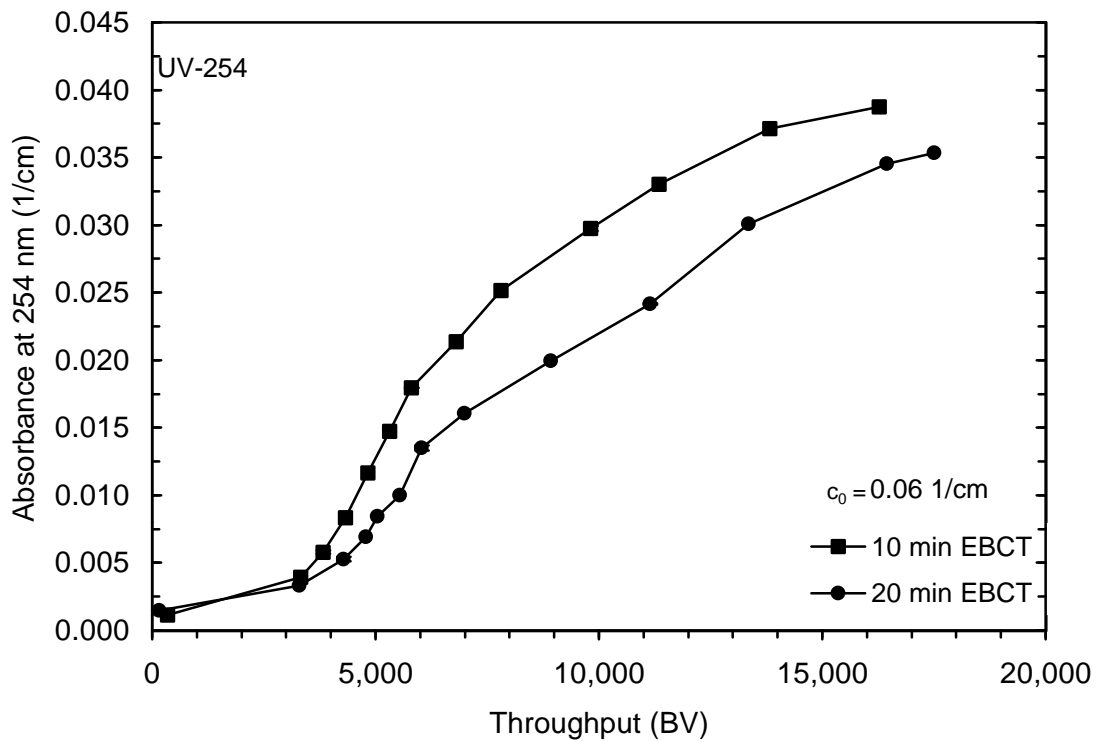
**Figure 59 SDS-TOX breakthrough for 10 and 20 minute EBCT contactors during session 2 (September), plotted as throughput in bed volumes treated**



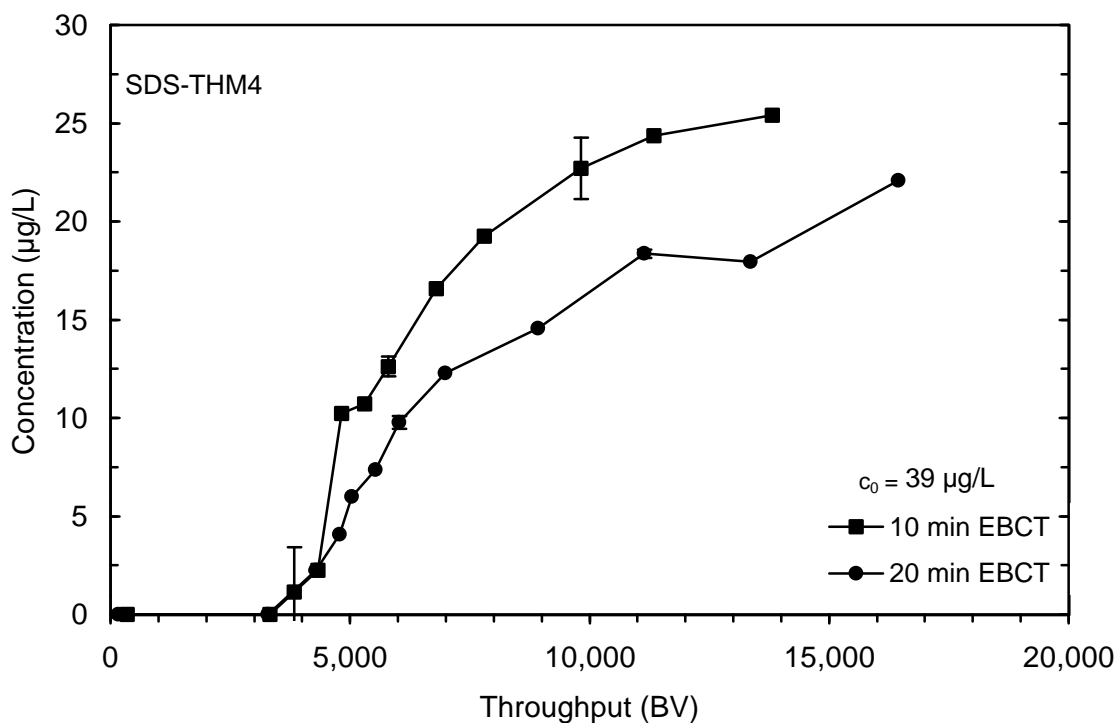
**Figure 60 SDS-CLD breakthrough for 10 and 20 minute EBCT contactors during session 2 (September), plotted as throughput in bed volumes treated**



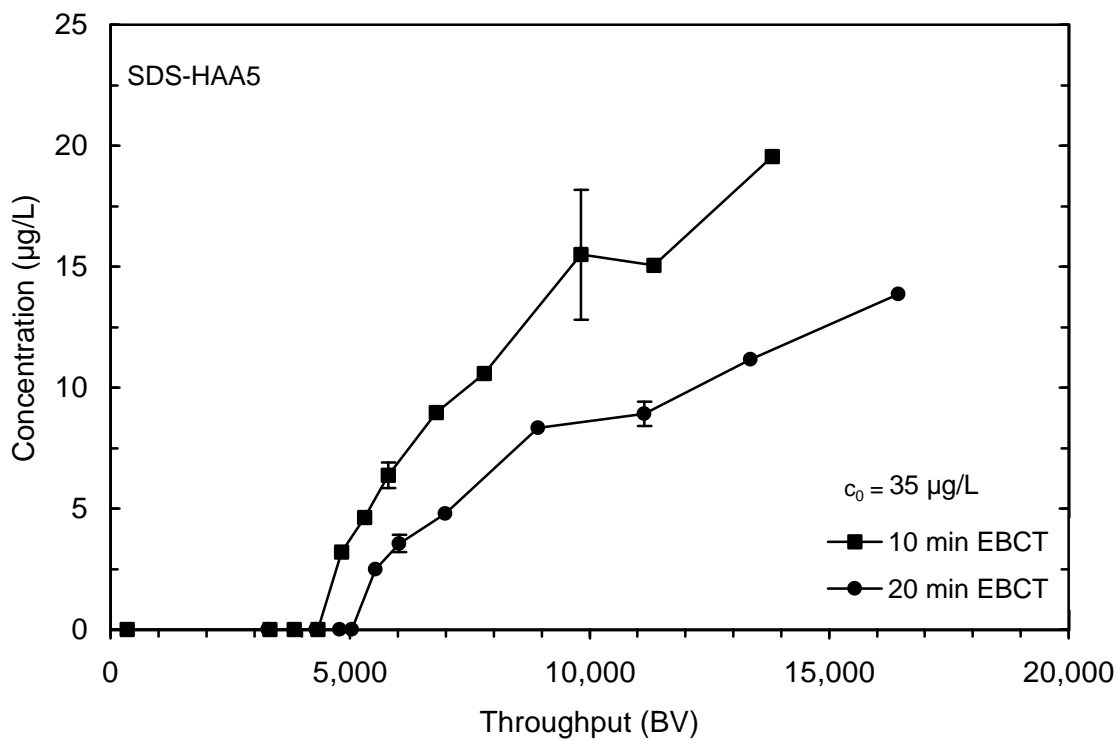
**Figure 61 TOC breakthrough for 10 and 20 minute EBCT contactors during session 3 (November), plotted as throughput in bed volumes treated**



**Figure 62 UV-254 breakthrough for 10 and 20 minute EBCT contactors during session 3 (November), plotted as throughput in bed volumes treated**

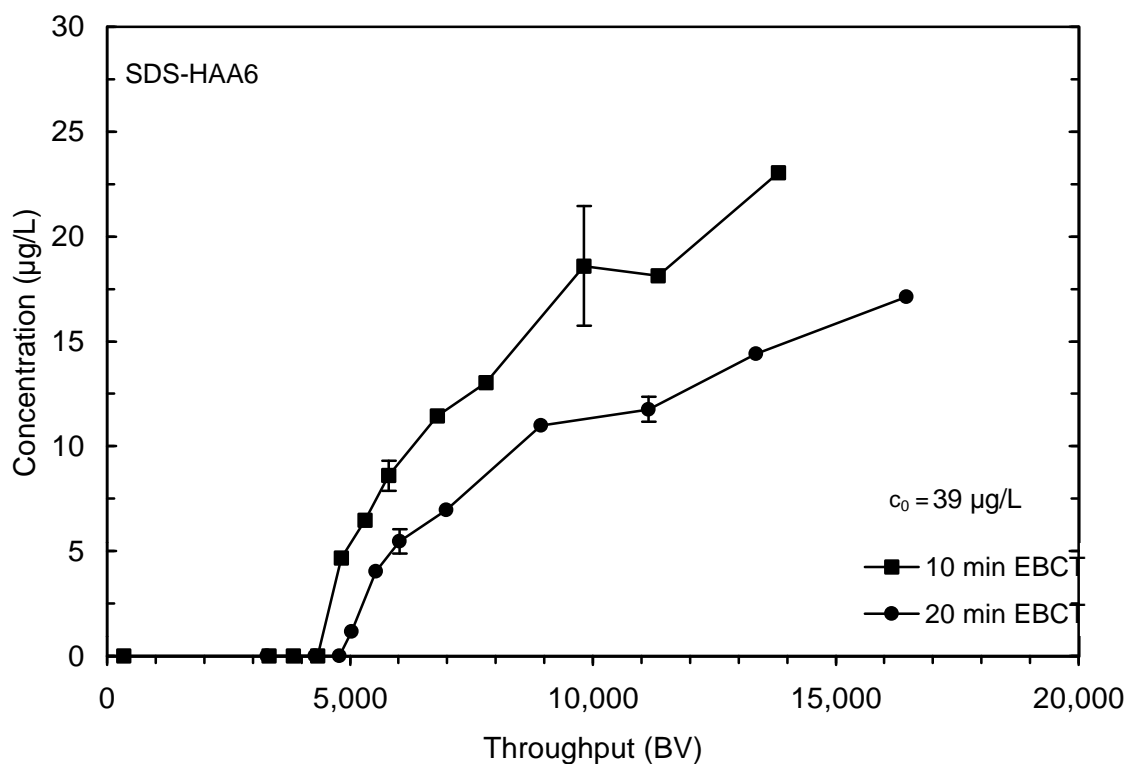


**Figure 63 SDS-THM4 breakthrough for 10 and 20 minute EBCT contactors during session 3 (November), plotted as throughput in bed volumes treated**

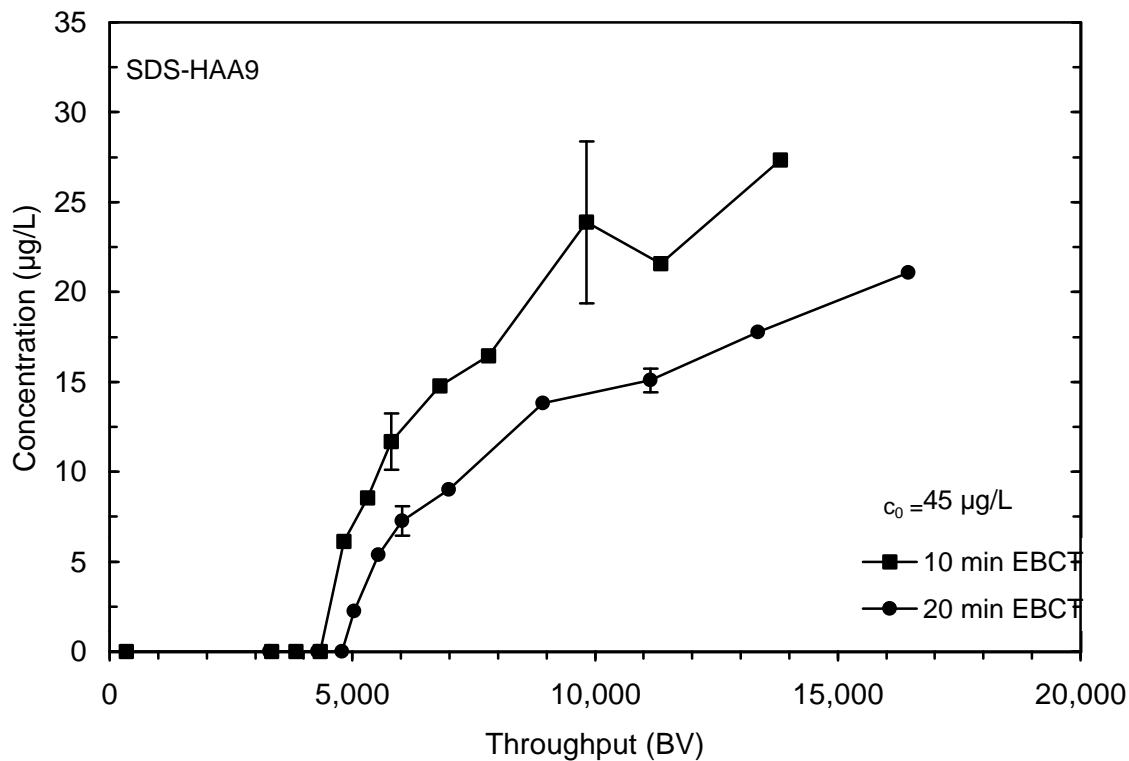


**Figure 64 SDS-HAA5 breakthrough for 10 and 20 minute EBCT contactors during session 3 (November), plotted as throughput in bed volumes treated**

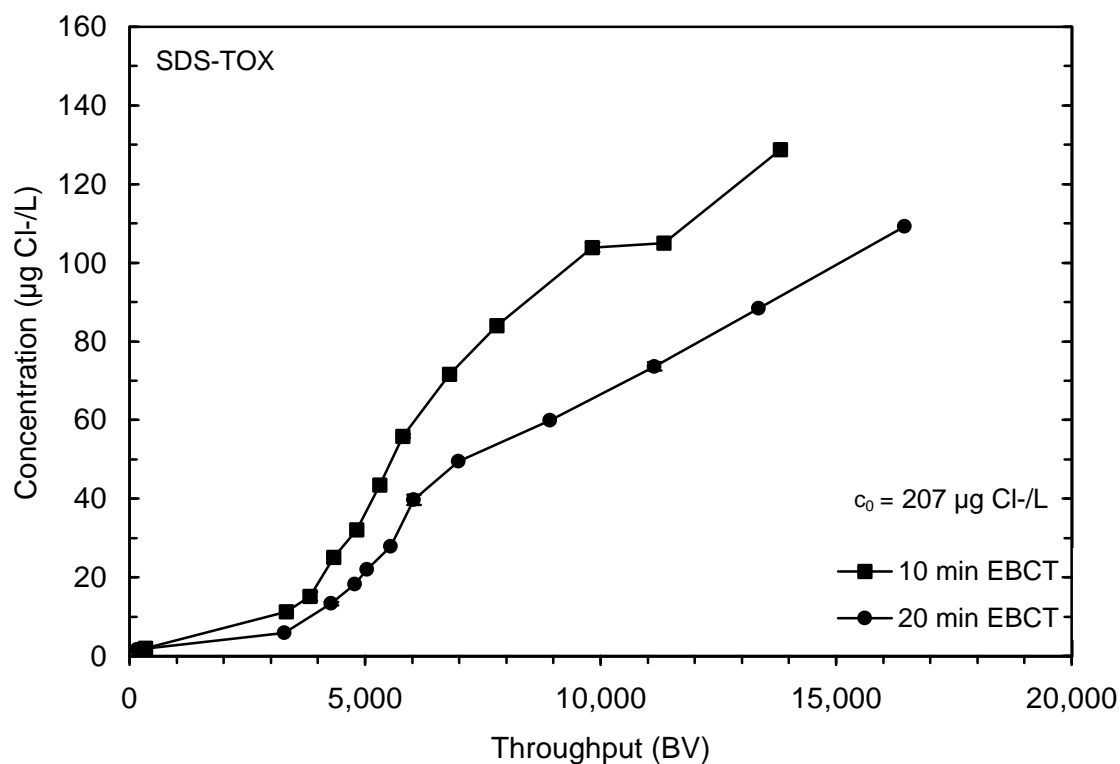




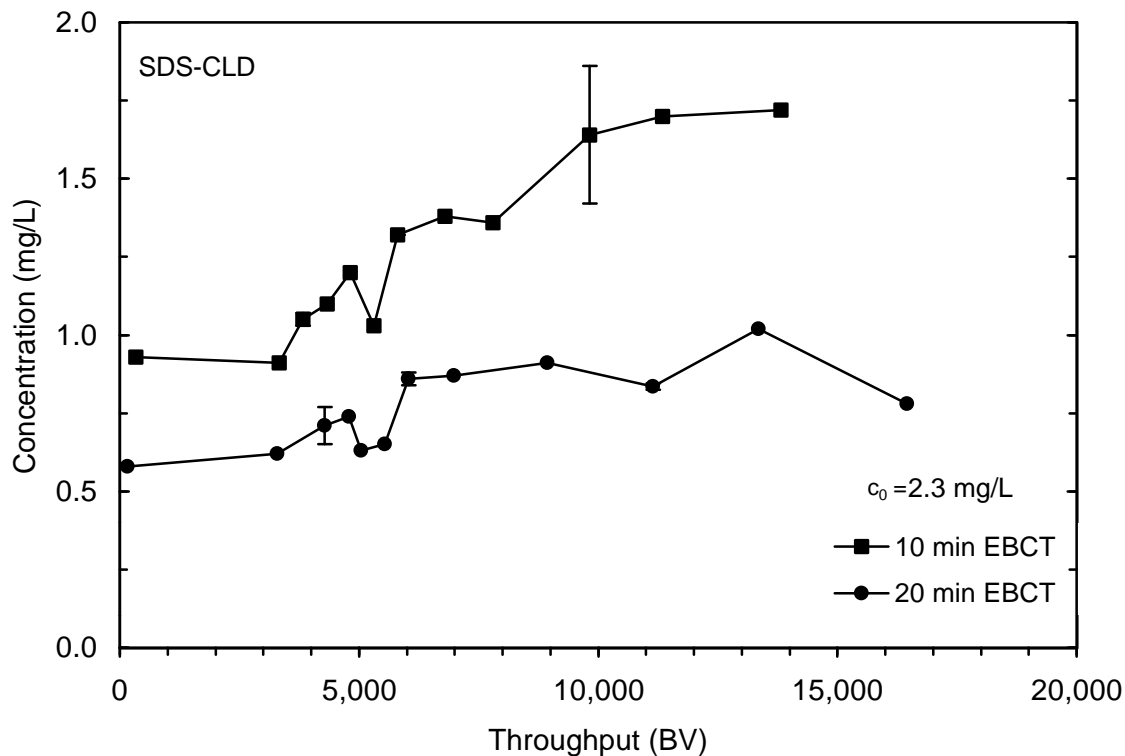
**Figure 65 SDS-HAA6 breakthrough for 10 and 20 minute EBCT contactors during session 3 (November), plotted as throughput in bed volumes treated**



**Figure 66 SDS-HAA9 breakthrough for 10 and 20 minute EBCT contactors during session 3 (November), plotted as throughput in bed volumes treated**



**Figure 67 SDS-TOX breakthrough for 10 and 20 minute EBCT contactors during session 3 (November), plotted as throughput in bed volumes treated**



**Figure 68 SDS-CLD breakthrough for 10 and 20 minute EBCT contactors during session 3 (November), plotted as throughput in bed volumes treated**

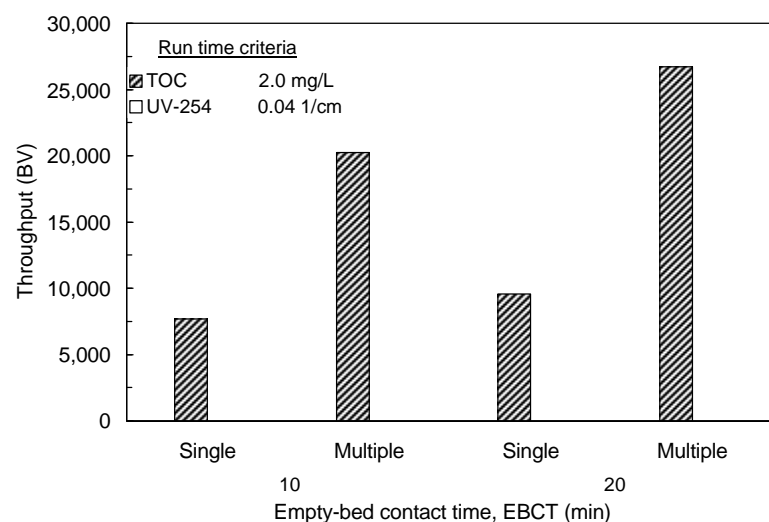


Figure 69 Throughput based on single contactor breakthrough and effluent blending for TOC and UV-254 effluent criteria (high) during session 1 (March)

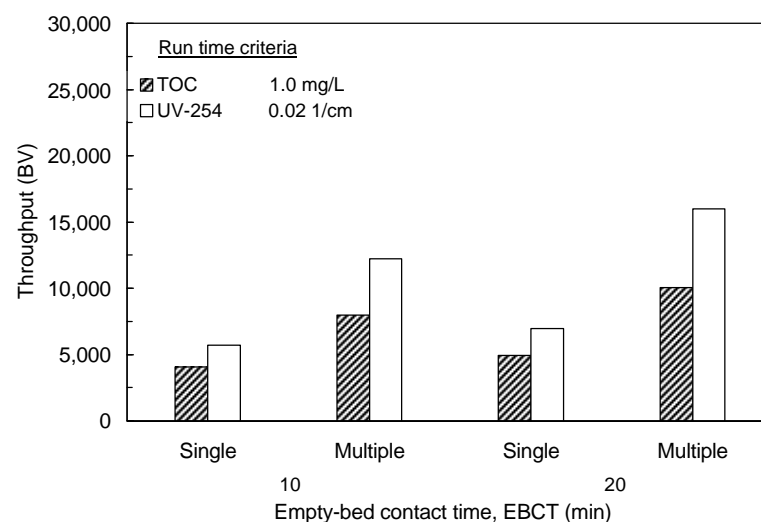


Figure 70 Throughput based on single contactor breakthrough and effluent blending for TOC and UV-254 effluent criteria (low) during session 1 (March)

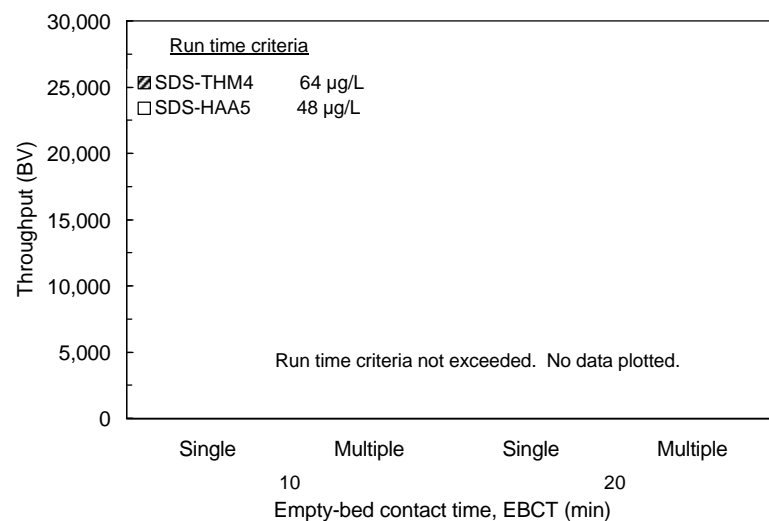


Figure 71 Throughput based on single contactor breakthrough and effluent blending for Stage 1 SDS-THM4 and SDS-HAA5 effluent criteria during session 1 (March)

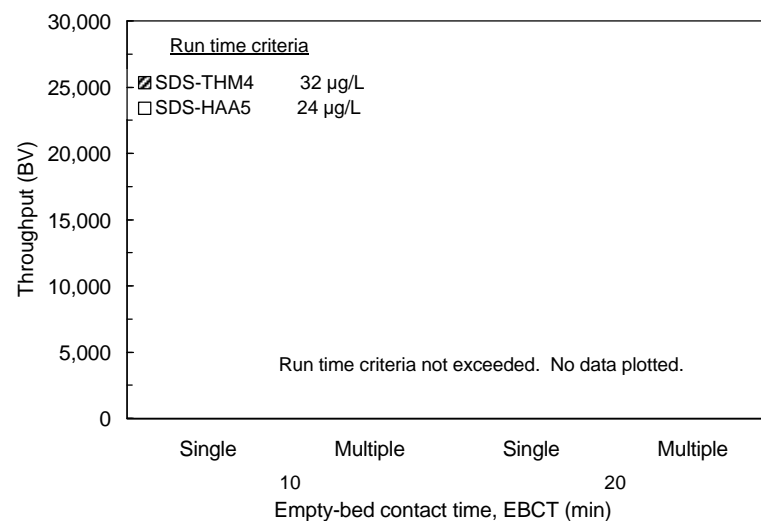
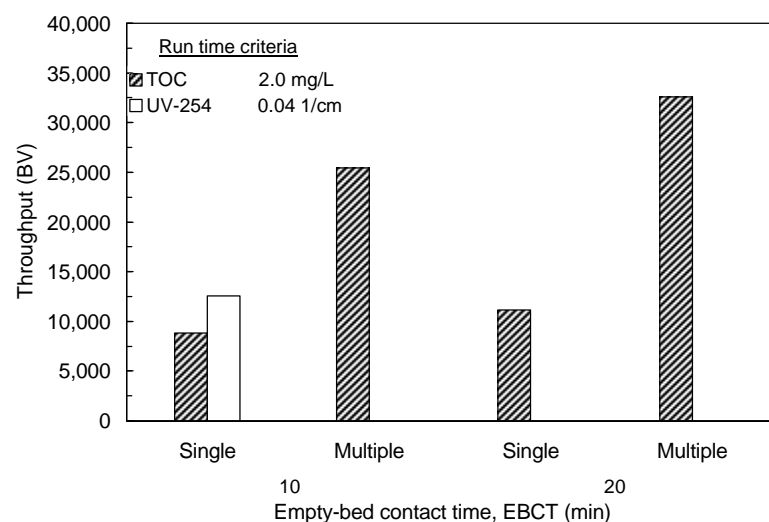
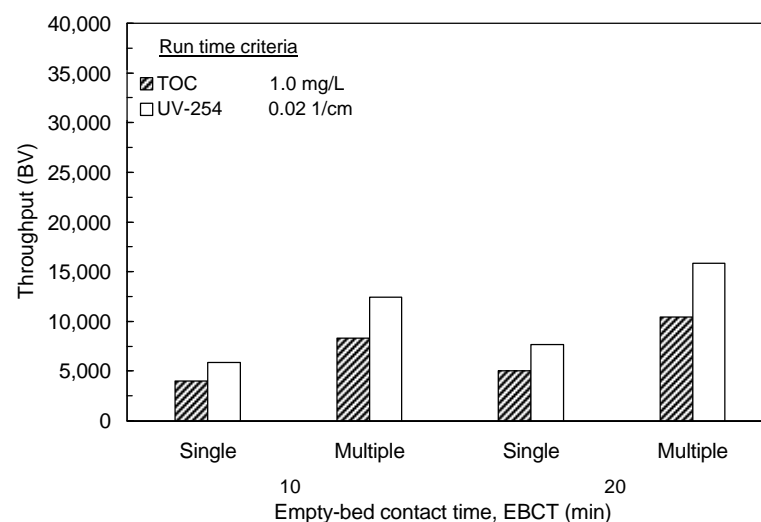


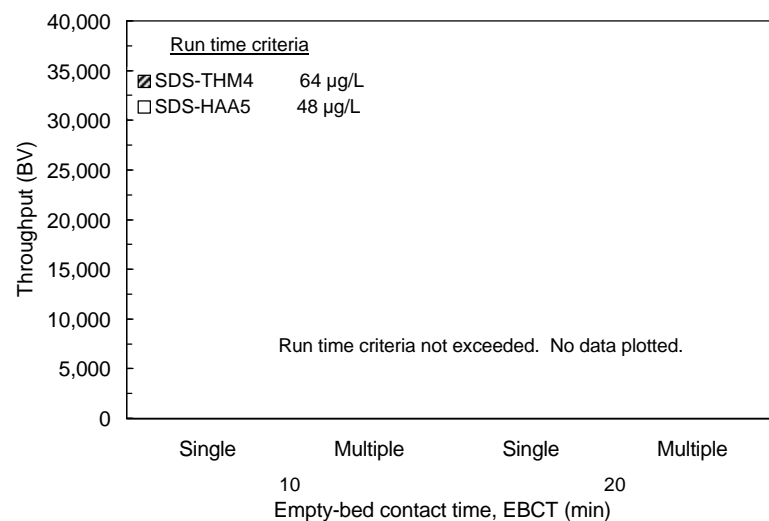
Figure 72 Throughput based on single contactor breakthrough and effluent blending for Stage 2 SDS-THM4 and SDS-HAA5 effluent criteria during session 1 (March)



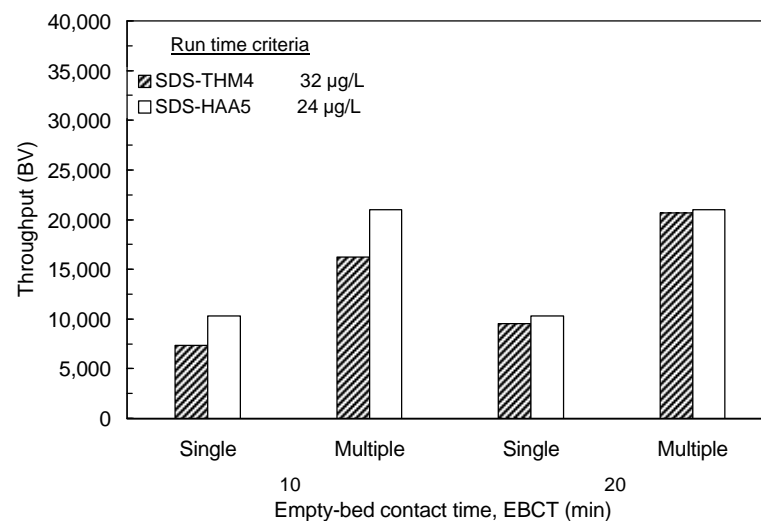
**Figure 73** Throughput based on single contactor breakthrough and effluent blending for TOC and UV-254 effluent criteria (high) during session 2 (September)



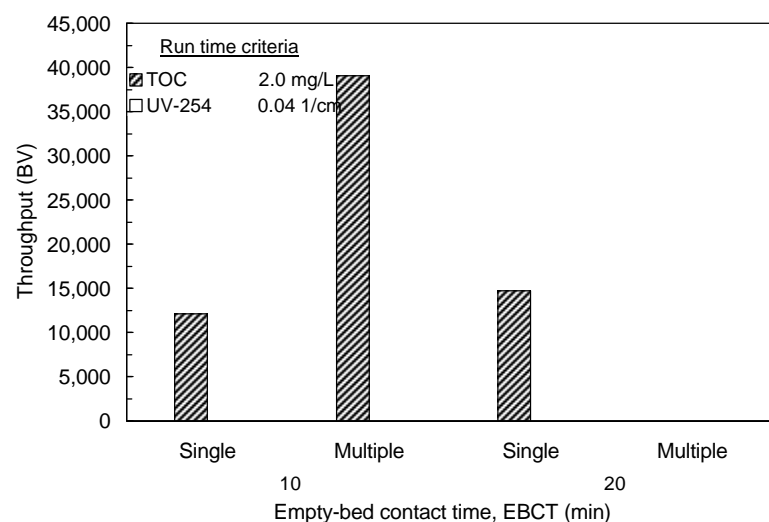
**Figure 74** Throughput based on single contactor breakthrough and effluent blending for TOC and UV-254 effluent criteria (low) during session 2 (September)



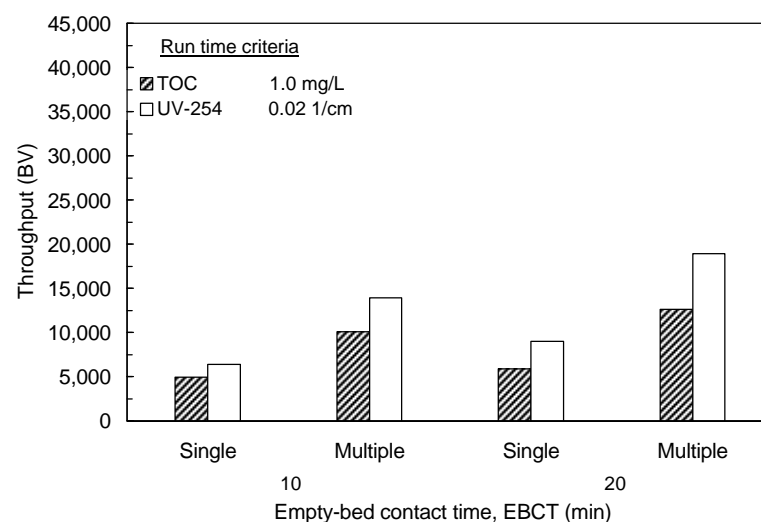
**Figure 75** Throughput based on single contactor breakthrough and effluent blending for Stage 1 SDS-THM4 and SDS-HAA5 effluent criteria during session 2 (September)



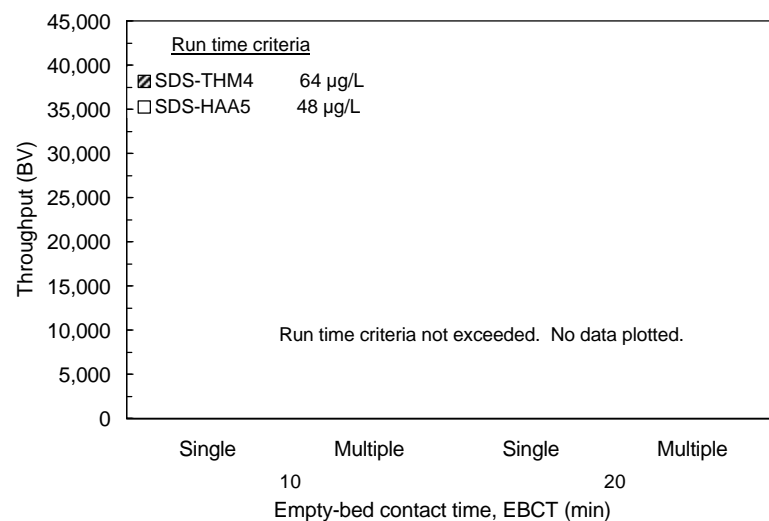
**Figure 76** Throughput based on single contactor breakthrough and effluent blending for Stage 2 SDS-THM4 and SDS-HAA5 effluent criteria during session 2 (September)



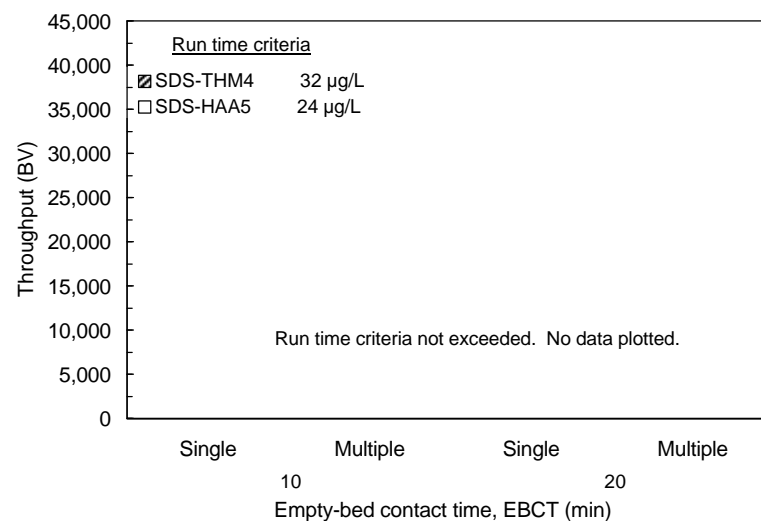
**Figure 77** Throughput based on single contactor breakthrough and effluent blending for TOC and UV-254 effluent criteria (high) during session 3 (November)



**Figure 78** Throughput based on single contactor breakthrough and effluent blending for TOC and UV-254 effluent criteria (low) during session 3 (November)



**Figure 79** Throughput based on single contactor breakthrough and effluent blending for Stage 1 SDS-THM4 and SDS-HAA5 effluent criteria during session 3 (November)



**Figure 80** Throughput based on single contactor breakthrough and effluent blending for Stage 2 SDS-THM4 and SDS-HAA5 effluent criteria during session 3 (November)

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# *10* *Impact of Influent pH*

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## 10 Impact of Influent pH

Using the batch of water sampled in November, two additional RSSCTs were operated at a an EBCT of 10 minutes, with influent pH values of 6.5 and 7.5. Although Iowa-American Water Company currently uses polyaluminum sulfate as coagulant, which yields a settled water pH of 7.0 to 7.2, the plant is considering two alternative coagulants: polyaluminum chloride (PACl) and ferric chloride. The use of PACl would yield a settled water pH of about 7.5, while the use of ferric chloride would yield a settled water pH of about 6.5. Operating the contactors with the same influent water adjusted to these pH values would generate data on the impact of influent pH on DBP precursor removal. Although the actual TOC and DBP precursor removal during coagulation may vary with the use of the alternative coagulants, the goal of this study was to evaluate the impact of influent pH only on GAC performance.

The influent water quality for each contactor is summarized in Table 20. SDS chlorination for all three influent pH contactors was conducted under constant conditions, including pH, summarized in Table 13. Therefore, differences in influent pH only affected adsorption of DBP precursors; all samples were buffered to pH 7.35 prior to SDS chlorination regardless of influent pH.

Figure 81 shows the impact of influent pH on TOC breakthrough. A small range of effluent TOC breakthrough behavior was observed, with run times to an effluent concentration of 1.0 mg/L ranging from 33 to 39 days. Run times to 70 percent TOC breakthrough ranged from 73 to 80 days. As influent pH decreased from 7.5 to 6.5, the effluent TOC profiles shifted to the right, indicating improved performance at lower influent pH. The level of immediate breakthrough was similar for all three runs; the point of initial breakthrough (effluent concentrations beginning to increase above immediate breakthrough levels) shifted to the right, from 15 to 24 days, with decreasing influent pH. At higher run times, above 80 days, the three curves showed a convergence. The impact of influent pH on UV<sub>254</sub> breakthrough was similar to that for TOC, as shown in Figure 82. For the adsorption of UV-absorbing compounds, breakthrough profiles shifted to the right as with decreasing influent pH.

A comparison of SDS-THM4 breakthrough for the three influent pH values is shown in Figure 83. Overall, the control of THM4 precursors improved with decreasing influent pH, and best performance was achieved at an influent pH of 6.5. The performance of the influent pH 7.0 and 7.5 runs was similar, although towards the end of the run higher effluent concentrations were observed for the influent pH 7.0 run.

The results obtained during the influent pH study for SDS-HAA5, SDS-HAA6, and SDS-HAA9 are shown in Figures 84, 85, and 86, respectively. In general, HAA precursor removal improved with decreasing pH. Although little difference in performance was observed between the influent pH 7.0 and 7.5 runs, the influent pH 6.5 run more consistently showed slightly improved performance.

The impact of influent pH on SDS-TOX breakthrough is shown in Figure 87. Especially during the early to middle portion of the run (20 to 60 days), the influent pH 6.5 run yielded improved

SDS-TOX precursor control. Towards the end of the run, the three curves converged. Plots of effluent SDS chlorine demand are shown in Figure 88.

The effluent pH and temperature for the three influent pH contactors was also monitored. The results are summarized in Table 34. The variability of both effluent pH and temperature was very low during all runs.

Tables 35 through 37 summarize run times to various GAC effluent criteria for the three influent pH runs. The mean, standard deviation, and percent standard deviation of the run times are also tabulated. Based on the calculated run times, the corresponding concentration of other measured parameters (DBP precursor surrogates and SDS-DBPs) at that run time were also calculated.

Bar graph plots of run times to TOC,  $UV_{254}$ , THM4, and HAA5 criteria were generated. Figures 89 and 90 summarize run times to effluent TOC and  $UV_{254}$  criteria, and Figures 91 and 92 summarize run times to effluent SDS-THM4 and SDS-HAA5 criteria. For cases where the effluent concentration did not reach the run time criterion, no bar is shown. For all influent pH contactors, neither Stage 1 or 2 HAA5 criteria were exceeded. Stage 2 THM4 criteria were also not exceeded.

Figures 93, 94, 95, and 96 show the breakthrough of formed  $CHCl_3$ , BDCM, DBCM, and  $CHBr_3$ , respectively, for all three influent pH contactors.  $CHBr_3$  was not detected above the MRL during this study. Overall, the influent pH 6.5 contactor yielded improved THM species precursor control over the influent pH 7.0 and 7.5 contactors. For SDS-BDCM, very little difference in performance was observed after 40 days.

The breakthrough of the nine HAA species for the influent pH runs is shown in Figures 97 through 105. Overall, the influent pH 6.5 contactor outperformed both the influent pH 7.0 and 7.5 contactors. Typically, the influent pH 7.5 contactor outperformed the influent pH 7.0 contactor for HAA species control, such as for SDS-DCAA and SDS-TCAA. For SDS-BCAA, the two runs yielded similar results, and for SDS-DCBAA, the influent pH 7.5 run again outperformed the influent pH 7.0 run.



Effluent sample number	Effluent pH at GAC influent pH			Effluent temperature (°C) at GAC influent pH		
	6.5	7.0	7.5	6.5	7.0	7.5
1	7.4	8.0	8.4	24	25	24
2	7.2	7.7	8.2	21	23	24
3	7.2	7.7	8.1	24	24	21
4	7.2	7.7	8.1	23	23	23
5	7.1	7.7	8.1	22	23	24
6	7.2	7.6	8.1	23	23	22
7	7.3	7.7	8.1	25	24	22
8	7.3	7.8	8.1	24	23	24
9	7.3	7.7	8.1	24	24	23
10	7.3	7.9	8.1	23	24	24
11	7.3	7.7	8.1	22	23	23
12	7.2	7.8	8.1	22	25	22
13	7.1	7.8	8.2	22	23	23
Mean	7.2	7.8	8.1	23	24	23
Standard deviation	±0.1	±0.1	±0.1	±1.1	±0.6	±0.9
Relative percent error	1%	1%	1%	5%	3%	4%

**Table 34 GAC effluent pH and temperature data for influent pH 6.5, 7.0, and 7.5 contactors**

Parameter	Units	Influent concen- tration	Breakthrough criterion	Value of listed parameter when breakthrough criterion is met (single contactor)								
				Run time (days)	Throughput (bed volumes)	TOC (mg/L)	UV <sub>254</sub> (1/cm)	SDS-THM4 (µg/L)	SDS-HAA5 (µg/L)	SDS-HAA6 (µg/L)	SDS-HAA9 (µg/L)	SDS-TOX (µg Cl <sup>-</sup> /L)
TOC	(mg/L)	2.8	2.0	84	12120	2.0	0.033	#	#	#	#	#
			1.0	39	5630	1.0	0.012	7	4	5	6	31
			1.4†	49	7120	1.4	0.019	12	7	9	12	59
UV <sub>254</sub>	(1/cm)	0.060	0.040	*	*							
			0.020	51	7310	1.4	0.020	13	7	9	12	62
			0.030†	75	10760	1.9	0.030	18	12	15	18	98
SDS-THM4	(µg/L)	39	80	*	*							
			64	*	*							
			32	*	*							
SDS-HAA5	(µg/L)	33	48	*	*							
			24	*	*							
SDS-HAA6	(µg/L)	37	48	*	*							
			24	*	*							
SDS-HAA9	(µg/L)	42	48	*	*							
			24	*	*							
SDS-TOX	(µg Cl <sup>-</sup> /L)	208	120	*	*							
			70	55	7850	1.5	0.022	14	8	10	13	70

†GAC effluent concentration equal to 50 percent of the average influent concentration.

\*Effluent concentration criteria not exceeded during GAC run time, value of listed parameter is left blank.

#Data not available for listed parameter at given breakthrough criterion.

**Table 35 Run times to selected GAC effluent criteria (influent pH 6.5)**

Parameter	Units	Influent concentration	Breakthrough criterion	Value of listed parameter when breakthrough criterion is met (single contactor)								
				Run time (days)	Throughput (bed volumes)	TOC (mg/L)	UV <sub>254</sub> (1/cm)	SDS-THM4 (µg/L)	SDS-HAA5 (µg/L)	SDS-HAA6 (µg/L)	SDS-HAA9 (µg/L)	SDS-TOX (µg Cl <sup>-</sup> /L)
TOC	(mg/L)	2.8	2.0	84	12130	2.0	0.034	25	16	20	23	113
			1.0	34	4920	1.0	0.012	10	4	5	7	34
			1.4†	42	6060	1.4	0.019	14	7	9	12	60
UV <sub>254</sub>	(1/cm)	0.060	0.040	*	*							
			0.020	44	6400	1.4	0.020	15	8	10	14	65
			0.030†	69	9880	1.8	0.030	23	15	19	24	104
SDS-THM4	(µg/L)	39	80	*	*							
			64	*	*							
			32	*	*							
SDS-HAA5	(µg/L)	33	48	*	*							
			24	*	*							
SDS-HAA6	(µg/L)	37	48	*	*							
			24	*	*							
SDS-HAA9	(µg/L)	42	48	*	*							
			24	86	12380	2.0	0.035	25	17	20	24	115
SDS-TOX	(µg Cl <sup>-</sup> /L)	208	120	90	12910	2.1	0.036	25	18	21	25	120
			70	47	6700	1.5	0.021	16	9	11	14	70

†GAC effluent concentration equal to 50 percent of the average influent concentration.

\*Effluent concentration criteria not exceeded during GAC run time, value of listed parameter is left blank.

#Data not available for listed parameter at given breakthrough criterion.

**Table 36 Run times to selected GAC effluent criteria (influent pH 7.0)**

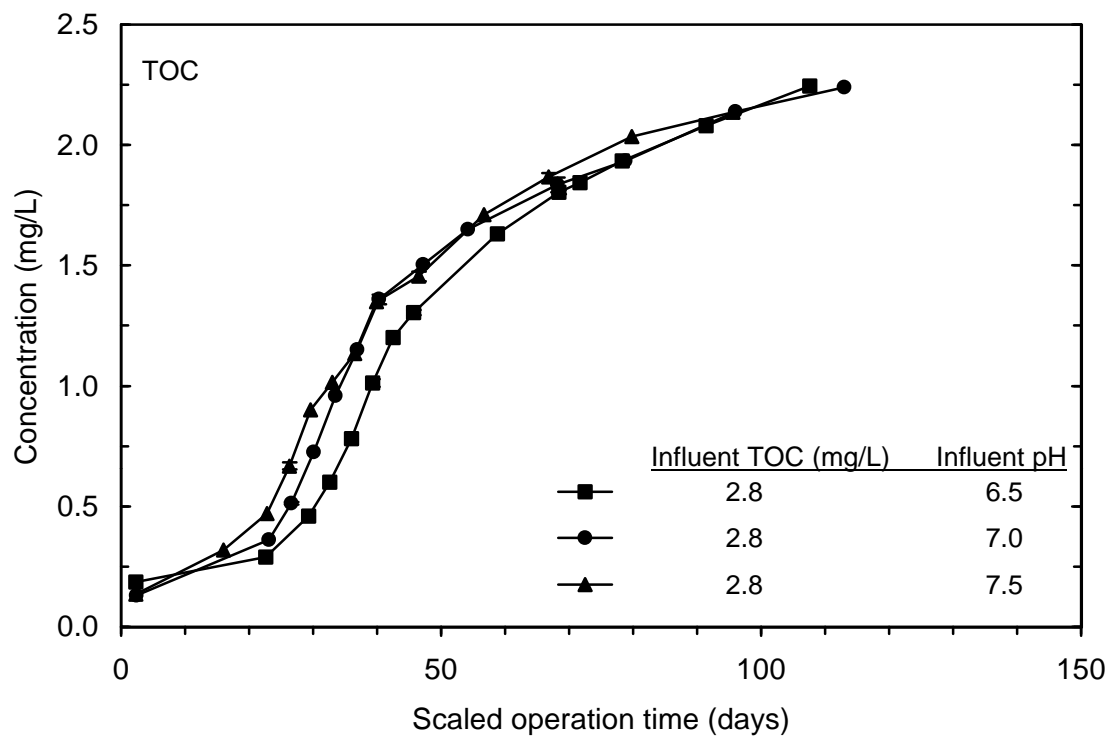
Parameter	Units	Influent concentration	Breakthrough criterion	Value of listed parameter when breakthrough criterion is met (single contactor)								
				Run time (days)	Throughput (bed volumes)	TOC (mg/L)	UV <sub>254</sub> (1/cm)	SDS-THM4 (µg/L)	SDS-HAA5 (µg/L)	SDS-HAA6 (µg/L)	SDS-HAA9 (µg/L)	SDS-TOX (µg Cl <sup>-</sup> /L)
TOC	(mg/L)	2.8	2.0	77	11100	2.0	0.034	20	14	17	21	102
			1.0	33	4690	1.0	0.013	9	4	5	7	36
			1.4†	43	6170	1.4	0.021	14	7	9	11	59
UV <sub>254</sub>	(1/cm)	0.060	0.040	*	*							
			0.020	41	5850	1.4	0.020	13	6	8	10	55
			0.030†	64	9220	1.8	0.030	19	11	14	16	87
SDS-THM4	(µg/L)	39	80	*	*							
			64	*	*							
			32	*	*							
SDS-HAA5	(µg/L)	33	48	*	*							
			24	*	*							
SDS-HAA6	(µg/L)	37	48	*	*							
			24	*	*							
SDS-HAA9	(µg/L)	42	48	*	*							
			24	*	*							
SDS-TOX	(µg Cl <sup>-</sup> /L)	208	120	*	*							
			70	50	7160	1.5	0.025	16	8	11	13	70

†GAC effluent concentration equal to 50 percent of the average influent concentration.

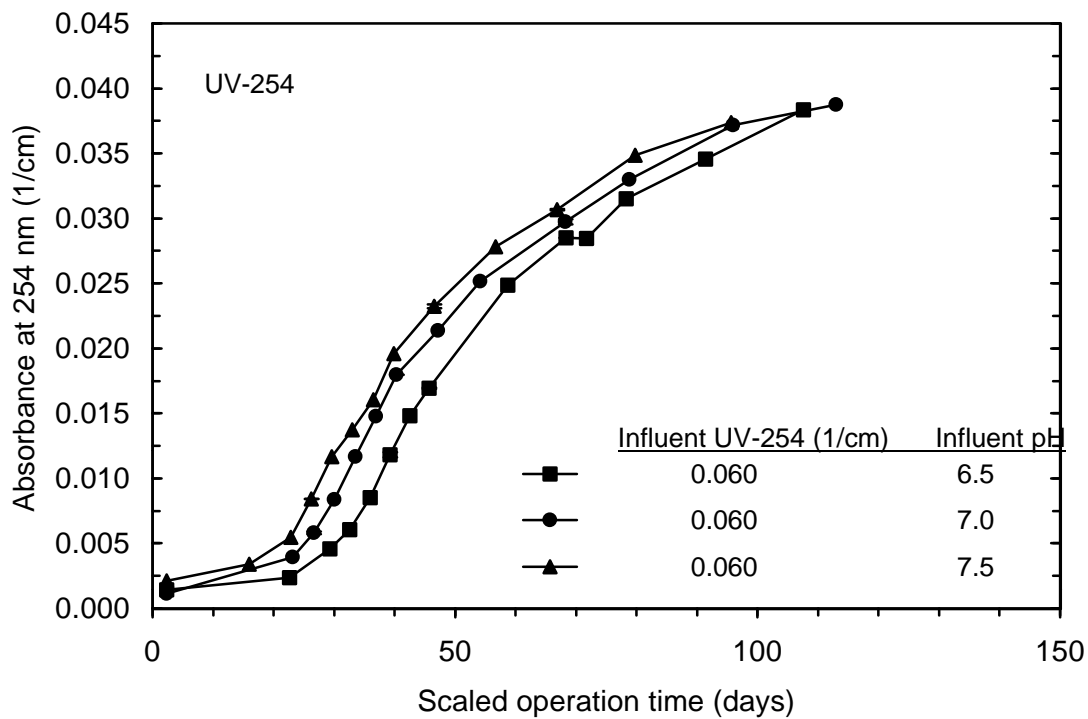
\*Effluent concentration criteria not exceeded during GAC run time, value of listed parameter is left blank.

#Data not available for listed parameter at given breakthrough criterion.

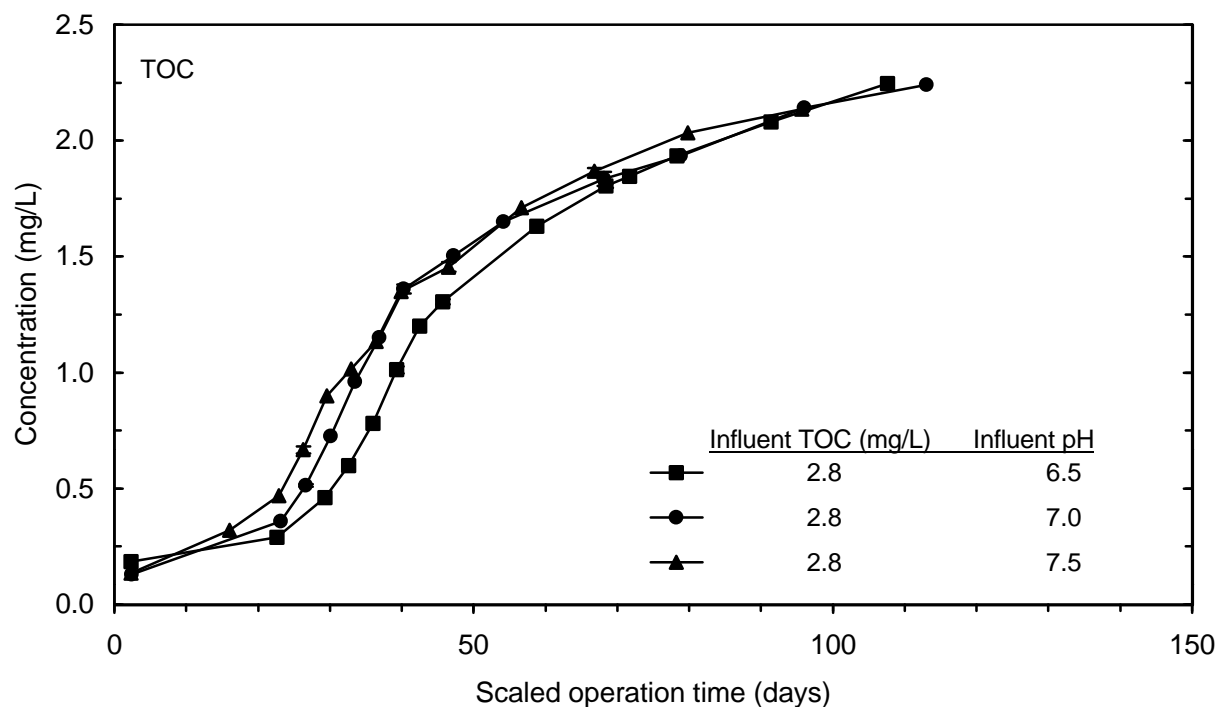
**Table 37 Run times to selected GAC effluent criteria (influent pH 7.5)**



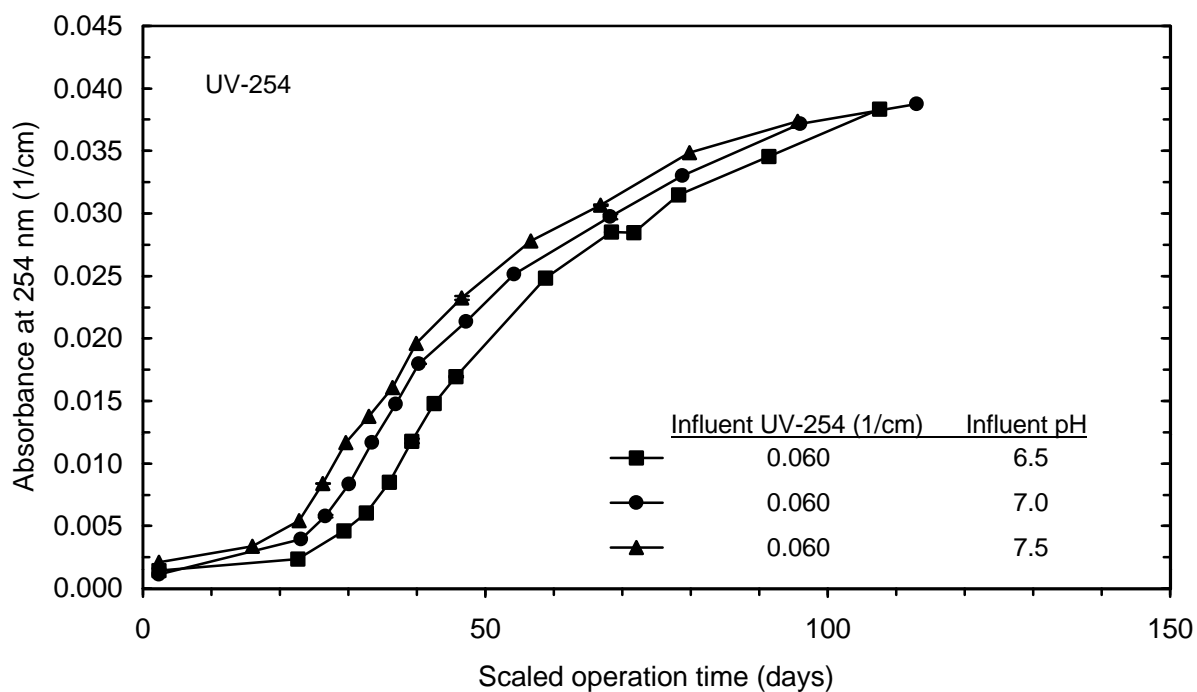
**Figure 81 Impact of influent pH on TOC breakthrough for 10 minute EBCT contactors**



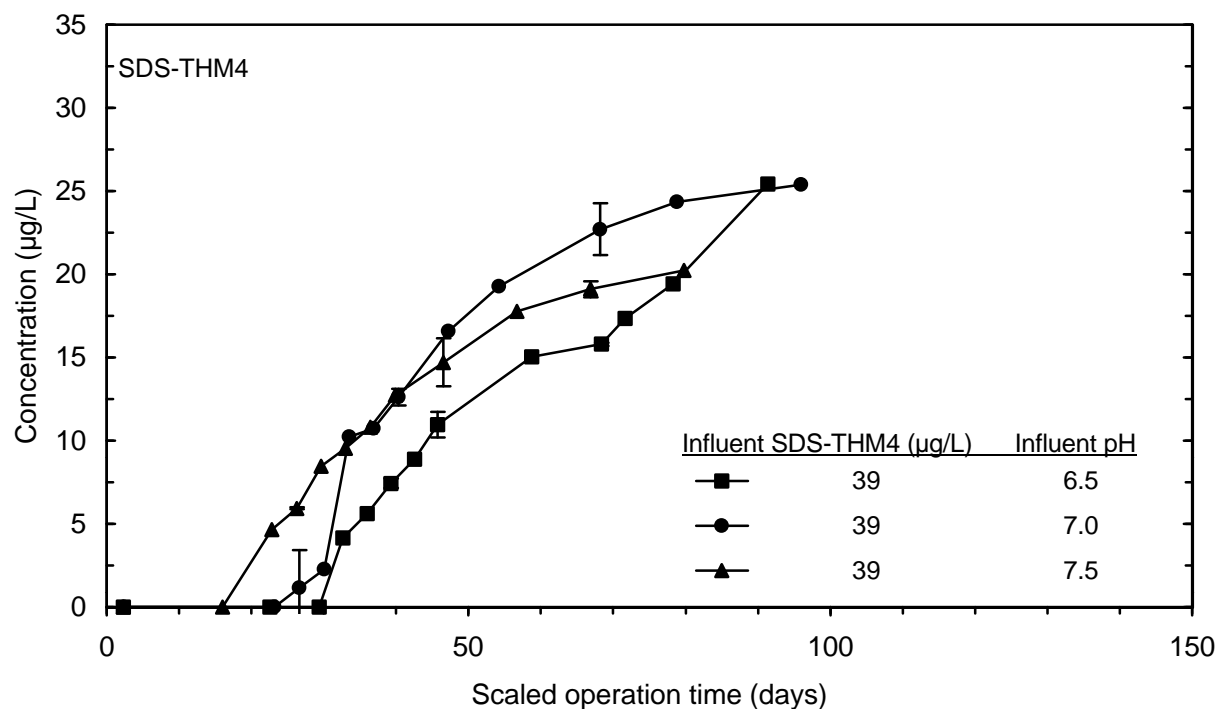
**Figure 82 Impact of influent pH on UV-254 breakthrough for 10 minute EBCT contactors**



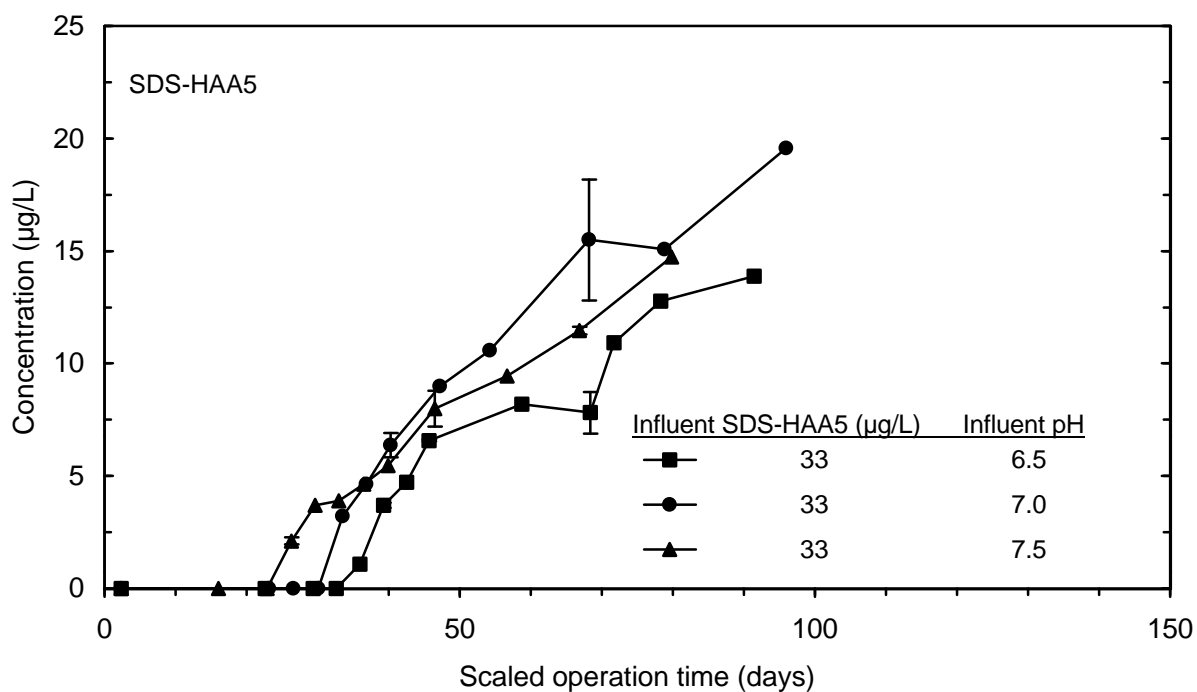
**Figure 81 Impact of influent pH on TOC breakthrough for 10 minute EBCT contactors**



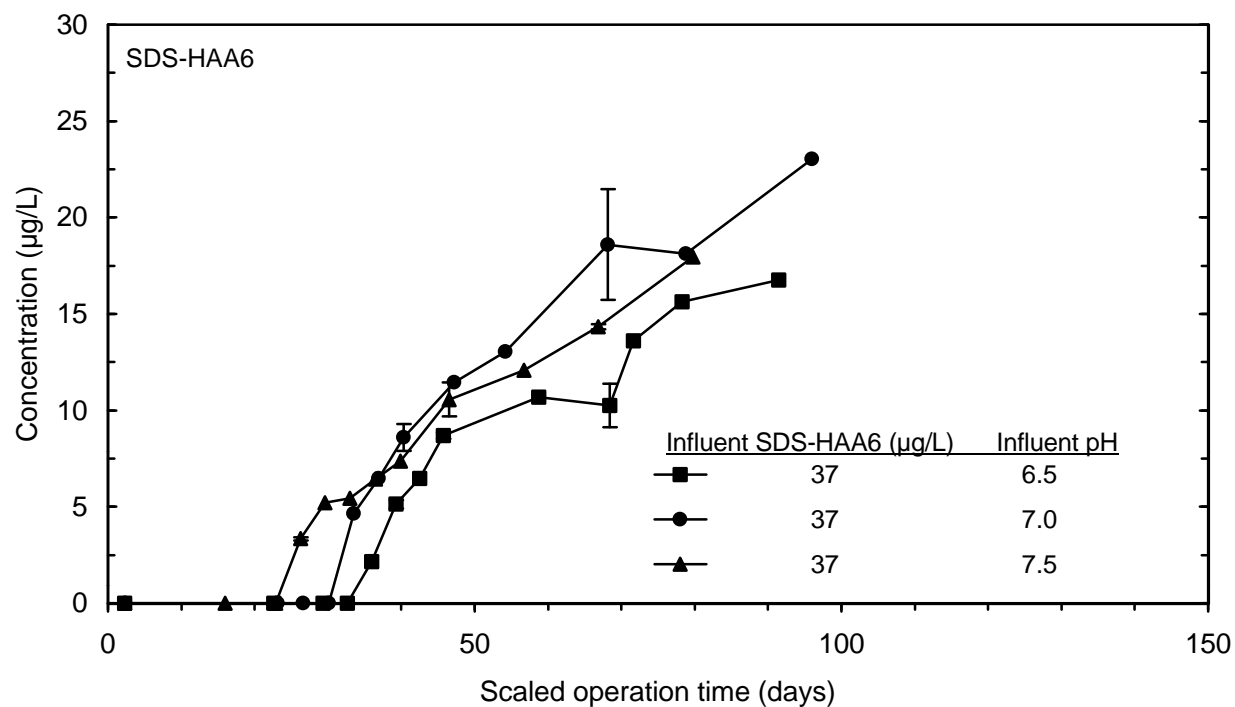
**Figure 82 Impact of influent pH on UV-254 breakthrough for 10 minute EBCT contactors**



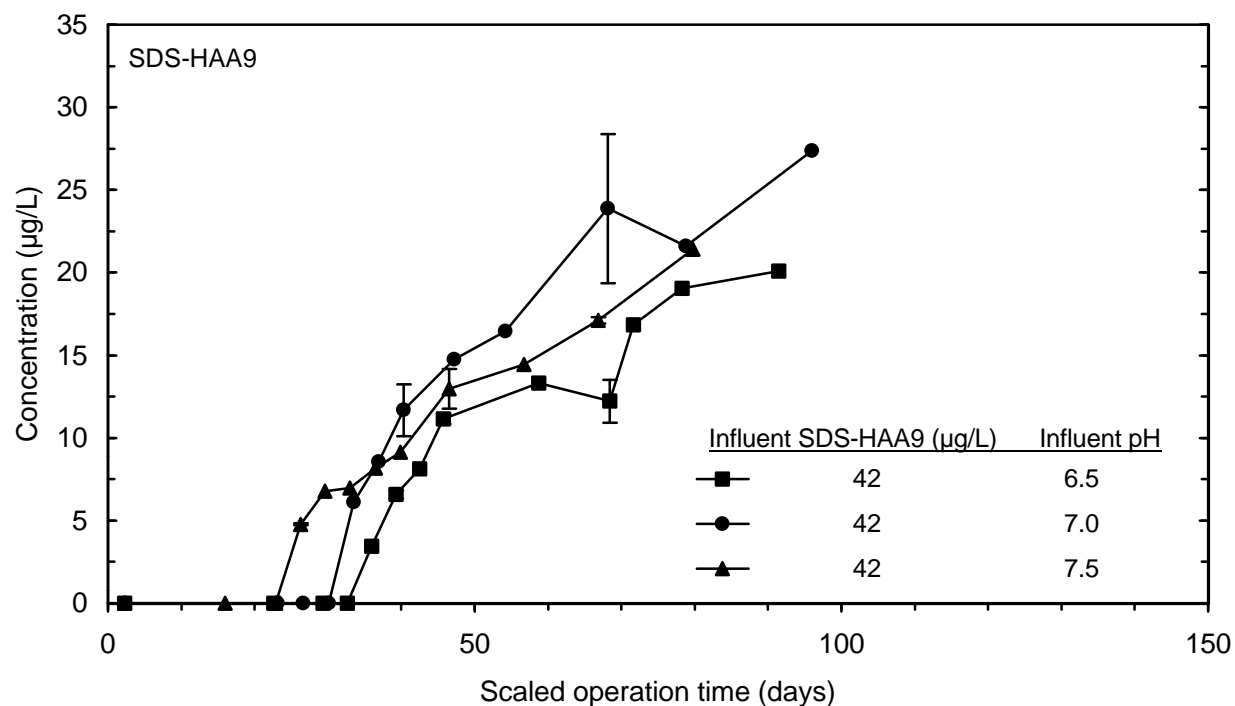
**Figure 83 Impact of influent pH on SDS-THM4 breakthrough for 10 minute EBCT contactors**



**Figure 84 Impact of influent pH on SDS-HAA5 breakthrough for 10 minute EBCT contactors**

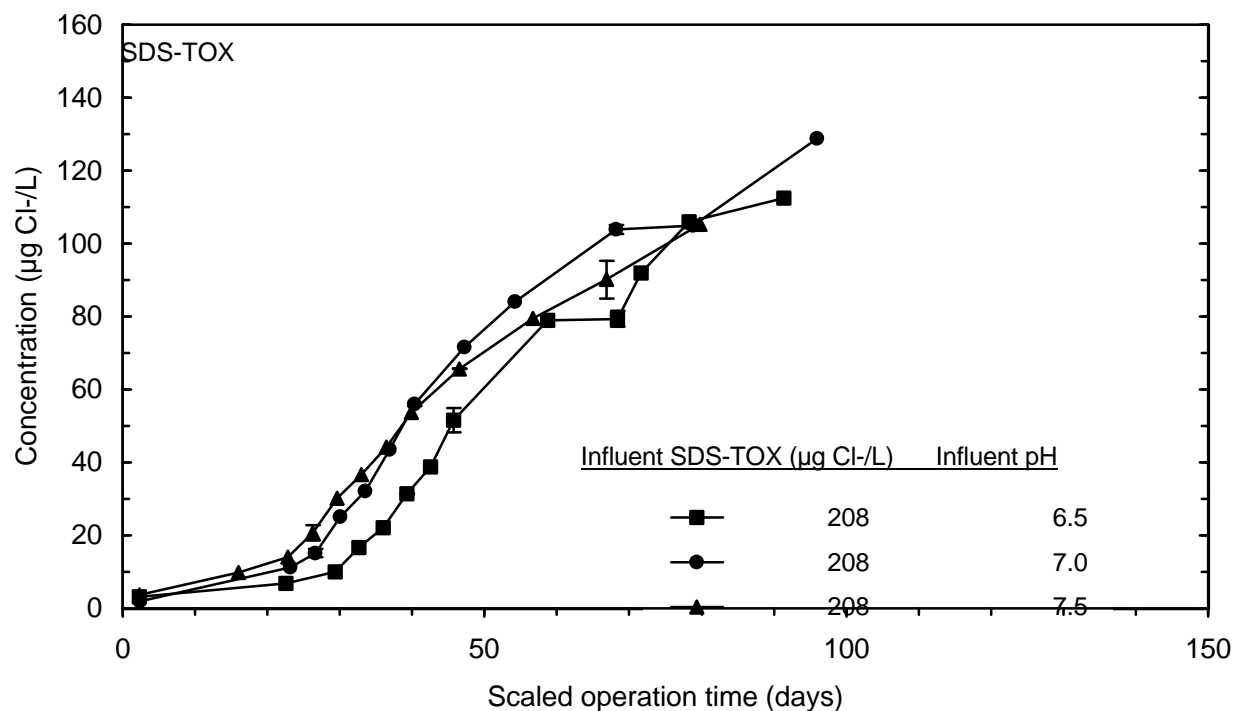


**Figure 85** Impact of influent pH on SDS-HAA6 breakthrough for 10 minute EBCT contactors

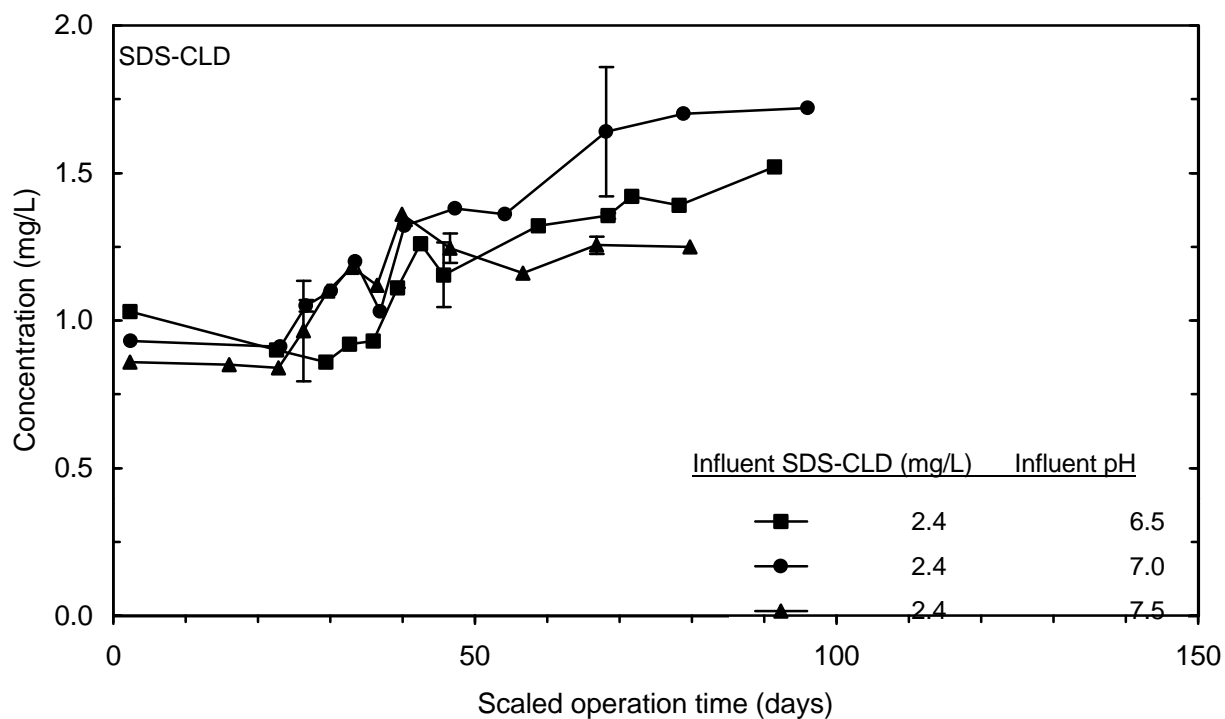


**Figure 86** Impact of influent pH on SDS-HAA9 breakthrough for 10 minute EBCT contactors





**Figure 87 Impact of influent pH on SDS-TOX breakthrough for 10 minute EBCT contactors**



**Figure 88 Impact of influent pH on SDS-CLD breakthrough for 10 minute EBCT contactors**

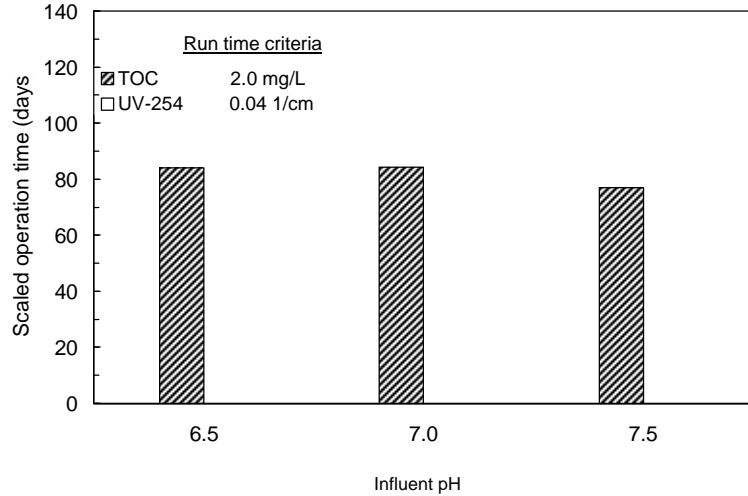


Figure 89 Impact of pH on run times based on single contactor breakthrough curves for TOC and UV-254 effluent criteria (high)

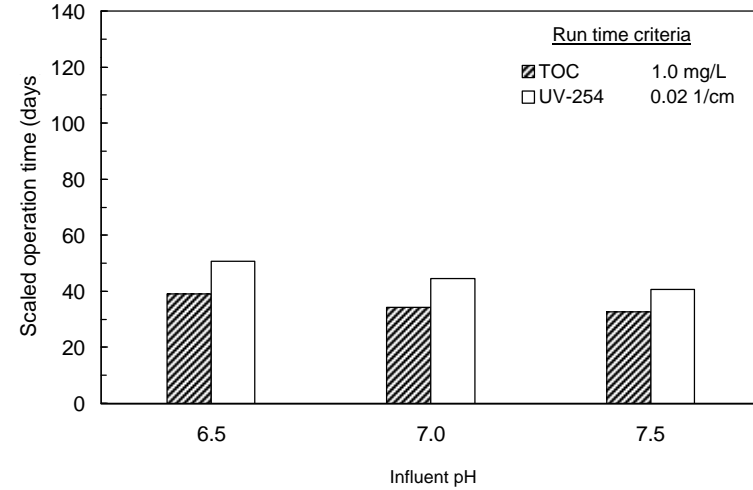


Figure 90 Impact of pH on run times based on single contactor breakthrough curves for TOC and UV-254 effluent criteria (low)

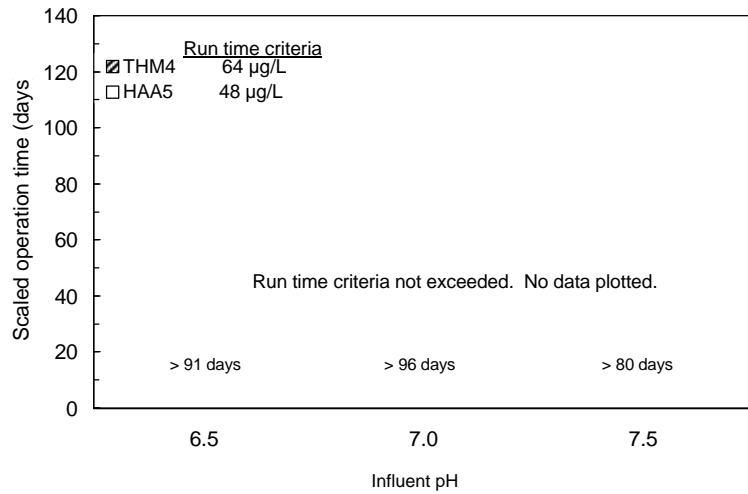


Figure 91 Impact of pH on run times based on single contactor breakthrough curves for Stage 1 THM4 and HAA5 effluent criteria

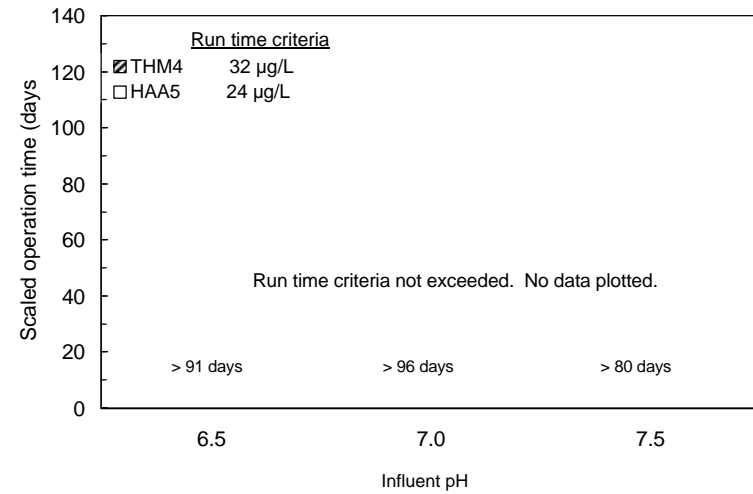
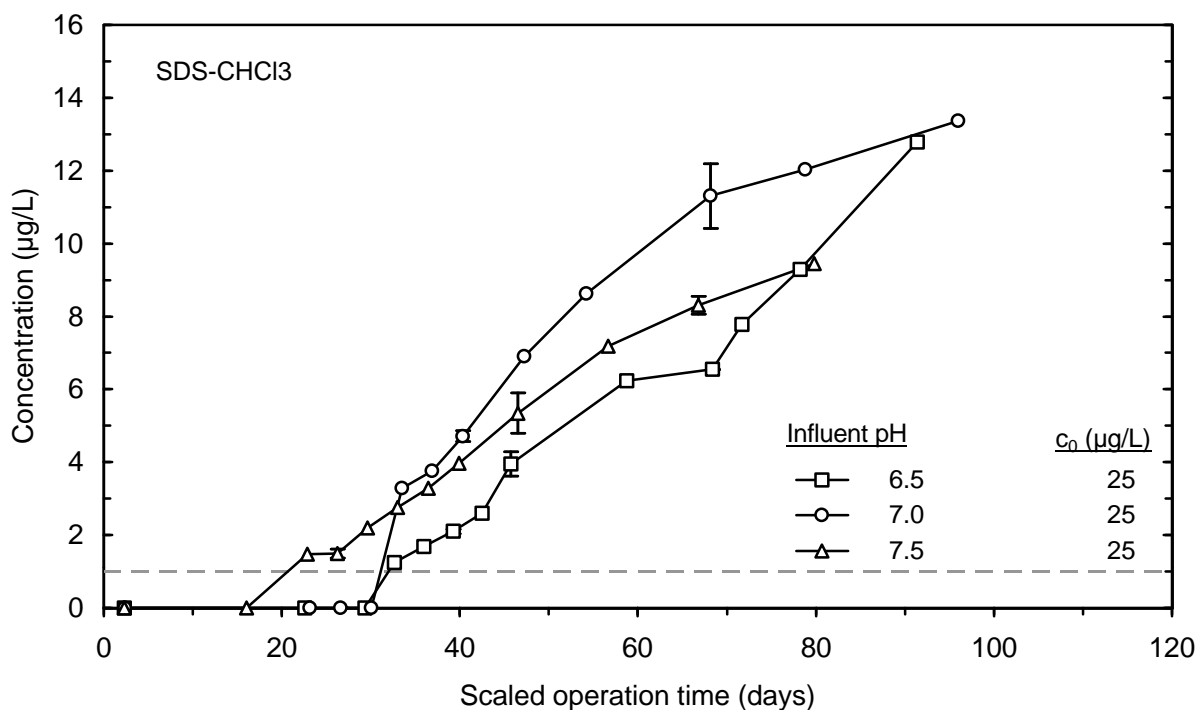
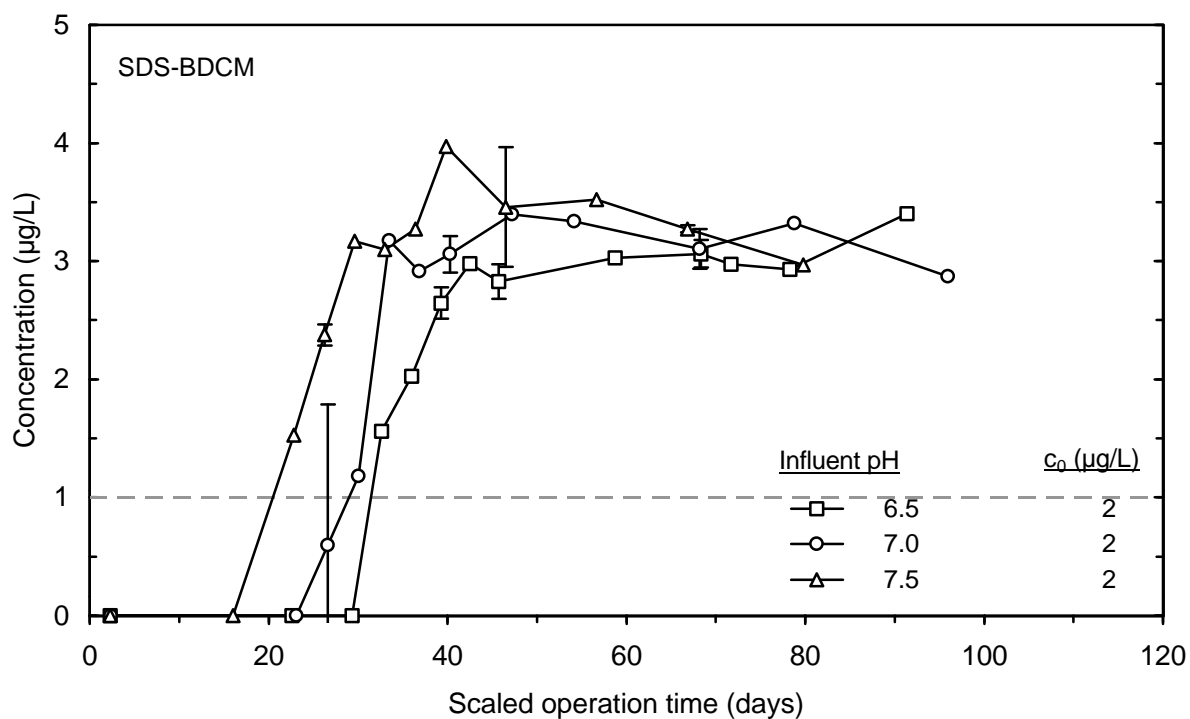


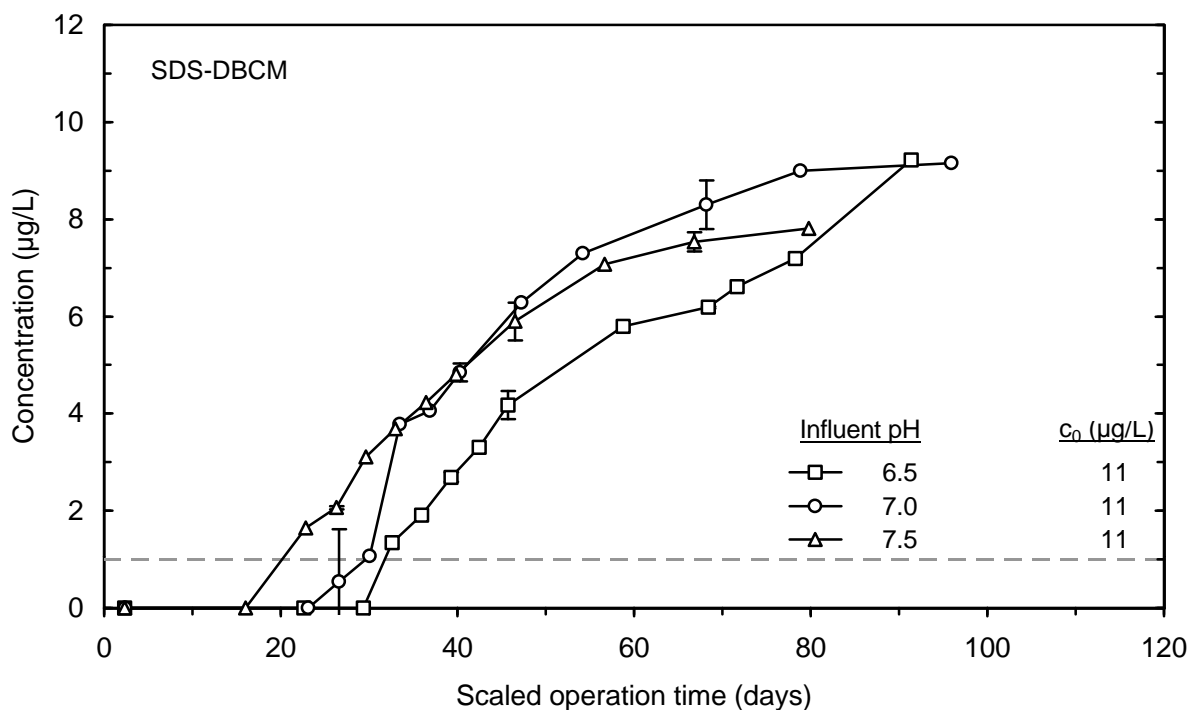
Figure 92 Impact of pH on run times based on single contactor breakthrough curves for Stage 2 THM4 and HAA5 effluent criteria



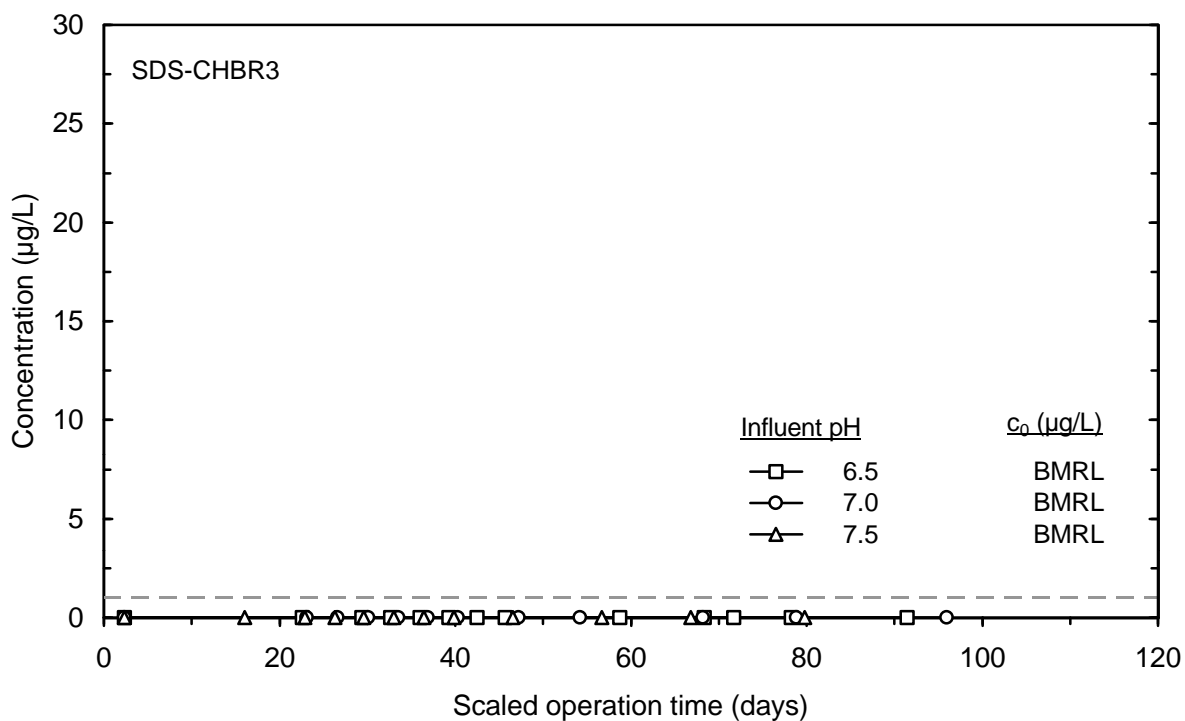
**Figure 93 Impact of influent pH on SDS-CHCl<sub>3</sub> breakthrough for 10 minute EBCT contactors**



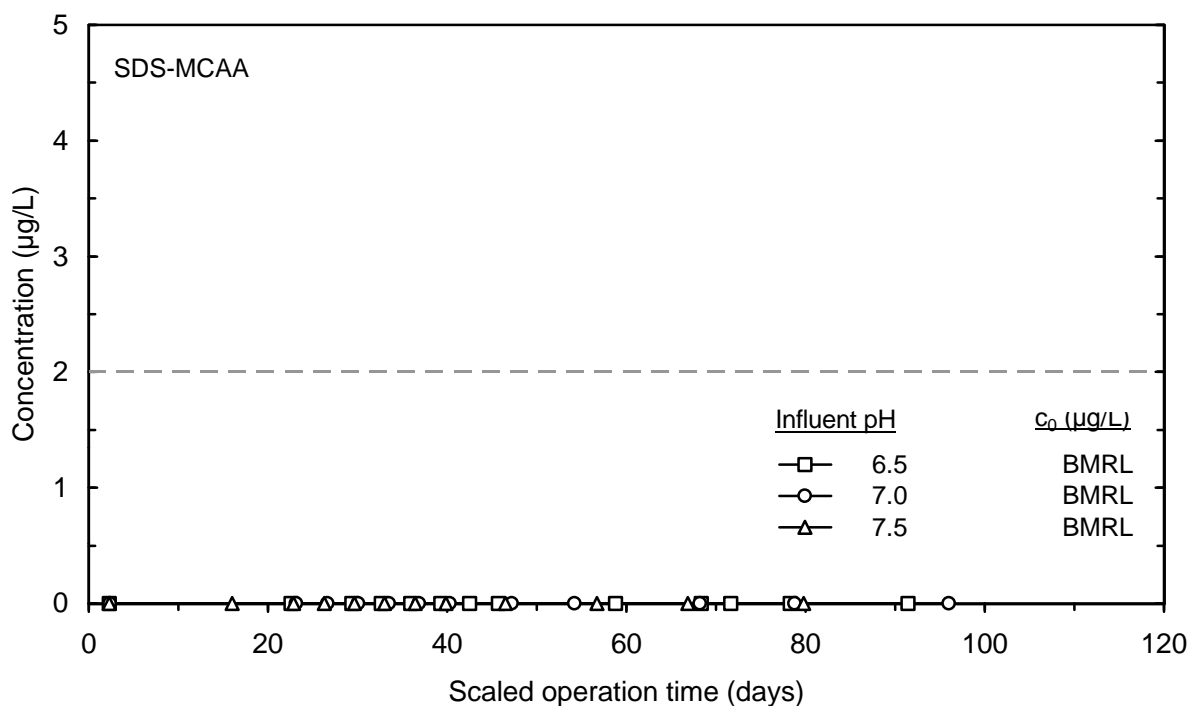
**Figure 94 Impact of influent pH on SDS-BDCM breakthrough for 10 minute EBCT contactors**



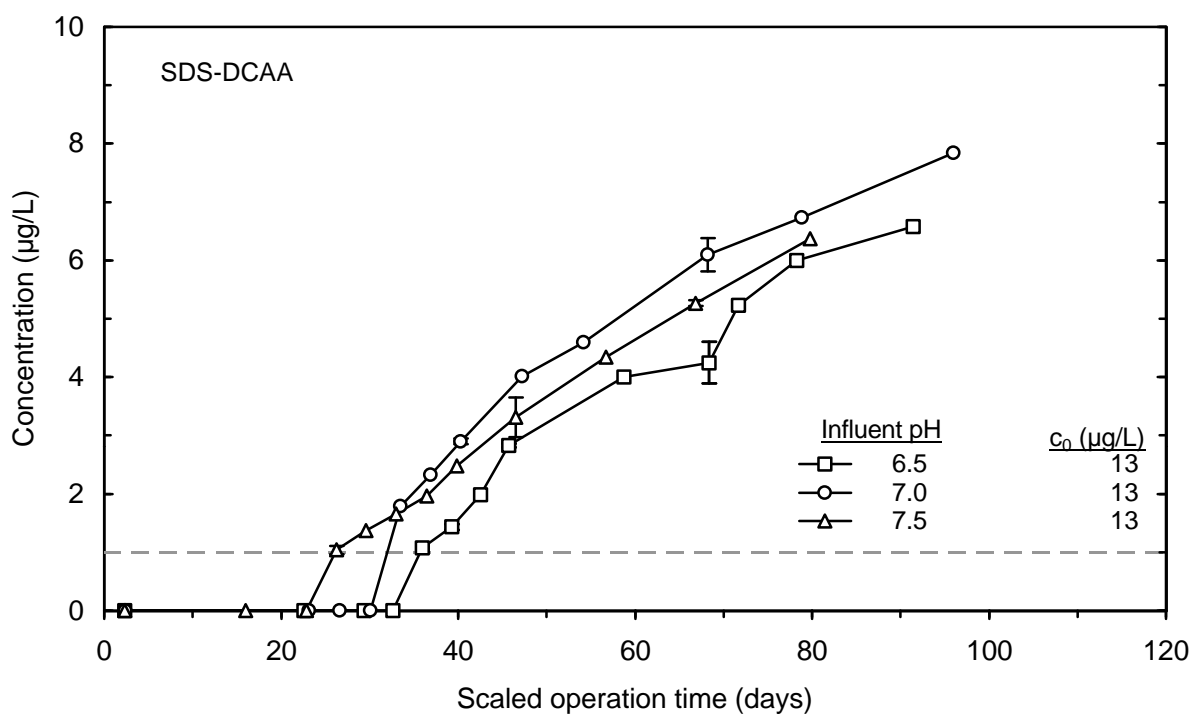
**Figure 95 Impact of influent pH on SDS-DBCM breakthrough for 10 minute EBCT contactors**



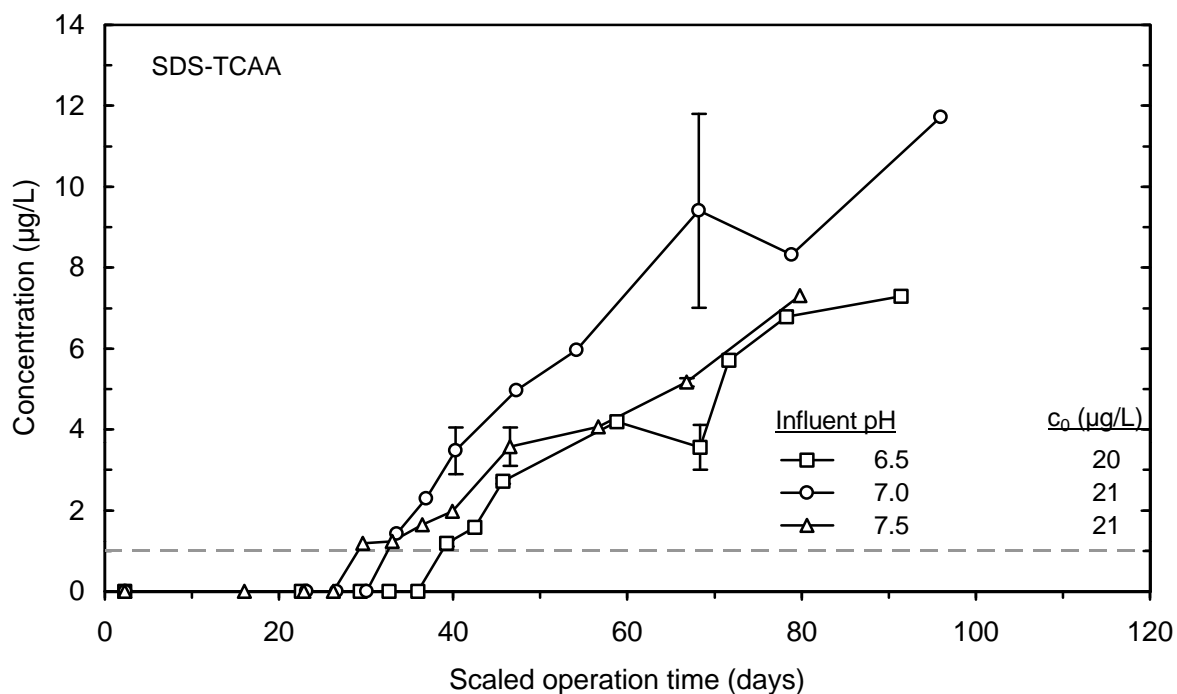
**Figure 96 Impact of influent pH on SDS-CHBR3 breakthrough for 10 minute EBCT contactors**



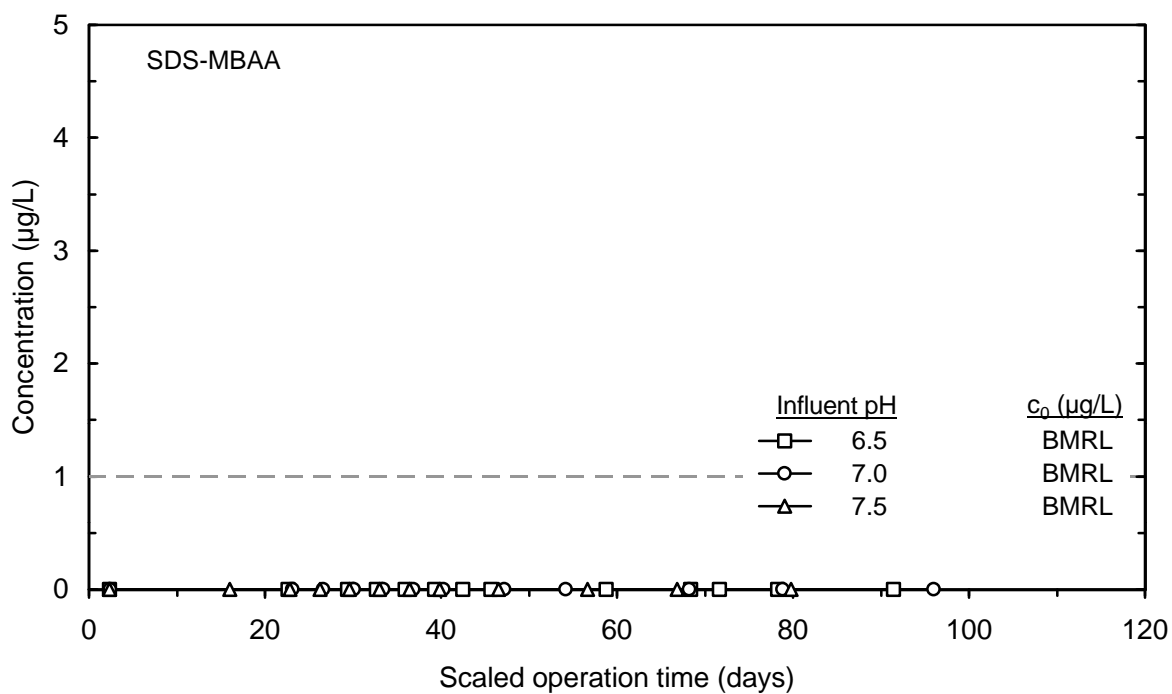
**Figure 97** Impact of influent pH on SDS-MCAA breakthrough for 10 minute EBCT contactors



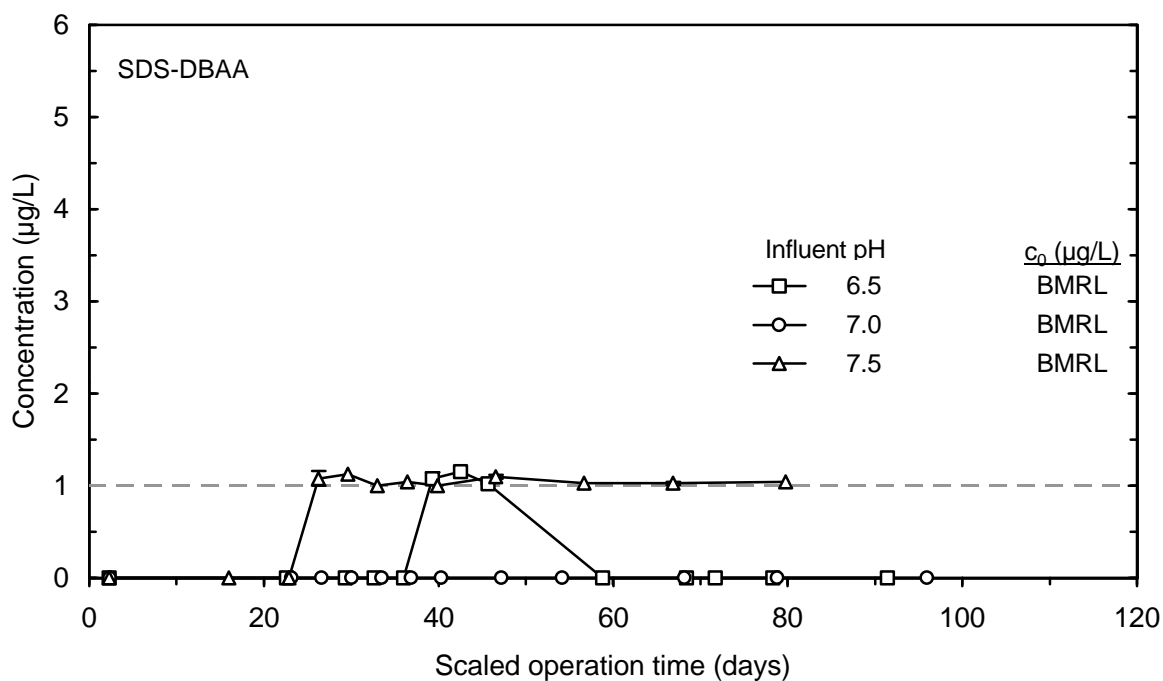
**Figure 98** Impact of influent pH on SDS-DCAA breakthrough for 10 minute EBCT contactors



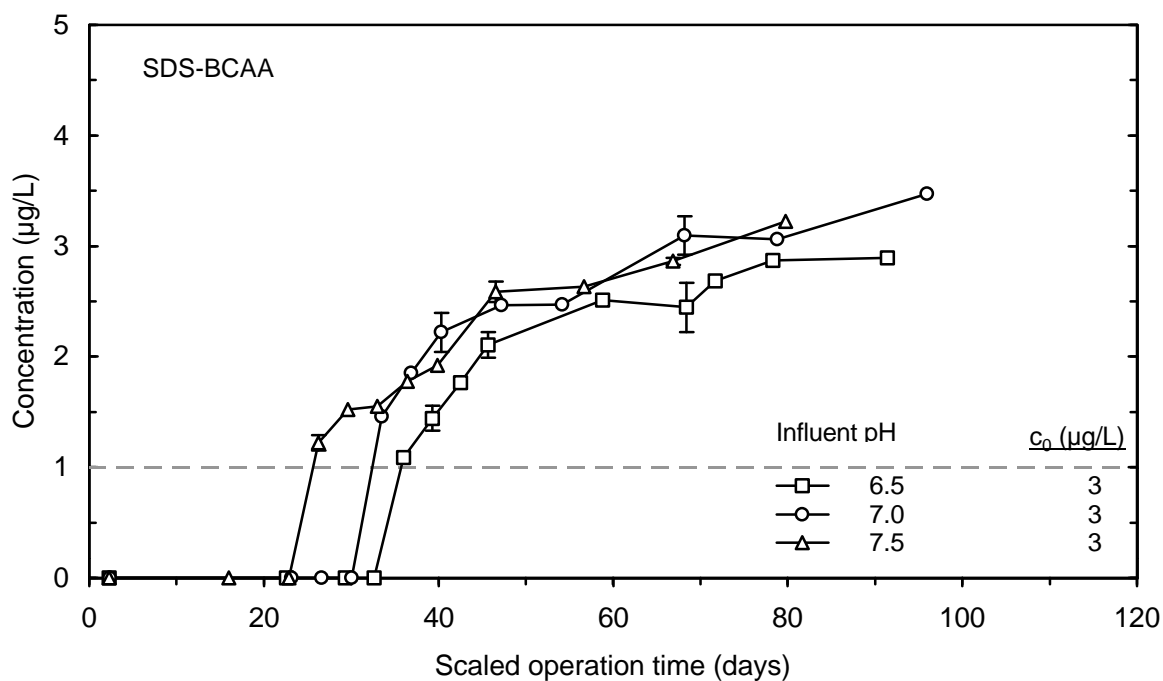
**Figure 99 Impact of influent pH on SDS-TCAA breakthrough for 10 minute EBCT contactors**



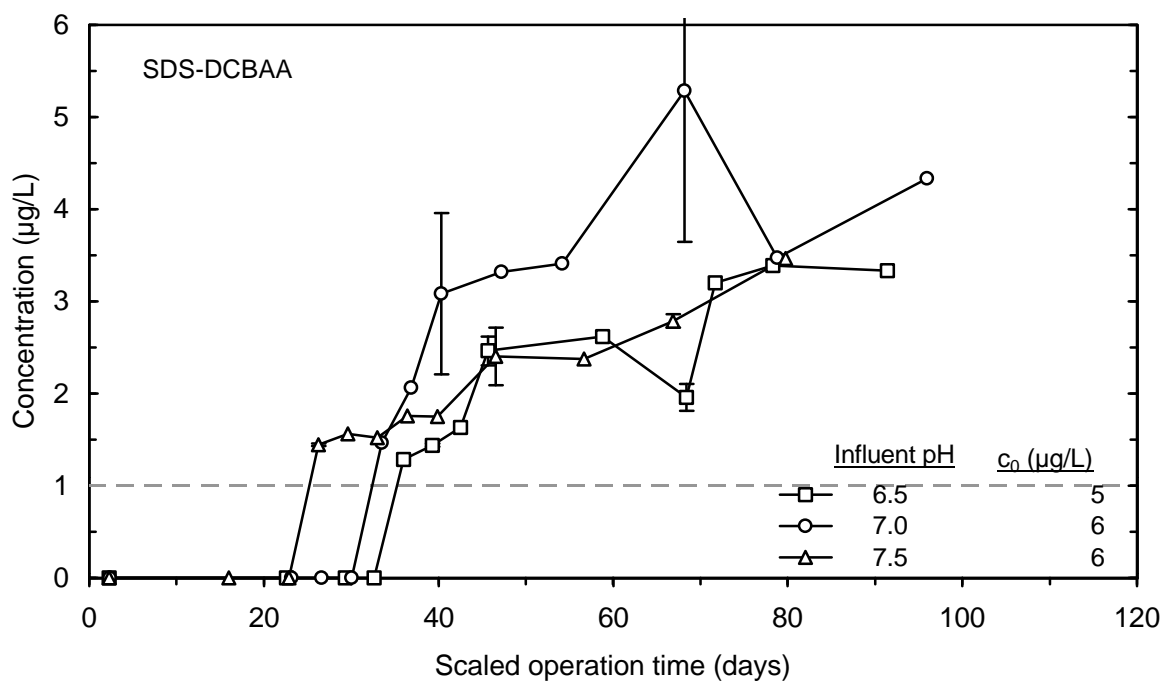
**Figure 100 Impact of influent pH on SDS-MBAA breakthrough for 10 minute EBCT contactors**



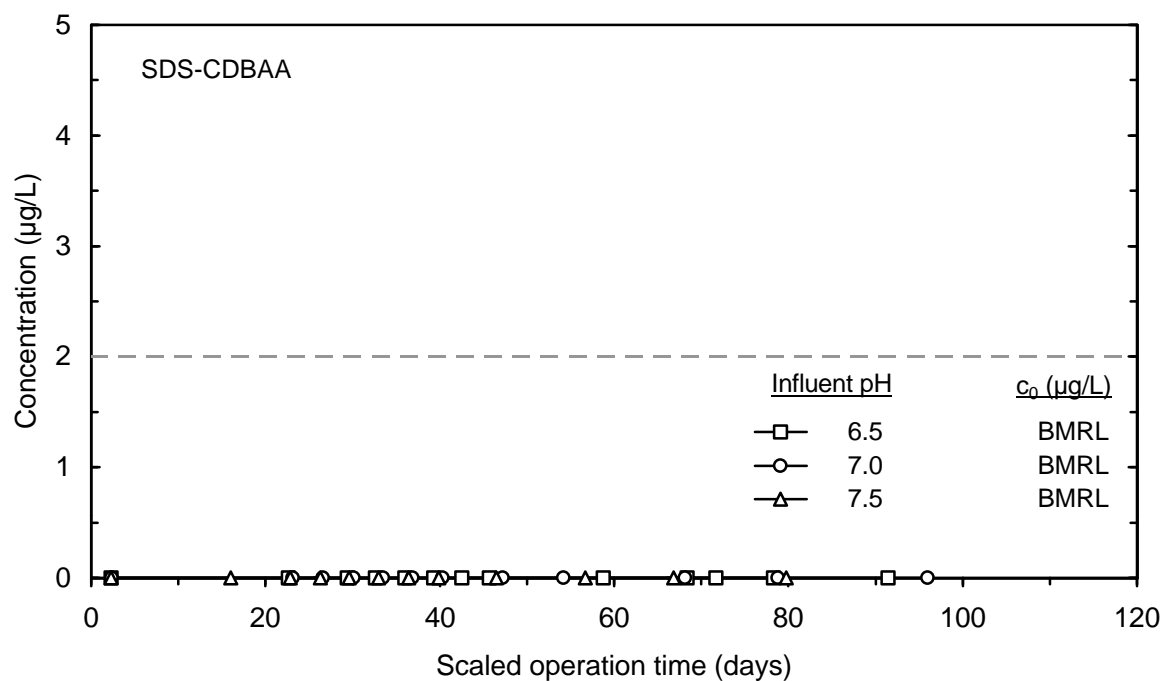
**Figure 101 Impact of influent pH on SDS-DBAA breakthrough for 10 minute EBCT contactors**



**Figure 102 Impact of influent pH on SDS-BCAA breakthrough for 10 minute EBCT contactors**

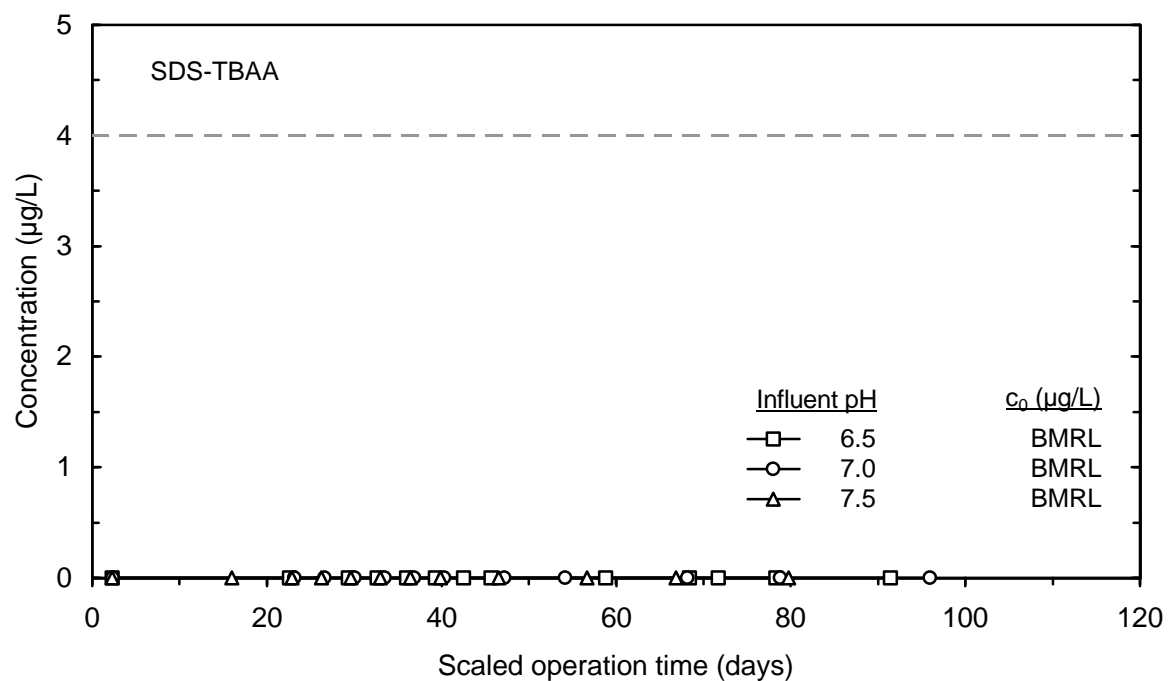


**Figure 103** Impact of influent pH on SDS-DCBAA breakthrough for 10 minute EBCT contactors



**Figure 104** Impact of influent pH on SDS-CDBAA breakthrough for 10 minute EBCT contactors





**Figure 105 Impact of influent pH on SDS-TBAA breakthrough for 10 minute EBCT contactors**

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# *11*

*Blended Effluent Simulation  
and Breakthrough Curve  
Extrapolation*

## 11 Blended Effluent Simulation and Breakthrough Curve Extrapolation

The data generated by an RSSCT simulates the performance of a single GAC contactor for DBP precursor control. For single contactor operation, when the effluent water quality exceeds levels set as run time criteria, the GAC must be replaced with reactivated or virgin GAC. In practice, multiple GAC contactors in parallel are used, and GAC run times are lengthened significantly by operating the contactors in a staggered mode: the GAC in each contactor is replaced with reactivated or virgin GAC at regular intervals (Westrick and Cohen, 1976; Roberts and Summers, 1982). The effluent from all contactors is blended prior to disinfection. Since only the blended effluent must meet a given water quality objective, each contactor can be operated longer and produce a water quality in excess of the system water quality objective. As a prelude to any type of cost analysis, the impact of blended GAC contactor effluents should be considered.

It is possible to model the performance of contactors operated in parallel staggered mode using the data produced by a single RSSCT. The breakthrough curve data are first fit to the logistic function, a function that results in a characteristic S-shape curve typical of breakthrough curves:

$$C(t) = \frac{A_f - A_0}{1 + Be^{-Dt}} + A_0 \quad (2)$$

This form of the logistic function is a variation of that presented in Chowdhury et al. (1996). The parameters  $A_f$ ,  $A_0$ ,  $B$ , and  $D$  are varied for a best-fit of the data by a sum of squares minimization algorithm. An equation that simulates a blended effluent scenario can be derived by the following integration of the logistic function:

$$\bar{C}(t) = \frac{1}{t} \int_0^t C(t) dt \quad (3)$$

For applications involving 10 or more staggered contactors operated in parallel, Equation 3 provides a good approximation of blended effluent water quality (Roberts and Summers, 1982). Integration of Equation 2 and substitution into Equation 3 yields:

$$\bar{C}(t) = A_f + \frac{A_f - A_0}{Dt} \ln \frac{1 + Be^{-Dt}}{1 + B} \quad (4)$$

After a best fit of the breakthrough data to Equation 2 was determined (using a least squares minimization approach), the parameter values were input into Equation 4. A plot of Equation 4, therefore, gives the blended effluent concentration for any contactor run time. A summary of the best fit parameter values and  $r^2$  values for fits to all 64 breakthrough sets is given in Table 38. As can be seen by the high  $r^2$  for curve fits (mean: 0.95, 25th percentile: 0.95, 75th percentile: 0.98), the model well fit the data. For all breakthrough curves, except those for SDS-CLD, the

value for  $A_0$  is zero and  $A_0$  can be dropped from Equations 2 and 4, yielding a three parameter model. The parameter  $A_0$  is needed for SDS-CLD to account for the high initial breakthrough.

For the March session, Figures 106 through 113 contain single column and blended effluent breakthrough curves for both 10 and 20 minute EBCT contactors for TOC,  $UV_{254}$ , SDS-THM4, SDS-HAA5, SDS-HAA6, SDS-HAA9, SDS-TOX, and SDS-CLD. The analysis summarized in these plots demonstrates the significant impact on overall costs of accounting for a blended effluent situation. For example, the 10 minute EBCT contactor TOC breakthrough curve plotted in Figure 106 reaches an effluent concentration of 1.0 mg/L after 28 days. The multiple contactor blended effluent breakthrough curve does not reach an effluent TOC concentration of 1.0 mg/L until after 55 days of single contactor operation time (a 96 percent increase). Thus, the operation time for each single contactor as a part of multiple GAC contactors operated in parallel staggered mode is about doubled. A similar analysis can be made for the SDS-DBPs. For example, the run time to the Stage 1 THM4 MCL based on a 10 minute EBCT contactor during the September session (as shown in Figure 116) is 51 days. After accounting for effluent blending, this run time is estimated to be 113 days, a 122 percent increase. Due to the relatively low concentrations of SDS-THM4 formed, the effluent blending estimate is based on a breakthrough curve extrapolation procedure, described below. The single contactor and blended effluent (multiple contactors) comparisons are presented for the September, November, and influent pH sessions for all parameters in Figures 114 through 137.

Table 39 summarizes the run time for a 10 minute EBCT contactor, assuming a blended effluent, for the March session. For each parameter and criterion, the value of other parameters is given when the run time criterion is met. Table 39 also includes, when applicable, run time calculations based on effluent blending of extrapolated breakthrough curves (described below). Tables 40 and 41 summarize the same information for the September and November sessions. Tables 42 through 44 summarize this information for the 20 minute EBCT contactor for all sessions. Finally, Tables 45 and 46 summarize this information for the data generated during the influent pH study.

For single and multiple contactor configurations, Tables 47 through 49 summarize the percent increase in run times observed between a 10 and 20 minute EBCT contactor, for all sessions. Based on the range of run time criteria applied, the average increase in run time between a 10 and 20 minute EBCT contactor over all sessions was 156 and 155 percent single and multiple contactor configurations, respectively. The similarity in percentages indicates that the percent increase in run time gained by the additional contact time for a single contactor is equivalent to that for a multiple contactor simulation.

By accounting for multiple contactor configurations, the estimated contactor run time increased by an average of 126 and 122 percent as compared to single contactor performance for 10 and 20 minute EBCTs, respectively, and over all sessions. Thus, when 10 or more contactors are operated in staggered mode, the run time of each contactor more than double that of a single GAC contactor.

The carbon usage rate (CUR) is a measure of the amount of carbon needed to treat water to the given GAC effluent run time criterion. The CUR is calculated by the following equation:

$$\text{CUR} = \frac{\text{EBCT} * r}{\text{RT}} \quad (5)$$

where  $r$  is the GAC density and RT is the run time. The CUR is normally reported with units of lbs/MG. Tables 50 through 52 summarize the percent decrease in CUR observed between 10 and 20 minute EBCT contactors for both single and multiple contactor configurations for all sessions. On average, the CUR for 20 minute EBCT contactors was 21 percent lower than that for 10 minute EBCT contactors, based on both single and multiple contactor breakthrough data. The CUR based on effluent blending was on 56 and 54 percent lower than that based on single contactor data for 10 and 20 minute EBCT contactors, respectively.

A seasonal comparison of multiple contactor simulation run times is summarized in Table 53, for a 10 minute EBCT, and in Table 54, for a 20 minute EBCT. The mean, standard deviation, and RSD of run times over the four quarterly sessions are listed in each table, providing a measure of the degree of seasonal variability evident in GAC performance after accounting for multiple contactor operation. For example, the run time to a GAC effluent TOC concentration of 1.0 mg/L for 10 minute EBCT contactors ranged from 29 to 46 days, with a RSD of 22 percent.

Bar graph summaries of run times to effluent criteria for single and multiple contactor configurations and for 10 and 20 minute EBCTs for the March session are shown in Figures 138 through 141. The same data are shown for the September and November sessions in Figures 142 through 149.

The calculated CURs are presented in a bar graph format for single and multiple contactor configurations and for both the 10 and 20 minute EBCTs for the three seasonal variability sessions in Figures 150 through 161.

In many cases, the blended effluent simulation results did not exceed run time criteria. To increase the benefit of the data set, a breakthrough curve extrapolation procedure was developed to allow reasonable and conservative run time estimates to be made, when blended effluent levels did not exceed the reactivation criteria. To the original breakthrough curve data set for each parameter, three points were added at 150, 200, and 250 percent of the run time at which the last sample point was reported ( $t_{\text{max}}$ ), based on the following set of equations:

Point	Run time	Concentration	
A	$1.5t_{\text{max}}$	$C(t_{\text{max}}) + 0.5[C_{\text{inf}} - C(t_{\text{max}})]$	(5)
B	$2.0t_{\text{max}}$	$C(t_{\text{max}}) + 0.6[C_{\text{inf}} - C(t_{\text{max}})]$	(6)
C	$2.5t_{\text{max}}$	$C(t_{\text{max}}) + 0.7[C_{\text{inf}} - C(t_{\text{max}})]$	(7)

where  $C_{\text{inf}}$  is the influent concentration for each parameter, and  $C(t_{\text{max}})$  is the effluent concentration of the parameter at  $t_{\text{max}}$ .

The logistic function curve was fit to the data set including the three extrapolation points. The integrated form of the logistic function (Equation 4) was again used to estimate blended effluent water quality for the extrapolation. The run time data contained in the figures and tables presented earlier in this section include the estimates derived by the extrapolation procedure, when applicable. No breakthrough curves were extrapolated beyond 250 percent of the maximum run time. Figures 162 through 217 contain the extrapolated breakthrough curves for all runs. Table 55 summarizes the best fit parameter values and  $r^2$  values for all curve fits with extrapolation.

Parameter	Coefficient	10 minute EBCT			20 minute EBCT			Influent pH Study--November	
		March	September	November	March	September	November	inf pH 6.5	inf pH 7.5
TOC	$A_o$	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	$A_f$	2.43	2.19	2.08	2.35	2.10	2.06	2.11	2.07
	$B$	22.0	25.4	28.5	25.2	27.6	16.4	29.0	17.7
	$D$	0.093	0.102	0.092	0.040	0.044	0.031	0.080	0.083
	$r^2$	0.989	0.979	0.979	0.983	0.984	0.980	0.984	0.991
UV <sub>254</sub>	$A_o$	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	$A_f$	0.038	0.039	0.037	0.034	0.036	0.036	0.037	0.037
	$B$	29.3	30.5	30.6	49.0	20.1	20.0	44.9	20.0
	$D$	0.085	0.082	0.077	0.043	0.029	0.026	0.076	0.074
	$r^2$	0.987	0.976	0.986	0.985	0.987	0.985	0.987	0.991
SDS-THM	$A_o$	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	$A_f$	11.1	40.2	23.9	12.3	40.0	19.4	25.5	19.6
	$B$	139.4	59.3	269.8	99.0	39.2	98.8	41.6	44.9
	$D$	0.133	0.114	0.140	0.045	0.041	0.052	0.066	0.111
	$r^2$	0.985	0.983	0.967	0.972	0.982	0.966	0.948	0.985
SDS-HAAI	$A_o$	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	$A_f$	13.0	23.5	17.6	10.2	36.7	12.4	14.0	14.7
	$B$	11.0	41.4	205.6	4.5	54.7	170.1	96.3	51.2
	$D$	0.095	0.102	0.110	0.021	0.034	0.045	0.082	0.084
	$r^2$	0.852	0.977	0.965	0.796	0.971	0.948	0.931	0.970
SDS-HAAI	$A_o$	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	$A_f$	14.4	26.6	20.6	10.0	40.6	15.0	15.4	17.2
	$B$	14.0	35.2	200.4	3.8	44.3	212.7	159.1	49.6
	$D$	0.102	0.103	0.114	0.020	0.034	0.052	0.103	0.090
	$r^2$	0.888	0.976	0.959	0.773	0.968	0.949	0.931	0.963
SDS-HAAI	$A_o$	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	$A_f$	16.1	30.0	24.4	11.6	47.0	18.4	16.7	20.3
	$B$	17.1	39.7	289.9	4.8	36.3	229.4	2281.8	43.9
	$D$	0.102	0.109	0.128	0.021	0.032	0.054	0.179	0.090
	$r^2$	0.894	0.974	0.955	0.832	0.971	0.950	0.928	0.955
SDS-TOX	$A_o$	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	$A_f$	101	157	118	95	159	108	112	104
	$B$	29.9	61.9	59.7	51.9	61.6	24.3	75.4	34.3
	$D$	0.093	0.116	0.094	0.042	0.045	0.027	0.085	0.087
	$r^2$	0.989	0.987	0.984	0.963	0.991	0.972	0.982	0.992
SDS-CLD	$A_o$	1.18	1.55	0.87	1.23	1.59	0.59	0.91	0.83
	$A_f$	1.75	2.85	1.75	1.50	2.50	0.89	1.41	1.24
	$B$	20.0	21.7	32.7	15348.4	55.6	336.9	7107.8	12087.2
	$D$	0.078	0.105	0.076	0.150	0.062	0.077	0.208	0.331
	$r^2$	0.953	0.989	0.940	0.784	0.983	0.702	0.888	0.897

Table 38 Summary of logistic function curve fit parameters and r2 values

Parameter	Units	Influent concentration	Breakthrough criterion	Value of listed parameter when breakthrough criterion is met (blended effluent)								
				Run time (days)	Throughput (bed volumes)	TOC (mg/L)	UV <sub>254</sub> (1/cm)	SDS-THM4 (µg/L)	SDS-HAA5 (µg/L)	SDS-HAA6 (µg/L)	SDS-HAA9 (µg/L)	SDS-TOX (µg Cl <sup>-</sup> /L)
TOC	(mg/L)	3.3	2.0	141#	20,260	2.0	0.031	10	11	12	13	88
			1.0	55	7,950	1.0	0.012	4	7	8	8	37
			1.6†	104	14,930	1.6	0.023	8	10	11	12	65
UV <sub>254</sub>	(1/cm)	0.060	0.040	*	*							
			0.020	85	12,240	1.5	0.020	6	9	10	11	57
			0.030†	132#	18,990	1.9	0.030	10	11	12	13	85
SDS-THM4	(µg/L)	20	80	*	*							
			64	*	*							
			32	*	*							
SDS-HAA5	(µg/L)	16	48	*	*							
			24	*	*							
SDS-HAA6	(µg/L)	17	48	*	*							
			24	*	*							
SDS-HAA9	(µg/L)	19	48	*	*							
			24	*	*							
SDS-TOX	(µg Cl <sup>-</sup> /L)	176	120	*	*							
			70	102#	14,750	1.7	0.025	8	10	11	12	70

†GAC effluent concentration equal to 50 percent of the average influent concentration.

\*Effluent concentration criteria not exceeded during GAC run time (including extrapolation procedure). Value of listed parameter is left blank.

#Run time estimated from breakthrough curve extrapolation procedure.

**Table 39 Run times to selected GAC effluent criteria based on effluent blending (10 minute EBCT) during session 1, March**



Parameter	Units	Influent concentration	Breakthrough criterion	Value of listed parameter when breakthrough criterion is met (blended effluent)								
				Run time (days)	Throughput (bed volumes)	TOC (mg/L)	UV <sub>254</sub> (1/cm)	SDS-THM4 (µg/L)	SDS-HAA5 (µg/L)	SDS-HAA6 (µg/L)	SDS-HAA9 (µg/L)	SDS-TOX (µg Cl <sup>-</sup> /L)
TOC	(mg/L)	3.0	2.0	176#	25,420	2.0	0.036	40	27	30	34	166
			1.0	58	8,290	1.0	0.012	16	9	11	13	61
			1.5†	90#	13,010	1.5	0.021	27	15	18	21	105
UV <sub>254</sub>	(1/cm)	0.065	0.040	*	*							
			0.020	86	12,420	1.4	0.020	25	15	17	20	100
			0.032†	147#	21,230	1.9	0.032	37	24	27	31	152
SDS-THM4	(µg/L)	67	80	*	*							
			64	*	*							
			32	113#	16,230	1.7	0.026	32	19	22	25	128
SDS-HAA5	(µg/L)	51	48	*	*							
			24	146#	21,000	1.9	0.032	37	24	27	31	151
SDS-HAA6	(µg/L)	55	48	*	*							
			24	123#	17,670	1.8	0.028	34	21	24	27	136
SDS-HAA9	(µg/L)	61	48	*	*							
			24	105#	15,140	1.6	0.025	30	18	21	24	121
SDS-TOX	(µg Cl <sup>-</sup> /L)	288	120	104#	14,990	1.6	0.024	30	18	21	24	120
			70	64	9,230	1.1	0.014	18	10	12	14	70

†GAC effluent concentration equal to 50 percent of the average influent concentration.

\*Effluent concentration criteria not exceeded during GAC run time (including extrapolation procedure). Value of listed parameter is left blank.

#Run time estimated from breakthrough curve extrapolation procedure.

**Table 40 Run times to selected GAC effluent criteria based on effluent blending (10 minute EBCT) during session 2, September**

Parameter	Units	Influent concentration	Breakthrough criterion	Value of listed parameter when breakthrough criterion is met (blended effluent)								
				Run time (days)	Throughput (bed volumes)	TOC (mg/L)	UV <sub>254</sub> (1/cm)	SDS-THM4 (µg/L)	SDS-HAA5 (µg/L)	SDS-HAA6 (µg/L)	SDS-HAA9 (µg/L)	SDS-TOX (µg Cl <sup>-</sup> /L)
TOC	(mg/L)	2.8	2.0	271#	39,070	2.0	0.038	*	*	*	*	*
			1.0	70	10,050	1.0	0.014	10	6	7	9	46
			1.4†	113	16,210	1.4	0.022	16	10	12	15	72
UV <sub>254</sub>	(1/cm)	0.060	0.040	*	*							
			0.020	97	13,910	1.3	0.020	15	9	11	14	67
			0.030†	159#	22,880	1.7	0.030	21	15	18	22	103
SDS-THM4	(µg/L)	39	80	*	*							
			64	*	*							
			32	*	*							
SDS-HAA5	(µg/L)	35	48	*	*							
			24	*	*							
SDS-HAA6	(µg/L)	39	48	*	*							
			24	*	*							
SDS-HAA9	(µg/L)	45	48	*	*							
			24	191#	27,470	1.8	0.033	23	18	20	24	114
SDS-TOX	(µg Cl <sup>-</sup> /L)	207	120	214#	30,890	1.9	0.035	24	19	21	25	120
			70	102#	14,620	1.4	0.021	16	9	12	14	70

†GAC effluent concentration equal to 50 percent of the average influent concentration.

\*Effluent concentration criteria not exceeded during GAC run time (including extrapolation procedure). Value of listed parameter is left blank.

#Run time estimated from breakthrough curve extrapolation procedure.

**Table 41 Run times to selected GAC effluent criteria based on effluent blending (10 minute EBCT) during session 3, November**

Parameter	Units	Influent concentration	Breakthrough criterion	Value of listed parameter when breakthrough criterion is met (blended effluent)								
				Run time (days)	Throughput (bed volumes)	TOC (mg/L)	UV <sub>254</sub> (1/cm)	SDS-THM4 (µg/L)	SDS-HAA5 (µg/L)	SDS-HAA6 (µg/L)	SDS-HAA9 (µg/L)	SDS-TOX (µg Cl <sup>-</sup> /L)
TOC	(mg/L)	3.3	2.0	371#	26,730	2.0	0.031	11	9	9	10	86
			1.0	140	10,070	1.0	0.013	4	5	5	6	33
			1.6†	245#	17,640	1.6	0.023	8	7	7	8	61
UV <sub>254</sub>	(1/cm)	0.060	0.040	*	*							
			0.020	222	16,000	1.5	0.020	7	6	7	7	55
			0.030†	354#	25,480	2.0	0.030	10	9	9	10	83
SDS-THM4	(µg/L)	20	80	*	*							
			64	*	*							
			32	*	*							
SDS-HAA5	(µg/L)	16	48	*	*							
			24	*	*							
SDS-HAA6	(µg/L)	17	48	*	*							
			24	*	*							
SDS-HAA9	(µg/L)	19	48	*	*							
			24	*	*							
SDS-TOX	(µg Cl <sup>-</sup> /L)	176	120	*	*							
			70	282#	20,320	1.8	0.025	9	8	8	9	70

†GAC effluent concentration equal to 50 percent of the average influent concentration.

\*Effluent concentration criteria not exceeded during GAC run time (including extrapolation procedure). Value of listed parameter is left blank.

#Run time estimated from breakthrough curve extrapolation procedure.

**Table 42 Run times to selected GAC effluent criteria based on effluent blending (20 minute EBCT) during session 1, March**

Parameter	Units	Influent concentration	Breakthrough criterion	Value of listed parameter when breakthrough criterion is met (blended effluent)								
				Run time (days)	Throughput (bed volumes)	TOC (mg/L)	UV <sub>254</sub> (1/cm)	SDS-THM4 (µg/L)	SDS-HAA5 (µg/L)	SDS-HAA6 (µg/L)	SDS-HAA9 (µg/L)	SDS-TOX (µg Cl <sup>-</sup> /L)
TOC	(mg/L)	3.0	2.0	453#	32,610	2.0	0.036	41	31	34	39	167
			1.0	145	10,420	1.0	0.012	16	9	11	13	61
			1.5†	229#	16,460	1.5	0.021	26	19	22	25	106
UV <sub>254</sub>	(1/cm)	0.065	0.040	*	*							
			0.020	220#	15,840	1.4	0.020	25	18	21	24	102
			0.032†	377#	27,150	1.9	0.032	38	29	32	36	154
SDS-THM4	(µg/L)	67	80	*	*							
			64	*	*							
			32	287#	20,680	1.7	0.026	32	24	27	30	130
SDS-HAA5	(µg/L)	51	48	*	*							
			24	291#	20,990	1.7	0.027	32	24	27	31	131
SDS-HAA6	(µg/L)	55	48	*	*							
			24	254#	18,300	1.6	0.023	29	21	24	28	117
SDS-HAA9	(µg/L)	61	48	*	*							
			24	221#	15,930	1.5	0.020	26	18	21	24	102
SDS-TOX	(µg Cl <sup>-</sup> /L)	288	120	261#	18,780	1.6	0.024	30	22	25	28	120
			70	162	11,630	1.1	0.014	18	11	14	16	70

†GAC effluent concentration equal to 50 percent of the average influent concentration.

\*Effluent concentration criteria not exceeded during GAC run time (including extrapolation procedure). Value of listed parameter is left blank.

#Run time estimated from breakthrough curve extrapolation procedure.

**Table 43 Run times to selected GAC effluent criteria based on effluent blending (20 minute EBCT) during session 2, September**

Parameter	Units	Influent concentration	Breakthrough criterion	Value of listed parameter when breakthrough criterion is met (blended effluent)								
				Run time (days)	Throughput (bed volumes)	TOC (mg/L)	UV <sub>254</sub> (1/cm)	SDS-THM4 (µg/L)	SDS-HAA5 (µg/L)	SDS-HAA6 (µg/L)	SDS-HAA9 (µg/L)	SDS-TOX (µg Cl <sup>-</sup> /L)
TOC	(mg/L)	2.8	2.0	*	*							
			1.0	176	12,640	1.0	0.013	10	4	6	8	39
			1.4†	271#	19,550	1.4	0.021	14	8	10	13	64
UV <sub>254</sub>	(1/cm)	0.060	0.040	*	*							
			0.020	263#	18,920	1.4	0.020	14	7	10	12	62
			0.030†	422#	30,380	1.8	0.030	20	13	16	20	97
SDS-THM4	(µg/L)	39	80	*	*							
			64	*	*							
			32	*	*							
SDS-HAA5	(µg/L)	35	48	*	*							
			24	*	*							
SDS-HAA6	(µg/L)	39	48	*	*							
			24	*	*							
SDS-HAA9	(µg/L)	45	48	*	*							
			24	*	*							
SDS-TOX	(µg Cl <sup>-</sup> /L)	207	120	*	*							
			70	294#	21,140	1.5	0.022	15	9	11	14	70

†GAC effluent concentration equal to 50 percent of the average influent concentration.

\*Effluent concentration criteria not exceeded during GAC run time (including extrapolation procedure). Value of listed parameter is left blank.

#Run time estimated from breakthrough curve extrapolation procedure.

**Table 44 Run times to selected GAC effluent criteria based on effluent blending (20 minute EBCT) during session 3, November**

Parameter	Units	Influent concentration	Breakthrough criterion	Value of listed parameter when breakthrough criterion is met (blended effluent)								
				Run time (days)	Throughput (bed volumes)	TOC (mg/L)	UV <sub>254</sub> (1/cm)	SDS-THM4 (µg/L)	SDS-HAA5 (µg/L)	SDS-HAA6 (µg/L)	SDS-HAA9 (µg/L)	SDS-TOX (µg Cl <sup>-</sup> /L)
TOC	(mg/L)	2.8	2.0	*	*							
			1.0	80	11,460	1.0	0.014	8	4	6	8	42
			1.4†	116#	16,670	1.4	0.022	14	8	10	12	70
UV <sub>254</sub>	(1/cm)	0.060	0.040	*	*							
			0.020	107#	15,440	1.3	0.020	13	7	9	11	63
			0.030†	169#	24,310	1.7	0.030	19	13	15	18	99
SDS-THM4	(µg/L)	38	80	*	*							
			64	*	*							
			32	*	*							
SDS-HAA5	(µg/L)	32	48	*	*							
			24	*	*							
SDS-HAA6	(µg/L)	35	48	*	*							
			24	*	*							
SDS-HAA9	(µg/L)	40	48	*	*							
			24	*	*							
SDS-TOX	(µg Cl <sup>-</sup> /L)	210	120	*	*							
			70	116#	16,700	1.4	0.022	14	8	10	12	70

†GAC effluent concentration equal to 50 percent of the average influent concentration.

\*Effluent concentration criteria not exceeded during GAC run time (including extrapolation procedure). Value of listed parameter is left blank.

#Run time estimated from breakthrough curve extrapolation procedure.

**Table 45 Run times to selected GAC effluent criteria based on effluent blending (influent pH 6.5, 10 minute EBCT) during session 3, November (influent pH stu**

Parameter	Units	Influent concentration	Breakthrough criterion	Value of listed parameter when breakthrough criterion is met (blended effluent)								
				Run time (days)	Throughput (bed volumes)	TOC (mg/L)	UV <sub>254</sub> (1/cm)	SDS-THM4 (µg/L)	SDS-HAA5 (µg/L)	SDS-HAA6 (µg/L)	SDS-HAA9 (µg/L)	SDS-TOX (µg Cl <sup>-</sup> /L)
TOC	(mg/L)	2.8	2.0	*	*							
			1.0	67	4,790	1.0	0.015	10	5	6	8	42
			1.4†	100#	7,160	1.4	0.022	14	8	11	13	67
UV <sub>254</sub>	(1/cm)	0.060	0.040	*	*							
			0.020	89	6,440	1.3	0.020	13	7	9	11	59
			0.030†	144#	10,370	1.7	0.030	19	13	16	18	95
SDS-THM4	(µg/L)	38	80	*	*							
			64	*	*							
			32	*	*							
SDS-HAA5	(µg/L)	32	48	*	*							
			24	*	*							
SDS-HAA6	(µg/L)	35	48	*	*							
			24	*	*							
SDS-HAA9	(µg/L)	40	48	*	*							
			24	*	*							
SDS-TOX	(µg Cl <sup>-</sup> /L)	210	120	*	*							
			70	104#	7,460	1.4	0.023	15	9	11	13	70

†GAC effluent concentration equal to 50 percent of the average influent concentration.

\*Effluent concentration criteria not exceeded during GAC run time (including extrapolation procedure). Value of listed parameter is left blank.

#Run time estimated from breakthrough curve extrapolation procedure.

**Table 46 Run times to selected GAC effluent criteria based on effluent blending (influent pH 7.5, 10 minute EBCT) during session 3, November (influent pH stu**

Parameter	Units	Influent concentra- tion	Breakthrough criterion	Run time (days) at given EBCT (min)				Increase in run time (%)			
				10		20		10 to 20 min EBCT		Single to multiple contactors	
				Contactor configuration							
				Single	Multiple	Single	Multiple	Single	Multiple	10	20
TOC	(mg/L)	3.3	2.0	53	141	133	371	148	164	163	180
			1.0	28	55	68	140	142	153	96	105
			1.6†	41	104	106	245	162	136	156	130
UV-254	(1/cm)	0.060	0.040	*	*	*	*				
			0.020	39	85	97	222	145	161	115	129
			0.030†	59	132	154	354	159	168	123	131
SDS-THM4	(µg/L)	20	80	*	*	*	*				
			64	*	*	*	*				
			32	*	*	*	*				
SDS-HAA5	(µg/L)	16	48	*	*	*	*				
			24	*	*	*	*				
SDS-HAA6	(µg/L)	17	48	*	*	*	*				
			24	*	*	*	*				
SDS-HAA9	(µg/L)	19	48	*	*	*	*				
			24	*	*	*	*				
SDS-TOX	(µg Cl <sup>-</sup> /L)	176	120	*	*	*	*				
			70	44	102	124	282	180	176	131	128

†GAC effluent concentration equal to 50 percent of the average influent concentration.

\*Effluent concentration criteria not exceeded during GAC run time (including extrapolation procedure). Calculated values are left blank.

#Run time estimated from breakthrough curve extrapolation procedure.

**Table 47 Summary of GAC run times to selected GAC effluent criteria during session 1, March**



Parameter	Units	Influent concentra- tion	Breakthrough criterion	Run time (days) at given EBCT (min)				Increase in run time (%)			
				10		20		10 to 20 min EBCT		Single to multiple contactors	
				Contactor configuration							
				Single	Multiple	Single	Multiple	Single	Multiple	10	20
TOC	(mg/L)	3.0	2.0	61	176	155	453	153	157	188	192
			1.0	28	58	70	145	150	151	106	107
			1.5†	38	90	100	229	163	153	138	129
UV-254	(1/cm)	0.065	0.040	87	*	*	*				
			0.020	40	86	106	220	162	155	113	107
			0.032†	69	147	173	377	149	156	113	119
SDS-THM4	(µg/L)	67	80	*	*	*	*				
			64	*	*	*	*				
			32	51	113	132	287	159	155	121	117
SDS-HAA5	(µg/L)	51	48	*	*	*	*				
			24	72	146	143	291	100	100	104	104
SDS-HAA6	(µg/L)	55	48	*	*	*	*				
			24	62	123	119	254	92	107	98	114
SDS-HAA9	(µg/L)	61	48	*	*	*	*				
			24	52	105	113	221	119	110	103	95
SDS-TOX	(µg Cl <sup>-</sup> /L)	288	120	50	104	120	261	143	151	110	117
			70	33	64	83	162	151	152	94	95

†GAC effluent concentration equal to 50 percent of the average influent concentration.

\*Effluent concentration criteria not exceeded during GAC run time (including extrapolation procedure). Calculated values are left blank.

#Run time estimated from breakthrough curve extrapolation procedure.

**Table 48 Summary of GAC run times to selected GAC effluent criteria during session 2, September**

Parameter	Units	Influent concentra- tion	Breakthrough criterion	Run time (days) at given EBCT (min)				Increase in run time (%)			
				10		20		10 to 20 min EBCT		Single to multiple contactors EBCT (min)	
				Contactor configuration							
				Single	Multiple	Single	Multiple	Single	Multiple	10	20
TOC	(mg/L)	2.8	2.0	84	271	204	*	142		222	
			1.0	34	70	82	176	139	151	104	114
			1.4†	42	113	117	271	177	141	166	132
UV-254	(1/cm)	0.060	0.040	*	*	*	*				
			0.020	44	97	124	263	180	172	117	111
			0.030†	69	159	185	422	168	166	131	129
SDS-THM4	(µg/L)	39	80	*	*	*	*				
			64	*	*	*	*				
			32	*	*	*	*				
SDS-HAA5	(µg/L)	35	48	*	*	*	*				
			24	*	*	*	*				
SDS-HAA6	(µg/L)	39	48	*	*	*	*				
			24	*	*	*	*				
SDS-HAA9	(µg/L)	45	48	*	*	*	*				
			24	86	191	*	*			122	
SDS-TOX	(µg Cl <sup>-</sup> /L)	207	120	90	214	*	*			139	
			70	47	102	147	294	215	189	118	100

†GAC effluent concentration equal to 50 percent of the average influent concentration.

\*Effluent concentration criteria not exceeded during GAC run time (including extrapolation procedure). Calculated values are left blank.

#Run time estimated from breakthrough curve extrapolation procedure.

**Table 49 Summary of GAC run times to selected GAC effluent criteria during session 3, November**

Parameter	Units	Influent concen- tration	Breakthrough criterion	Carbon usage rate, CUR (lbs/MG) at given EBCT (min)				Decrease in CUR (%)			
				10		20		10 to 20 min EBCT		Single to multiple contactors	
				Contactor configuration				Contactor configuration		EBCT (min)	
				Single	Multiple	Single	Multiple	Single	Multiple	10	20
TOC	(mg/L)	3.3	2.0	540	200	430	160	20	20	63	63
			1.0	1,020	520	840	410	18	21	49	51
			1.6†	710	280	540	230	24	18	61	57
UV-254	(1/cm)	0.060	0.040	*	*	*	*				
			0.020	730	340	590	260	19	24	53	56
			0.030†	490	220	370	160	24	27	55	57
SDS-THM4	(µg/L)	20	80	*	*	*	*				
			64	*	*	*	*				
			32	*	*	*	*				
SDS-HAA5	(µg/L)	16	48	*	*	*	*				
			24	*	*	*	*				
SDS-HAA6	(µg/L)	17	48	*	*	*	*				
			24	*	*	*	*				
SDS-HAA9	(µg/L)	19	48	*	*	*	*				
			24	*	*	*	*				
SDS-TOX	(µg Cl <sup>-</sup> /L)	176	120	*	*	*	*				
			70	650	280	460	200	29	29	57	57

†GAC effluent concentration equal to 50 percent of the average influent concentration.

\*Effluent concentration criteria not exceeded during GAC run time (including extrapolation procedure). Calculated values are left blank.

**Table 50 Summary of carbon usage rates to selected GAC effluent criteria during session 1, March**

Parameter	Units	Influent concentration	Breakthrough criterion	Carbon usage rate, CUR (lbs/MG) at given EBCT (min)				Decrease in CUR (%)			
				10		20		10 to 20 min EBCT		Single to multiple contactors	
				Contactor configuration		Contactor configuration		Contactor configuration		EBCT (min)	
				Single	Multiple	Single	Multiple	Single	Multiple	10	20
TOC	(mg/L)	3.0	2.0	470	160	370	130	21	19	66	65
			1.0	1,030	500	820	400	20	20	51	51
			1.5†	760	320	580	250	24	22	58	57
UV-254	(1/cm)	0.065	0.040	330	*	*	*				
			0.020	710	330	540	260	24	21	54	52
			0.032†	420	200	330	150	21	25	52	55
SDS-THM4	(µg/L)	67	80	*	*	*	*				
			64	*	*	*	*				
			32	560	260	440	200	21	23	54	55
SDS-HAA5	(µg/L)	51	48	*	*	*	*				
			24	400	200	400	200	0	0	50	50
SDS-HAA6	(µg/L)	55	48	*	*	*	*				
			24	460	230	480	230	-4	0	50	52
SDS-HAA9	(µg/L)	61	48	*	*	*	*				
			24	560	270	510	260	9	4	52	49
SDS-TOX	(µg Cl <sup>-</sup> /L)	288	120	580	280	480	220	17	21	52	54
			70	870	450	690	360	21	20	48	48

†GAC effluent concentration equal to 50 percent of the average influent concentration.

\*Effluent concentration criteria not exceeded during GAC run time (including extrapolation procedure). Calculated values are left blank.

**Table 51 Summary of carbon usage rates to selected GAC effluent criteria during session 2, September**

Parameter	Units	Influent concen- tration	Breakthrough criterion	Carbon usage rate, CUR (lbs/MG) at given EBCT (min)				Decrease in CUR (%)			
				10		20		10 to 20 min EBCT		Single to multiple contactors	
				Contactor configuration				Contactor configuration		EBCT (min)	
				Single	Multiple	Single	Multiple	Single	Multiple	10	20
TOC	(mg/L)	2.8	2.0	340	110	280	*	18		68	
			1.0	840	410	700	330	17	20	51	53
			1.4†	680	260	490	210	28	19	62	57
UV-254	(1/cm)	0.060	0.040	*	*	*	*				
			0.020	650	300	460	220	29	27	54	52
			0.030†	420	180	310	140	26	22	57	55
SDS-THM4	(µg/L)	39	80	*	*	*	*				
			64	*	*	*	*				
			32	*	*	*	*				
SDS-HAA5	(µg/L)	35	48	*	*	*	*				
			24	*	*	*	*				
SDS-HAA6	(µg/L)	39	48	*	*	*	*				
			24	*	*	*	*				
SDS-HAA9	(µg/L)	45	48	*	*	*	*				
			24	330	150	*	*			55	
SDS-TOX	(µg Cl <sup>-</sup> /L)	207	120	320	130	*	*			59	
			70	620	280	390	200	37	29	55	49

†GAC effluent concentration equal to 50 percent of the average influent concentration.

\*Effluent concentration criteria not exceeded during GAC run time (including extrapolation procedure). Calculated values are left blank.

**Table 52 Summary of carbon usage rates to selected GAC effluent criteria during session 3, November**

Parameter	Units	Value	Run time (days)			Mean	Standard deviation	Relative standard deviation (%)
			Session					
			1 March	2 September	3 November			
TOC	(mg/L)	2.0	141#	176#	271#	196	±67	34%
		1.0	55	58	70	61	±8	13%
		c/c <sub>0</sub> = 50% <sup>†</sup>	104	90#	113	102	±11	11%
UV-254	(1/cm)	0.040	*	*	*			
		0.020	85	86	97	89	±6	7%
		c/c <sub>0</sub> = 50% <sup>†</sup>	132#	147#	159#	146	±14	9%
SDS-THM4	(µg/L)	80	*	*	*			
		64	*	*	*			
		32	*	113#	*	>113		
SDS-HAA5	(µg/L)	48	*	*	*			
		24	*	146#	*	>146		
SDS-HAA6	(µg/L)	48	*	*	*			
		24	*	123#	*	>123		
SDS-HAA9	(µg/L)	48	*	*	*			
		24	*	105#	191#	148	±61	41%
SDS-TOX	(µg Cl <sup>-</sup> /L)	120	*	104#	214#	159	±78	49%
		70	102#	64	102#	89	±22	24%
Extrapolated run time (days)		--	225	185	240	217	±28	13%

<sup>†</sup>GAC effluent concentration equal to 50 percent of the average influent concentration.

\*Effluent concentration criteria not exceeded during GAC run time (including extrapolation procedure). Calculated values are left blank

#Run time estimated from breakthrough curve extrapolation procedure.

**Table 53 Run times to selected GAC effluent criteria based on effluent blending (10 minute EBCT)**

Parameter	Units	Value	Run time (days)			Mean	Standard deviation	Relative standard deviation (%)
			Session					
			1 March	2 September	3 November			
TOC	(mg/L)	2.0	371#	453#	*	412	±58	14%
		1.0	140	145	176	153	±19	13%
		c/c <sub>0</sub> = 50% <sup>†</sup>	245#	229#	271#	248	±22	9%
UV-254	(1/cm)	0.040	*	*	*			
		0.020	222	220#	263#	235	±24	10%
		c/c <sub>0</sub> = 50% <sup>†</sup>	354#	377#	422#	384	±35	9%
SDS-THM4	(µg/L)	80	*	*	*			
		64	*	*	*			
		32	*	287#	*	>287		
SDS-HAA5	(µg/L)	48	*	*	*			
		24	*	291#	*	>291		
SDS-HAA6	(µg/L)	48	*	*	*			
		24	*	254#	*	>254		
SDS-HAA9	(µg/L)	48	*	*	*			
		24	*	221#	*	>221		
SDS-TOX	(µg Cl <sup>-</sup> /L)	120	*	261#	*	>261		
		70	282#	162	294#	246	±73	30%
Extrapolated run time (days)		--	571	471	571	538	±58	11%

<sup>†</sup>GAC effluent concentration equal to 50 percent of the average influent concentration.

\*Effluent concentration criteria not exceeded during GAC run time (including extrapolation procedure). Calculated values are left blank.

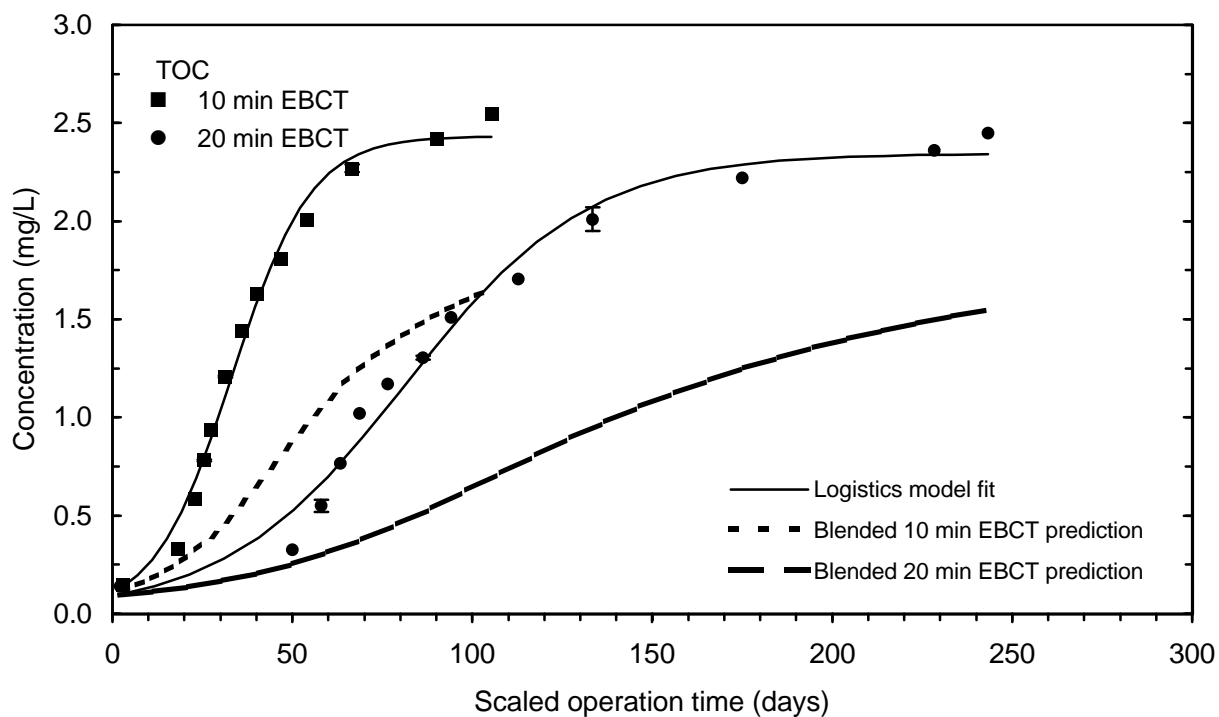
#Run time estimated from breakthrough curve extrapolation procedure.

**Table 54 Run times to selected GAC effluent criteria based on effluent blending (20 minute EBCT)**

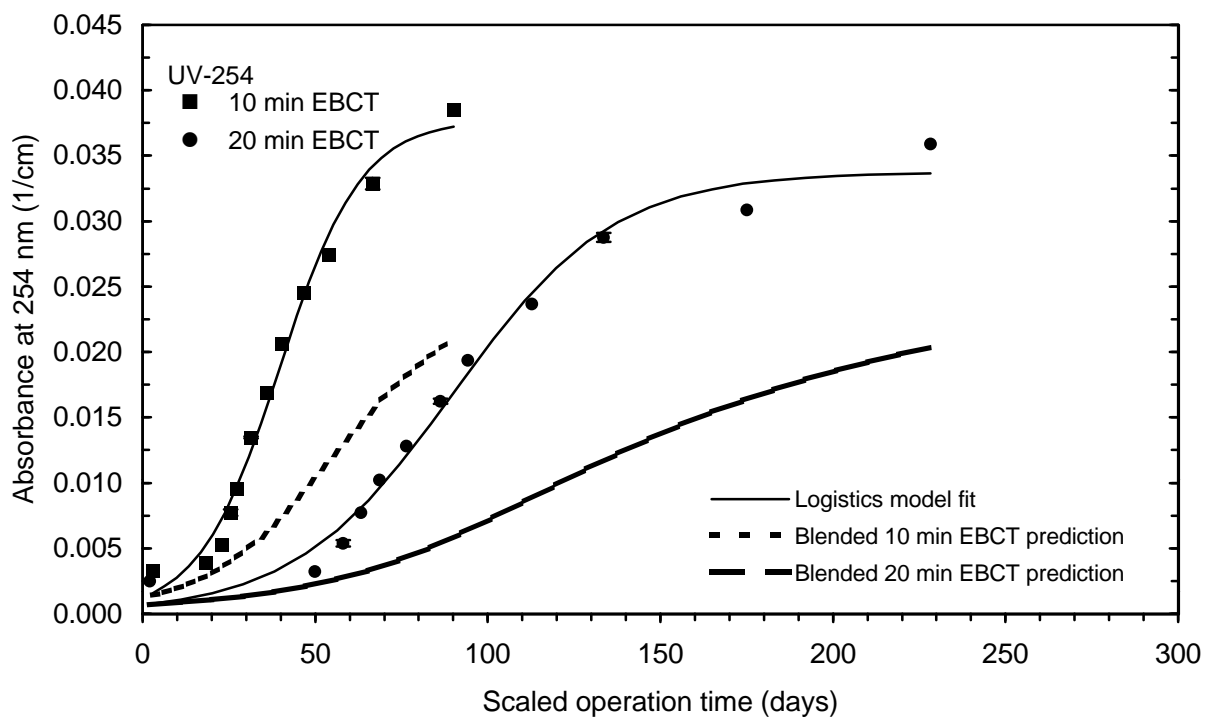
Parameter	Coefficient	10 minute EBCT			20 minute EBCT			Influent pH Study--November	
		March	September	November	March	September	November	inf pH 6.5	inf pH 7.5
TOC	$A_o$	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	$A_f$	2.76	2.80	2.89	3.33	2.75	2.98	2.90	2.88
	$B$	13.8	7.2	6.7	8.1	9.2	6.3	9.5	6.3
	$D$	0.069	0.057	0.058	0.030	0.028	0.023	0.084	0.027
	$r^2$	0.971	0.946	0.949	0.960	0.956	0.967	0.972	0.949
UV <sub>254</sub>	$A_o$	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	$A_f$	0.050	0.055	0.055	0.067	0.055	0.055	0.051	0.053
	$B$	15.0	10.5	10.0	12.6	12.6	10.7	10.2	9.3
	$D$	0.052	0.056	0.051	0.026	0.024	0.022	0.067	0.023
	$r^2$	0.948	0.937	0.945	0.954	0.946	0.939	0.928	0.943
SDS-THM	$A_o$	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	$A_f$	15.4	49.2	100.3	54.5	49.5	103.1	83.4	82.6
	$B$	28.3	8.8	9.3	11.8	12.2	10.7	9.3	8.7
	$D$	0.069	0.069	0.057	0.033	0.033	0.025	0.075	0.031
	$r^2$	0.911	0.904	0.939	0.905	0.939	0.960	0.948	0.946
SDS-HAAI	$A_o$	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	$A_f$	14.1	27.2	29.0	28.3	27.2	29.4	24.7	24.5
	$B$	9.8	9.5	9.5	14.9	9.8	11.0	13.5	13.2
	$D$	0.084	0.055	0.050	0.023	0.023	0.022	0.079	0.028
	$r^2$	0.843	0.892	0.871	0.947	0.806	0.914	0.927	0.904
SDS-HAAI	$A_o$	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	$A_f$	15.3	31.7	33.8	31.5	31.6	34.2	29.6	29.3
	$B$	12.4	8.3	9.6	12.4	9.3	10.0	12.6	11.9
	$D$	0.092	0.057	0.059	0.025	0.025	0.024	0.087	0.031
	$r^2$	0.882	0.901	0.886	0.935	0.830	0.904	0.937	0.908
SDS-HAAI	$A_o$	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	$A_f$	17.0	34.0	37.1	31.0	33.5	37.2	33.1	34.2
	$B$	15.5	5.8	7.4	9.4	5.4	8.6	16.8	10.8
	$D$	0.093	0.055	0.057	0.025	0.024	0.025	0.108	0.031
	$r^2$	0.890	0.877	0.873	0.866	0.799	0.914	0.923	0.885
SDS-TOX	$A_o$	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	$A_f$	144	183	223	169	184	224	194	194
	$B$	11.7	10.6	10.6	71.3	14.0	11.0	13.6	10.3
	$D$	0.047	0.052	0.051	0.046	0.024	0.022	0.078	0.025
	$r^2$	0.920	0.898	0.924	0.945	0.915	0.928	0.957	0.946

**Table 55 Summary of logistic function curve fit parameters and r2 values for curve fits after breakthrough curve extrapolation**

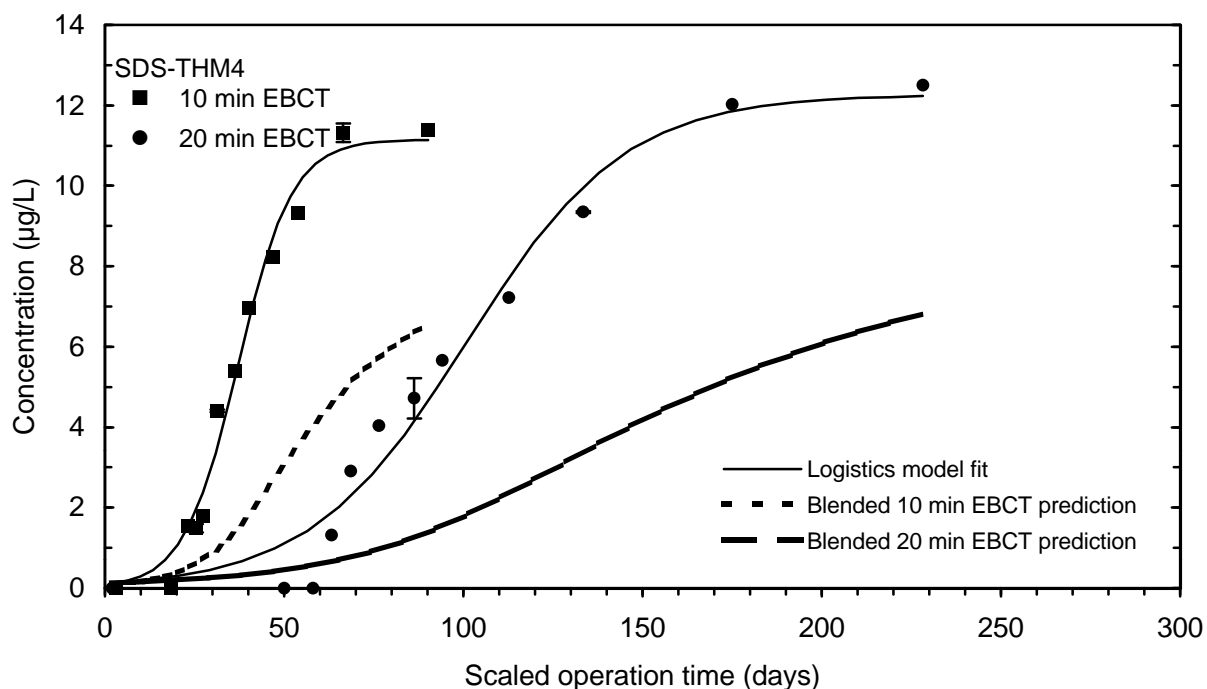




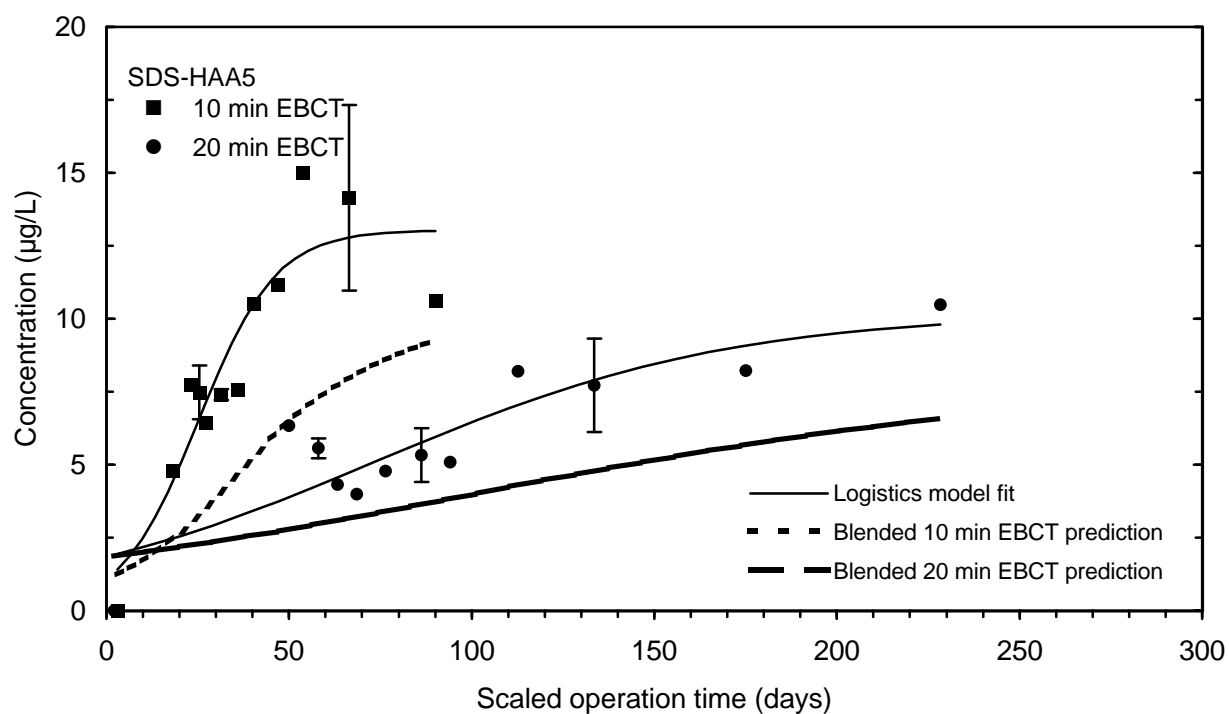
**Figure 106 TOC breakthrough and effluent blending for 10 and 20 minute EBCT contactors during session 1 (March)**



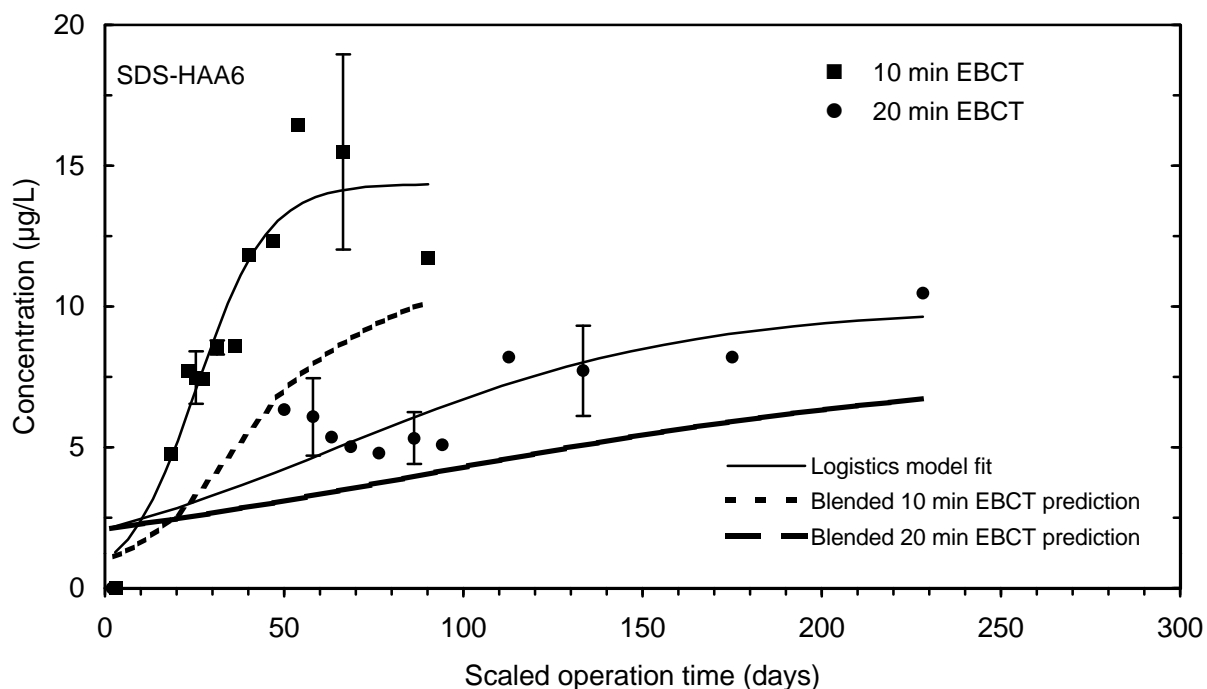
**Figure 107 UV-254 breakthrough and effluent blending for 10 and 20 minute EBCT contactors during session 1 (March)**



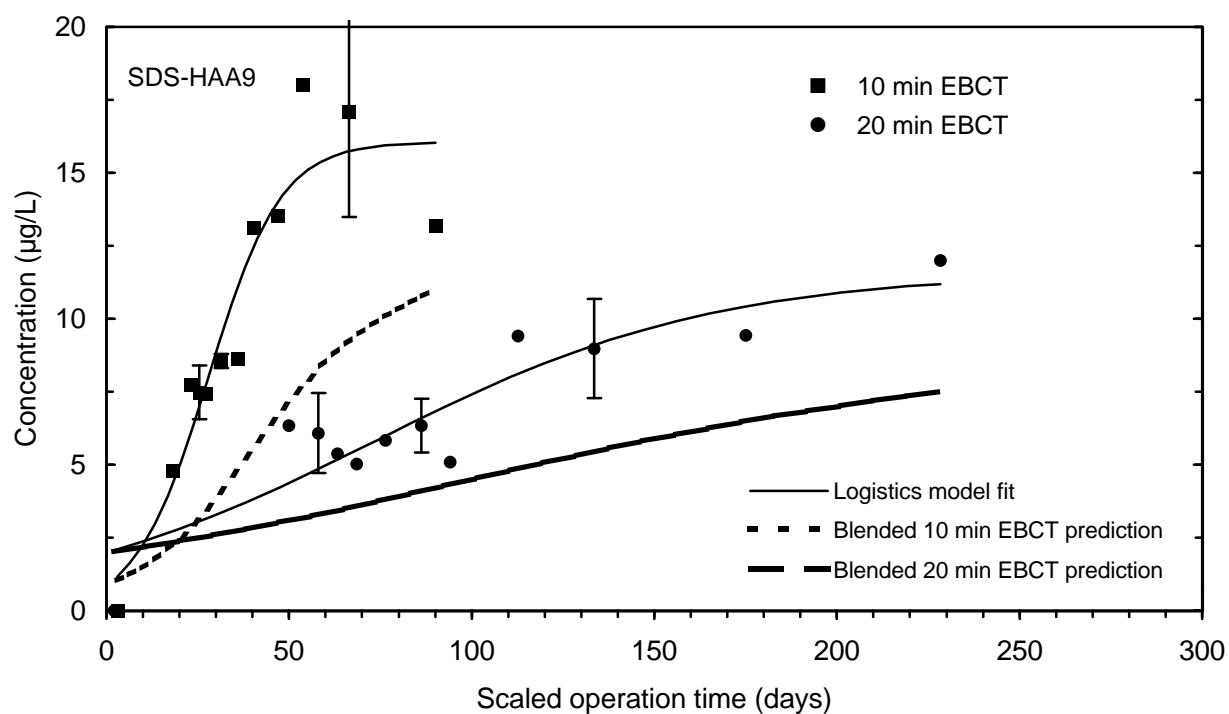
**Figure 108 SDS-THM4 breakthrough and effluent blending for 10 and 20 minute EBCT contactors during session 1 (March)**



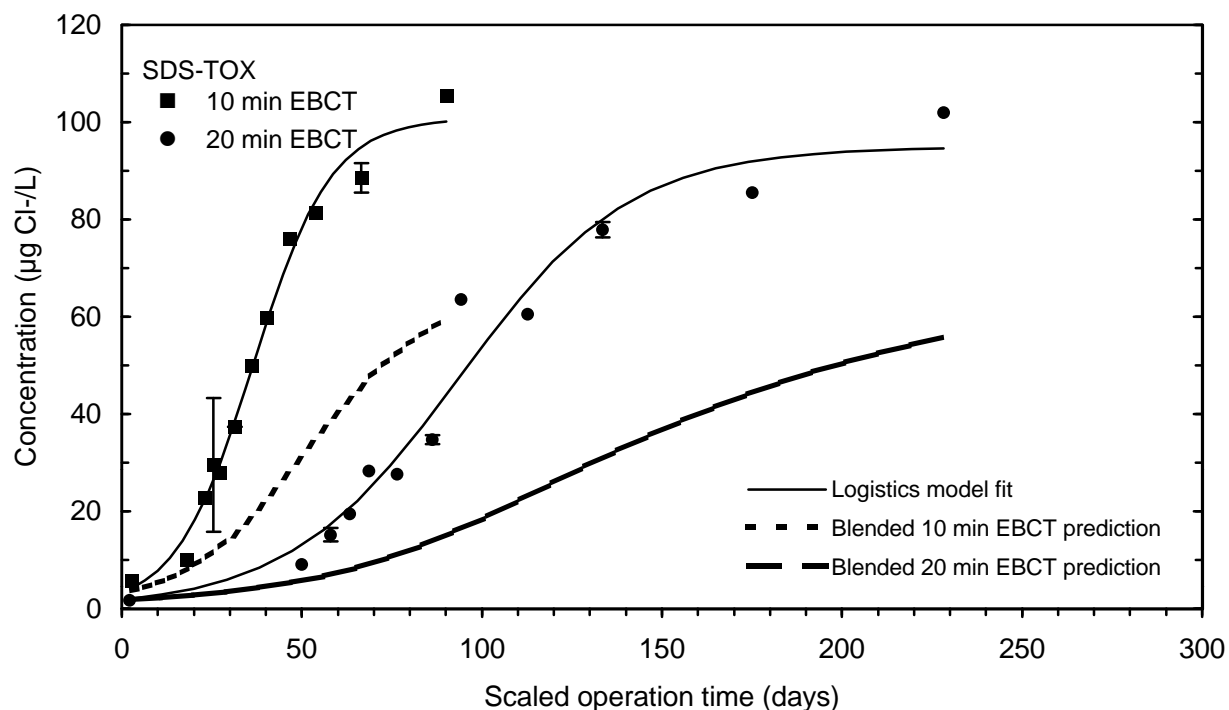
**Figure 109 SDS-HAA5 breakthrough and effluent blending for 10 and 20 minute EBCT contactors during session 1 (March)**



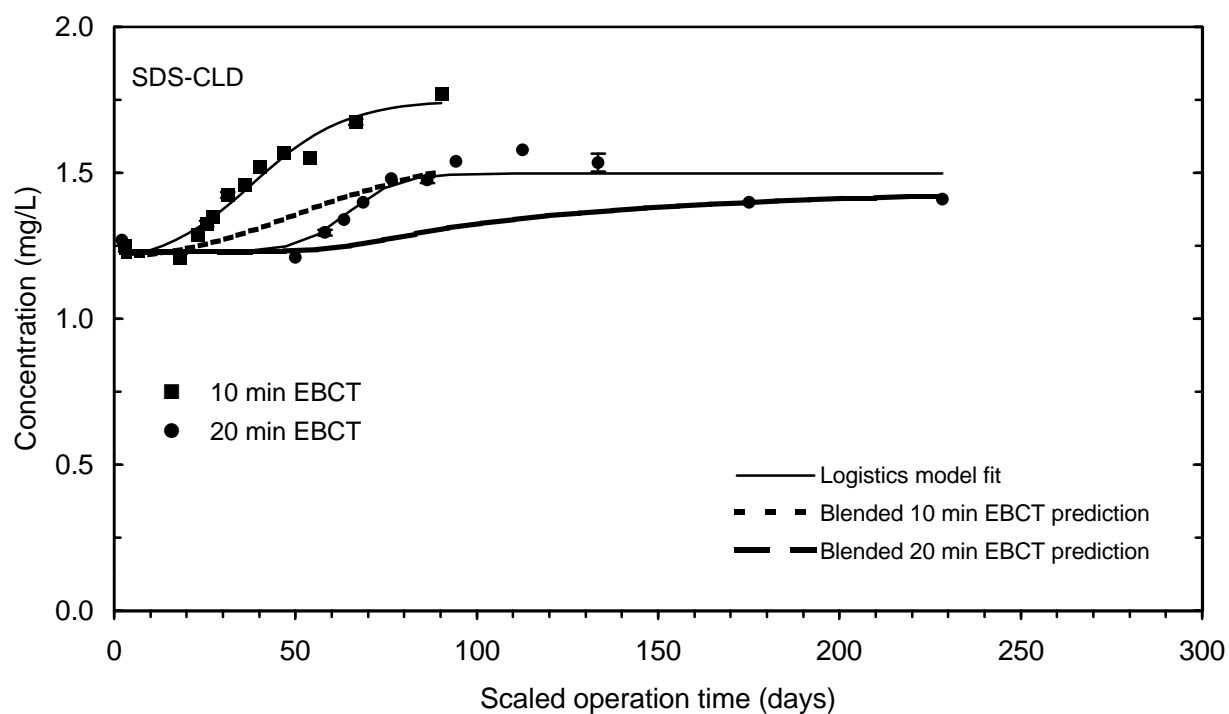
**Figure 110 SDS-HAA6 breakthrough and effluent blending for 10 and 20 minute EBCT contactors during session 1 (March)**



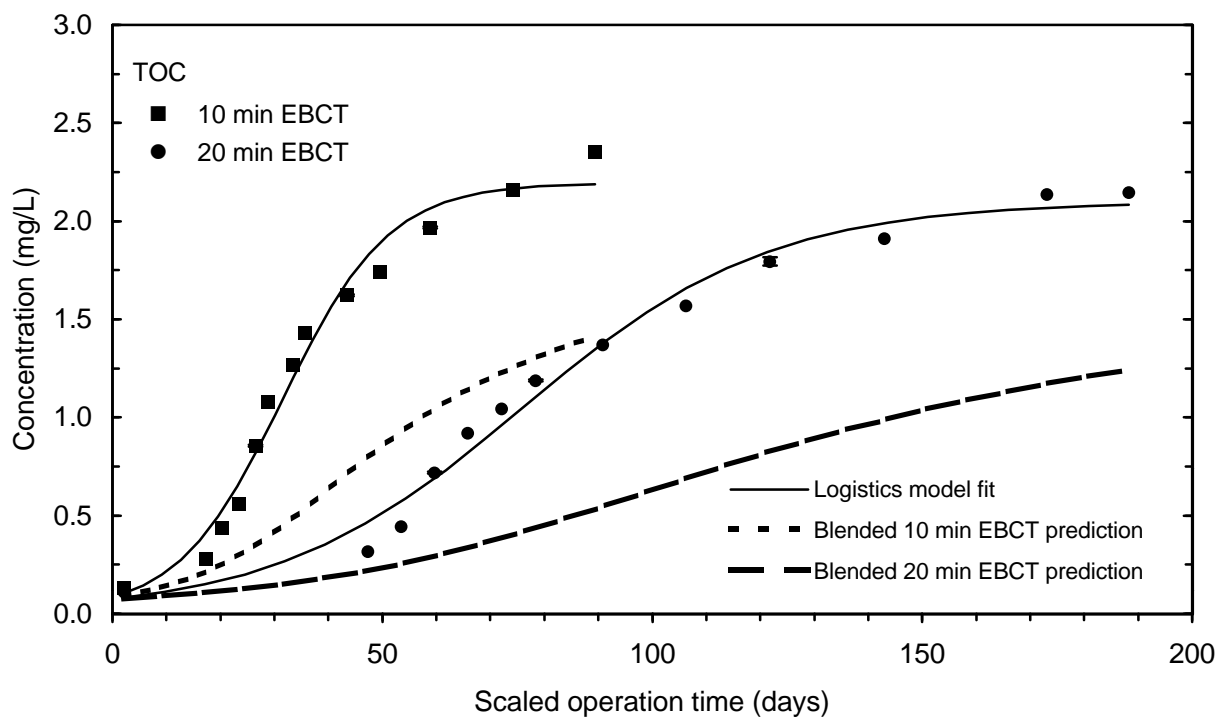
**Figure 111 SDS-HAA9 breakthrough and effluent blending for 10 and 20 minute EBCT contactors during session 1 (March)**



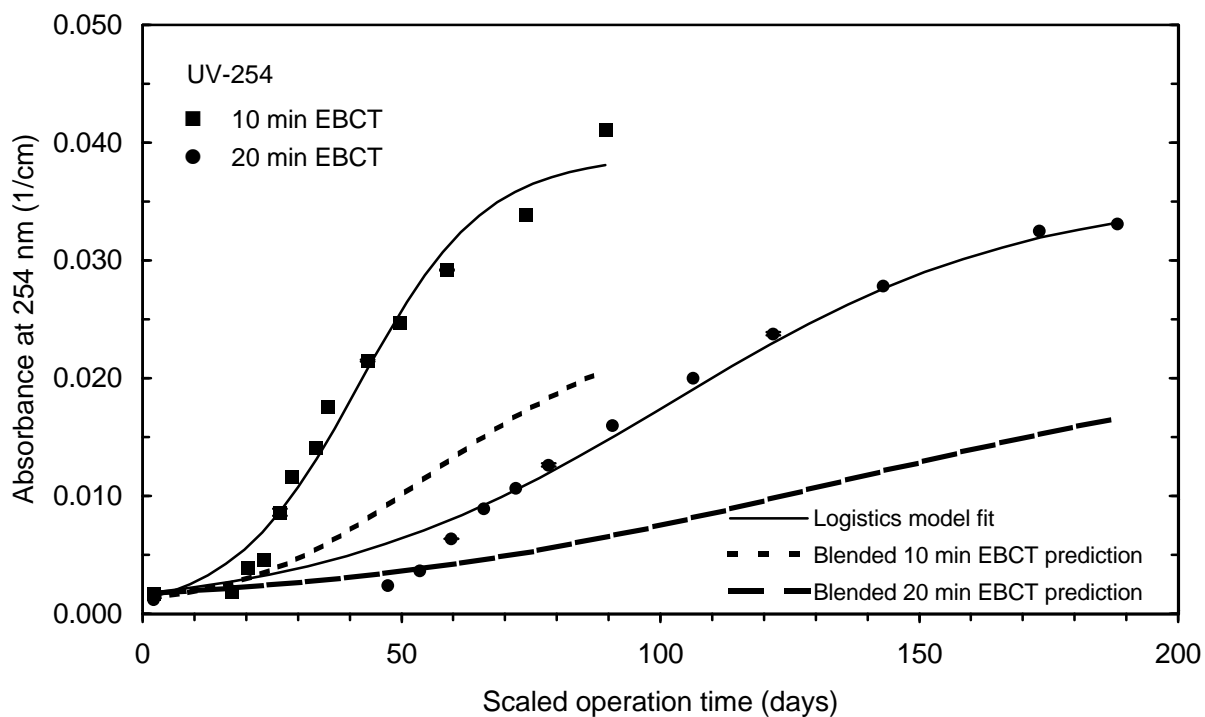
**Figure 112 SDS-TOX breakthrough and effluent blending for 10 and 20 minute EBCT contactors during session 1 (March)**



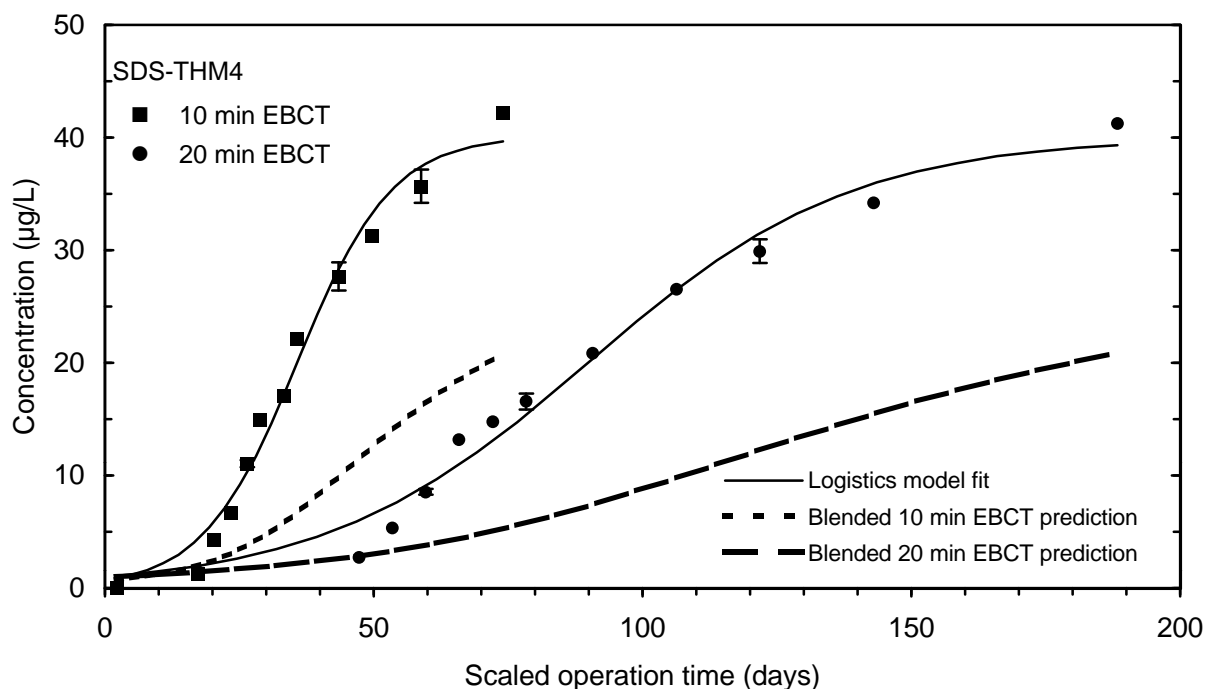
**Figure 113 SDS-CLD breakthrough and effluent blending for 10 and 20 minute EBCT contactors during session 1 (March)**



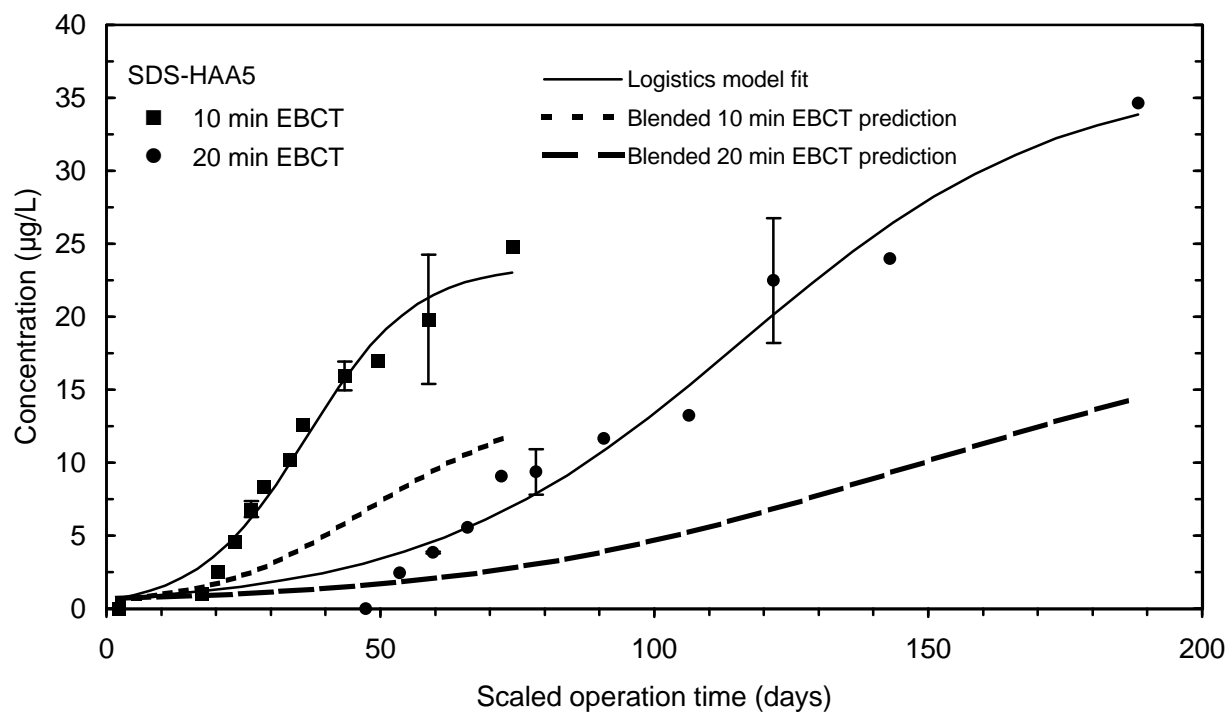
**Figure 114 TOC breakthrough and effluent blending for 10 and 20 minute EBCT contactors during session 2 (September)**



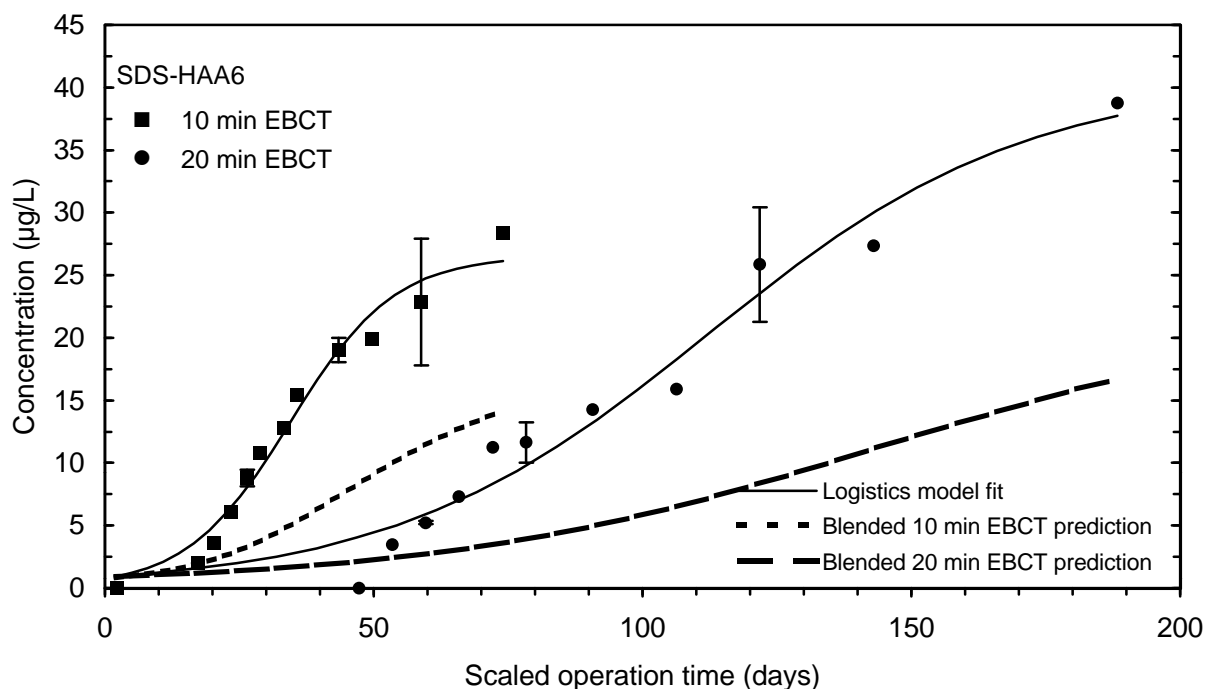
**Figure 115 UV-254 breakthrough and effluent blending for 10 and 20 minute EBCT contactors during session 2 (September)**



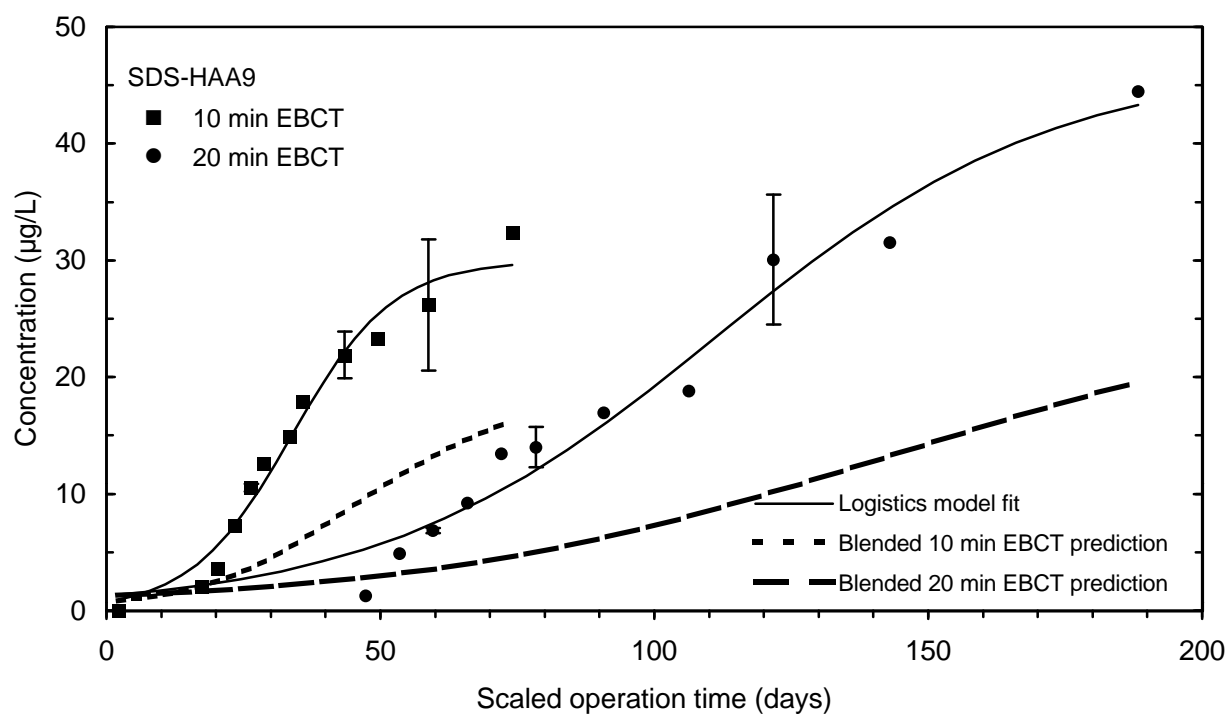
**Figure 116 SDS-THM4 breakthrough and effluent blending for 10 and 20 minute EBCT contactors during session 2 (September)**



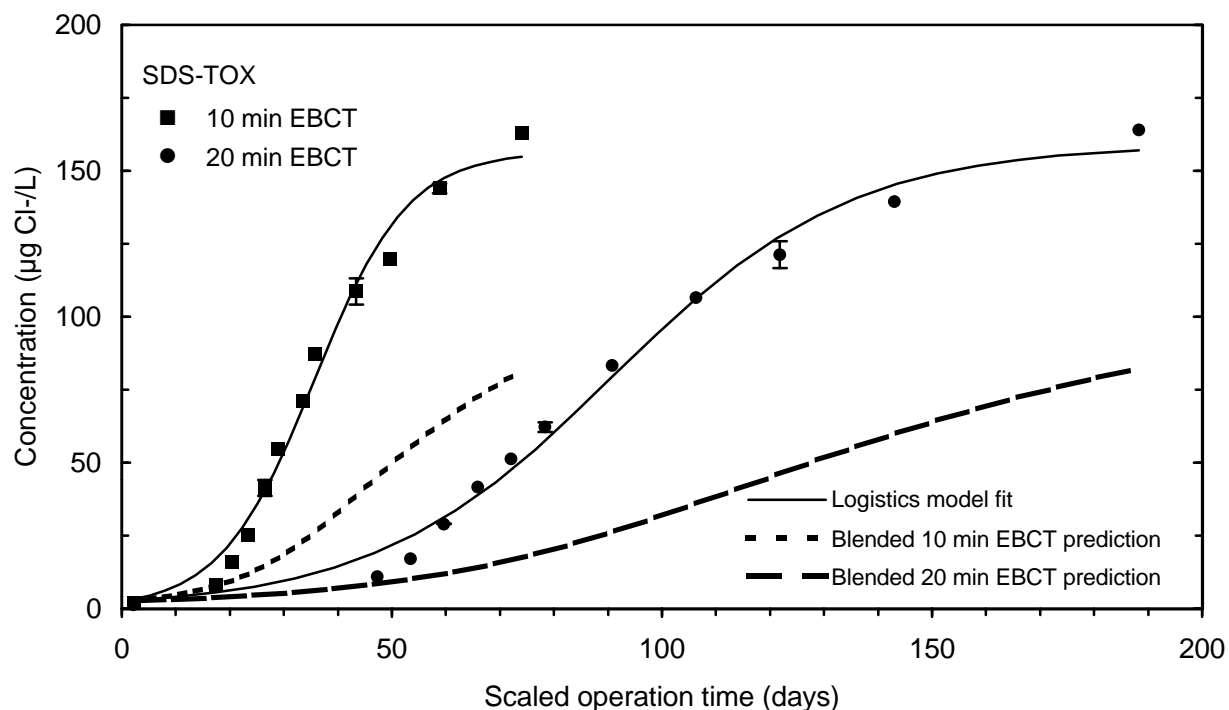
**Figure 117 SDS-HAA5 breakthrough and effluent blending for 10 and 20 minute EBCT contactors during session 2 (September)**



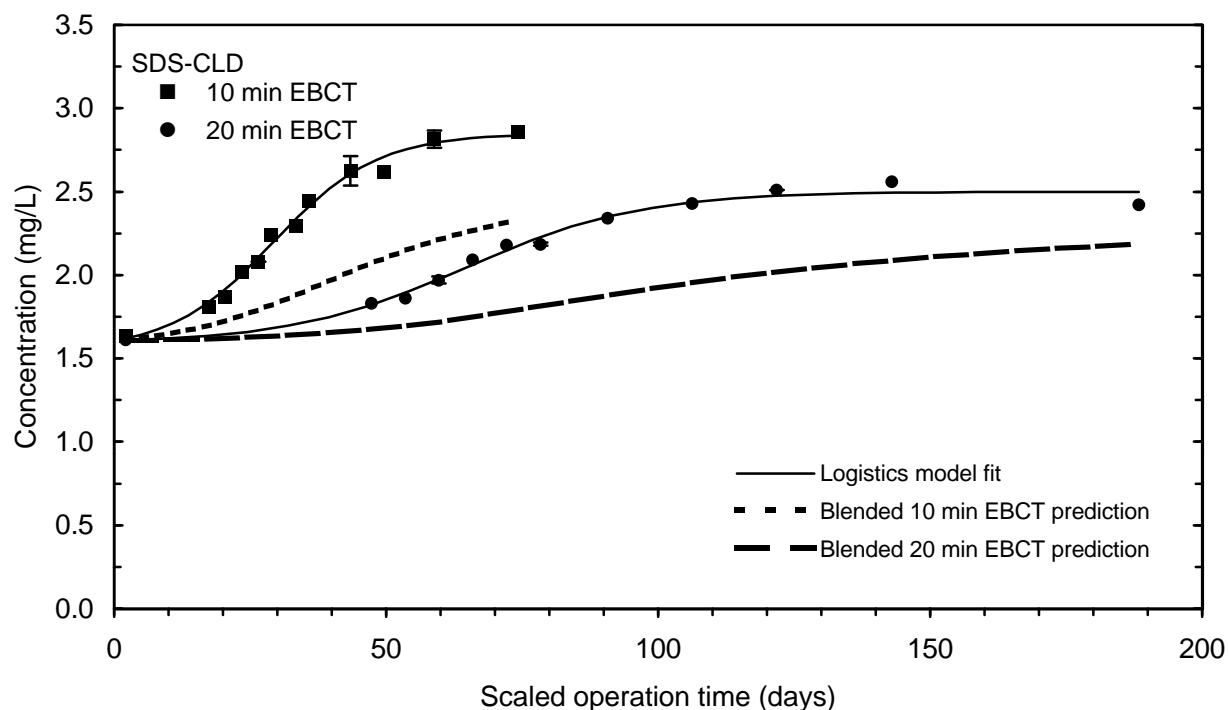
**Figure 118 SDS-HAA6 breakthrough and effluent blending for 10 and 20 minute EBCT contactors during session 2 (September)**



**Figure 119 SDS-HAA9 breakthrough and effluent blending for 10 and 20 minute EBCT contactors during session 2 (September)**

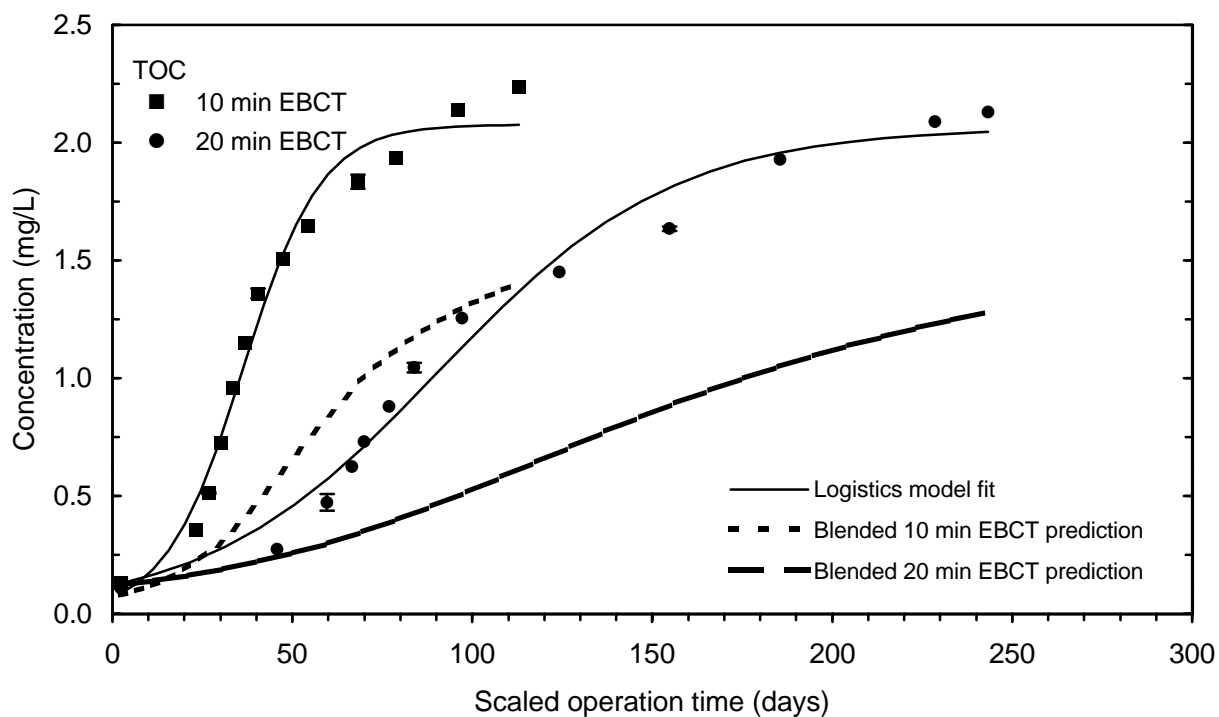


**Figure 120 SDS-TOX breakthrough and effluent blending for 10 and 20 minute EBCT contactors during session 2 (September)**

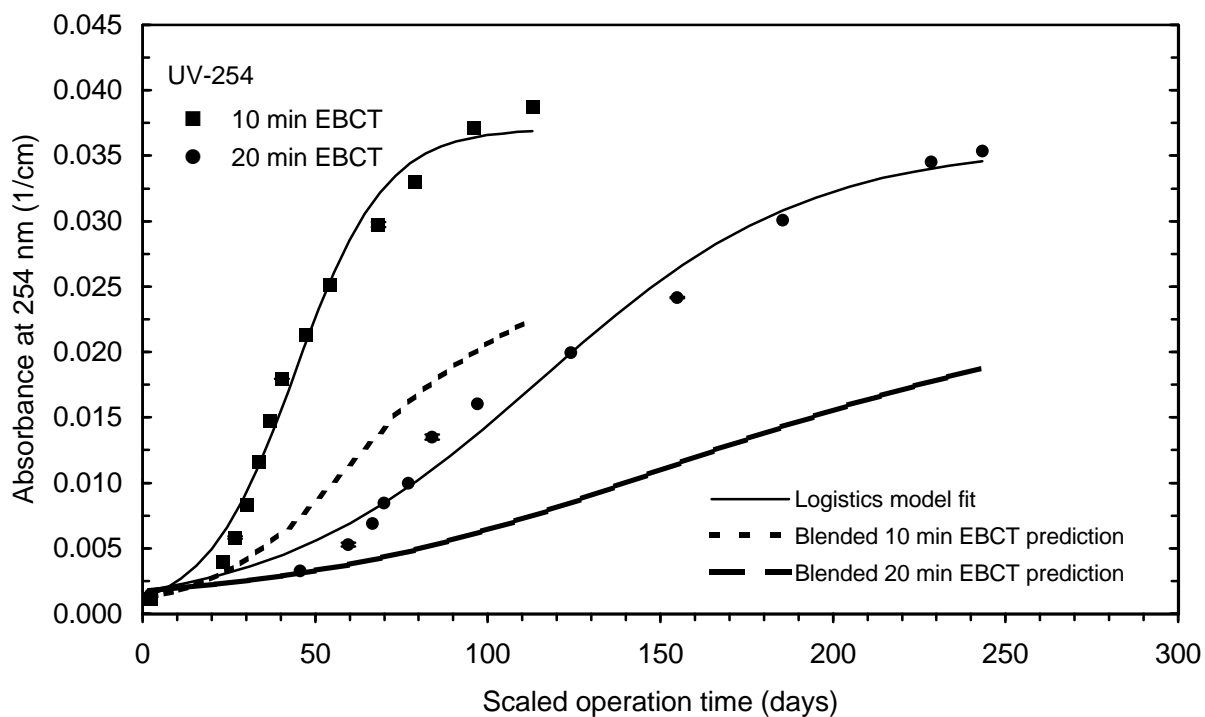


**Figure 121 SDS-CLD breakthrough and effluent blending for 10 and 20 minute EBCT contactors during session 2 (September)**

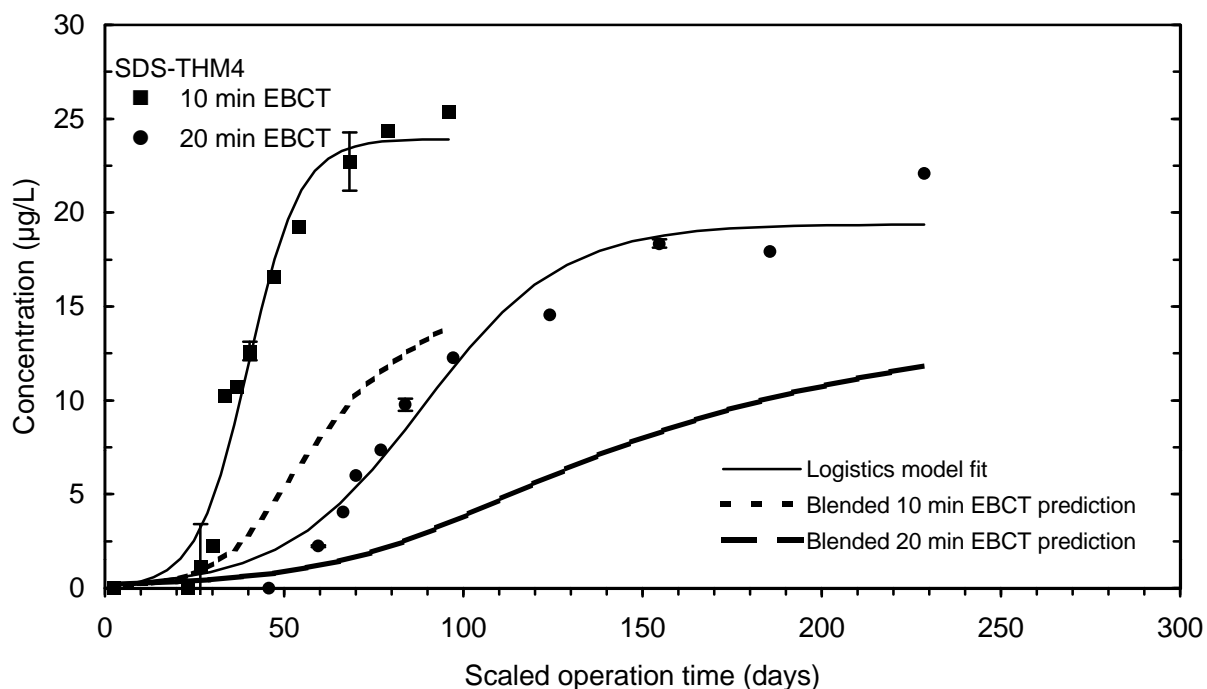




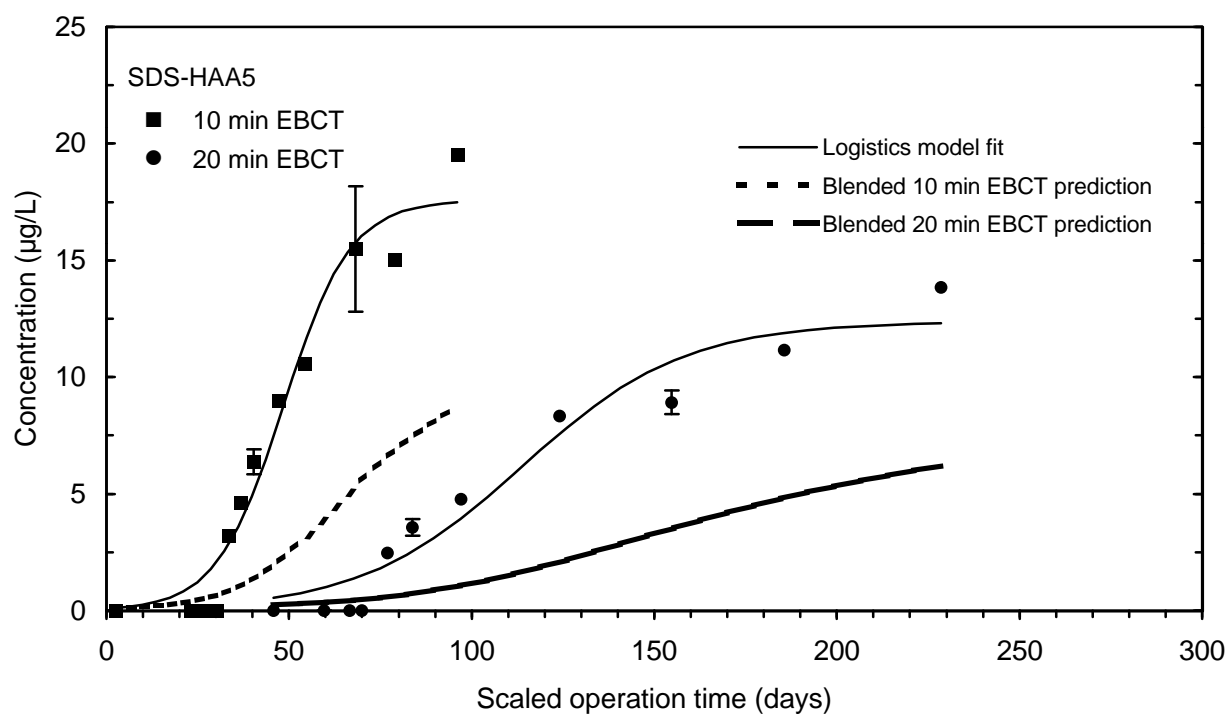
**Figure 122 TOC breakthrough and effluent blending for 10 and 20 minute EBCT contactors during session 3 (November)**



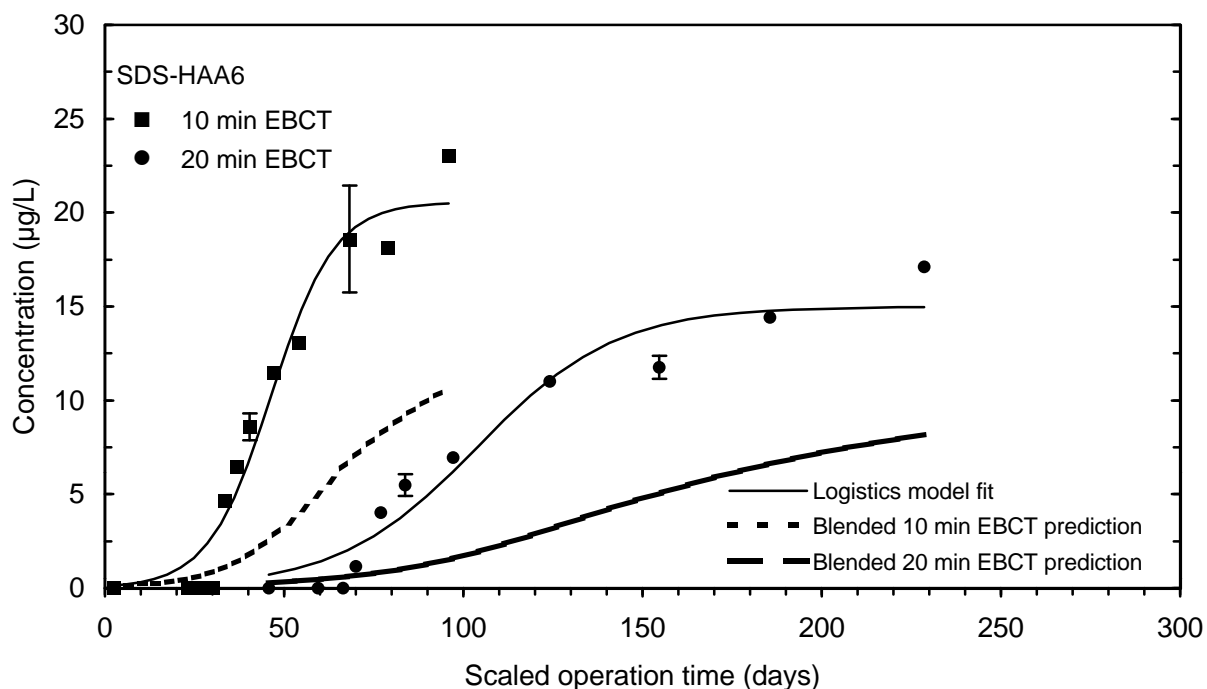
**Figure 123 UV-254 breakthrough and effluent blending for 10 and 20 minute EBCT contactors during session 3 (November)**



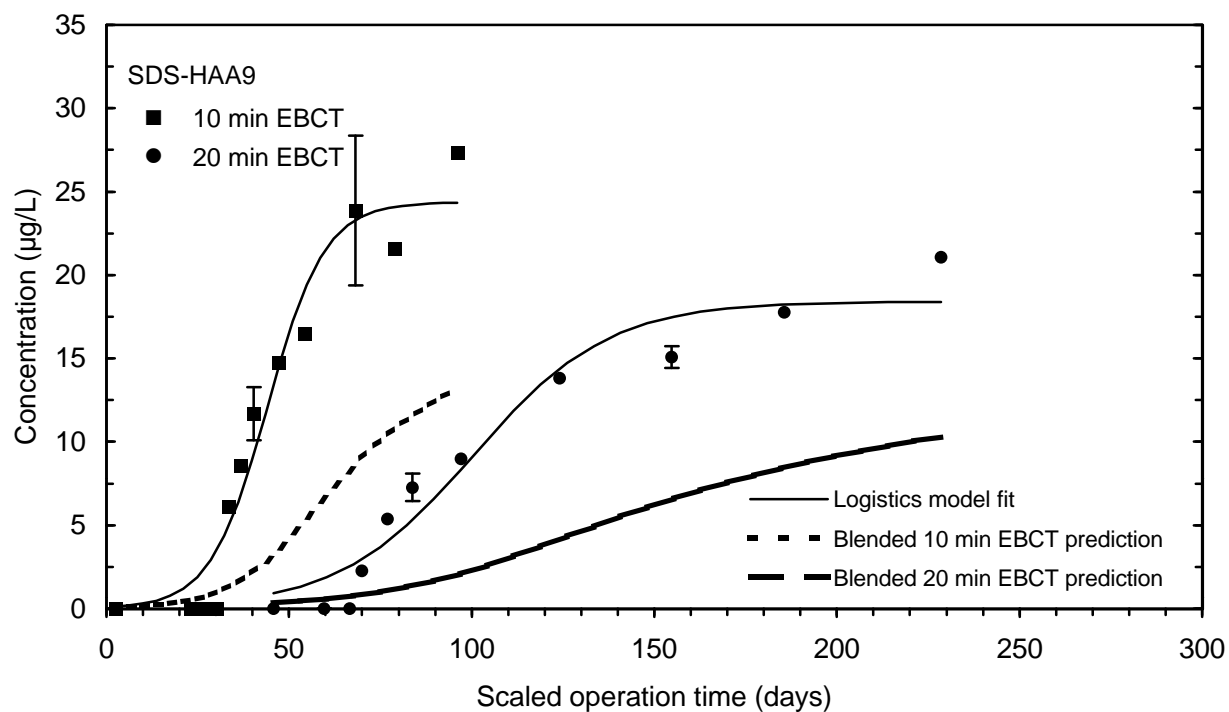
**Figure 124 SDS-THM4 breakthrough and effluent blending for 10 and 20 minute EBCT contactors during session 3 (November)**



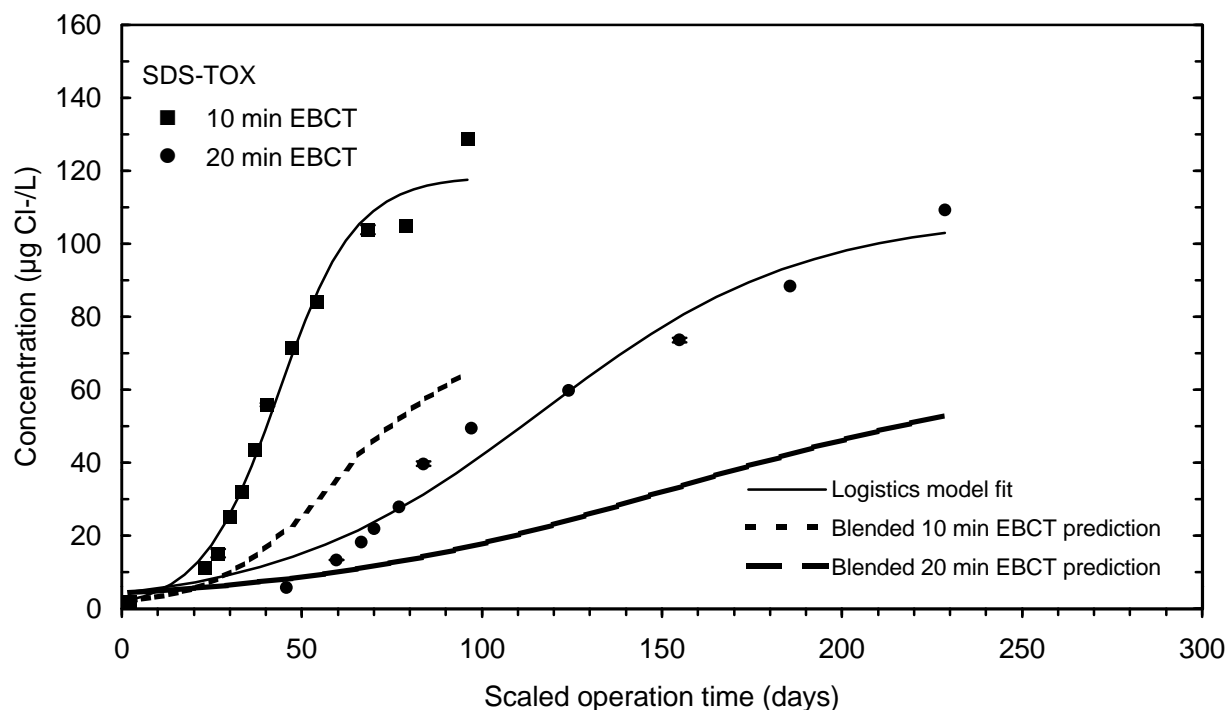
**Figure 125 SDS-HAA5 breakthrough and effluent blending for 10 and 20 minute EBCT contactors during session 3 (November)**



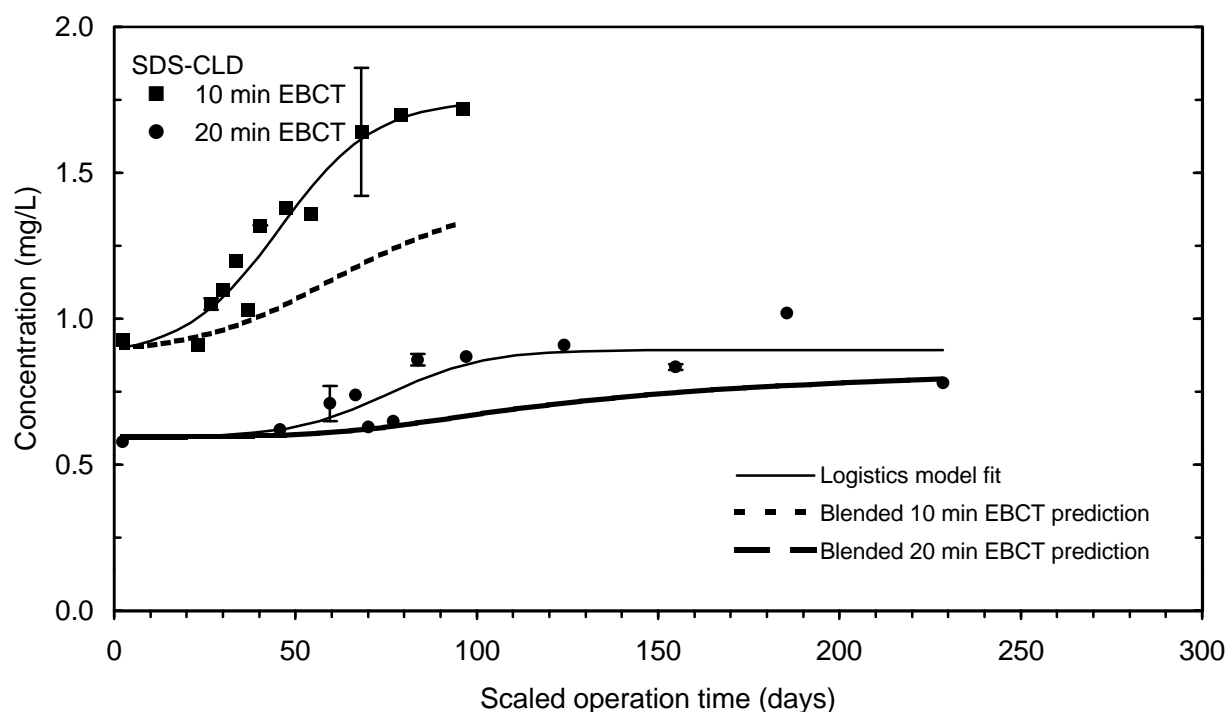
**Figure 126 SDS-HAA6 breakthrough and effluent blending for 10 and 20 minute EBCT contactors during session 3 (November)**



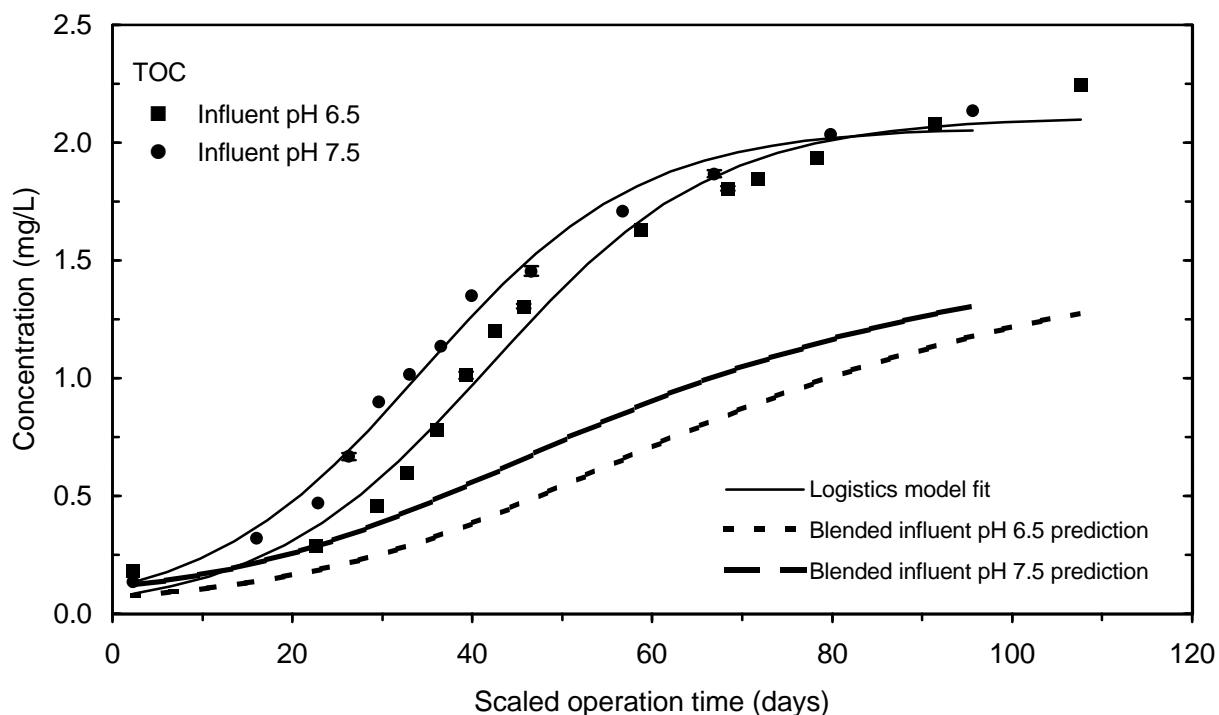
**Figure 127 SDS-HAA9 breakthrough and effluent blending for 10 and 20 minute EBCT contactors during session 3 (November)**



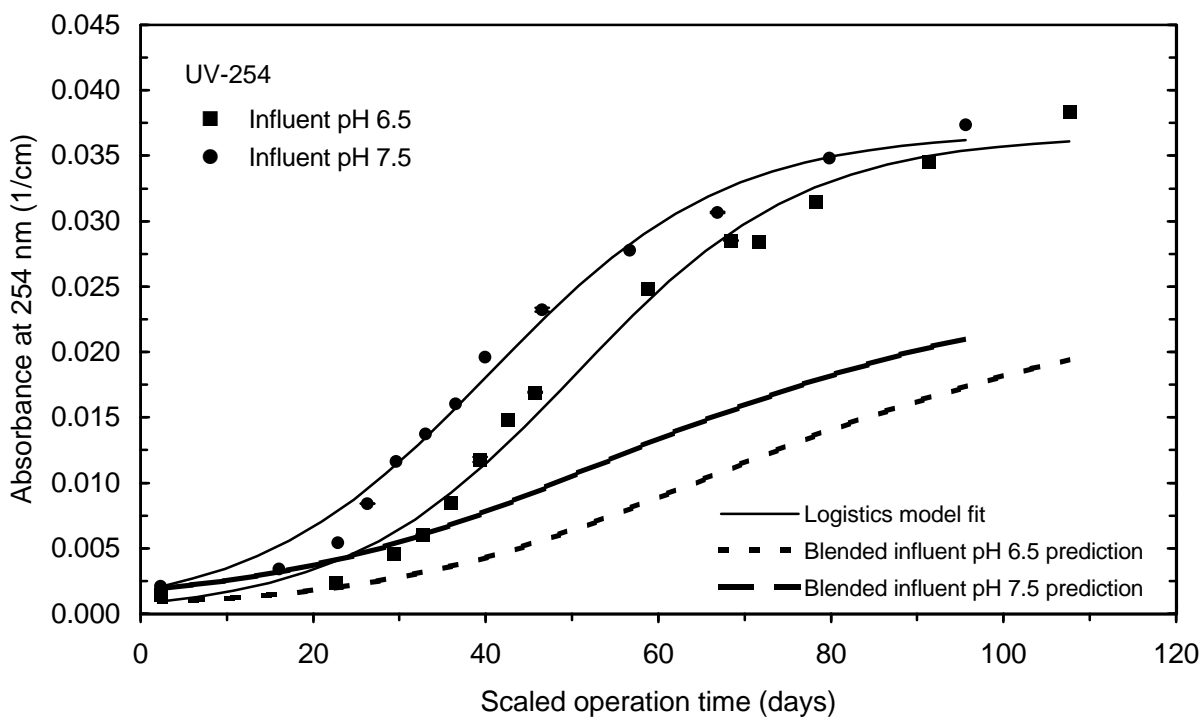
**Figure 128 SDS-TOX breakthrough and effluent blending for 10 and 20 minute EBCT contactors during session 3 (November)**



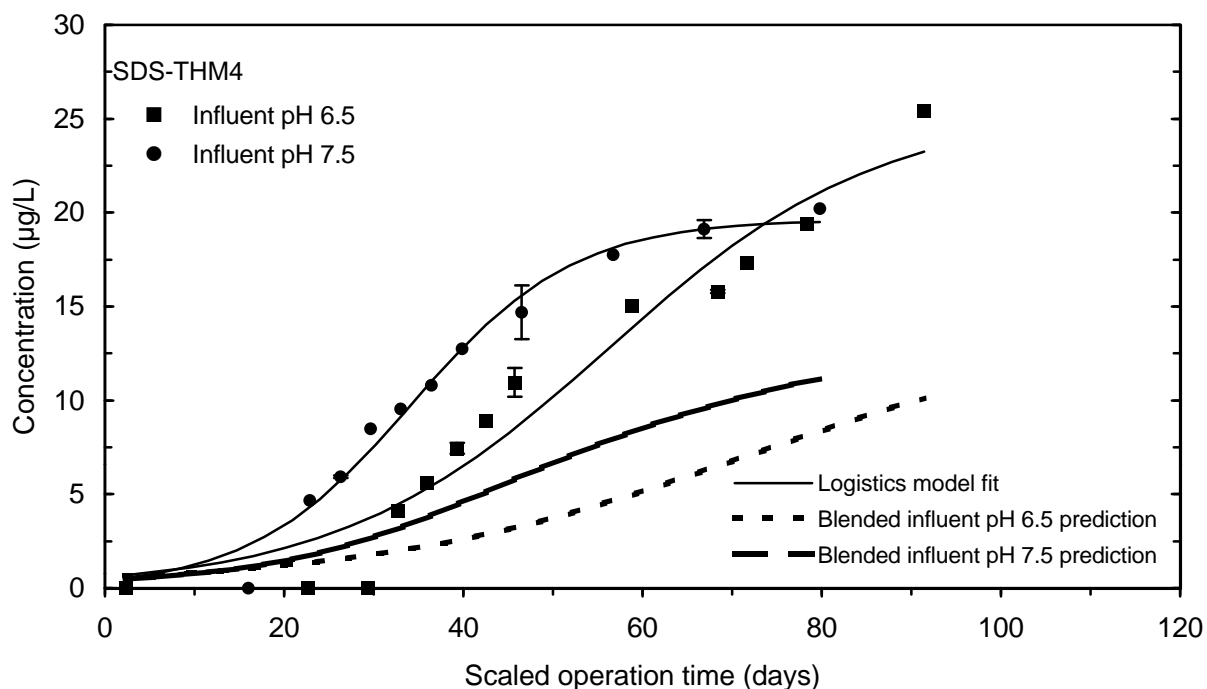
**Figure 129 SDS-CLD breakthrough and effluent blending for 10 and 20 minute EBCT contactors during session 3 (November)**



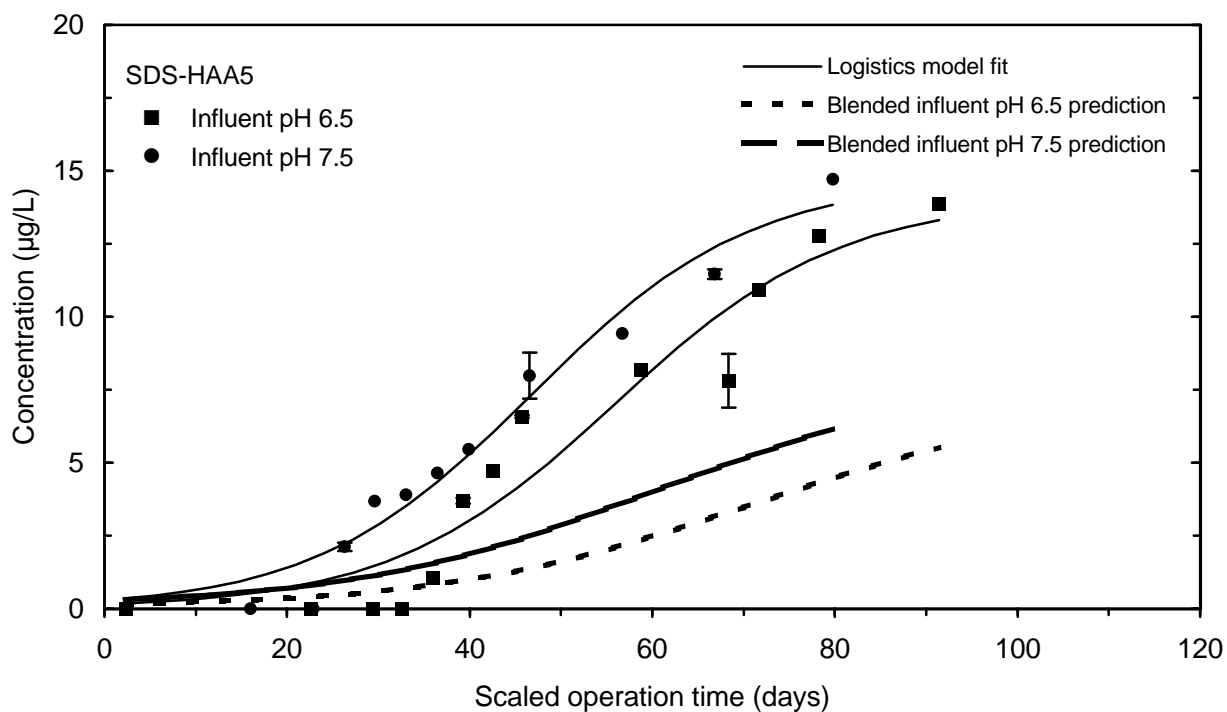
**Figure 130 TOC breakthrough and effluent blending for influent pH 6.5 and 7.5 (10 minute EBCT) contactors during session 4 (November; influent pH study)**



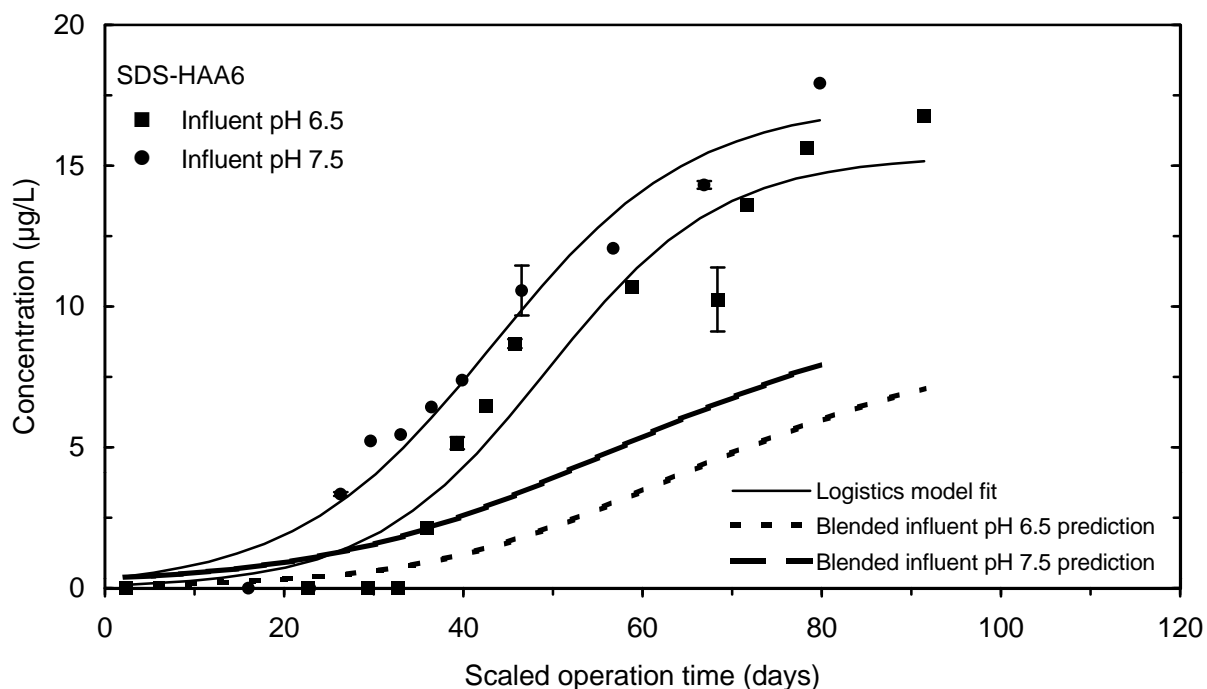
**Figure 131 UV-254 breakthrough and effluent blending for influent pH 6.5 and 7.5 (10 minute EBCT) contactors during session 4 (November; influent pH study)**



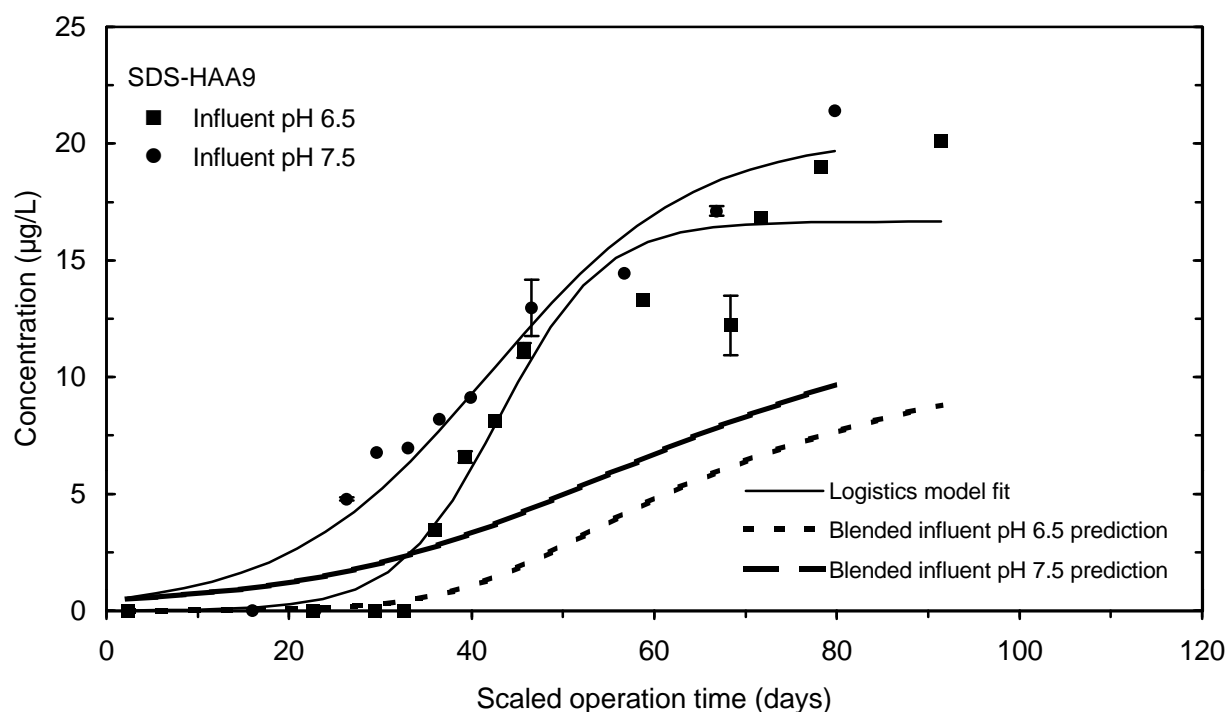
**Figure 132 SDS-THM4 breakthrough and effluent blending for influent pH 6.5 and 7.5 (10 minute EBCT) contactors during session 4 (November; influent pH study)**



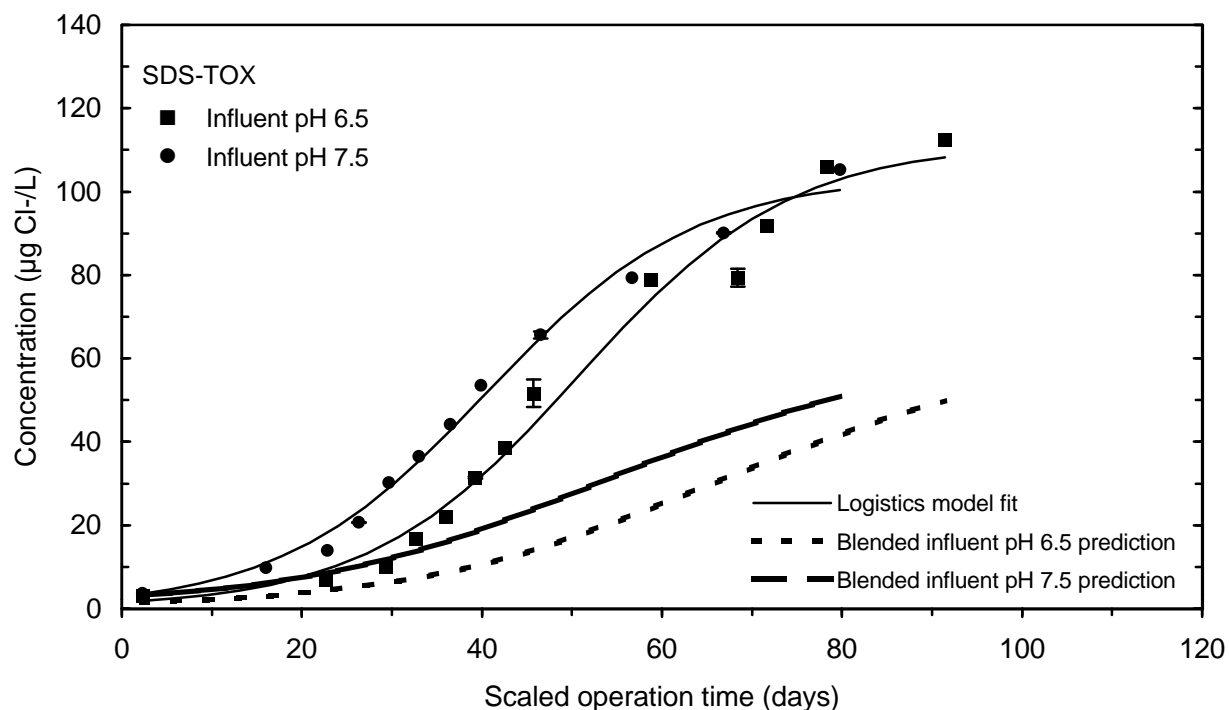
**Figure 133 SDS-HAA5 breakthrough and effluent blending for influent pH 6.5 and 7.5 (10 minute EBCT) contactors during session 4 (November; influent pH study)**



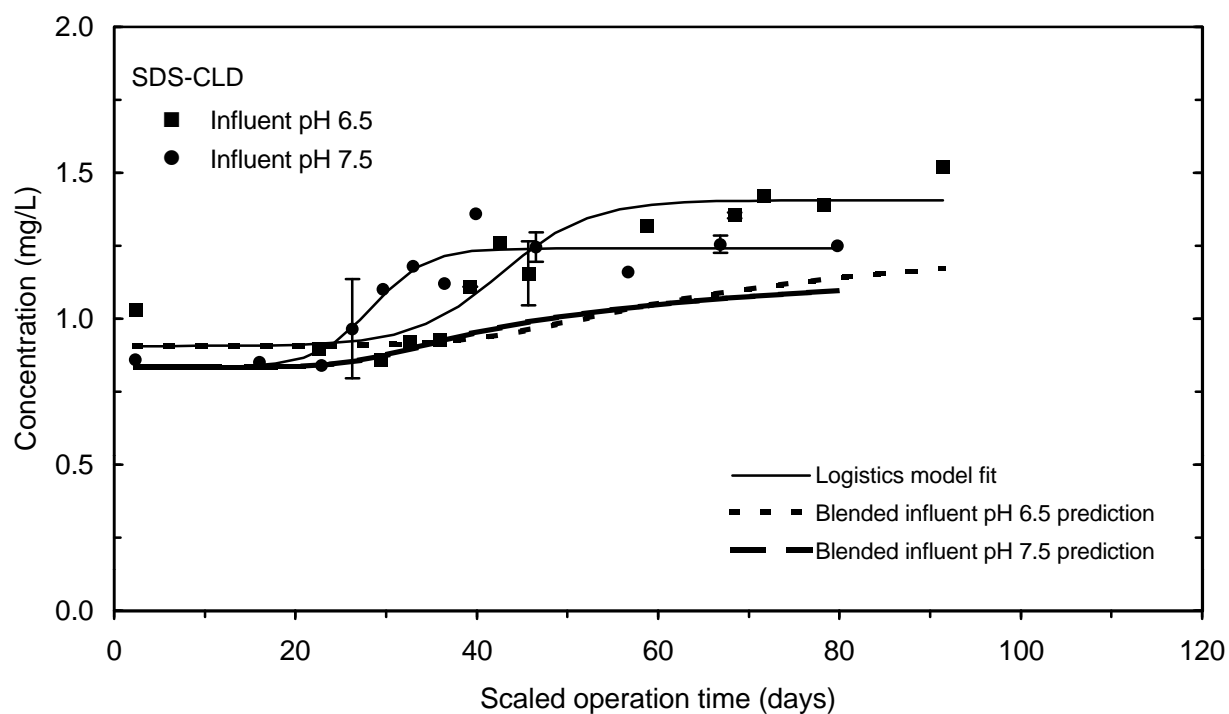
**Figure 134 SDS-HAA6 breakthrough and effluent blending for influent pH 6.5 and 7.5 (10 minute EBCT) contactors during session 4 (November; influent pH study)**



**Figure 135 SDS-HAA9 breakthrough and effluent blending for influent pH 6.5 and 7.5 (10 minute EBCT) contactors during session 4 (November; influent pH study)**

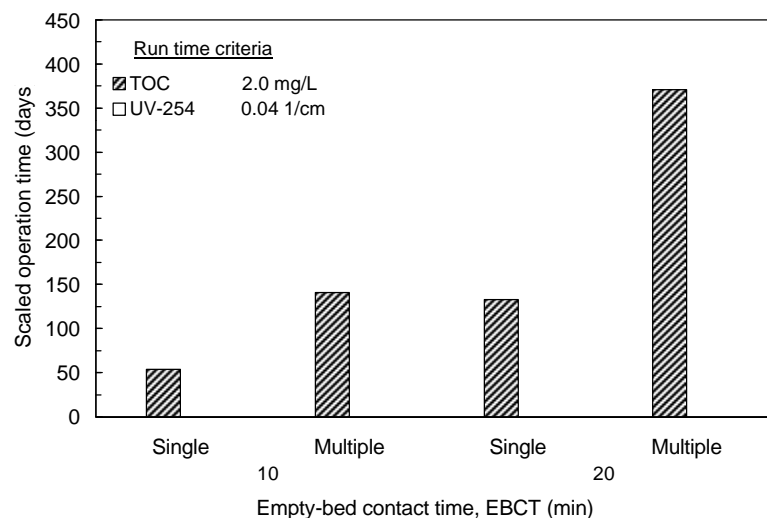


**Figure 136 SDS-TOX breakthrough and effluent blending for influent pH 6.5 and 7.5 (10 minute EBCT) contactors during session 4 (November; influent pH study)**

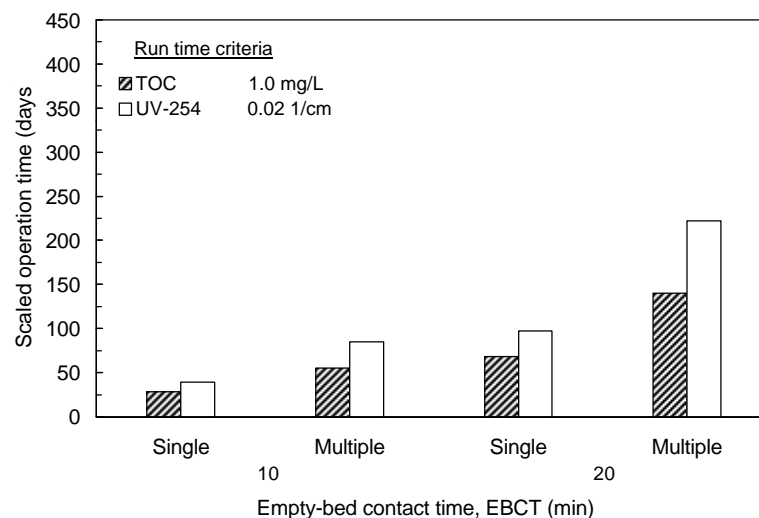


**Figure 137 SDS-CLD breakthrough and effluent blending for influent pH 6.5 and 7.5 (10 minute EBCT) contactors during session 4 (November; influent pH study)**

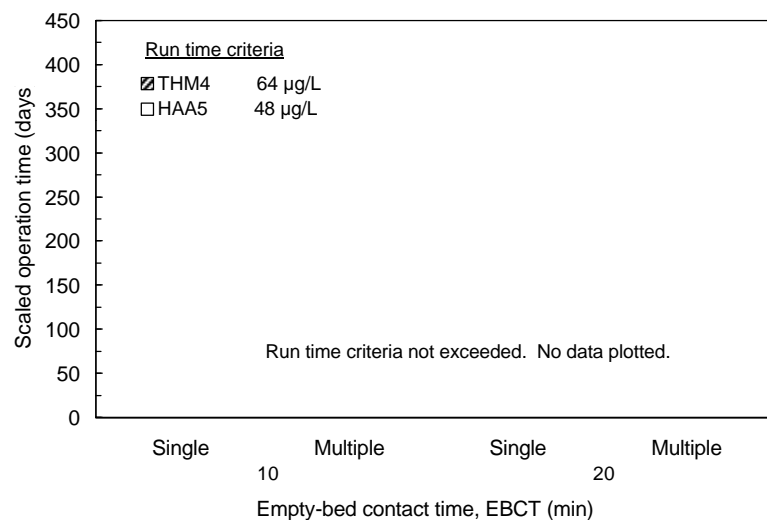




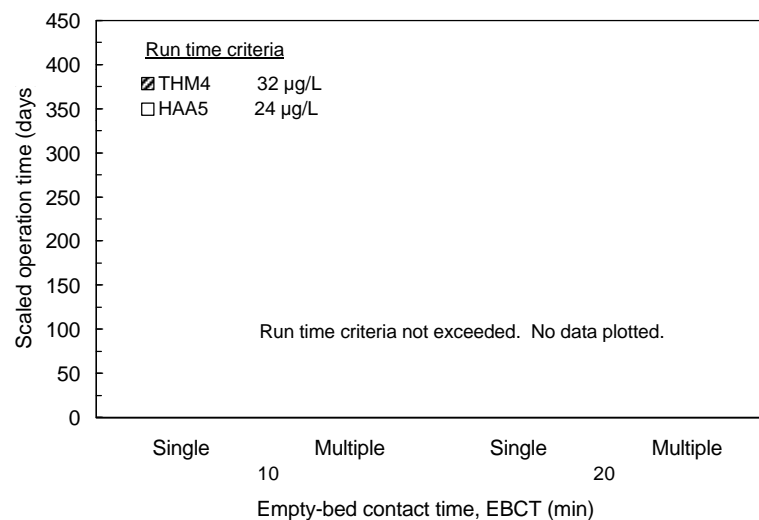
**Figure 138 GAC run times based on single contactor breakthrough and effluent blending for TOC and UV-254 effluent criteria (high) during session 1 (March)**



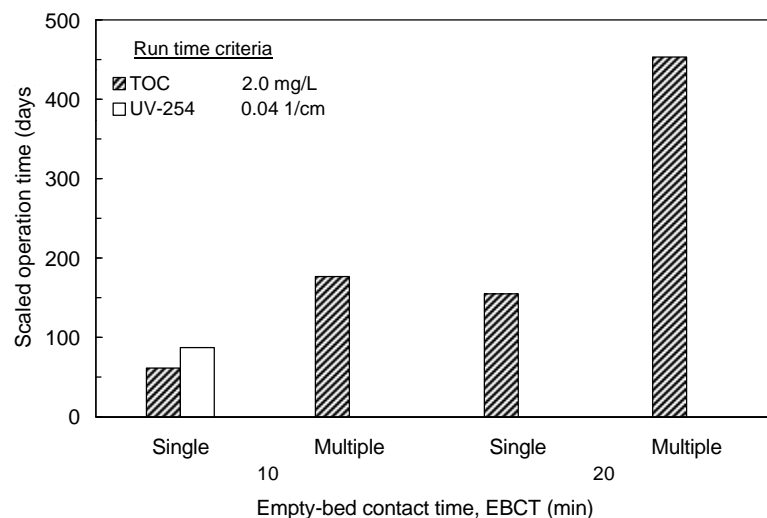
**Figure 139 GAC run times based on single contactor breakthrough and effluent blending for TOC and UV-254 effluent criteria (low) during session 1 (March)**



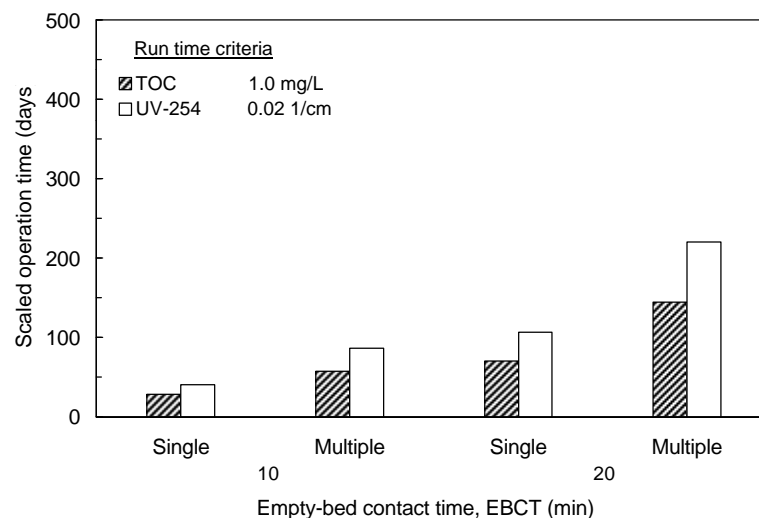
**Figure 140 GAC run times based on single contactor breakthrough and effluent blending for Stage 1 THM4 and HAA5 effluent criteria during session 1 (March)**



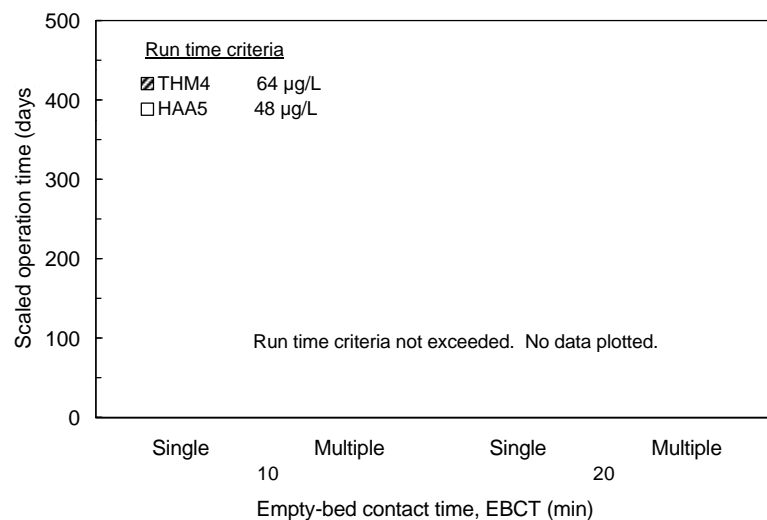
**Figure 141 GAC run times based on single contactor breakthrough and effluent blending for Stage 2 THM4 and HAA5 effluent criteria during session 1 (March)**



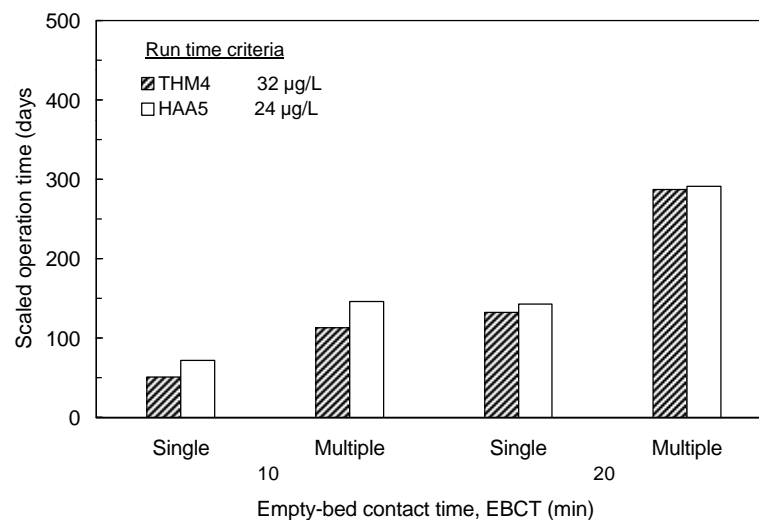
**Figure 142 GAC run times based on single contactor breakthrough and effluent blending for TOC and UV-254 effluent criteria (high) during session 2 (September)**



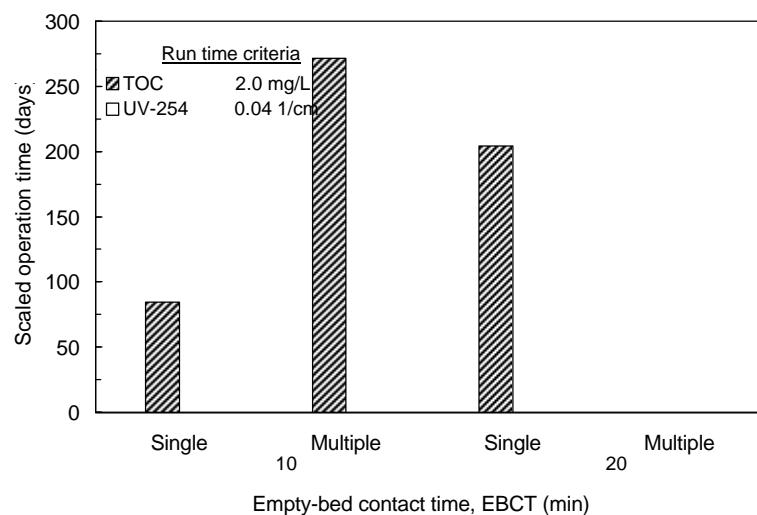
**Figure 143 GAC run times based on single contactor breakthrough and effluent blending for TOC and UV-254 effluent criteria (low) during session 2 (September)**



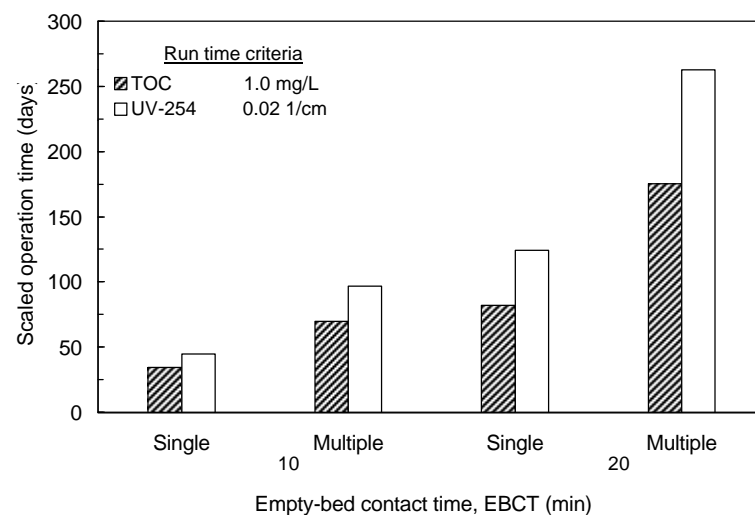
**Figure 144 GAC run times based on single contactor breakthrough and effluent blending for Stage 1 THM4 and HAA5 effluent criteria during session 2 (September)**



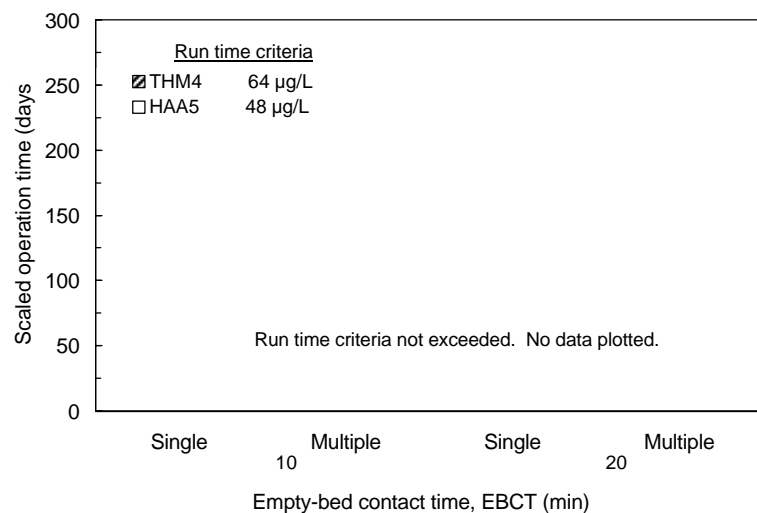
**Figure 145 GAC run times based on single contactor breakthrough and effluent blending for Stage 2 THM4 and HAA5 effluent criteria during session 2 (September)**



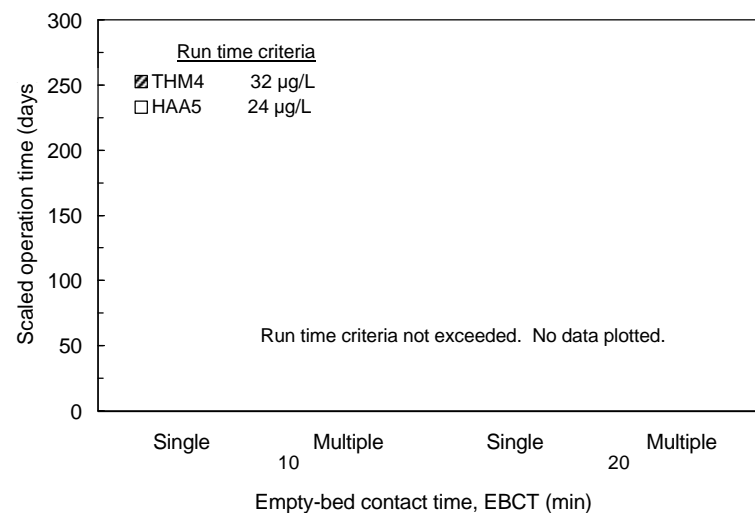
**Figure 146 GAC run times based on single contactor breakthrough and effluent blending for TOC and UV-254 effluent criteria (high) during session 3 (November)**



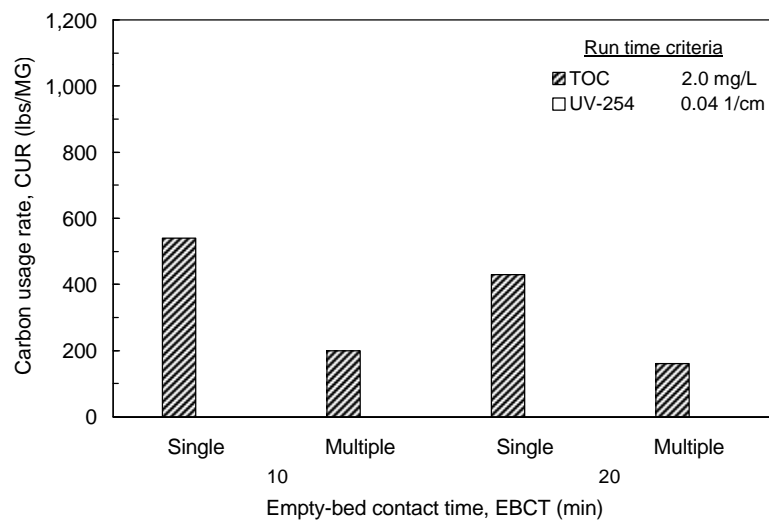
**Figure 147 GAC run times based on single contactor breakthrough and effluent blending for TOC and UV-254 effluent criteria (low) during session 3 (November)**



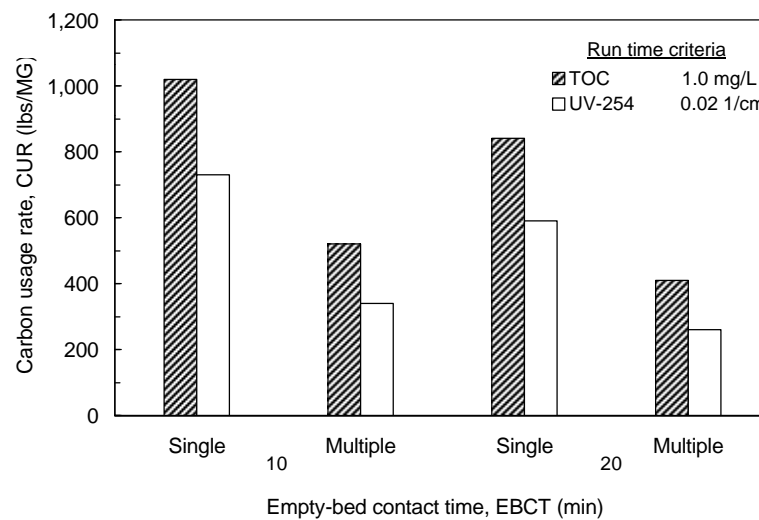
**Figure 148 GAC run times based on single contactor breakthrough and effluent blending for Stage 1 THM4 and HAA5 effluent criteria during session 3 (November)**



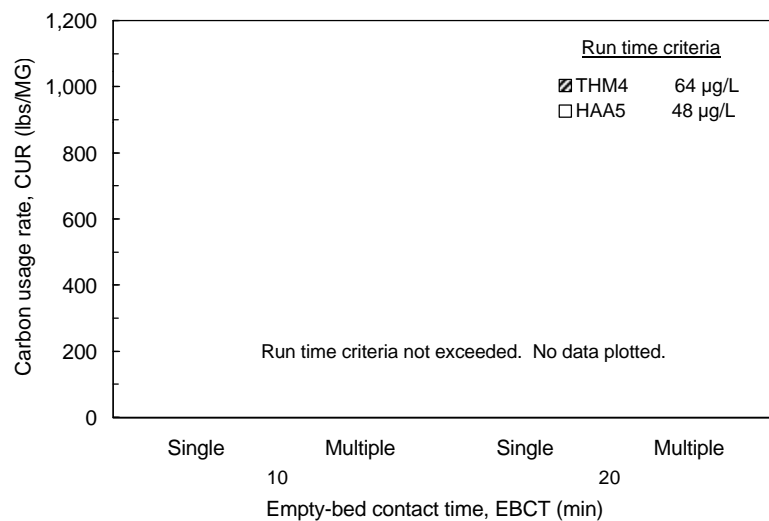
**Figure 149 GAC run times based on single contactor breakthrough and effluent blending for Stage 2 THM4 and HAA5 effluent criteria during session 3 (November)**



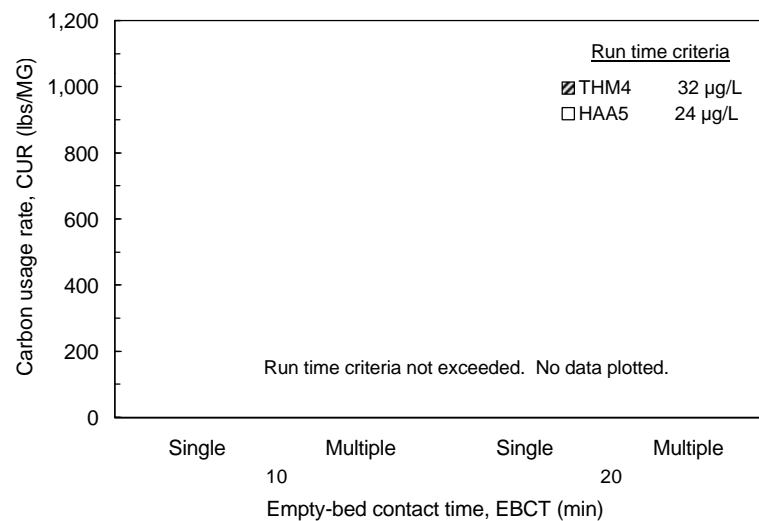
**Figure 150 Carbon usage rates based on single contactor breakthrough and effluent blending for TOC and UV-254 effluent criteria (high) during session 1 (March)**



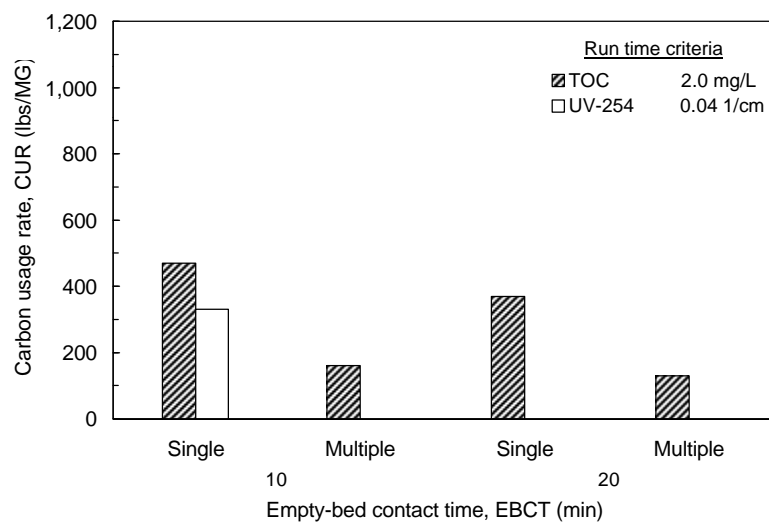
**Figure 151 Carbon usage rates based on single contactor breakthrough and effluent blending for TOC and UV-254 effluent criteria (low) during session 1 (March)**



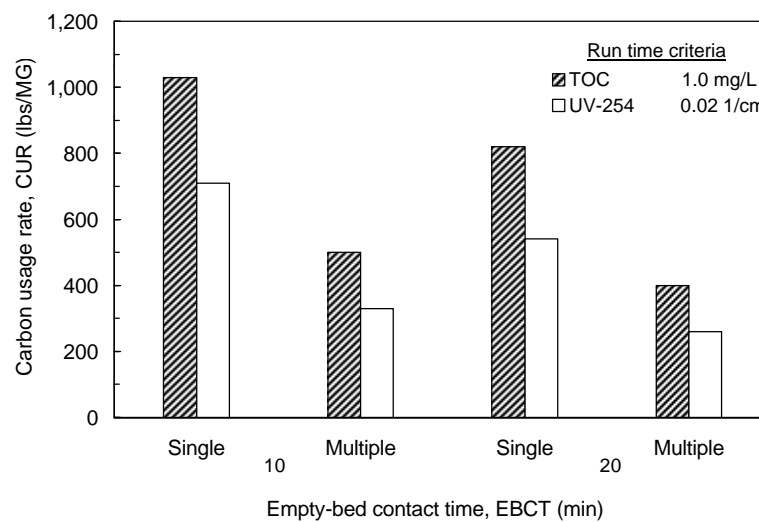
**Figure 152 Carbon usage rates based on single contactor breakthrough and effluent blending for Stage 1 THM4 and HAA5 effluent criteria during session 1 (March)**



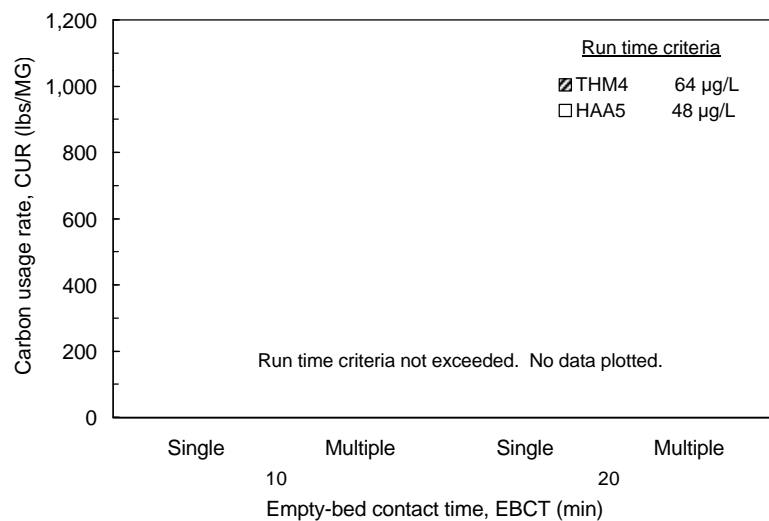
**Figure 153 Carbon usage rates based on single contactor breakthrough and effluent blending for Stage 2 THM4 and HAA5 effluent criteria during session 1 (March)**



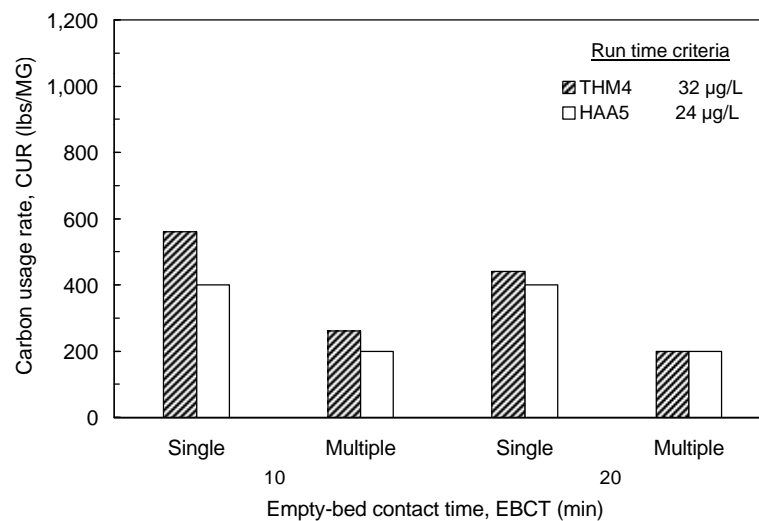
**Figure 154 Carbon usage rates based on single contactor breakthrough and effluent blending for TOC and UV-254 effluent criteria (high) during session 2 (September)**



**Figure 155 Carbon usage rates based on single contactor breakthrough and effluent blending for TOC and UV-254 effluent criteria (low) during session 2 (September)**



**Figure 156 Carbon usage rates based on single contactor breakthrough and effluent blending for Stage 1 THM4 and HAA5 effluent criteria during session 2 (September)**



**Figure 157 Carbon usage rates based on single contactor breakthrough and effluent blending for Stage 2 THM4 and HAA5 effluent criteria during session 2 (September)**

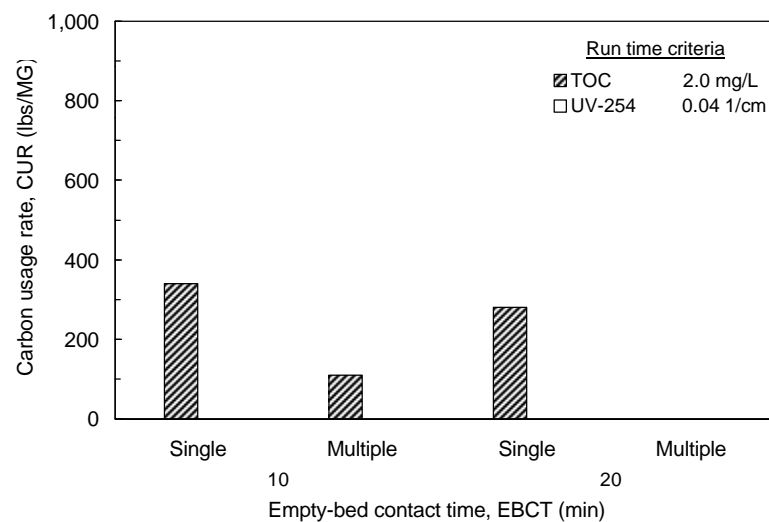


Figure 158 Carbon usage rates based on single contactor breakthrough and effluent blending for TOC and UV-254 effluent criteria (high) during session 3 (November)

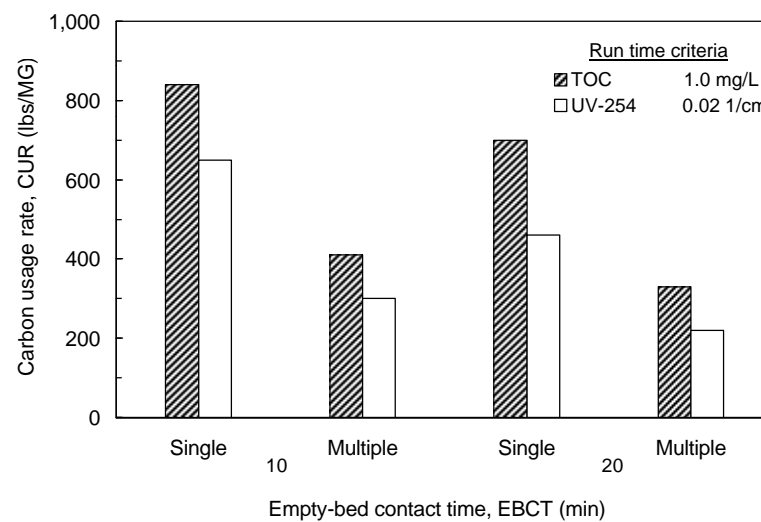


Figure 159 Carbon usage rates based on single contactor breakthrough and effluent blending for TOC and UV-254 effluent criteria (low) during session 3 (November)

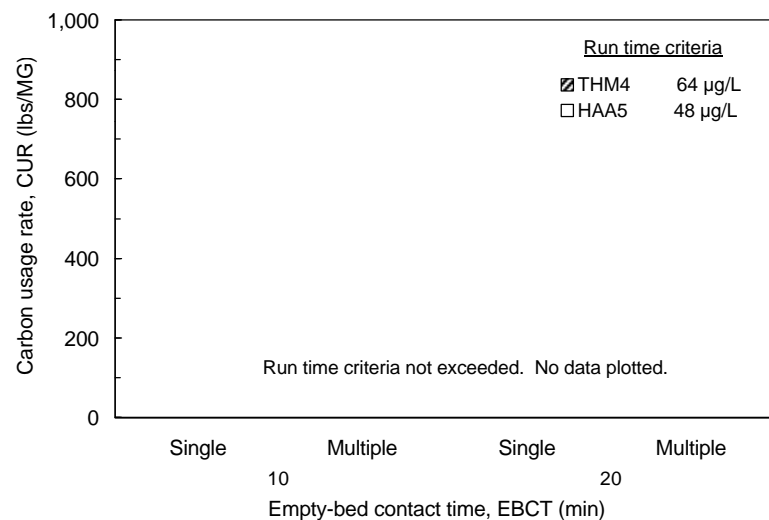


Figure 160 Carbon usage rates based on single contactor breakthrough and effluent blending for Stage 1 THM4 and HAA5 effluent criteria during session 3 (November)

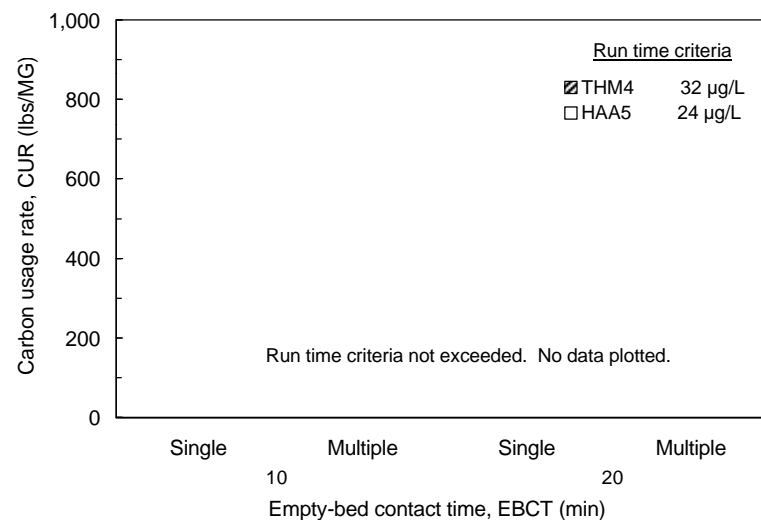
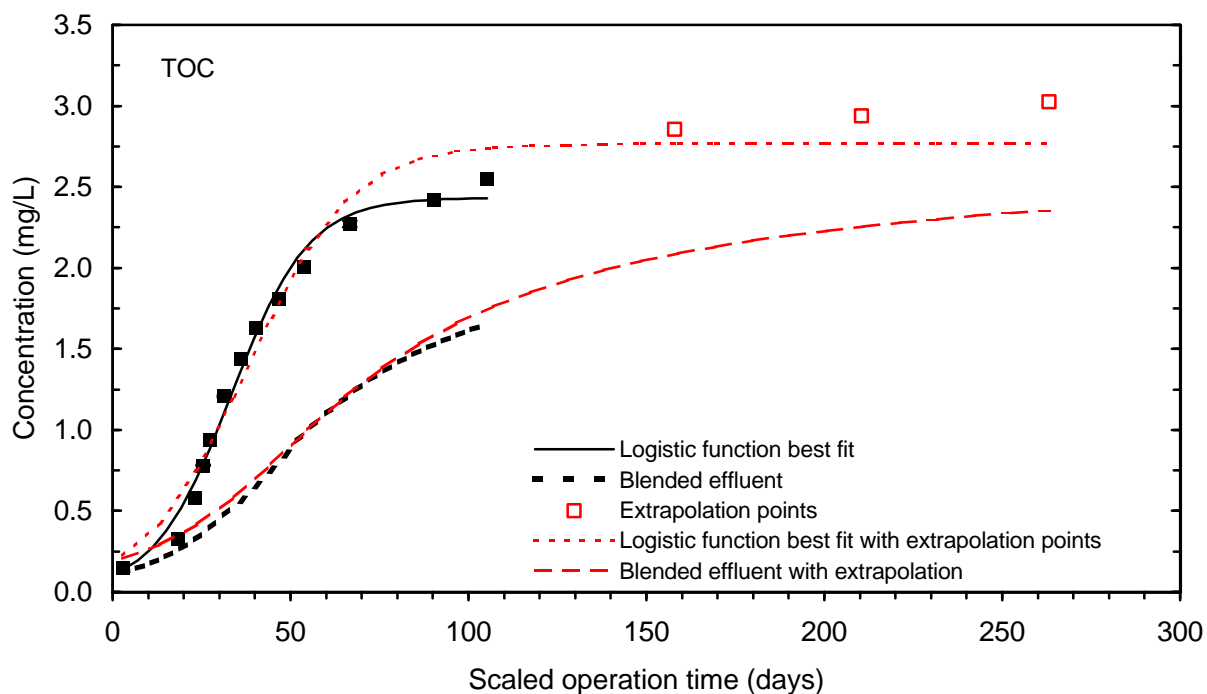
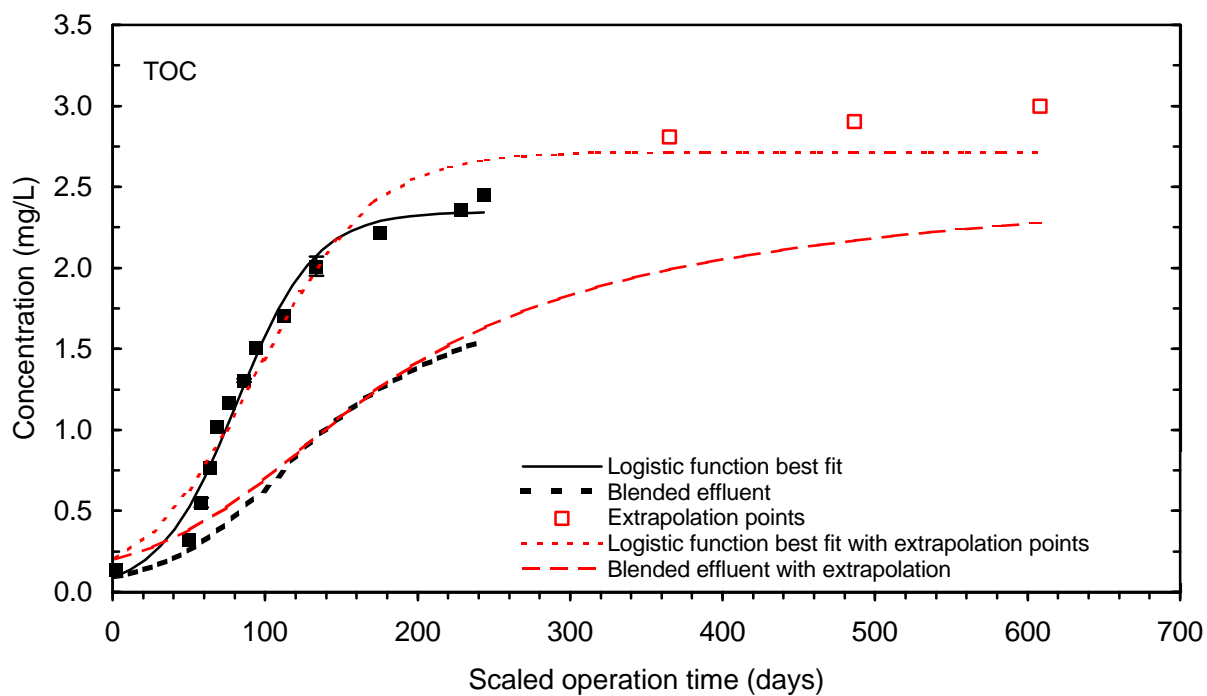


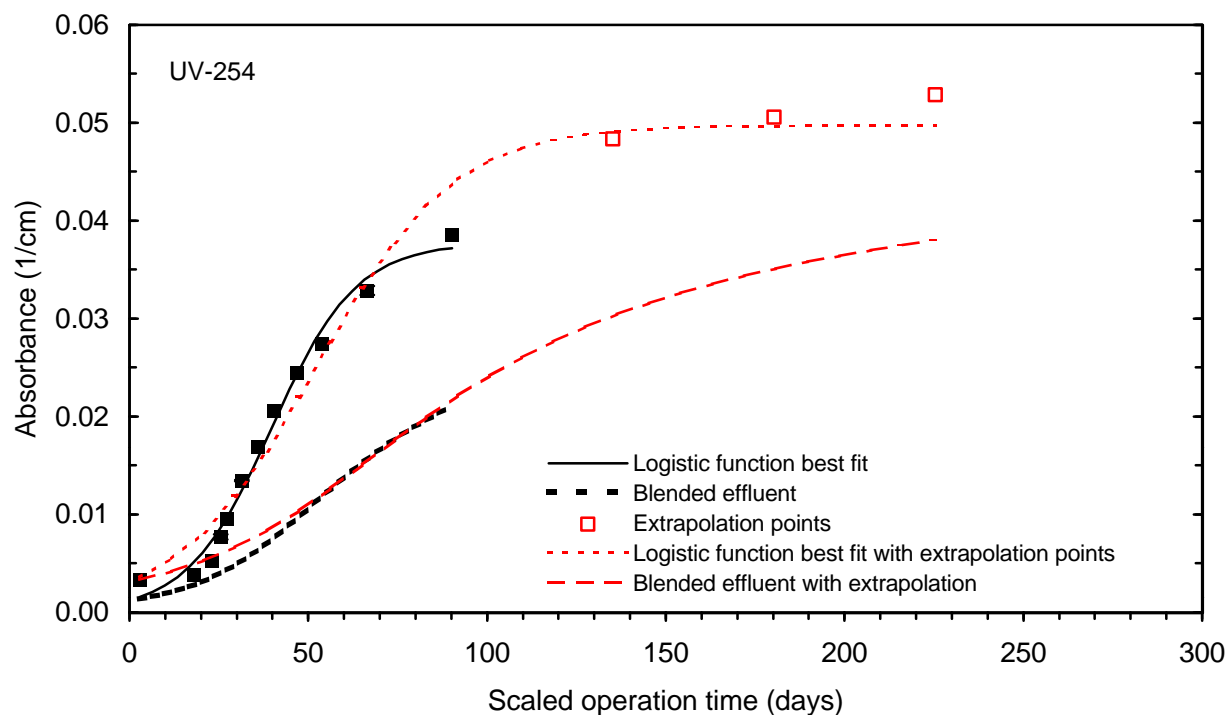
Figure 161 Carbon usage rates based on single contactor breakthrough and effluent blending for Stage 2 THM4 and HAA5 effluent criteria during session 3 (November)



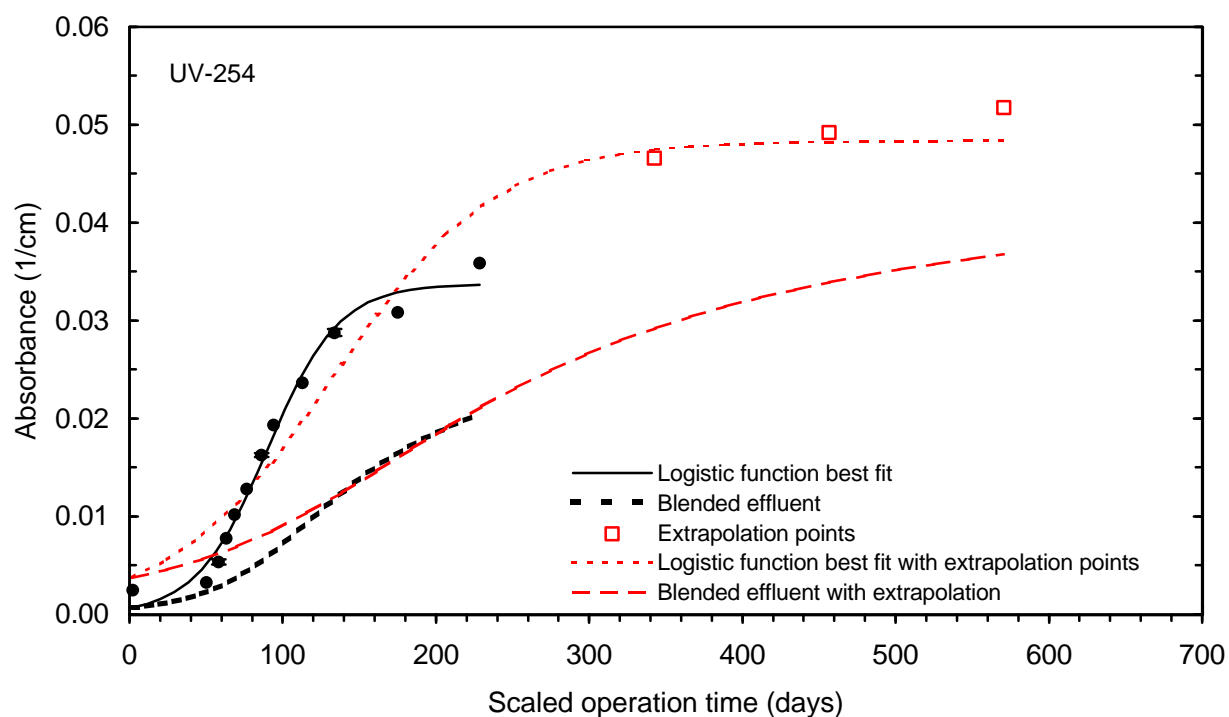
**Figure 162 Single contactor and blended effluent extrapolated TOC breakthrough curve (10 minute EBCT) during session 1, March**



**Figure 163 Single contactor and blended effluent extrapolated TOC breakthrough curve (20 minute EBCT) during session 1, March**

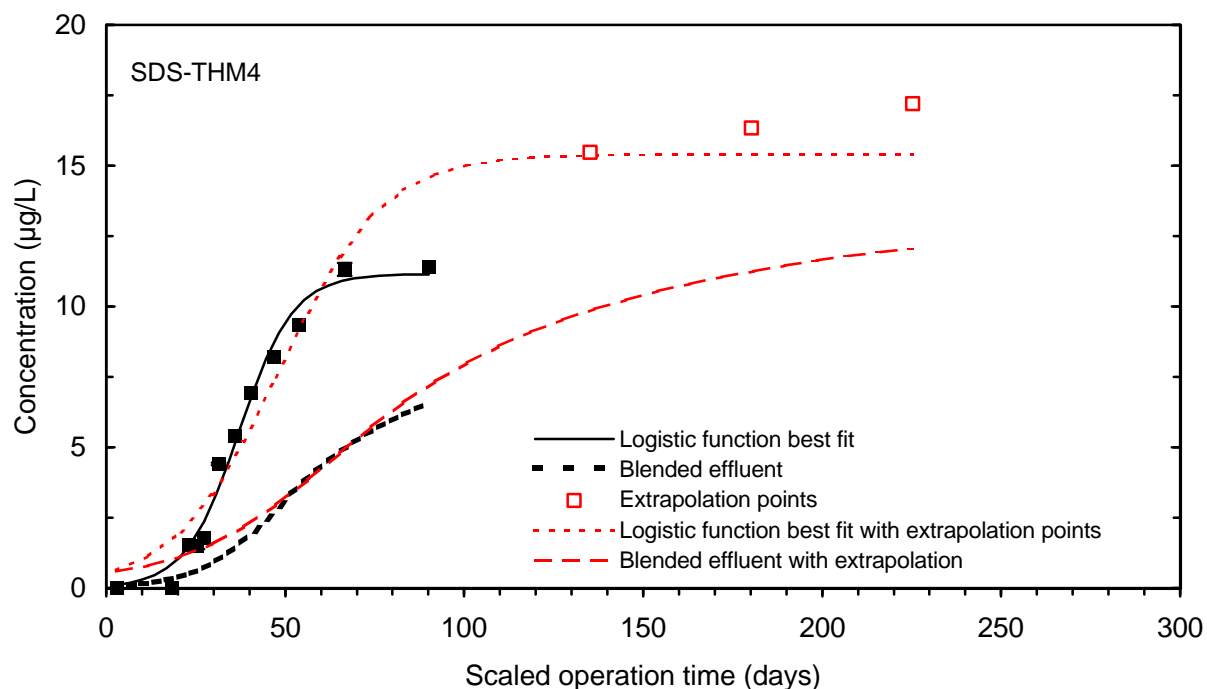


**Figure 164 Single contactor and blended effluent extrapolated UV-254 breakthrough curve (10 minute EBCT) during session 1, March**

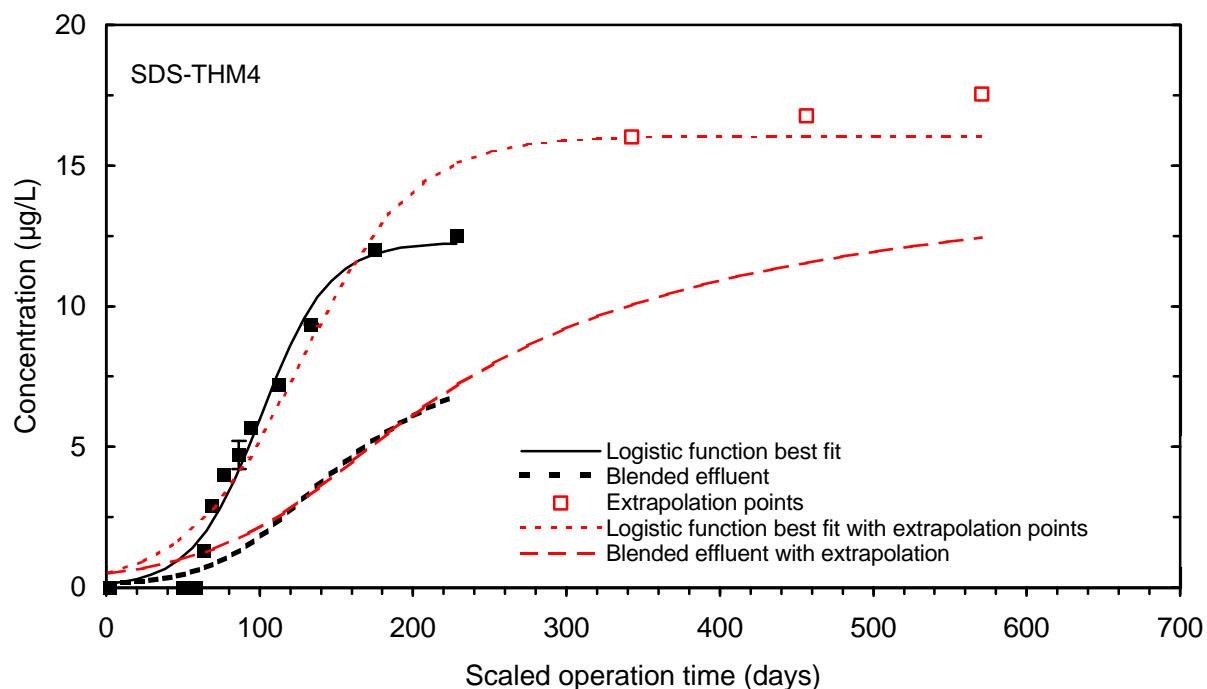


**Figure 165 Single contactor and blended effluent extrapolated UV-254 breakthrough curve (20 minute EBCT) during session 1, March**

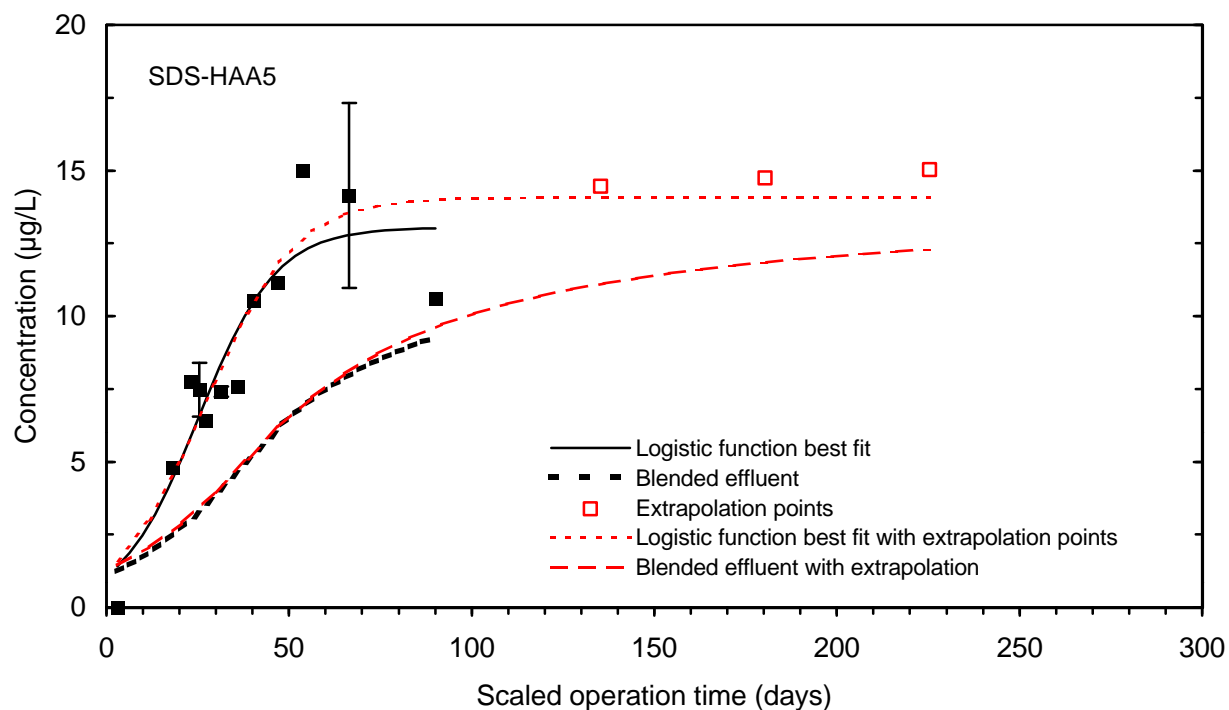




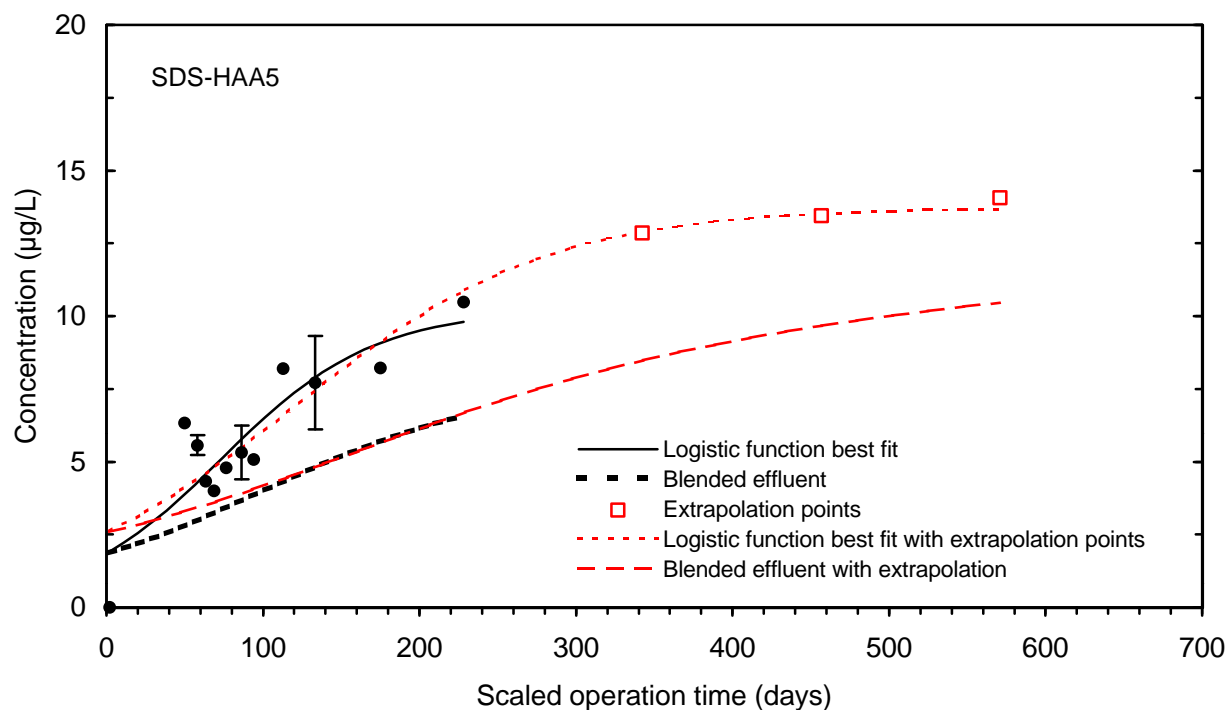
**Figure 166 Single contactor and blended effluent extrapolated SDS-THM4 breakthrough curve (10 minute EBCT) during session 1, March**



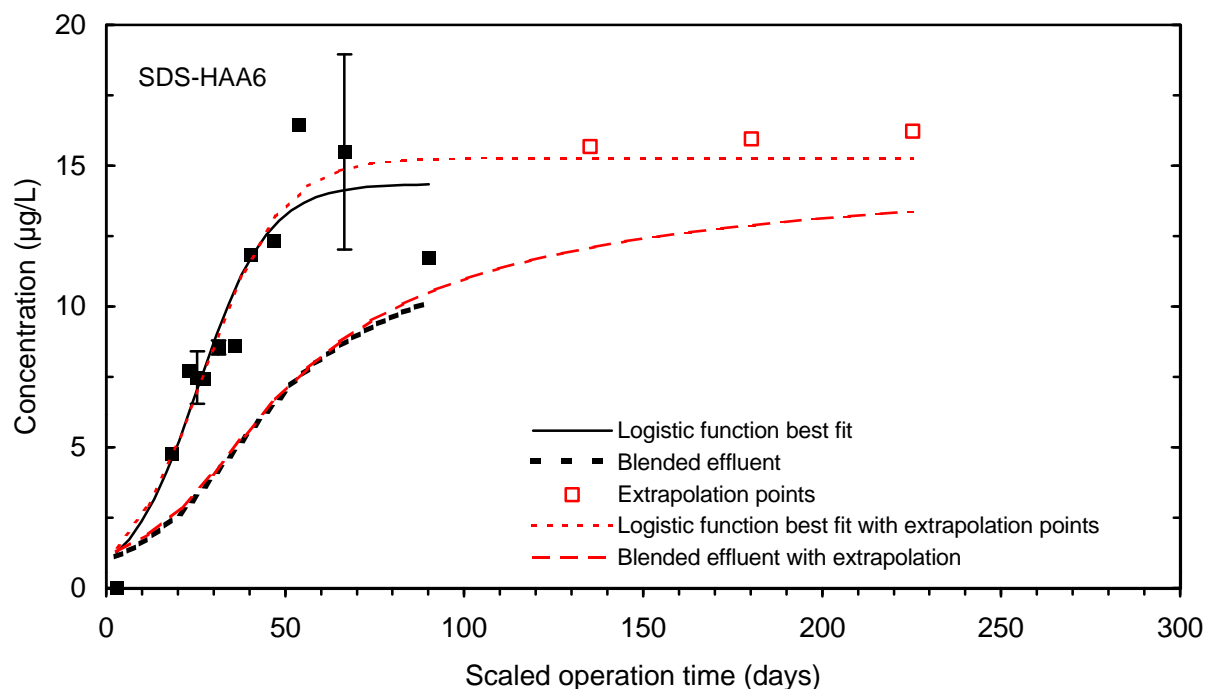
**Figure 167 Single contactor and blended effluent extrapolated SDS-THM4 breakthrough curve (20 minute EBCT) during session 1, March**



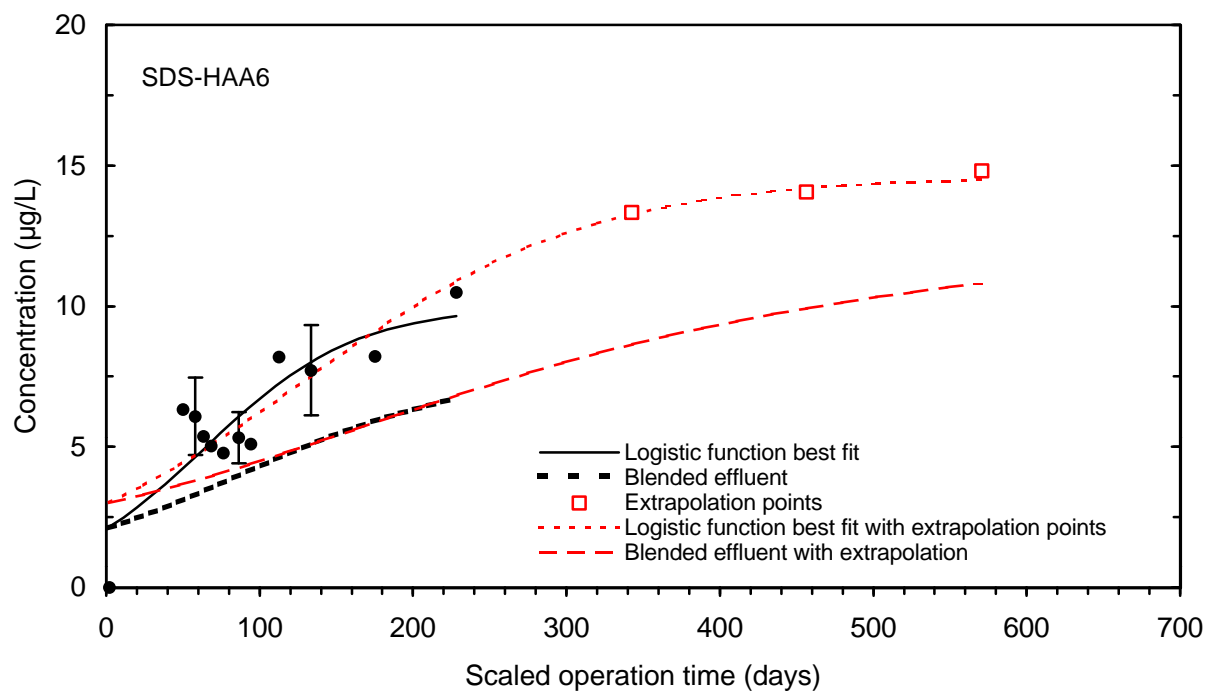
**Figure 168 Single contactor and blended effluent extrapolated SDS-HAA5 breakthrough curve (10 minute EBCT) during session 1, March**



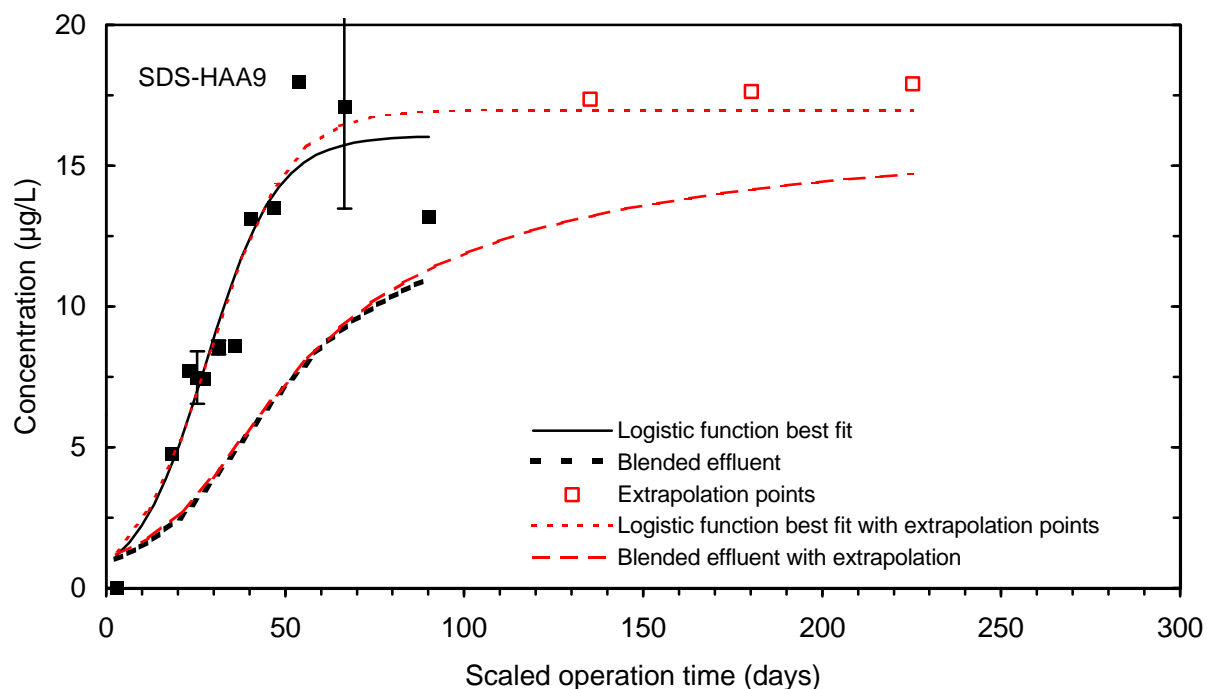
**Figure 169 Single contactor and blended effluent extrapolated SDS-HAA5 breakthrough curve (20 minute EBCT) during session 1, March**



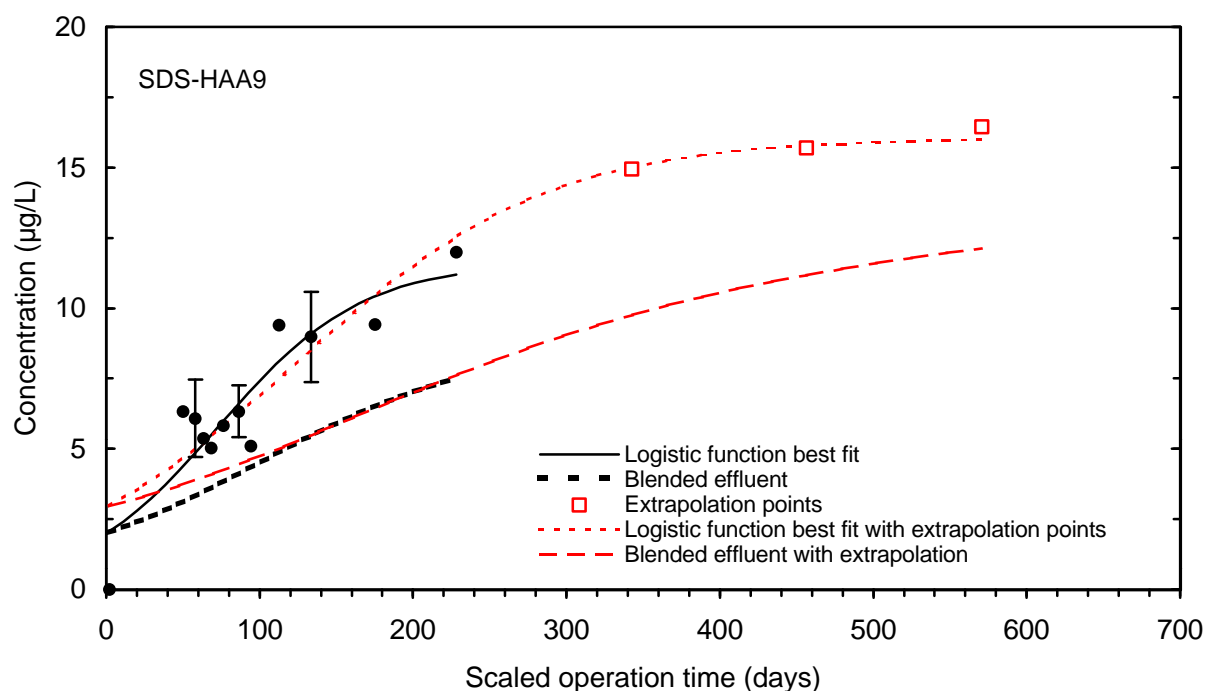
**Figure 170 Single contactor and blended effluent extrapolated SDS-HAA6 breakthrough curve (10 minute EBCT) during session 1, March**



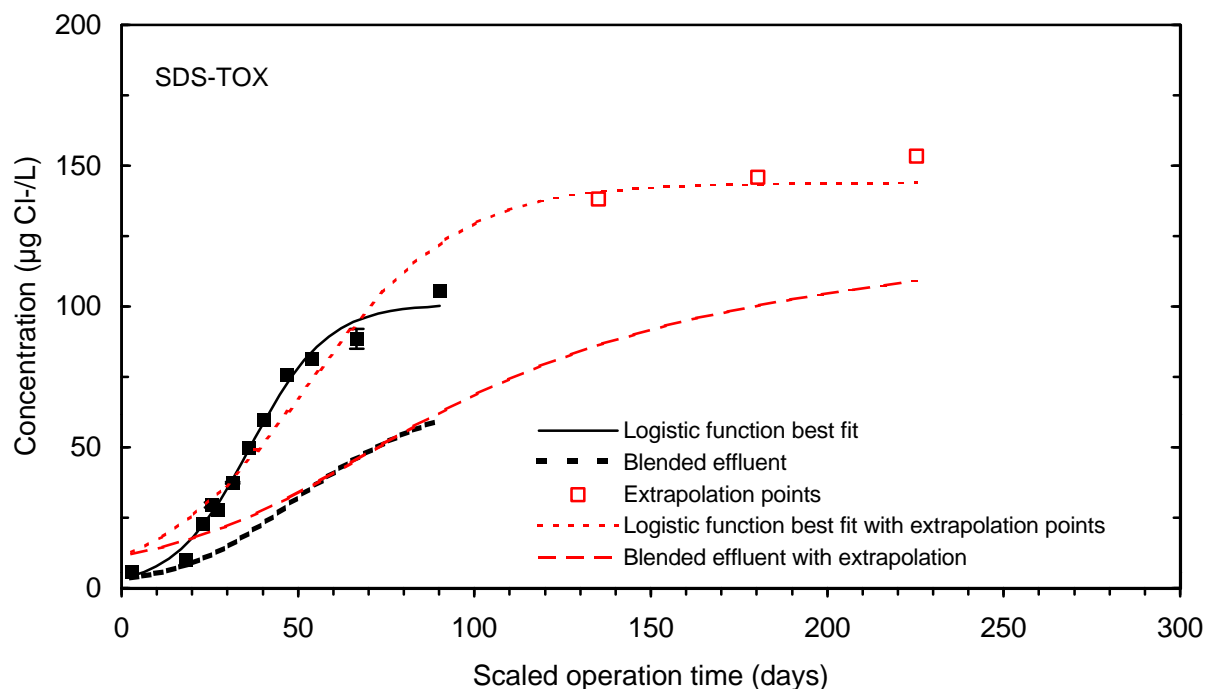
**Figure 171 Single contactor and blended effluent extrapolated SDS-HAA6 breakthrough curve (20 minute EBCT) during session 1, March**



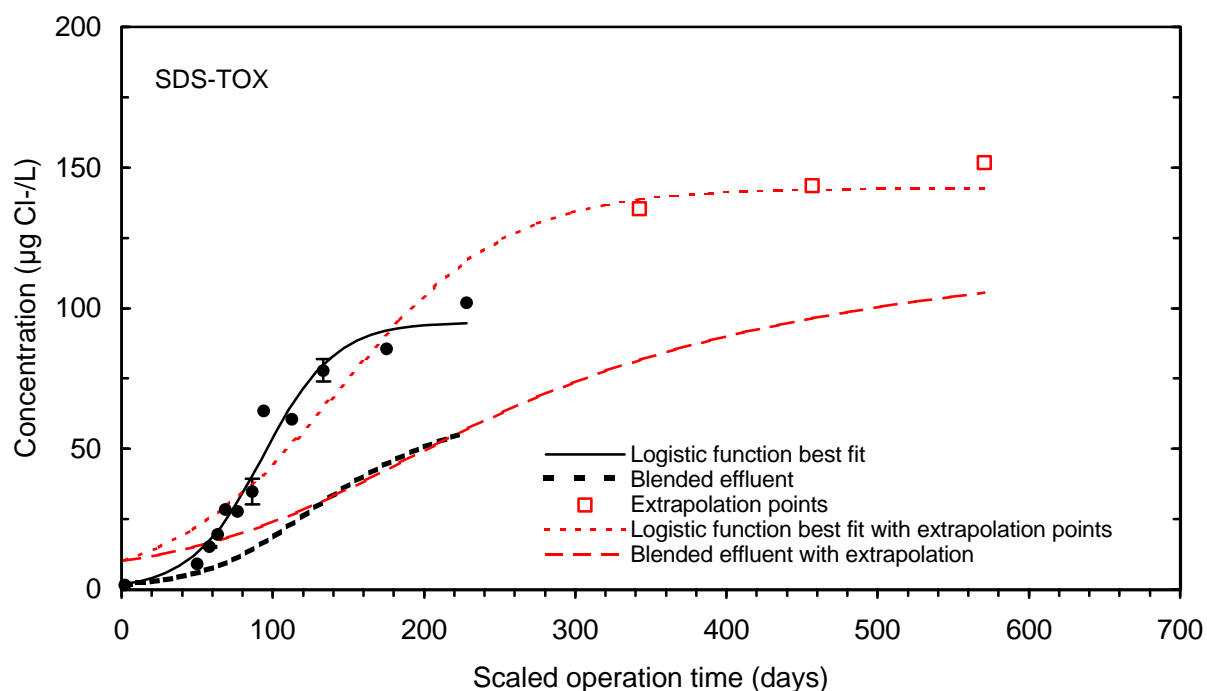
**Figure 172 Single contactor and blended effluent extrapolated SDS-HAA9 breakthrough curve (10 minute EBCT) during session 1, March**



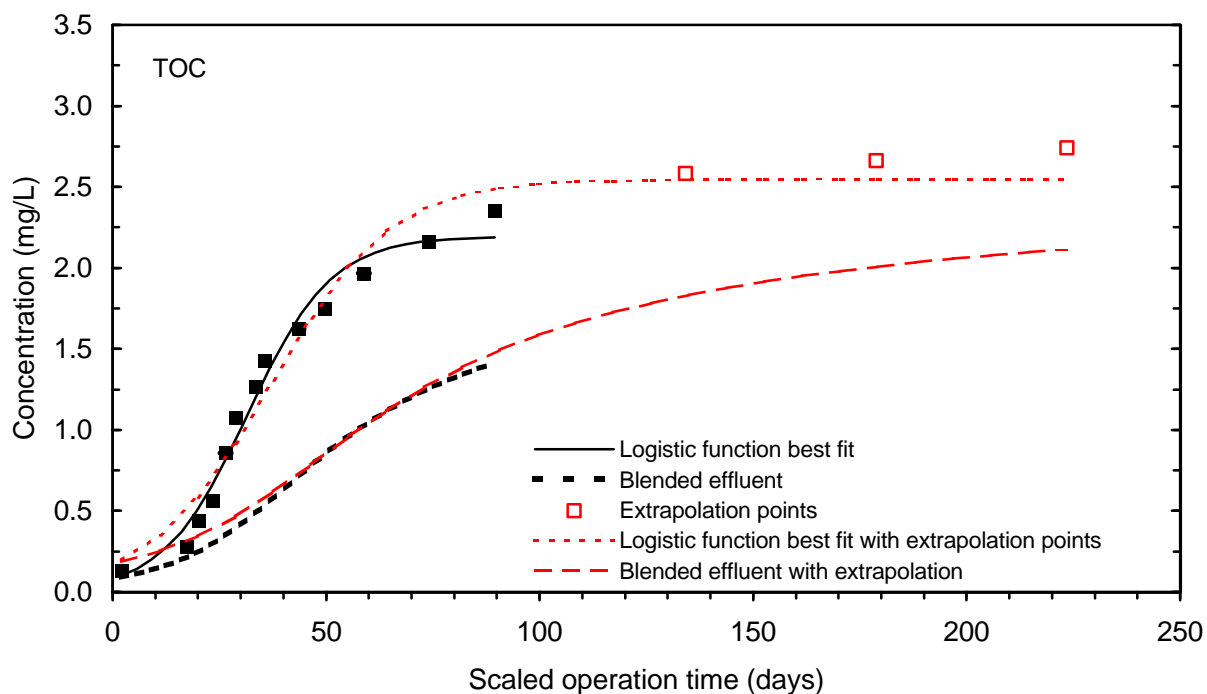
**Figure 173 Single contactor and blended effluent extrapolated SDS-HAA9 breakthrough curve (20 minute EBCT) during session 1, March**



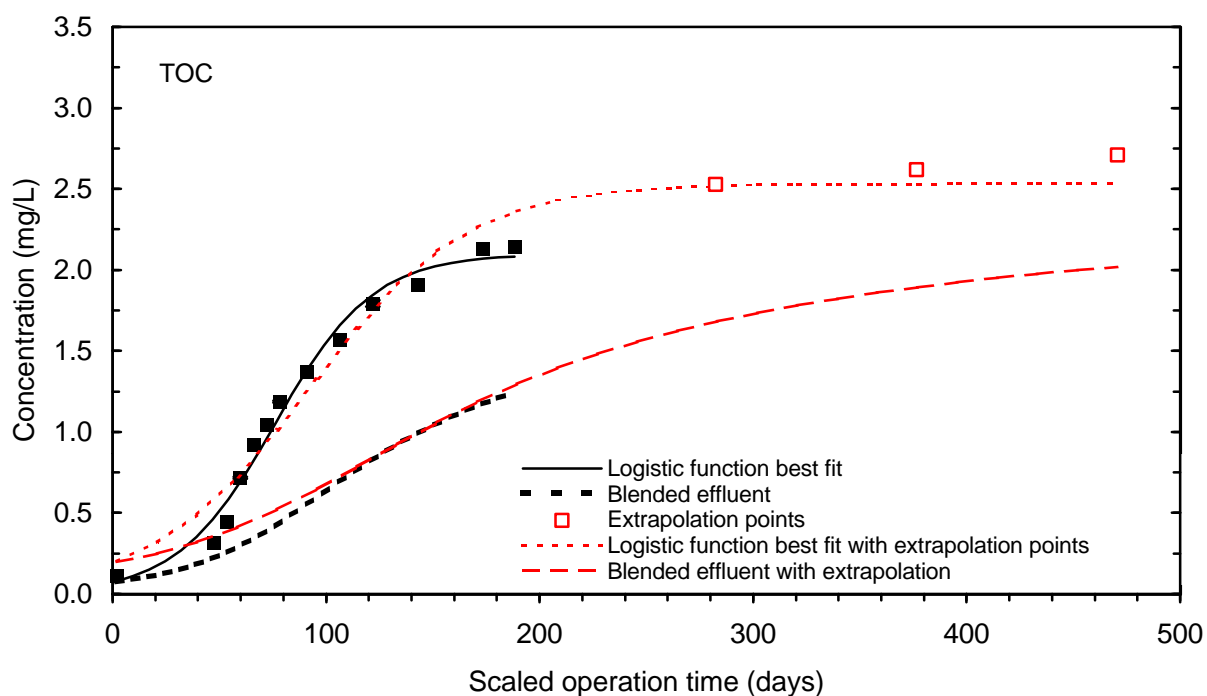
**Figure 174 Single contactor and blended effluent extrapolated SDS-TOX breakthrough curve (10 minute EBCT) during session 1, March**



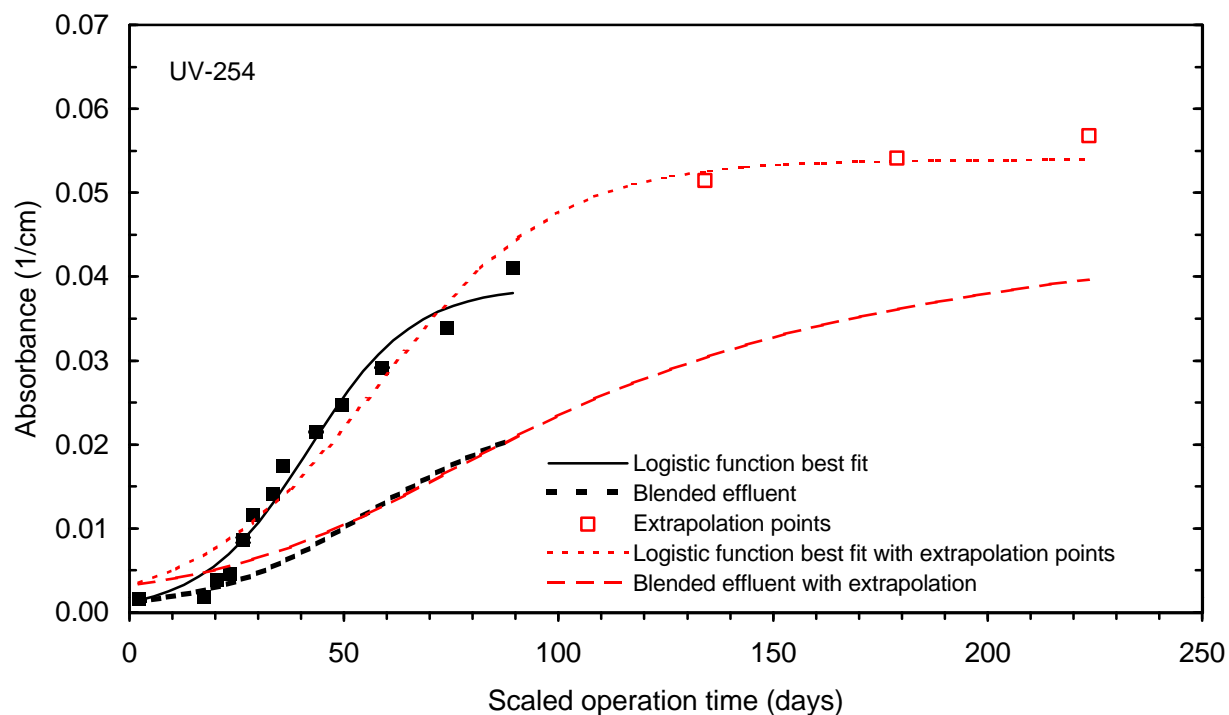
**Figure 175 Single contactor and blended effluent extrapolated SDS-TOX breakthrough curve (20 minute EBCT) during session 1, March**



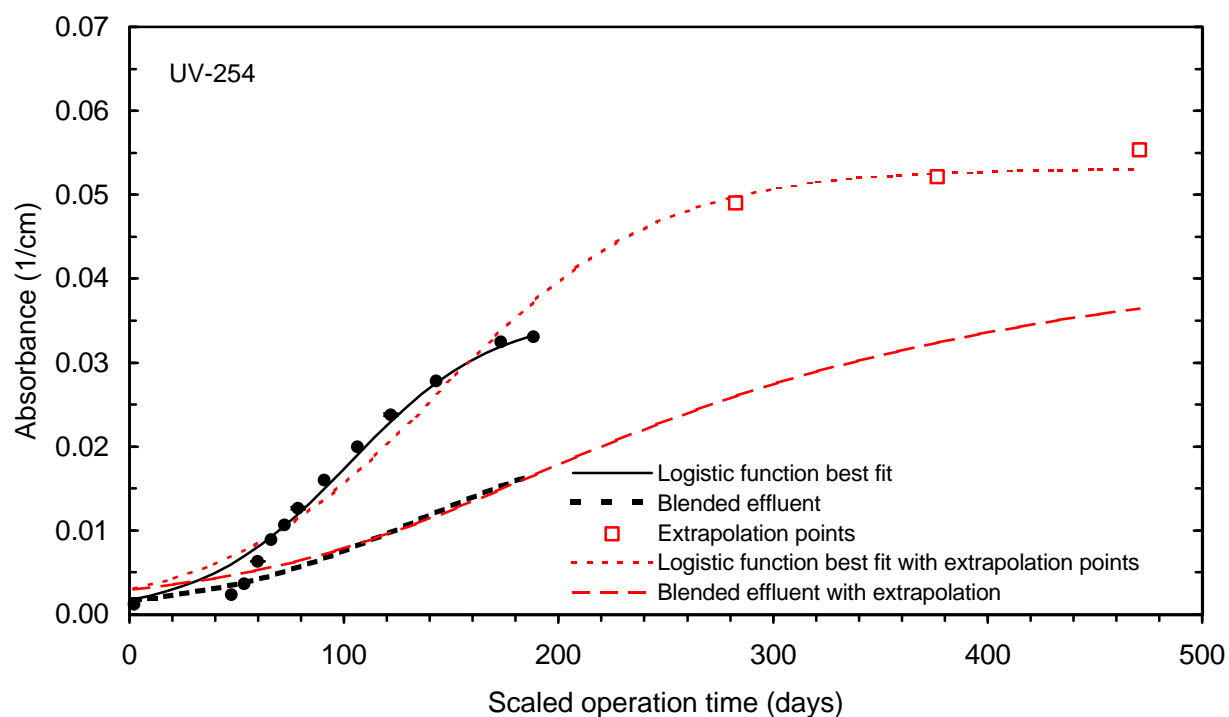
**Figure 176 Single contactor and blended effluent extrapolated TOC breakthrough curve (10 minute EBCT) during session 2, September**



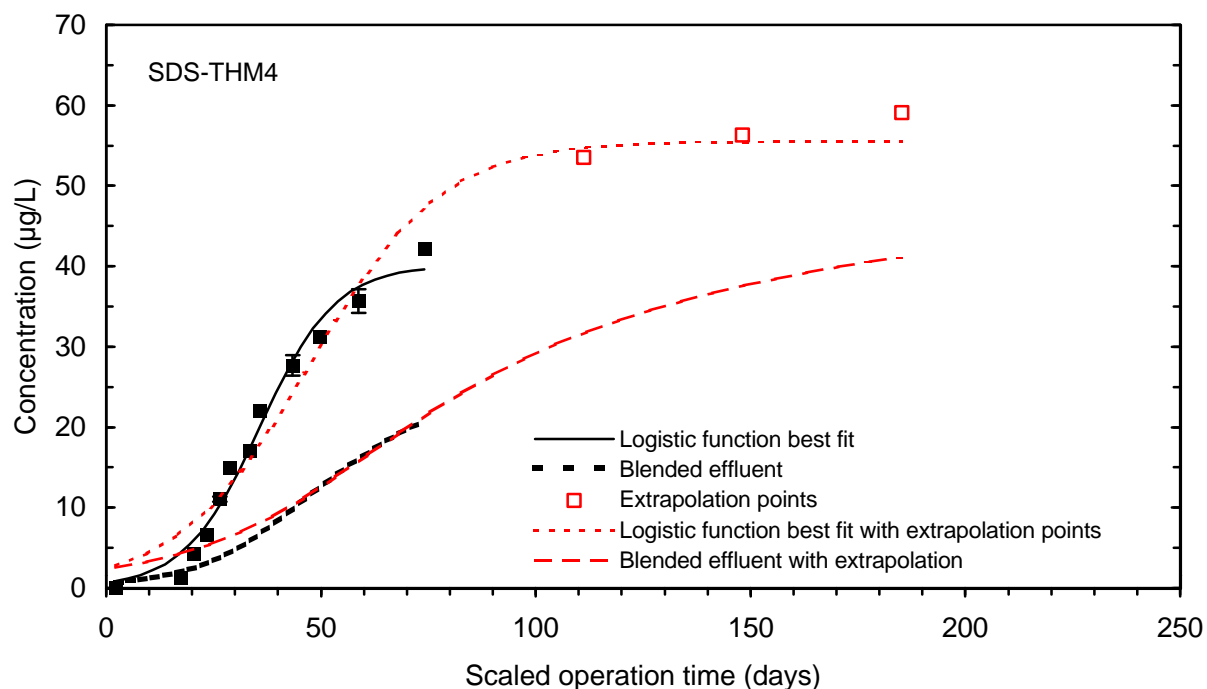
**Figure 177 Single contactor and blended effluent extrapolated TOC breakthrough curve (20 minute EBCT) during session 2, September**



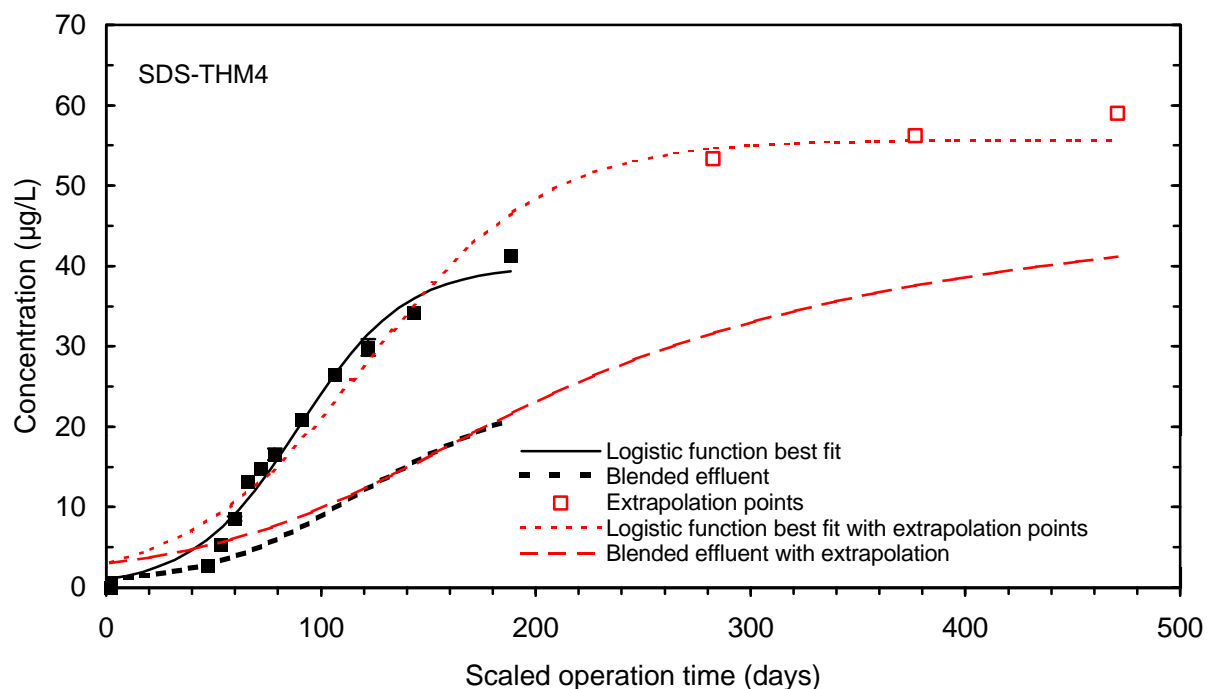
**Figure 178 Single contactor and blended effluent extrapolated UV-254 breakthrough curve (10 minute EBCT) during session 2, September**



**Figure 179 Single contactor and blended effluent extrapolated UV-254 breakthrough curve (20 minute EBCT) during session 2, September**

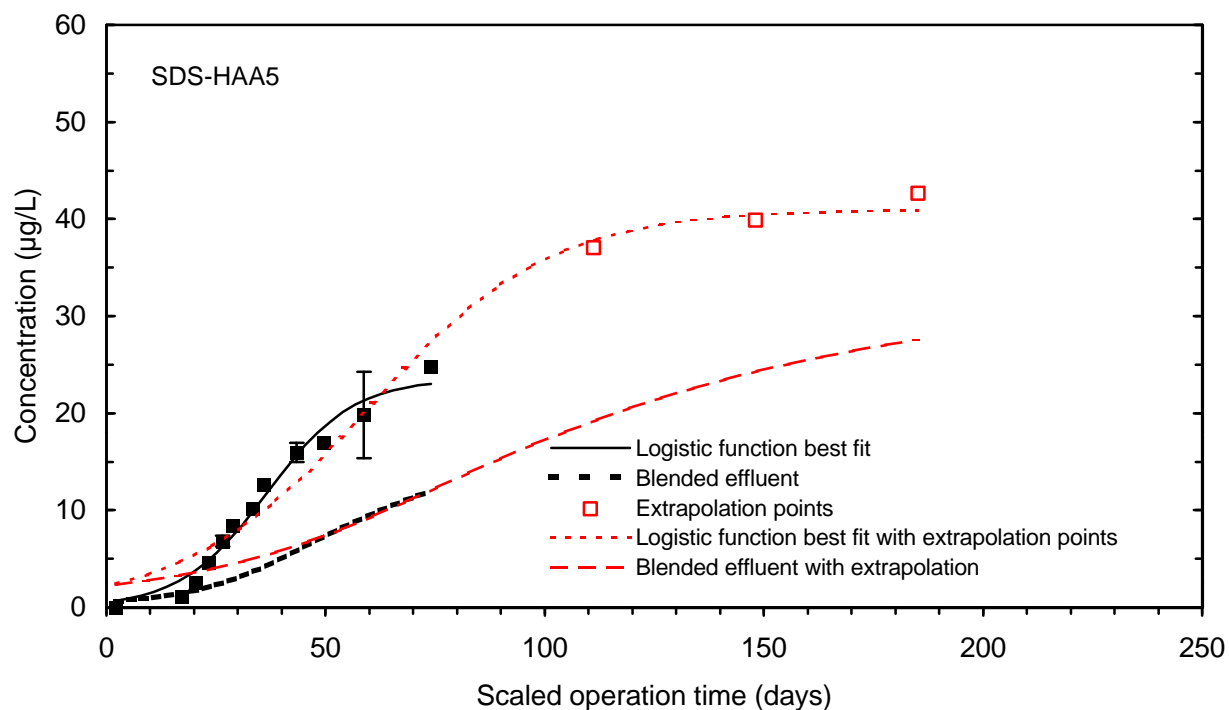


**Figure 180 Single contactor and blended effluent extrapolated SDS-THM4 breakthrough curve (10 minute EBCT) during session 2, September**

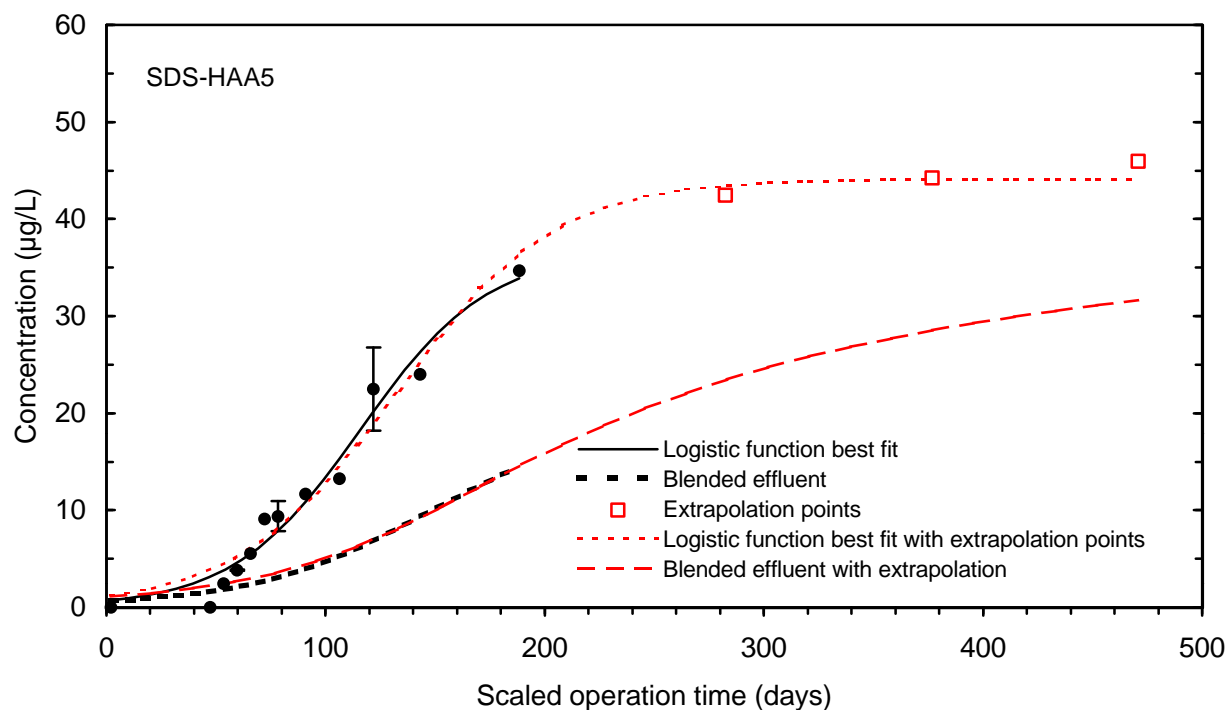


**Figure 181 Single contactor and blended effluent extrapolated SDS-THM4 breakthrough curve (20 minute EBCT) during session 2, September**

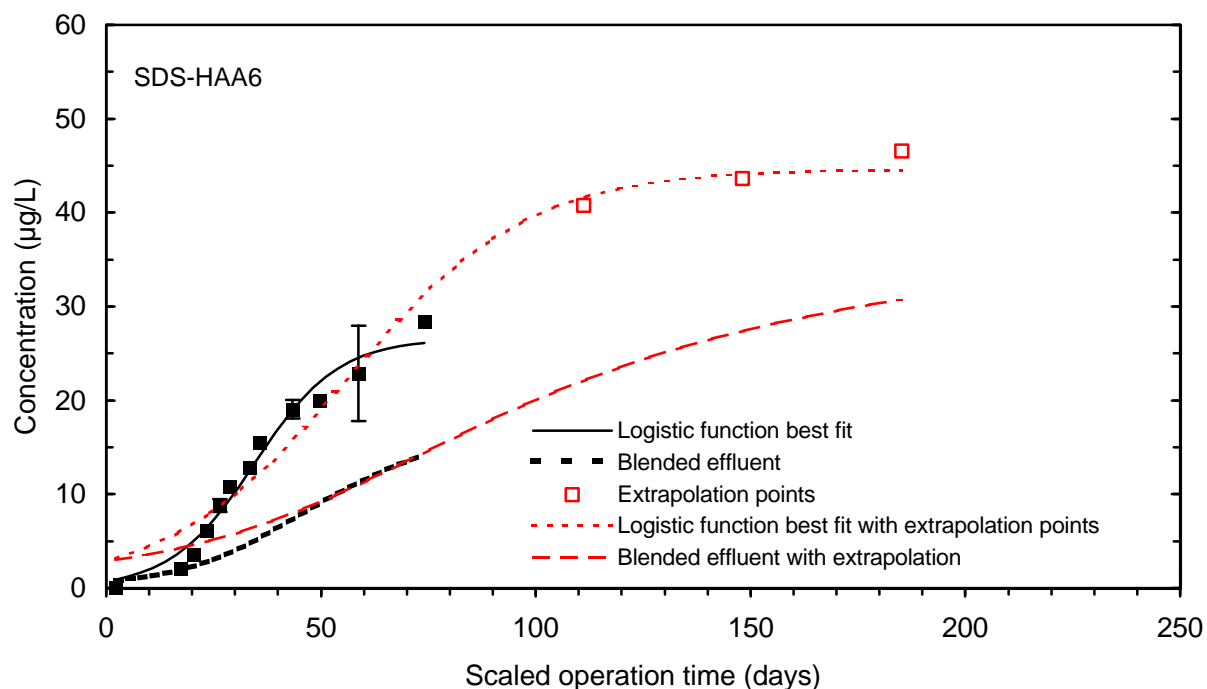




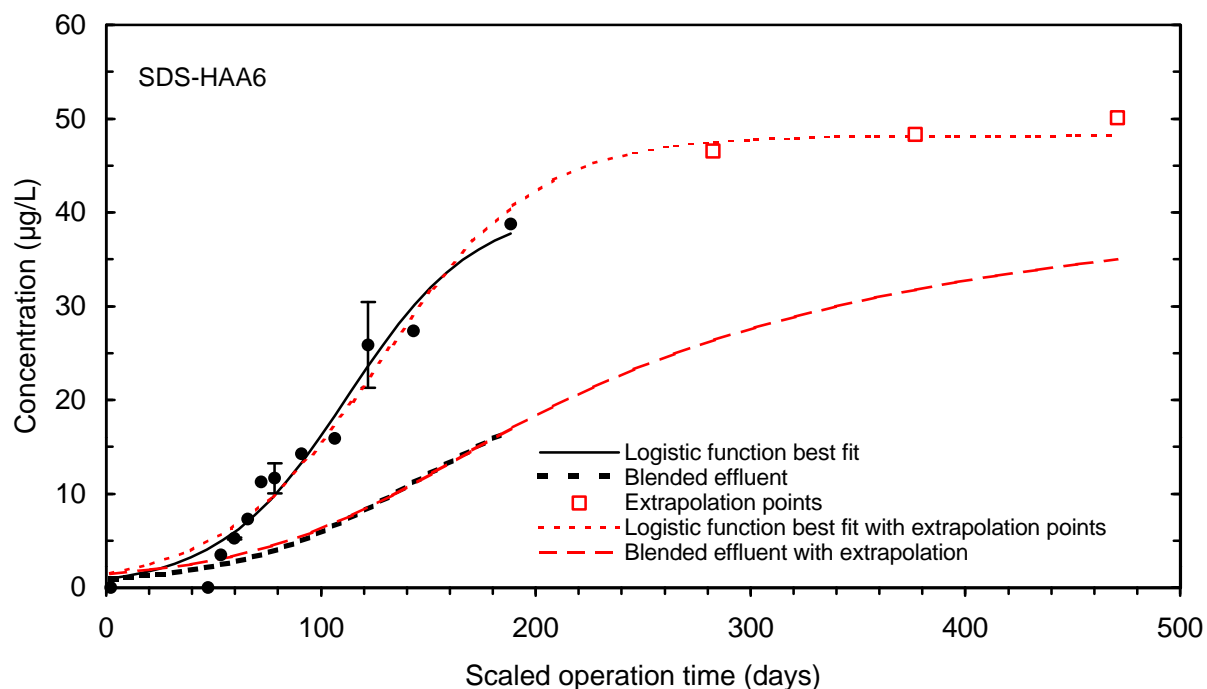
**Figure 182 Single contactor and blended effluent extrapolated SDS-HAA5 breakthrough curve (10 minute EBCT) during session 2, September**



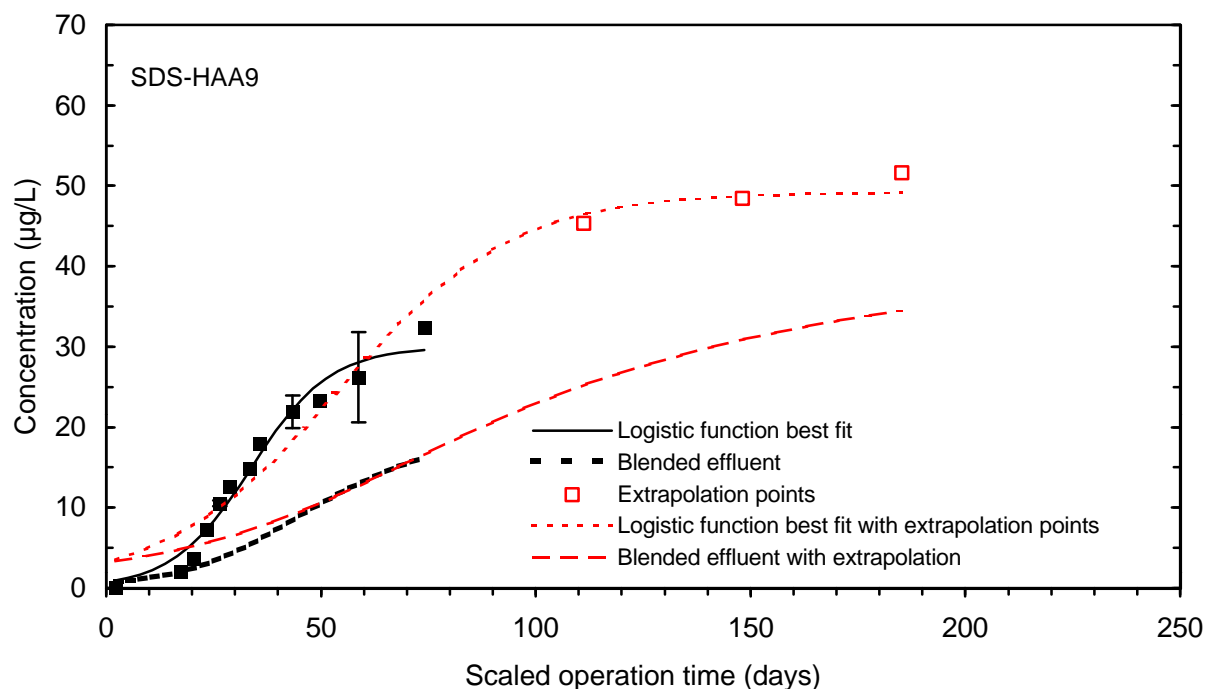
**Figure 183 Single contactor and blended effluent extrapolated SDS-HAA5 breakthrough curve (20 minute EBCT) during session 2, September**



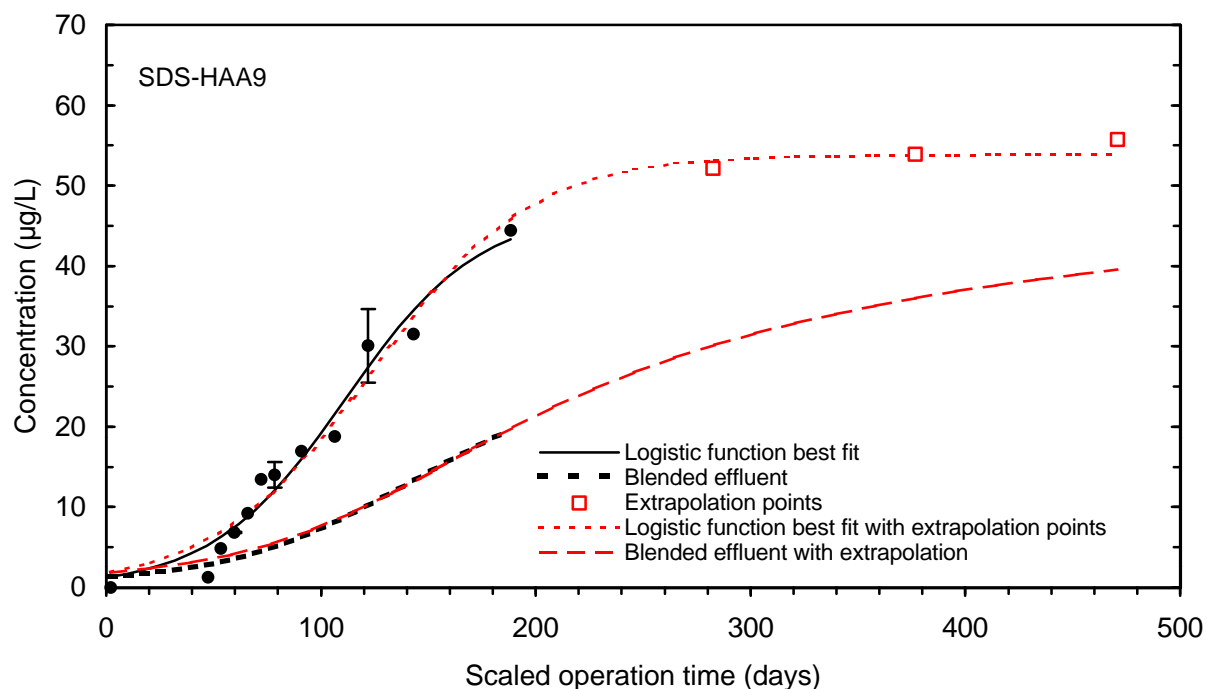
**Figure 184 Single contactor and blended effluent extrapolated SDS-HAA6 breakthrough curve (10 minute EBCT) during session 2, September**



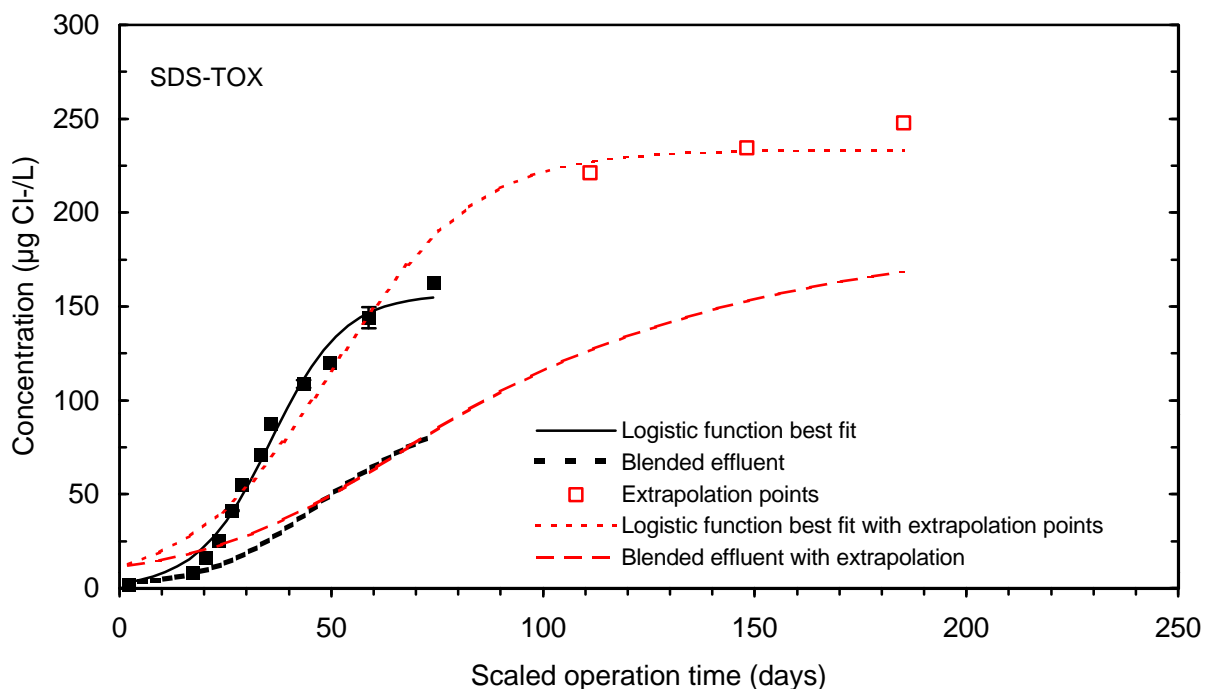
**Figure 185 Single contactor and blended effluent extrapolated SDS-HAA6 breakthrough curve (20 minute EBCT) during session 2, September**



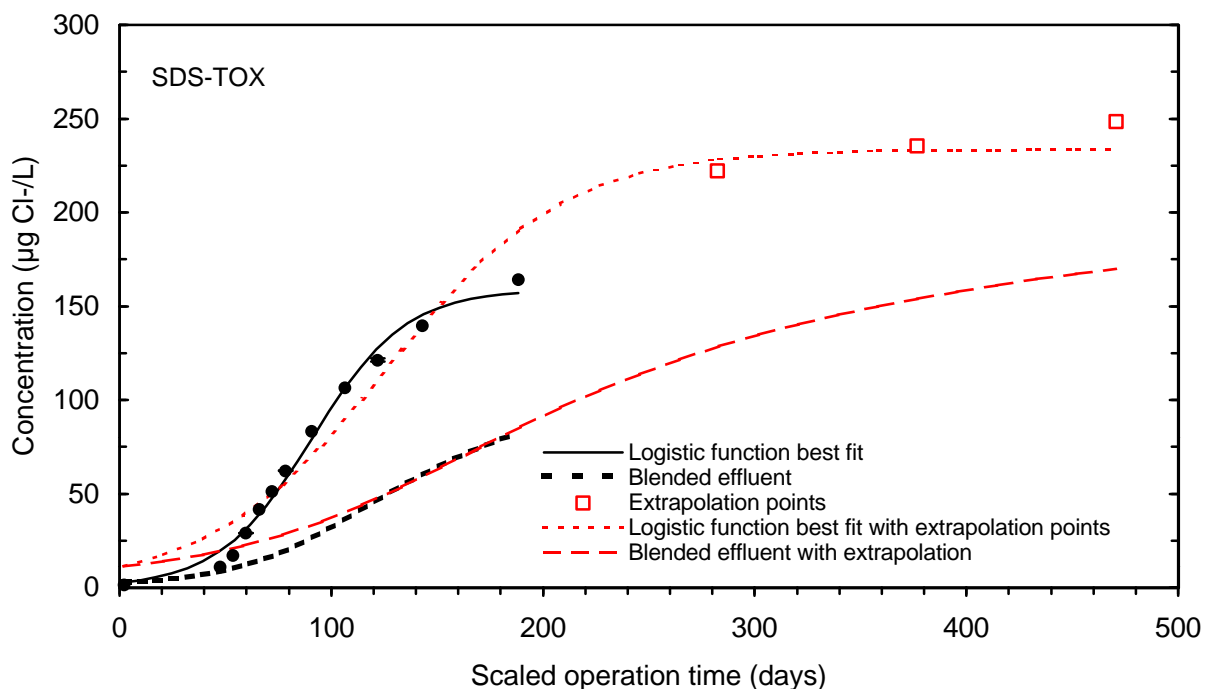
**Figure 186 Single contactor and blended effluent extrapolated SDS-HAA9 breakthrough curve (10 minute EBCT) during session 2, September**



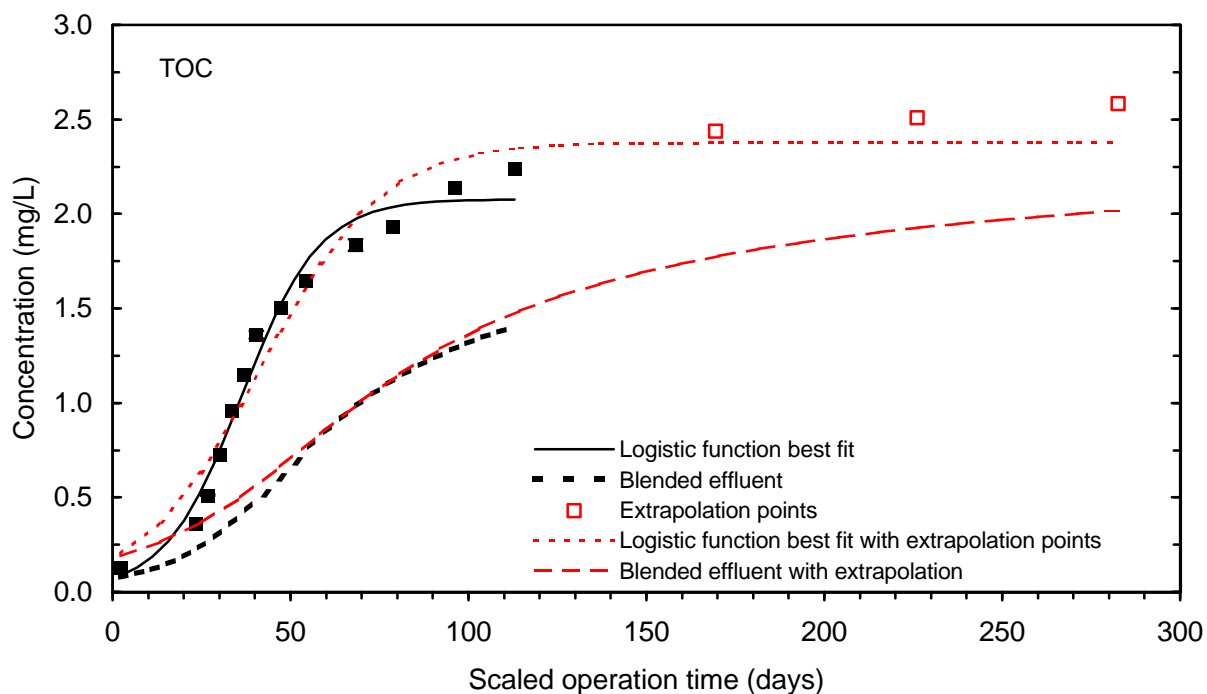
**Figure 187 Single contactor and blended effluent extrapolated SDS-HAA9 breakthrough curve (20 minute EBCT) during session 2, September**



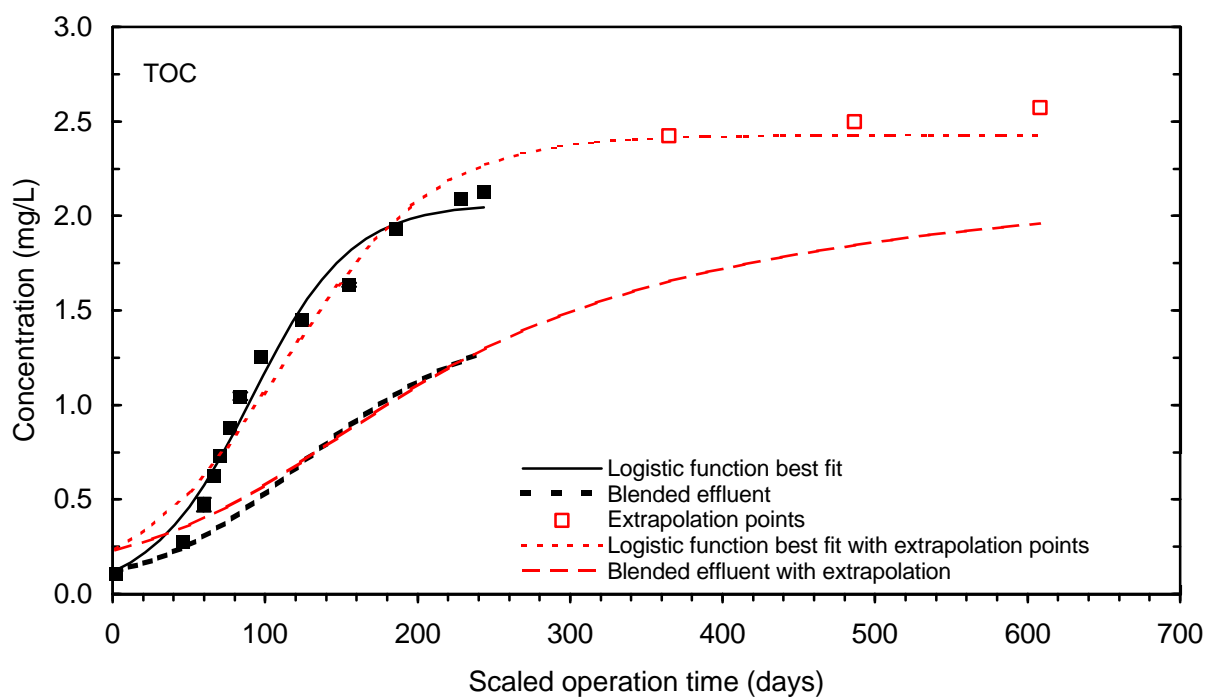
**Figure 188 Single contactor and blended effluent extrapolated SDS-TOX breakthrough curve (10 minute EBCT) during session 2, September**



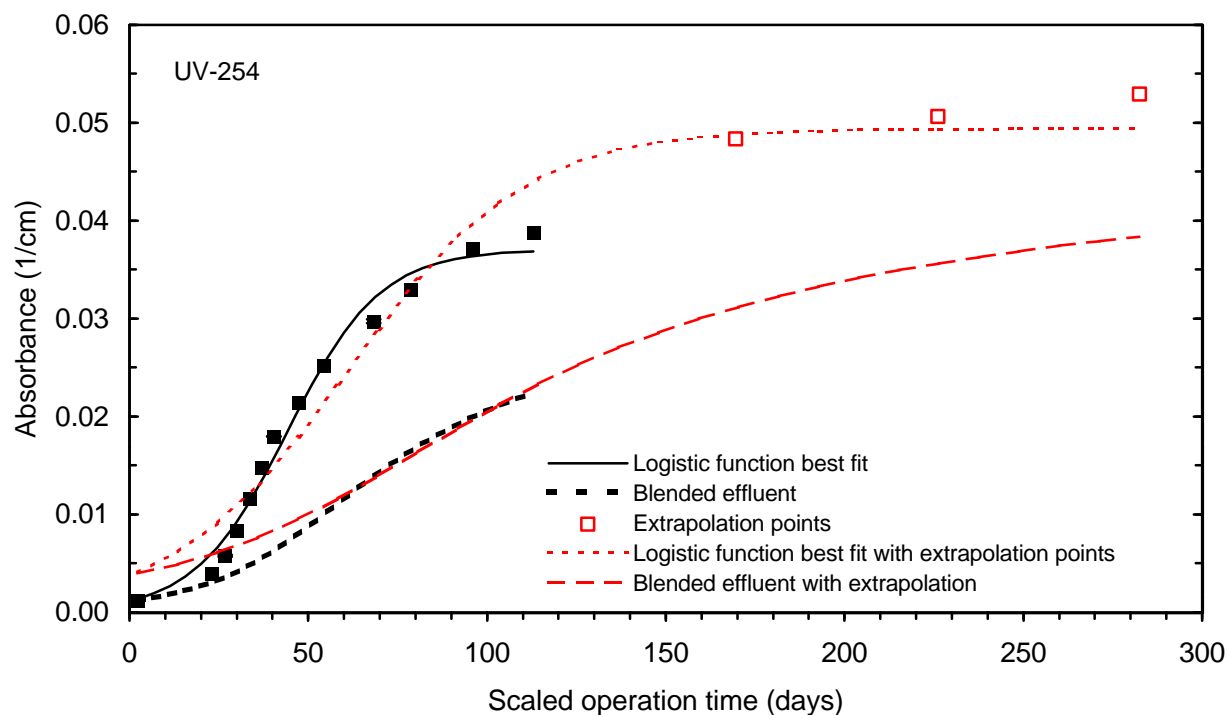
**Figure 189 Single contactor and blended effluent extrapolated SDS-TOX breakthrough curve (20 minute EBCT) during session 2, September**



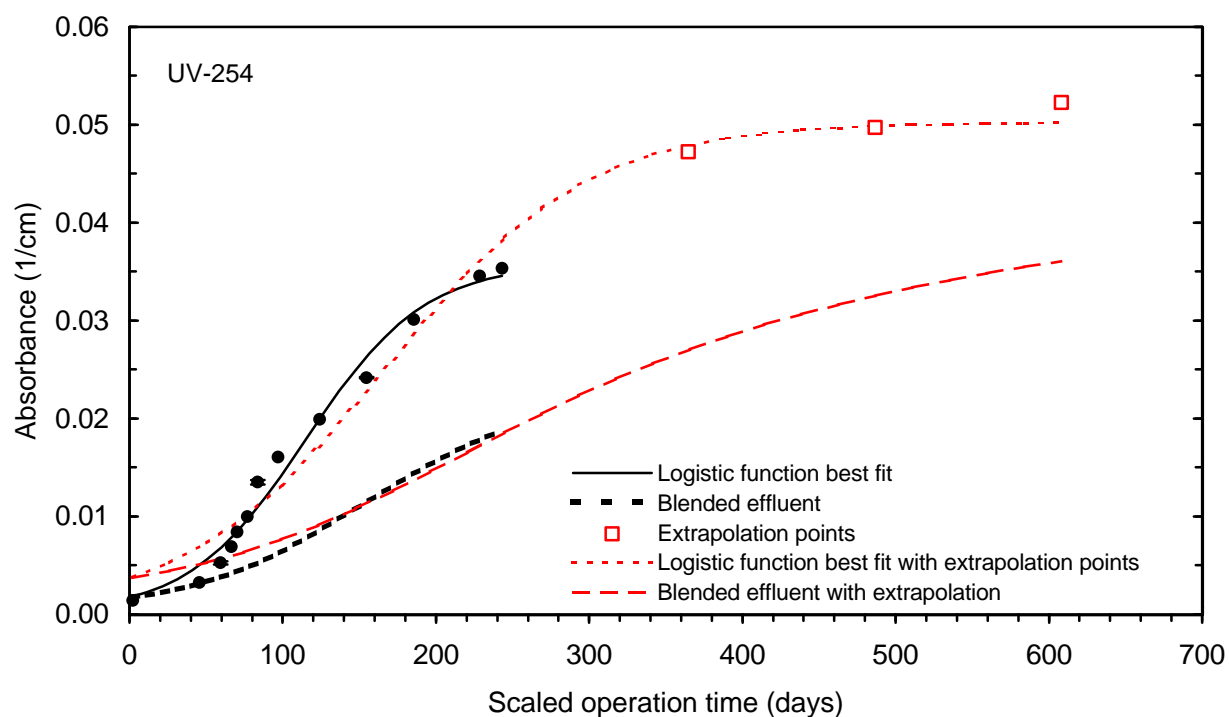
**Figure 190 Single contactor and blended effluent extrapolated TOC breakthrough curve (10 minute EBCT) during session 3, November**



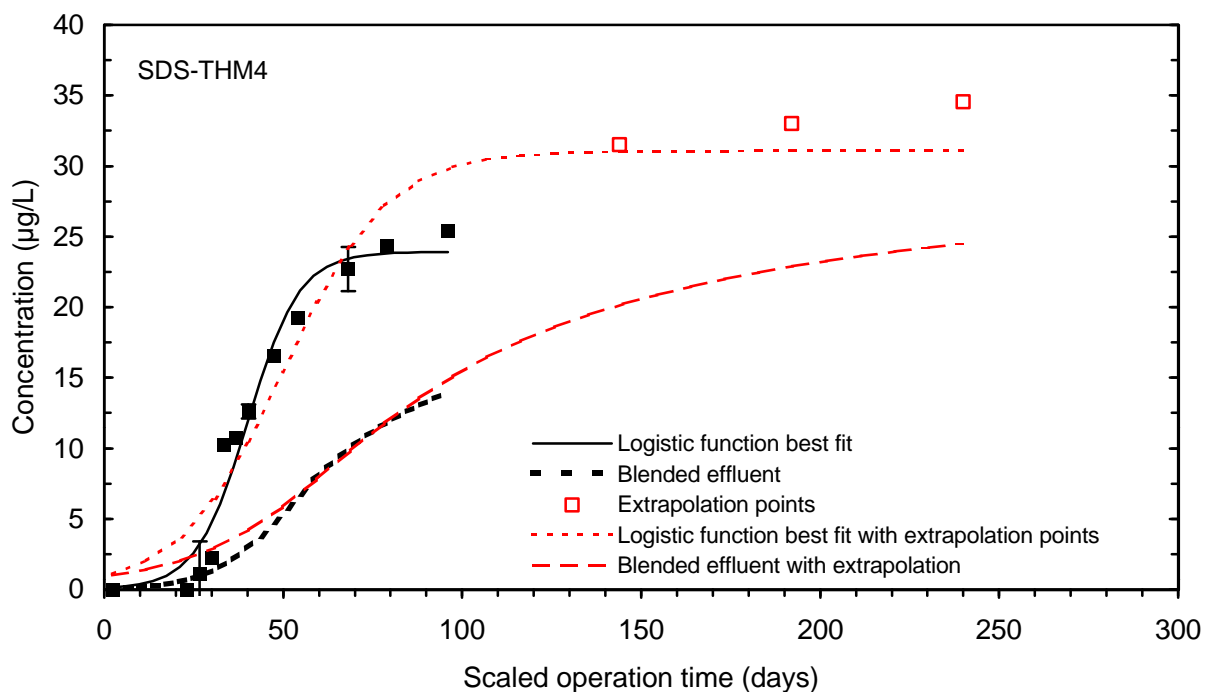
**Figure 191 Single contactor and blended effluent extrapolated TOC breakthrough curve (20 minute EBCT) during session 3, November**



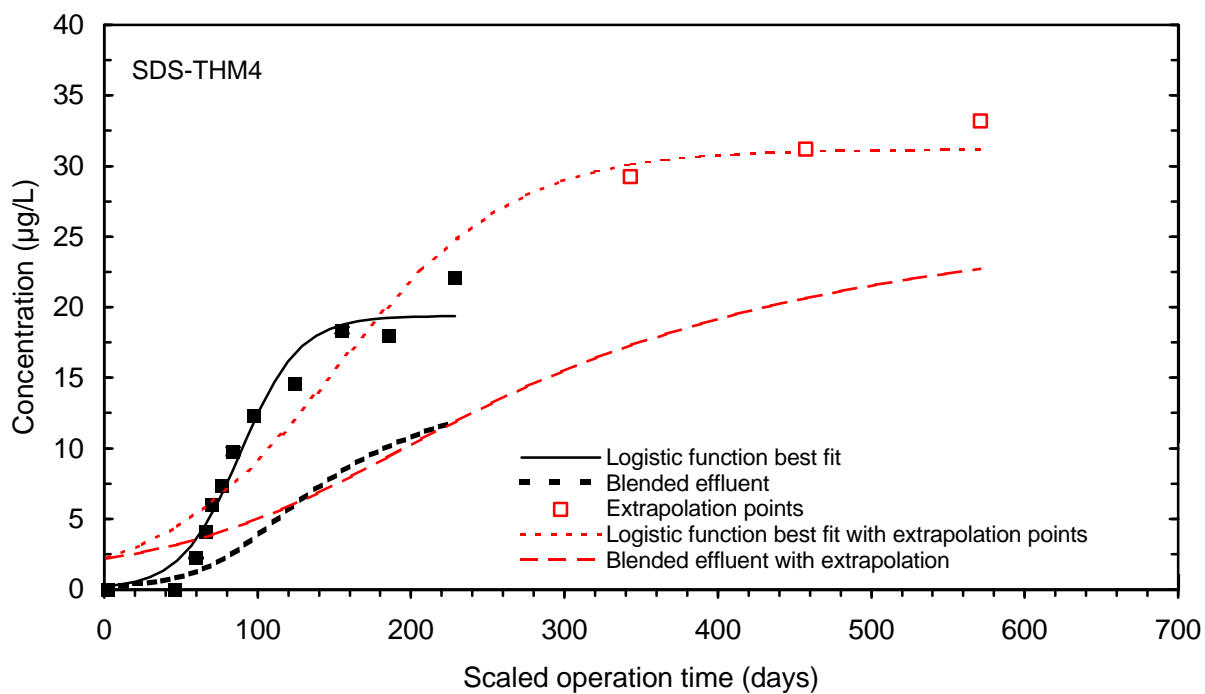
**Figure 192 Single contactor and blended effluent extrapolated UV-254 breakthrough curve (10 minute EBCT) during session 3, November**



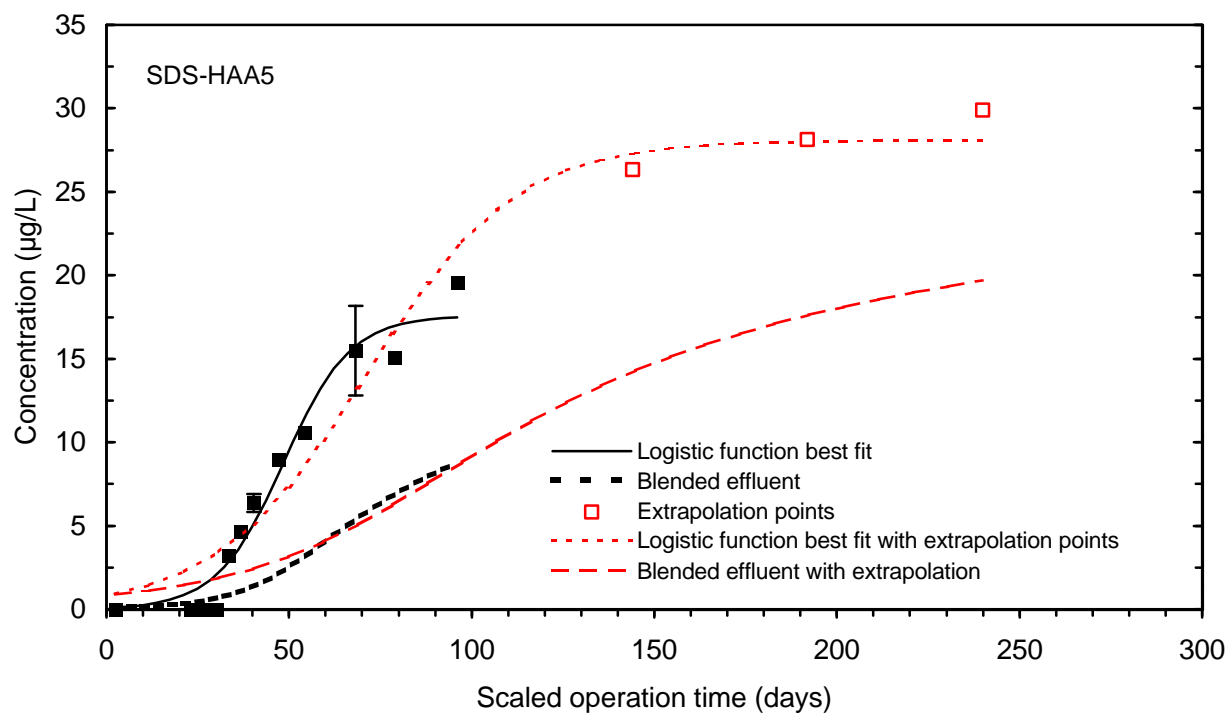
**Figure 193 Single contactor and blended effluent extrapolated UV-254 breakthrough curve (20 minute EBCT) during session 3, November**



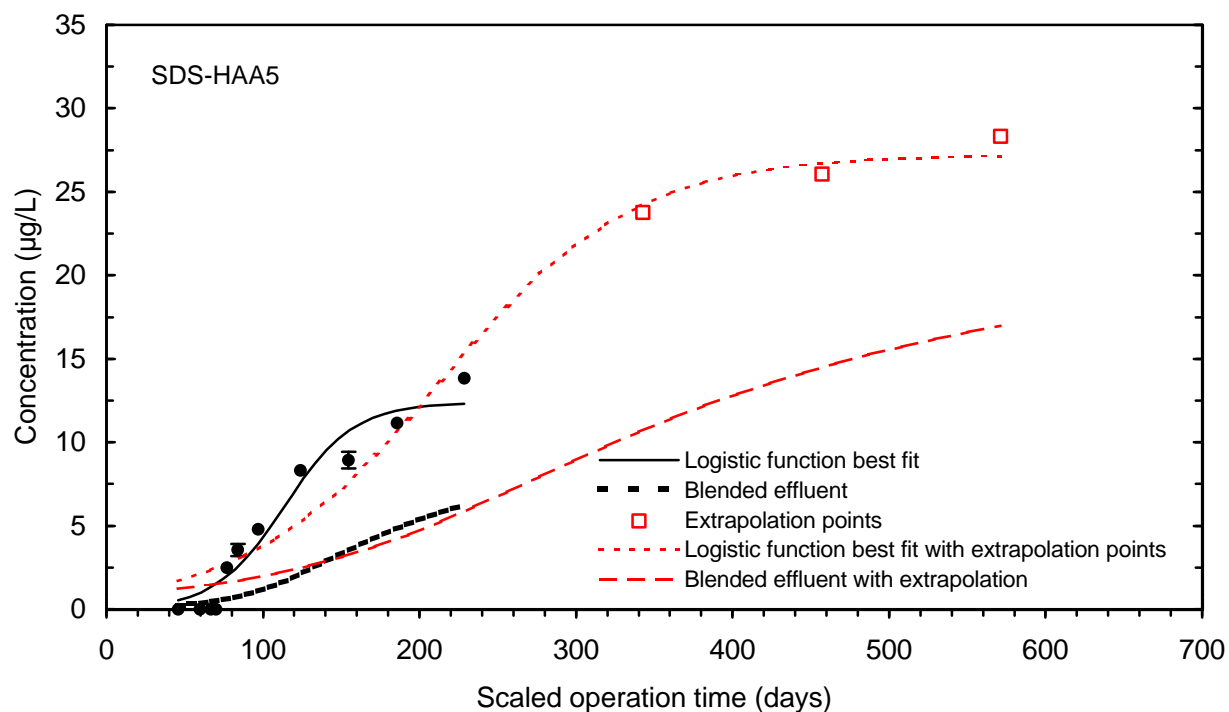
**Figure 194 Single contactor and blended effluent extrapolated SDS-THM4 breakthrough curve (10 minute EBCT) during session 3, November**



**Figure 195 Single contactor and blended effluent extrapolated SDS-THM4 breakthrough curve (20 minute EBCT) during session 3, November**

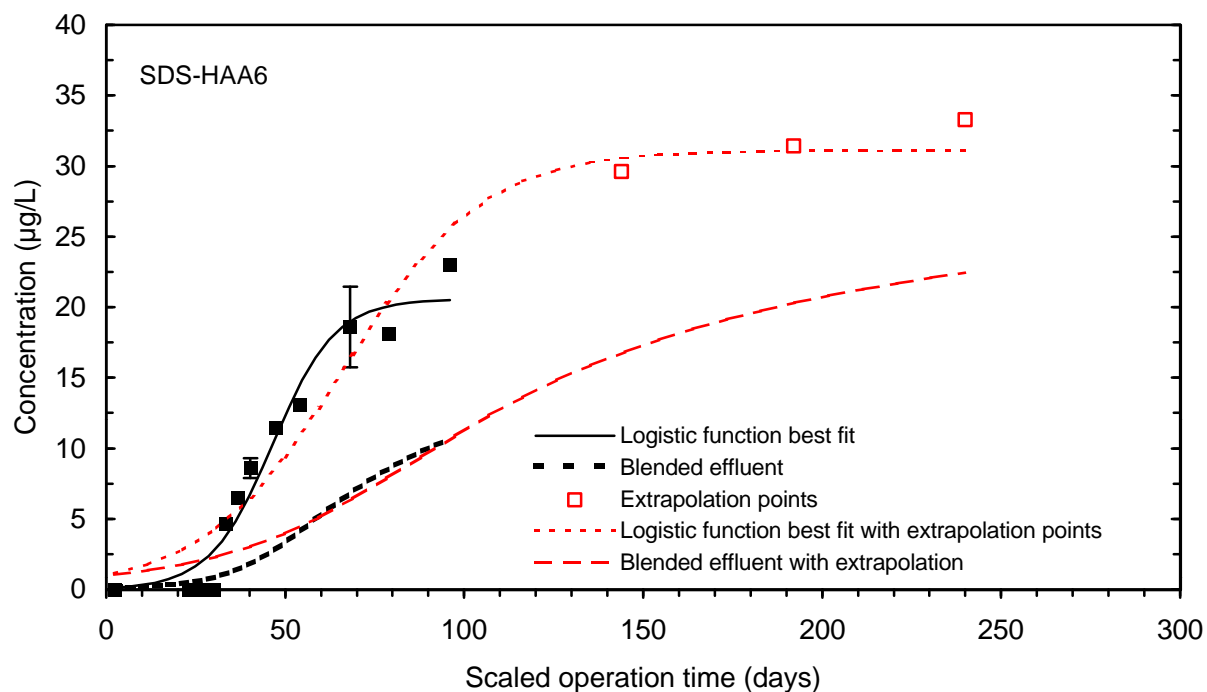


**Figure 196 Single contactor and blended effluent extrapolated SDS-HAA5 breakthrough curve (10 minute EBCT) during session 3, November**

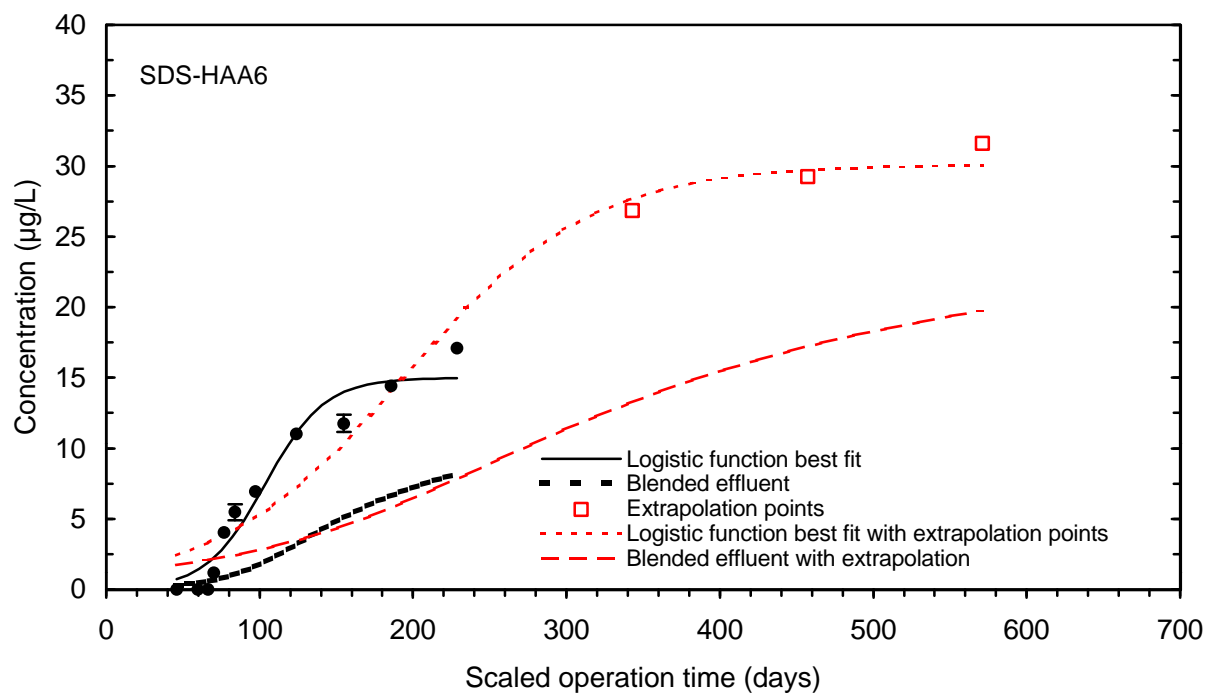


**Figure 197 Single contactor and blended effluent extrapolated SDS-HAA5 breakthrough curve (20 minute EBCT) during session 3, November**

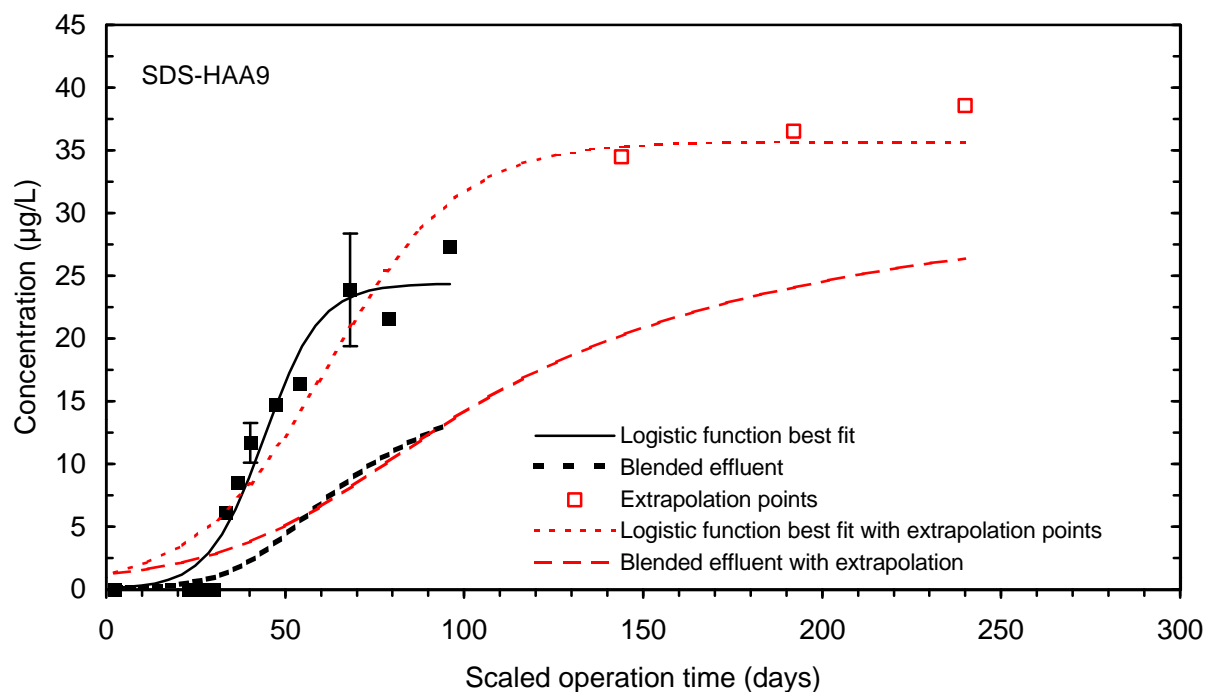




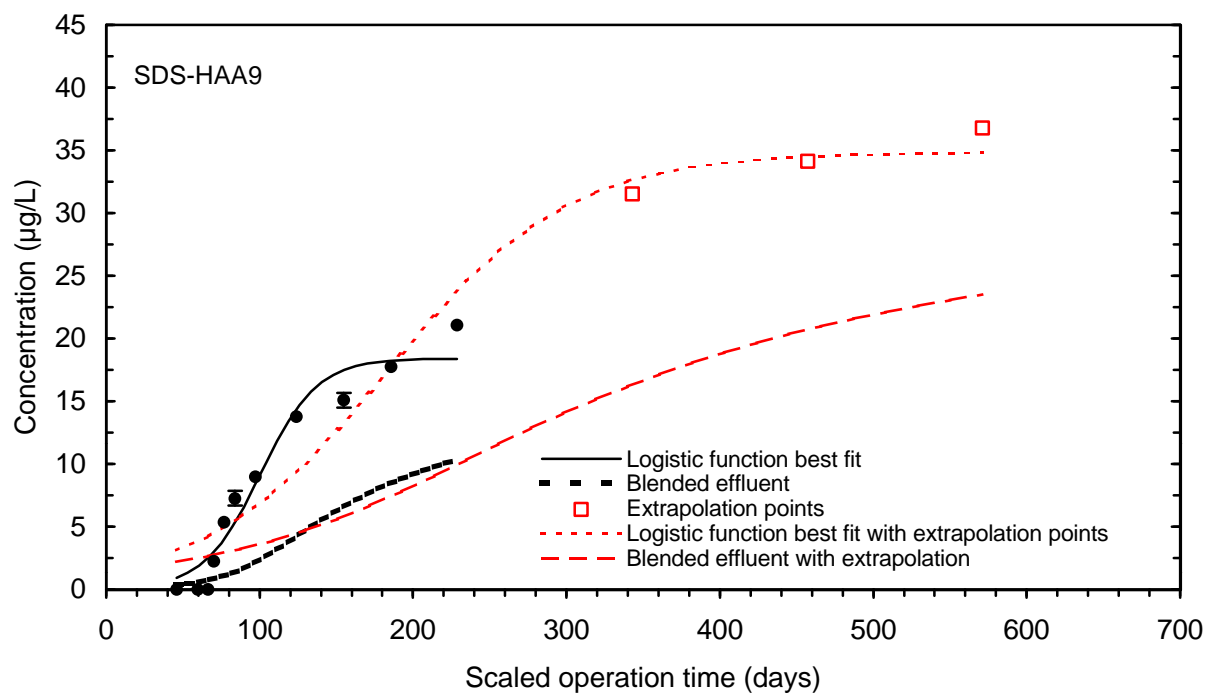
**Figure 198 Single contactor and blended effluent extrapolated SDS-HAA6 breakthrough curve (10 minute EBCT) during session 3, November**



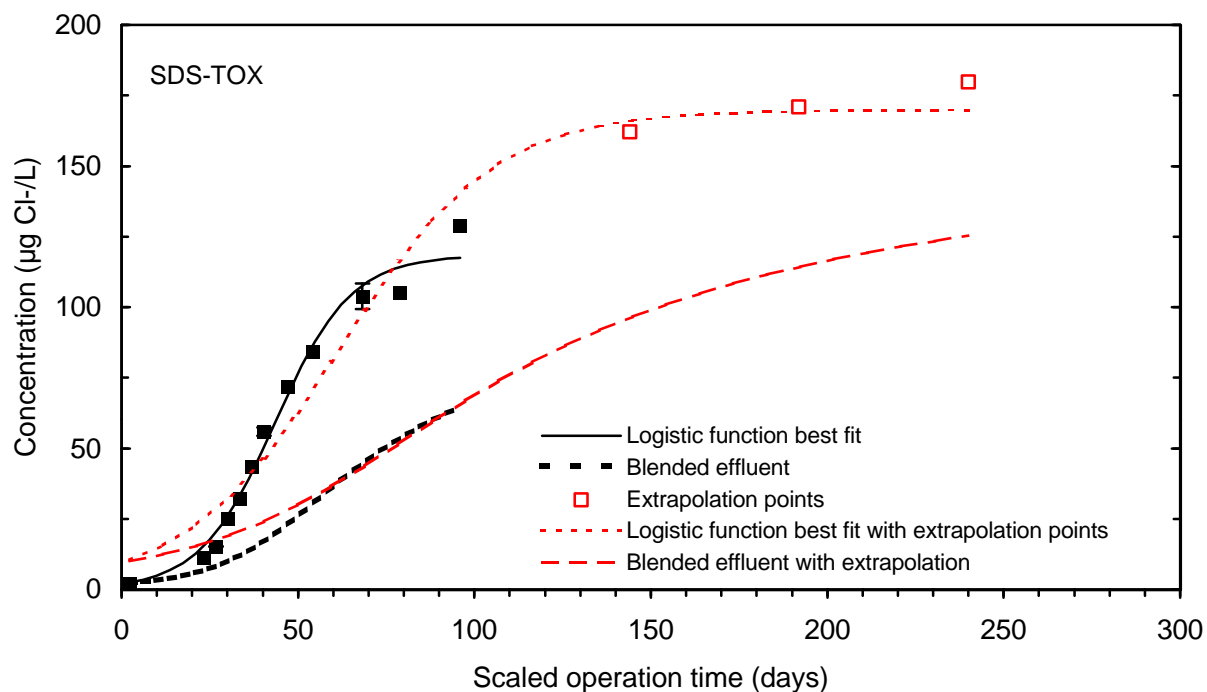
**Figure 199 Single contactor and blended effluent extrapolated SDS-HAA6 breakthrough curve (20 minute EBCT) during session 3, November**



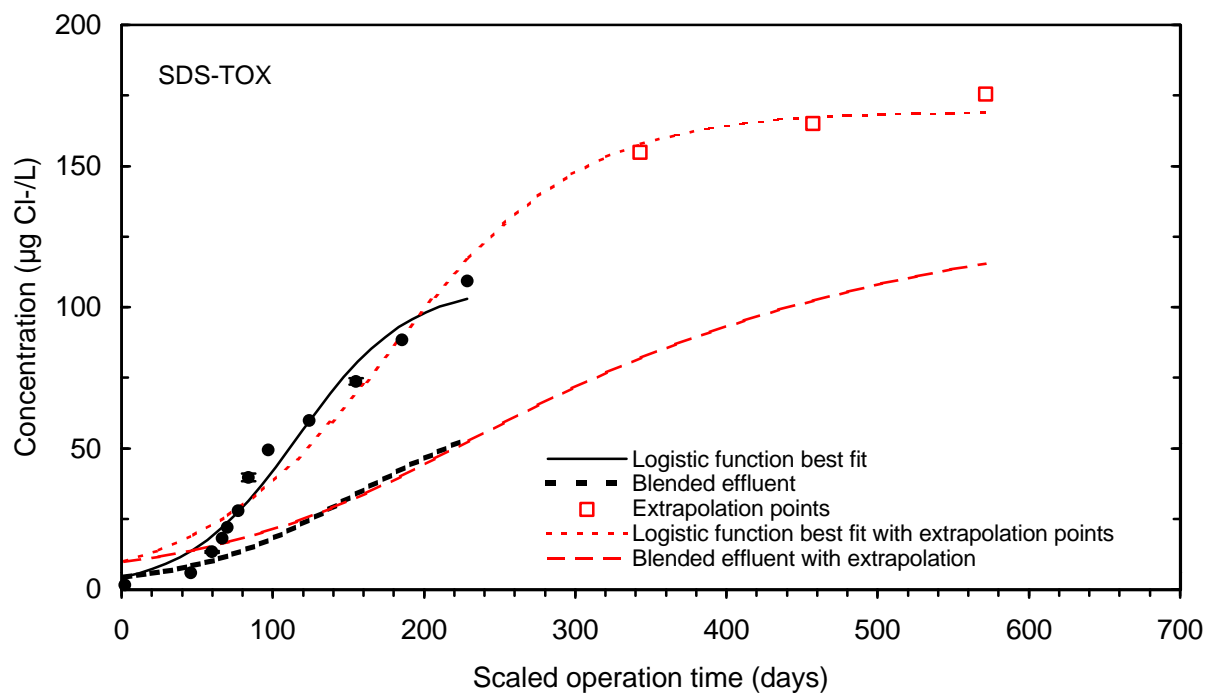
**Figure 200 Single contactor and blended effluent extrapolated SDS-HAA9 breakthrough curve (10 minute EBCT) during session 3, November**



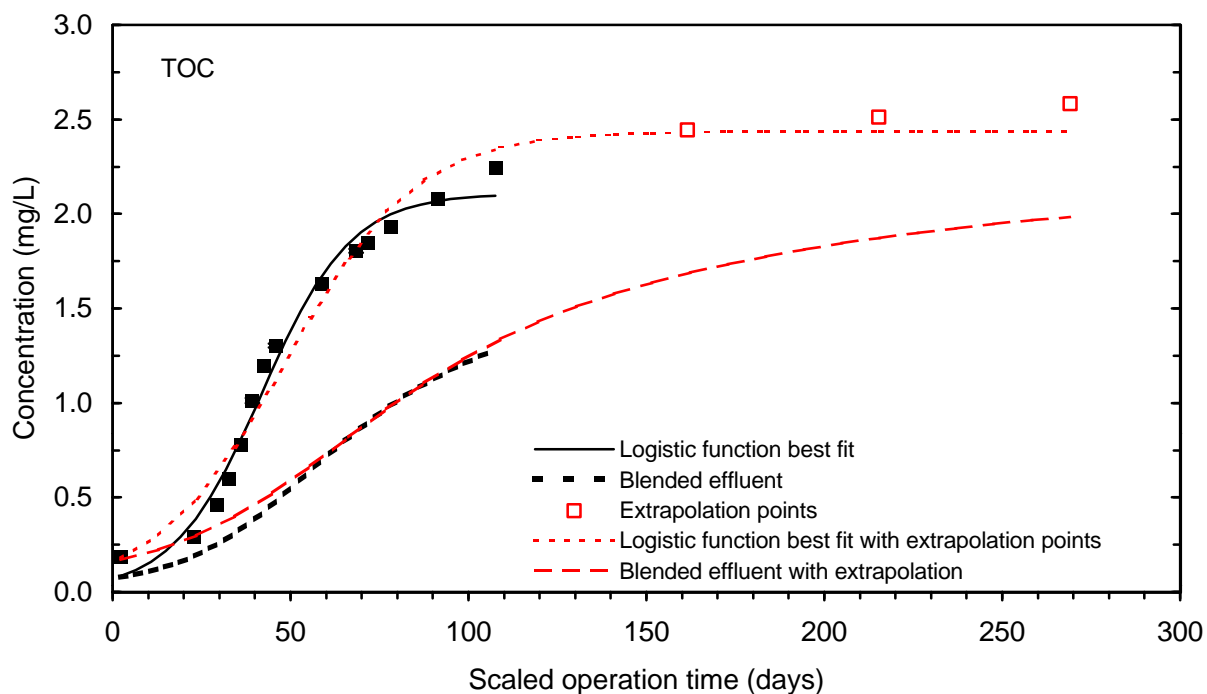
**Figure 201 Single contactor and blended effluent extrapolated SDS-HAA9 breakthrough curve (20 minute EBCT) during session 3, November**



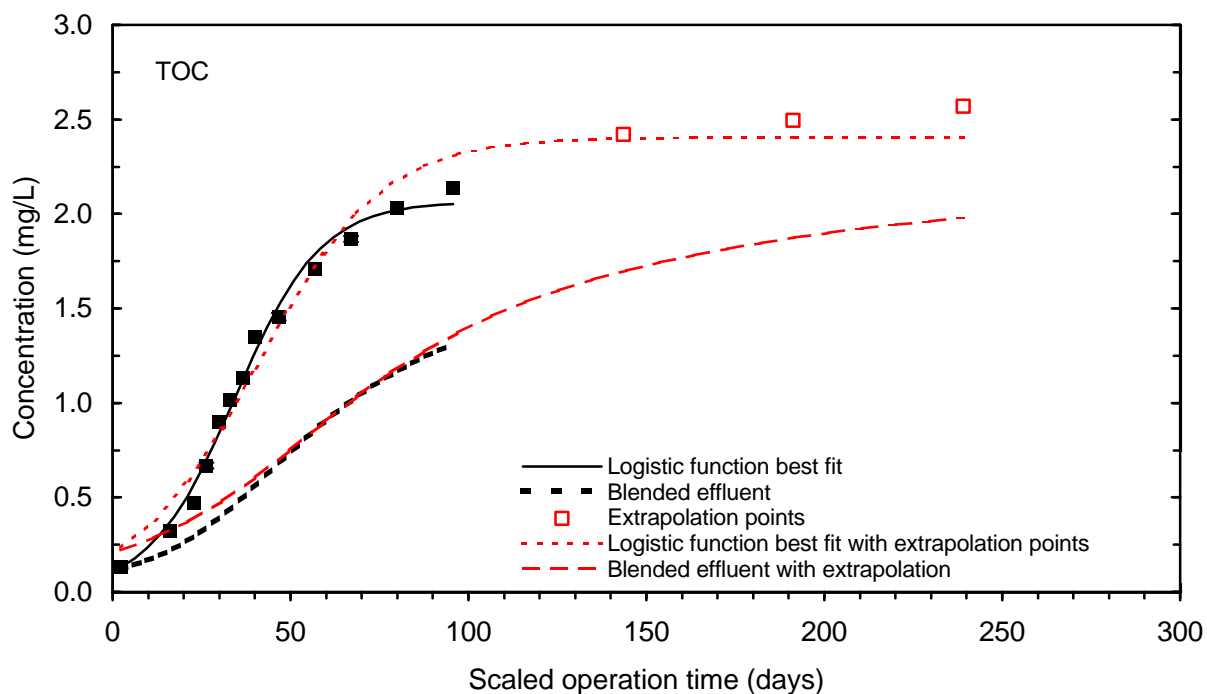
**Figure 202 Single contactor and blended effluent extrapolated SDS-TOX breakthrough curve (10 minute EBCT) during session 3, November**



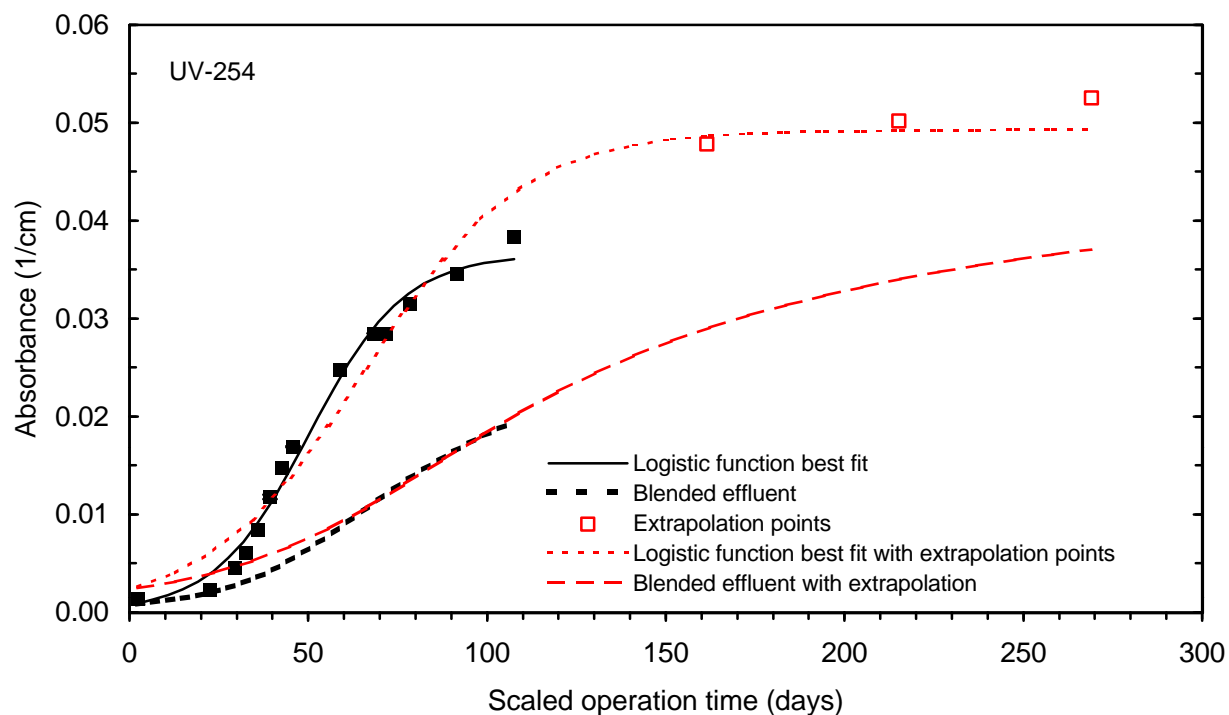
**Figure 203 Single contactor and blended effluent extrapolated SDS-TOX breakthrough curve (20 minute EBCT) during session 3, November**



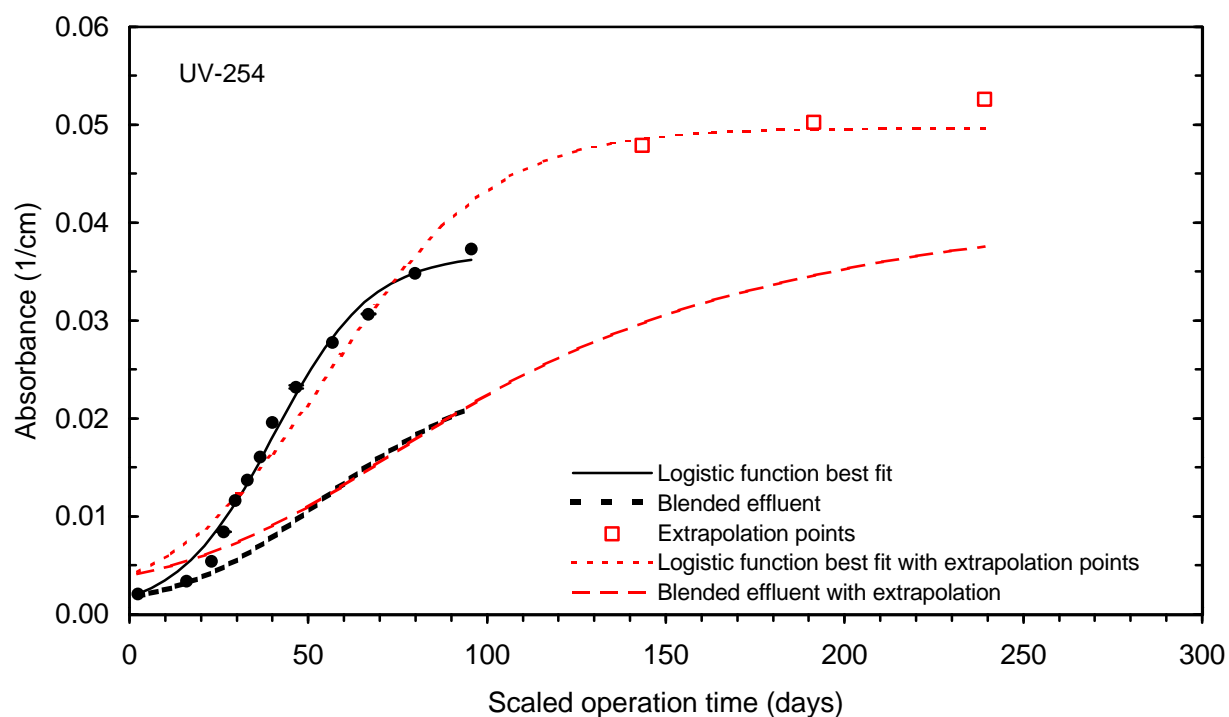
**Figure 204 Single contactor and blended effluent extrapolated TOC breakthrough curve for influent pH 6.5 contactor (10 minute EBCT) during session 4, November**



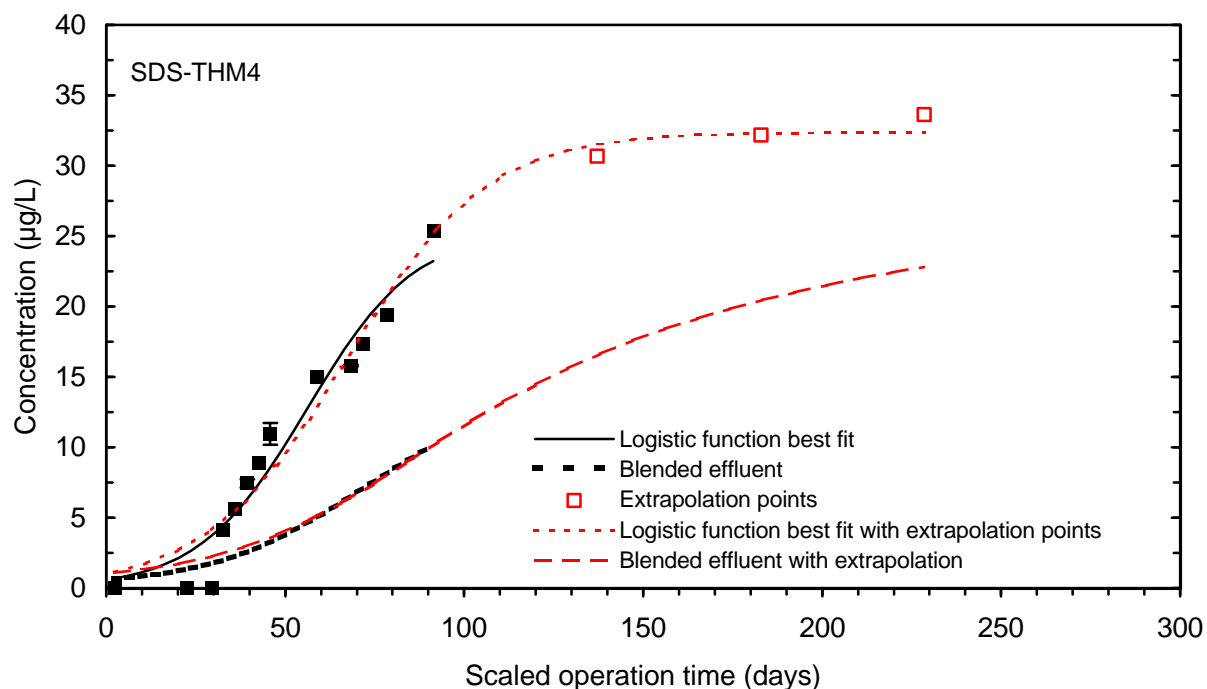
**Figure 205 Single contactor and blended effluent extrapolated TOC breakthrough curve for influent pH 7.5 contactor (10 minute EBCT) during session 4, November**



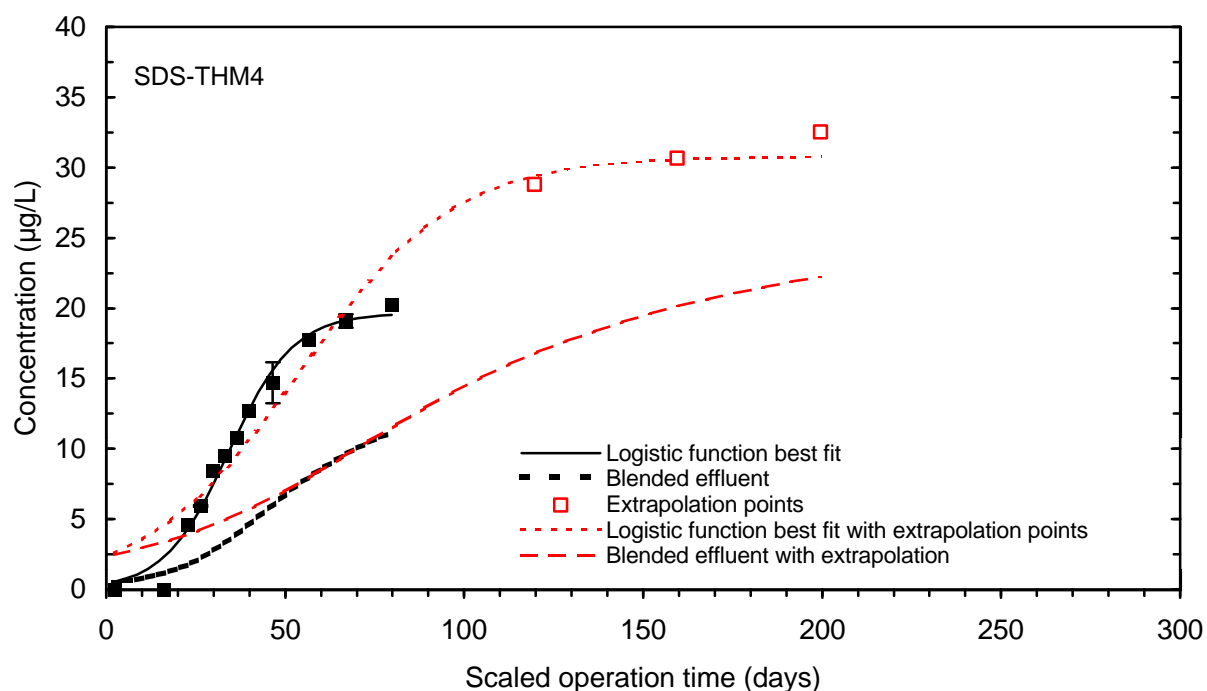
**Figure 206 Single contactor and blended effluent extrapolated UV-254 breakthrough curve for influent pH 6.5 contactor (10 minute EBCT) during session 4, November**



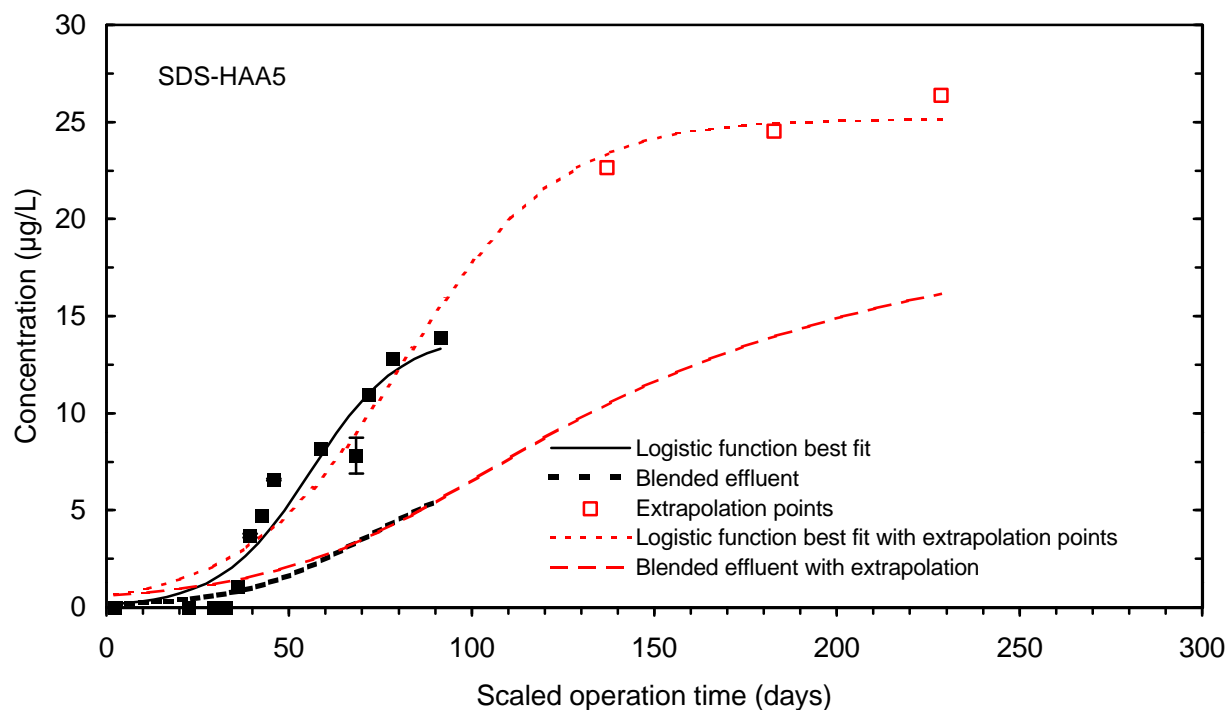
**Figure 207 Single contactor and blended effluent extrapolated UV-254 breakthrough curve for influent pH 7.5 contactor (10 minute EBCT) during session 4, November**



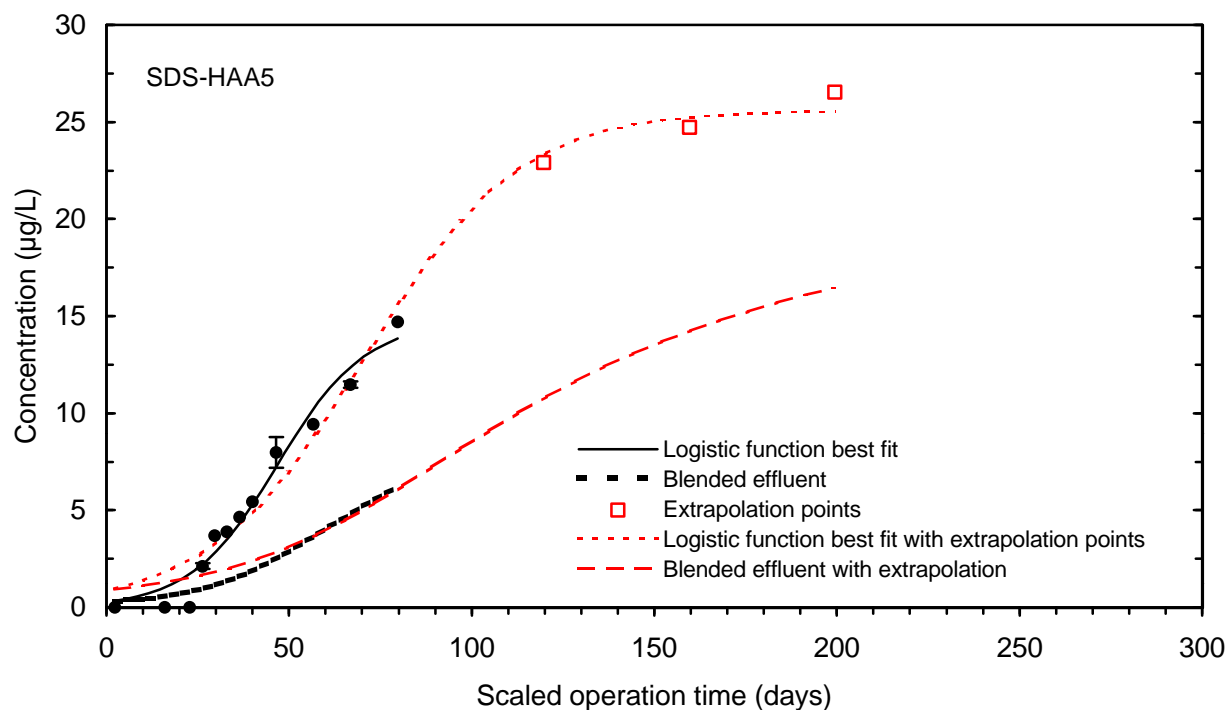
**Figure 208 Single contactor and blended effluent extrapolated SDS-THM4 breakthrough curve for influent pH 6.5 contactor (10 minute EBCT) during session 4, November**



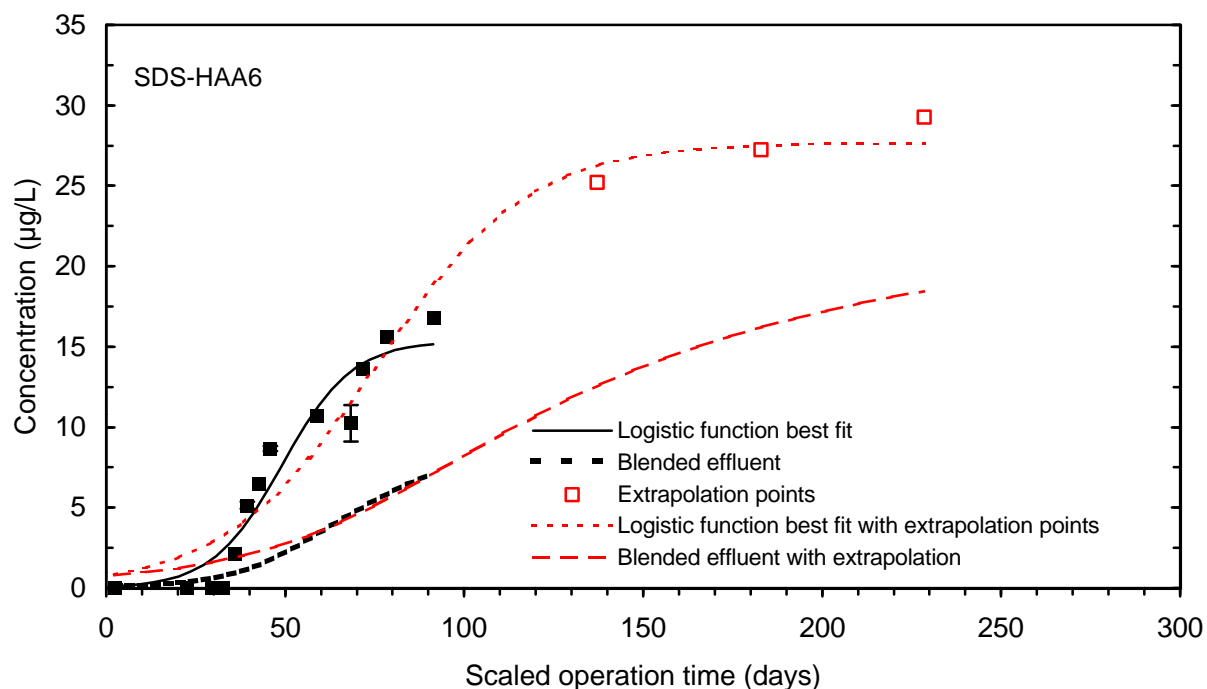
**Figure 209 Single contactor and blended effluent extrapolated SDS-THM4 breakthrough curve for influent pH 7.5 contactor (10 minute EBCT) during session 4, November**



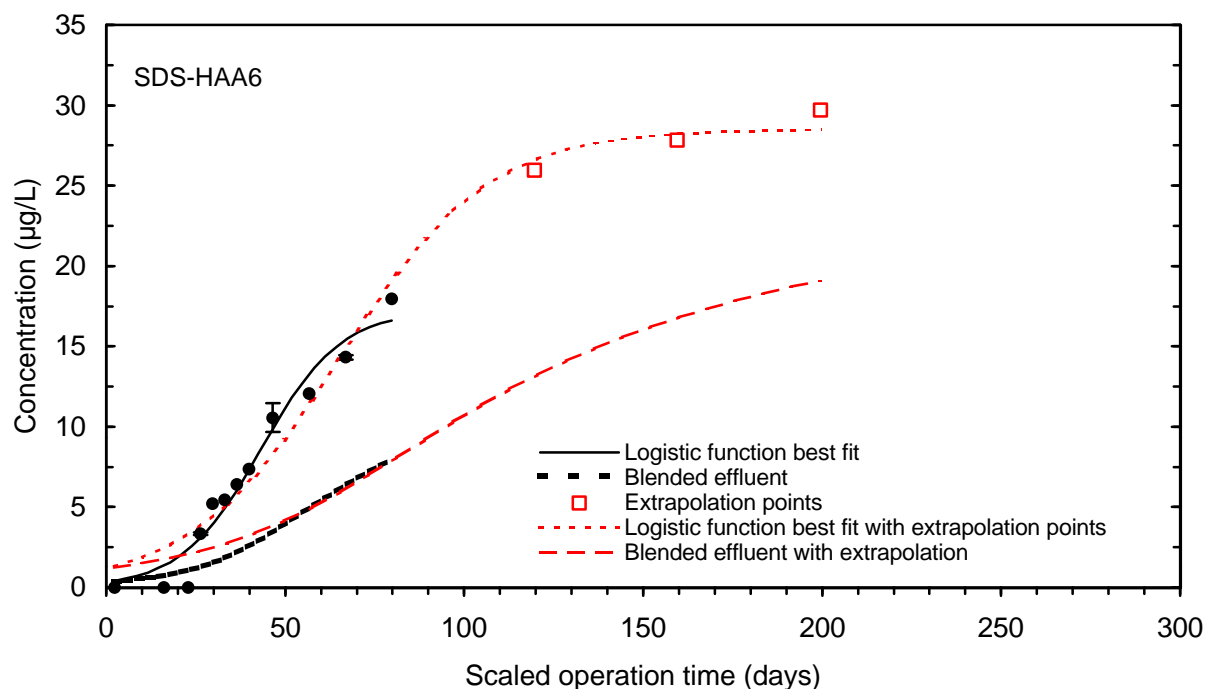
**Figure 210 Single contactor and blended effluent extrapolated SDS-HAA5 breakthrough curve for influent pH 6.5 contactor (10 minute EBCT) during session 4, November**



**Figure 211 Single contactor and blended effluent extrapolated SDS-HAA5 breakthrough curve for influent pH 7.5 contactor (10 minute EBCT) during session 4, November**

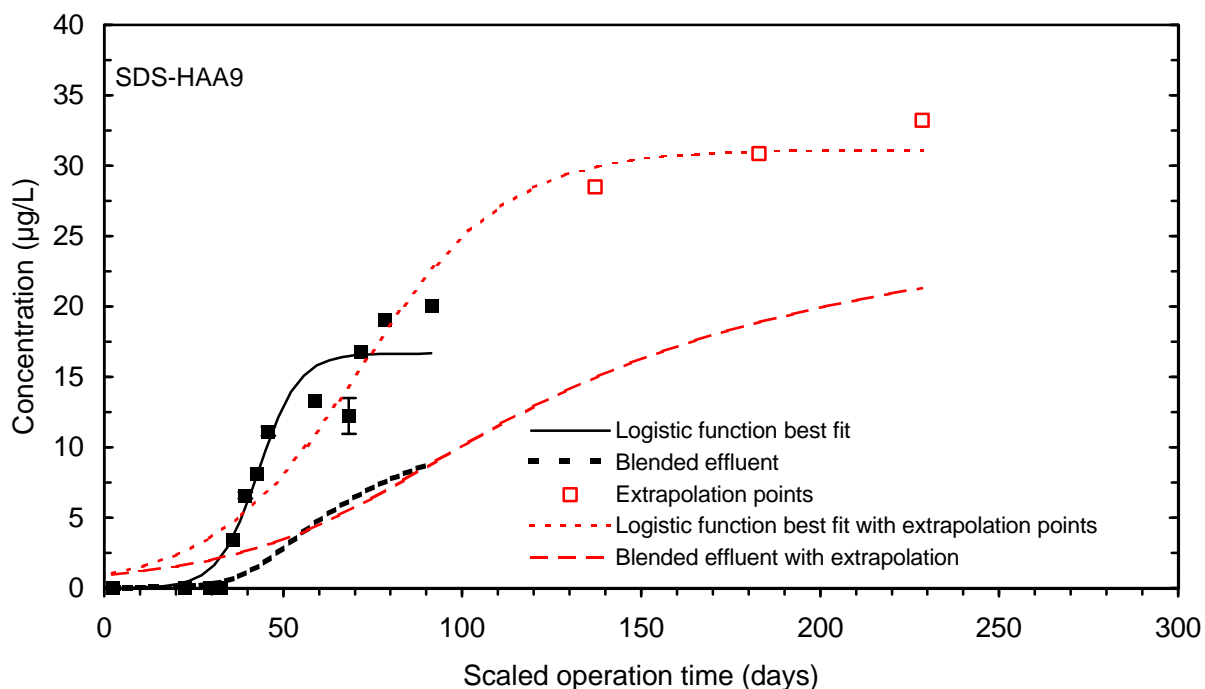


**Figure 212 Single contactor and blended effluent extrapolated SDS-HAA6 breakthrough curve for influent pH 6.5 contactor (10 minute EBCT) during session 4, November**

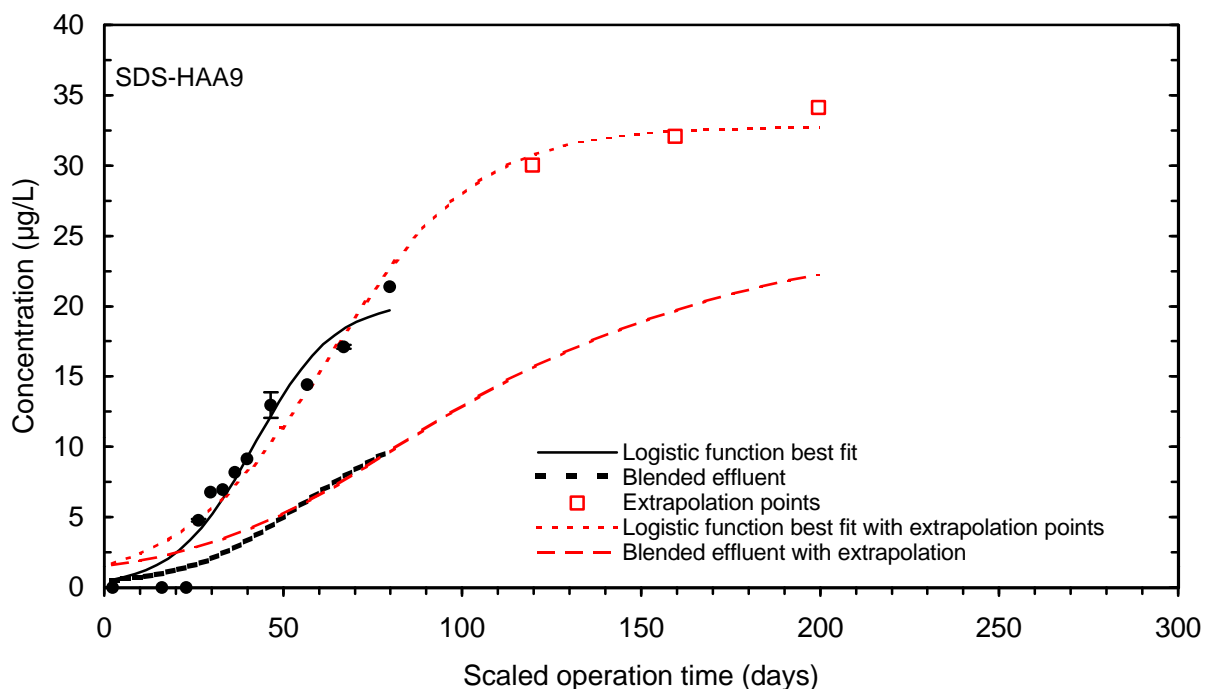


**Figure 213 Single contactor and blended effluent extrapolated SDS-HAA6 breakthrough curve for influent pH 7.5 contactor (10 minute EBCT) during session 4, November**

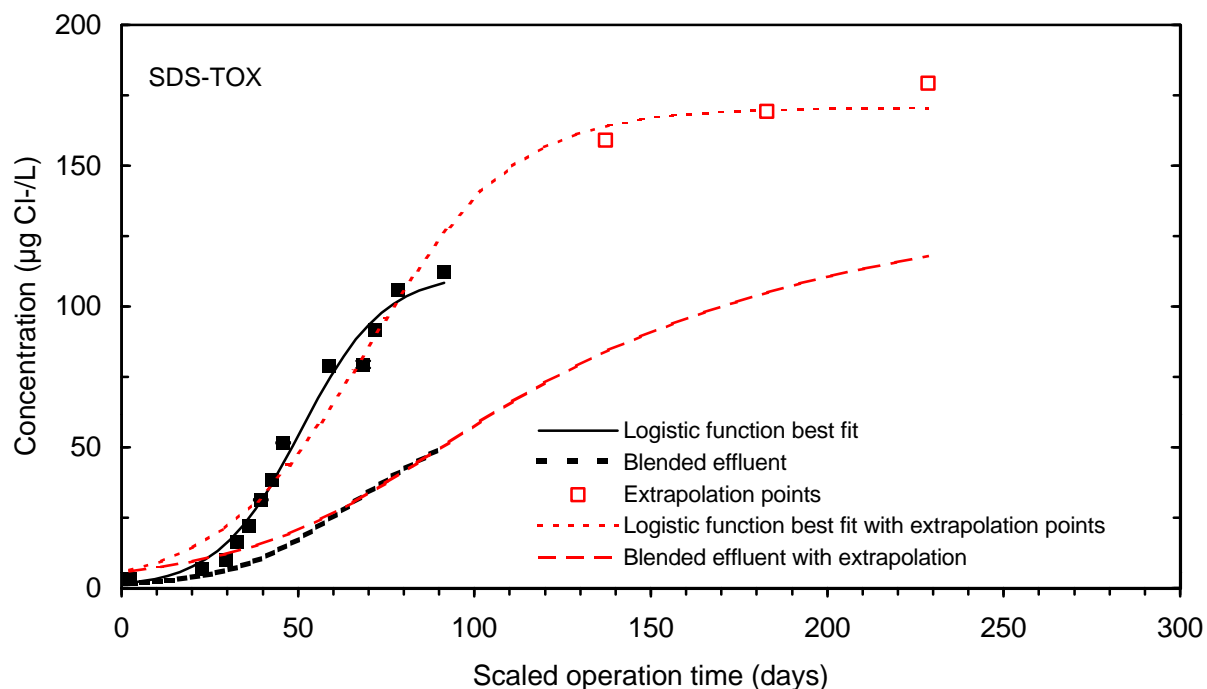




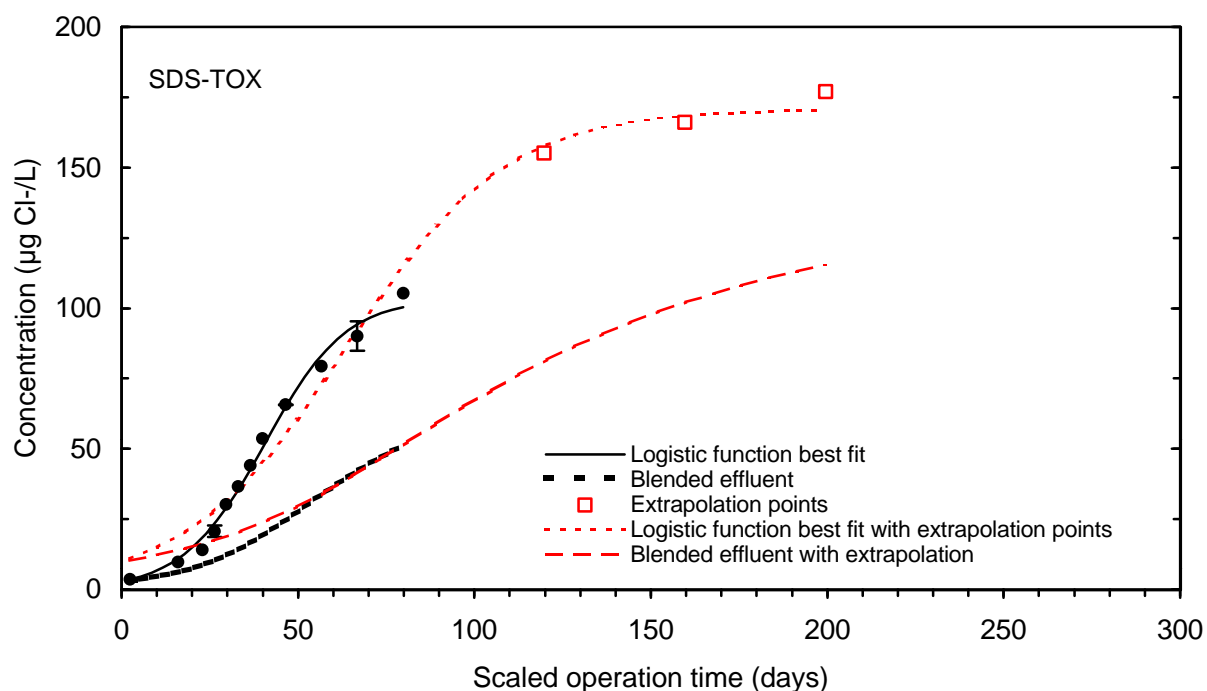
**Figure 214 Single contactor and blended effluent extrapolated SDS-HAA9 breakthrough curve for influent pH 6.5 contactor (10 minute EBCT) during session 4, November**



**Figure 215 Single contactor and blended effluent extrapolated SDS-HAA9 breakthrough curve for influent pH 7.5 contactor (10 minute EBCT) during session 4, November**



**Figure 216 Single contactor and blended effluent extrapolated SDS-TOX breakthrough curve for influent pH 6.5 contactor (10 minute EBCT) during session 4, November**



**Figure 217 Single contactor and blended effluent extrapolated SDS-TOX breakthrough curve for influent pH 7.5 contactor (10 minute EBCT) during session 4, November**

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# *12*

*Normalized DBP Precursor  
Breakthrough*

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## 12 Normalized DBP Precursor Breakthrough

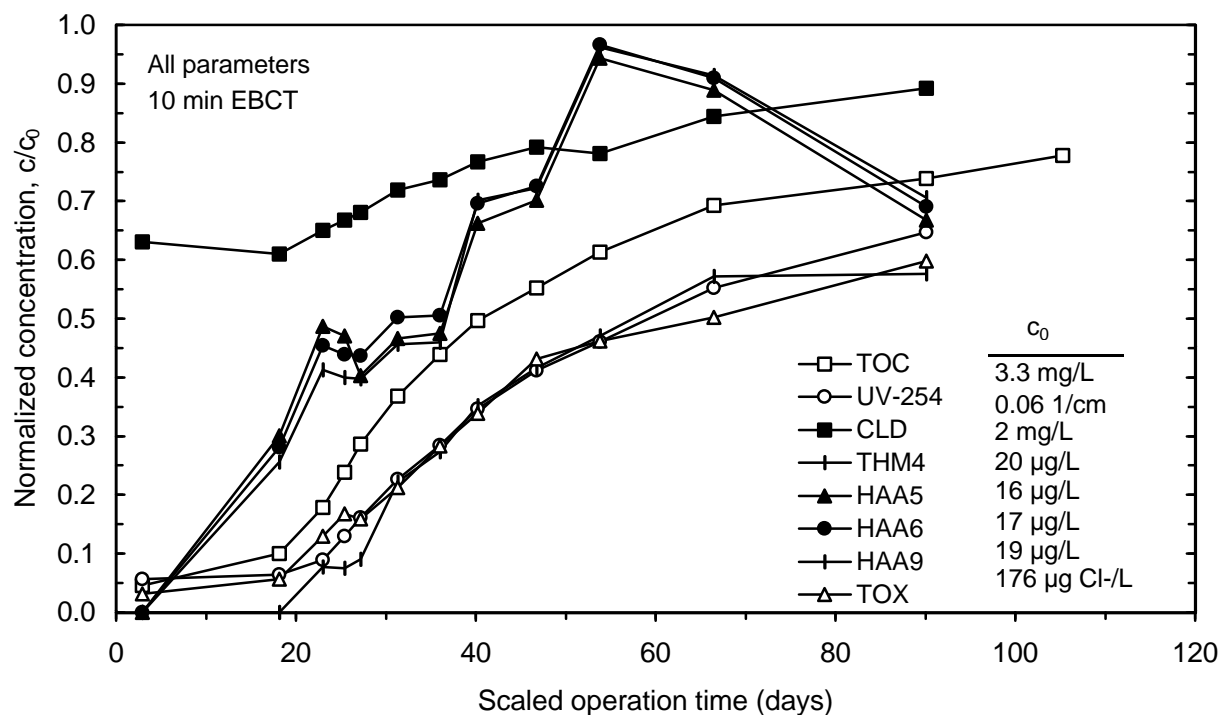
An additional method of analyzing GAC breakthrough data is to divide the GAC effluent concentrations of each parameter by their respective GAC influent concentrations. The relative breakthrough patterns of each parameter can then be compared on a percent breakthrough level. This type of analysis helps determine whether surrogates for DBP precursor breakthrough, such as TOC and UV<sub>254</sub>, are reliable indicators of DBP precursor breakthrough. An analysis of the extent to which the surrogates can be classified as conservative indicators of specific DBP precursor breakthrough is also useful.

The normalized breakthrough patterns for all parameters (DBP surrogates and SDS-DBPs) for the 10 minute contactor run during the March session are shown in Figure 218. Relatively high initial relative levels of chlorine demand were present, due to inorganic chlorine demand. The normalized breakthrough SDS-HAA occurred earlier than that of TOC during most of the run. Therefore, TOC did not serve as a conservative indicator for SDS-HAA breakthrough during this run that utilized a 3-hour SDS incubation time. Normalized SDS-THM4 and SDS-TOX breakthrough occurred after normalized TOC breakthrough, and both matched normalized UV<sub>254</sub> very well. Overall, results for the 20 minute EBCT contactor during the March session were similar (Figure 219) except that during the second half of the run, normalized TOC breakthrough did serve as a conservative indicator for normalized SDS-HAA breakthrough.

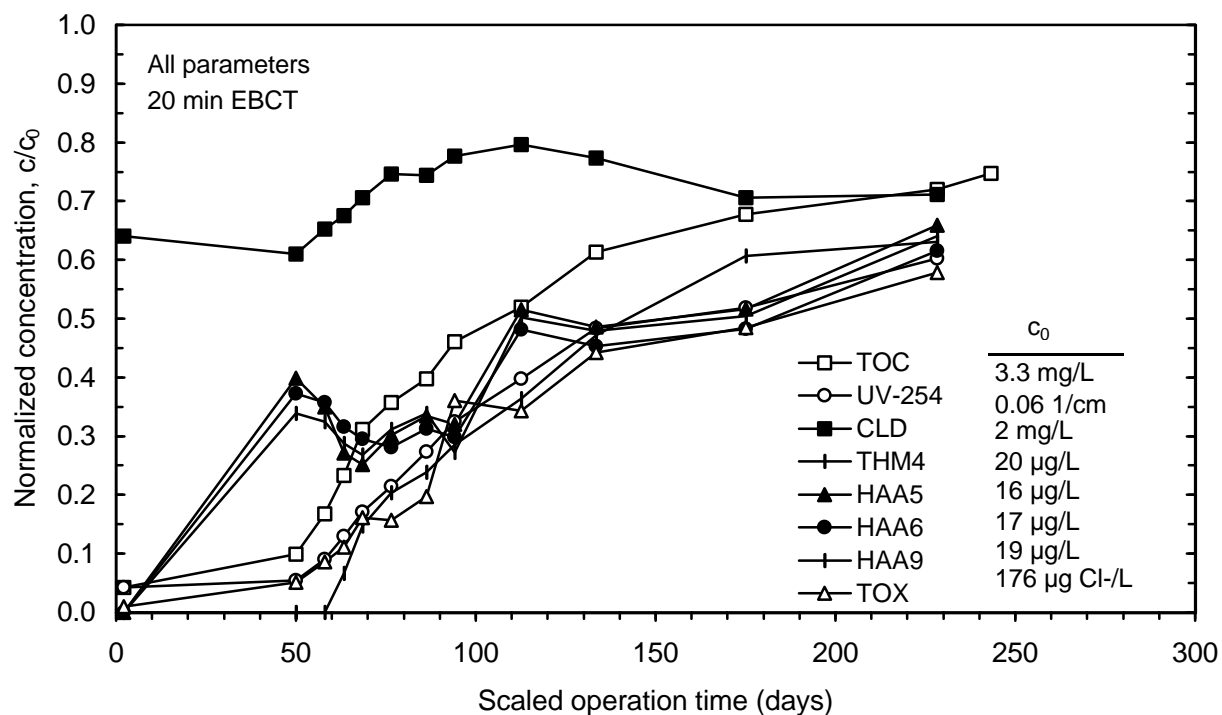
For the 10 and 20 minute EBCT contactors operated during the September session, Figures 220 and 221, TOC served as a conservative indicator for normalized SDS-THM4, SDS-HAA, and SDS-TOX breakthrough. Normalized SDS-DBP breakthrough matched that for UV<sub>254</sub>. The longer incubation time (24 hours instead of 3 hours) and higher incubation temperature as compared to the March session may have contributed to the change in relative breakthrough patterns of SDS-HAA.

For the 10 and 20 minute contactors operated at influent pH 7.0 during the November session (Figures 222 and 223), TOC again served as a conservative indicator for SDS-DBP breakthrough. Normalized TOC breakthrough was followed by that for SDS-THM4, UV<sub>254</sub>, SDS-TOX, and SDS-HAA.

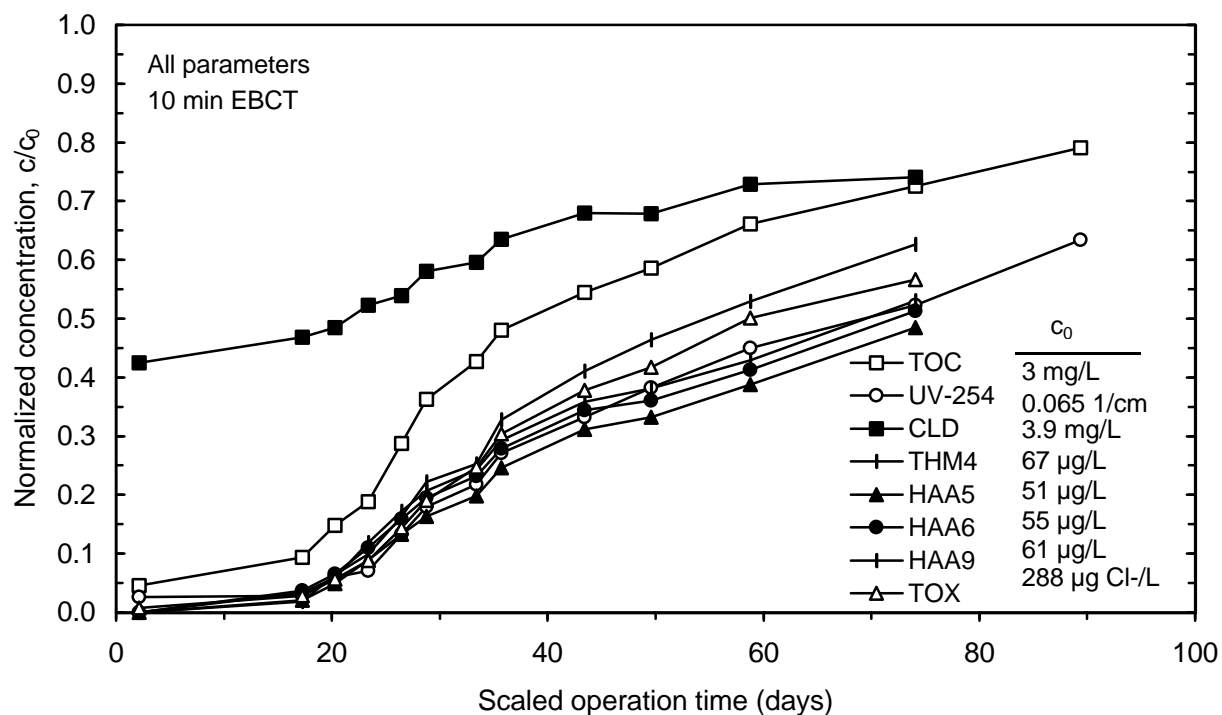
Although the relative order of normalized breakthrough was not impacted by influent pH, comparison of Figures 224 and 225 shows that the magnitude of the spread between normalized TOC breakthrough and normalized SDS-DBP breakthrough increased with decreasing influent pH. Normalized SDS-THM4 matched the breakthrough of normalized UV<sub>254</sub> closely. These analytes were followed by the normalized breakthrough curves for SDS-TOX and SDS-HAA.



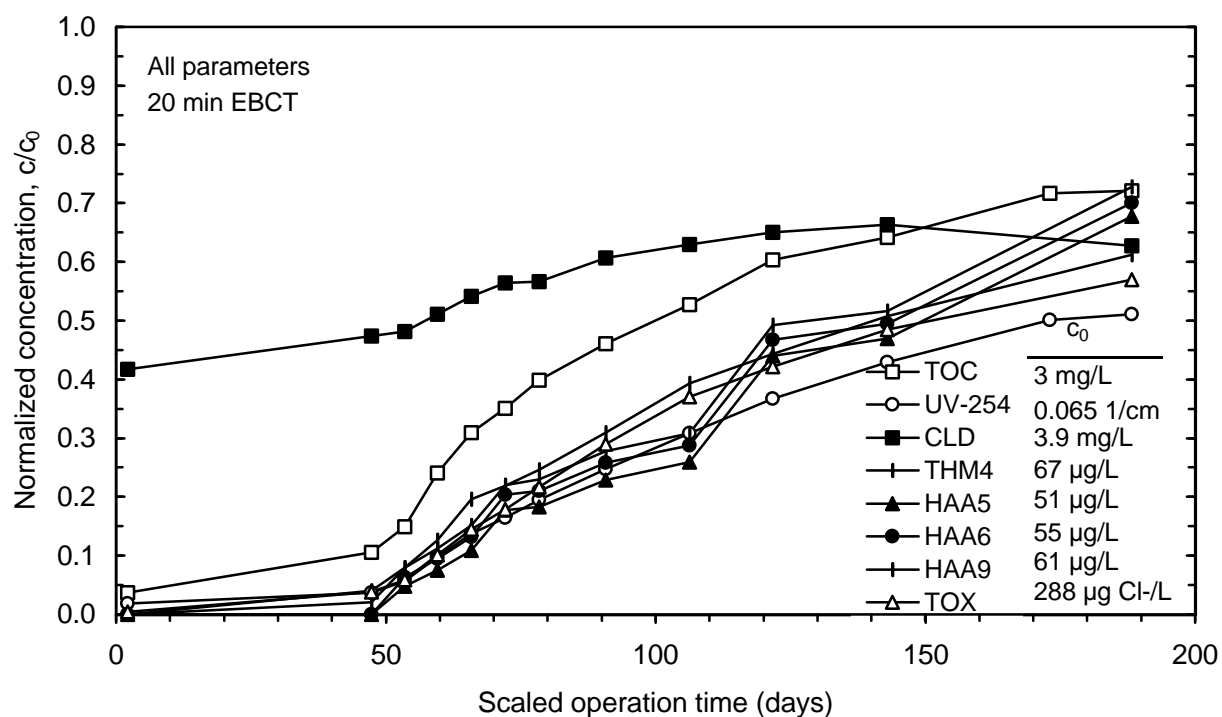
**Figure 218 Normalized breakthrough patterns (10 minute EBCT) during session 1, March**



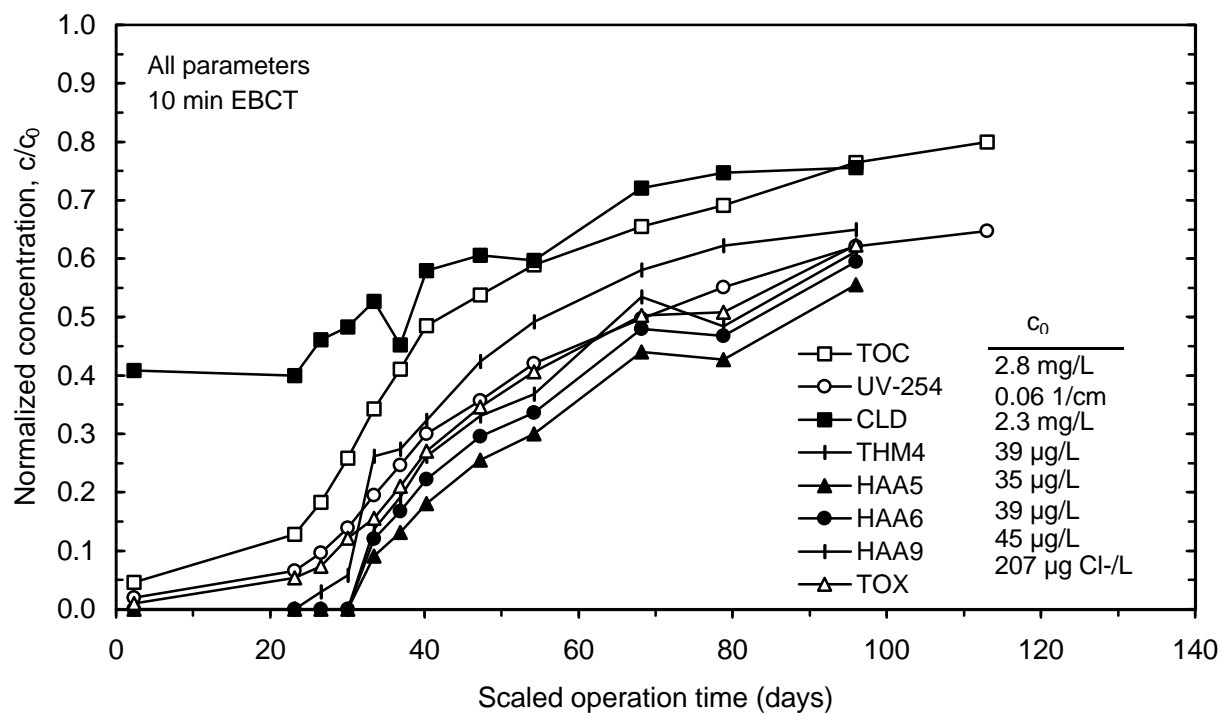
**Figure 219 Normalized breakthrough patterns (20 minute EBCT) during session 1, March**



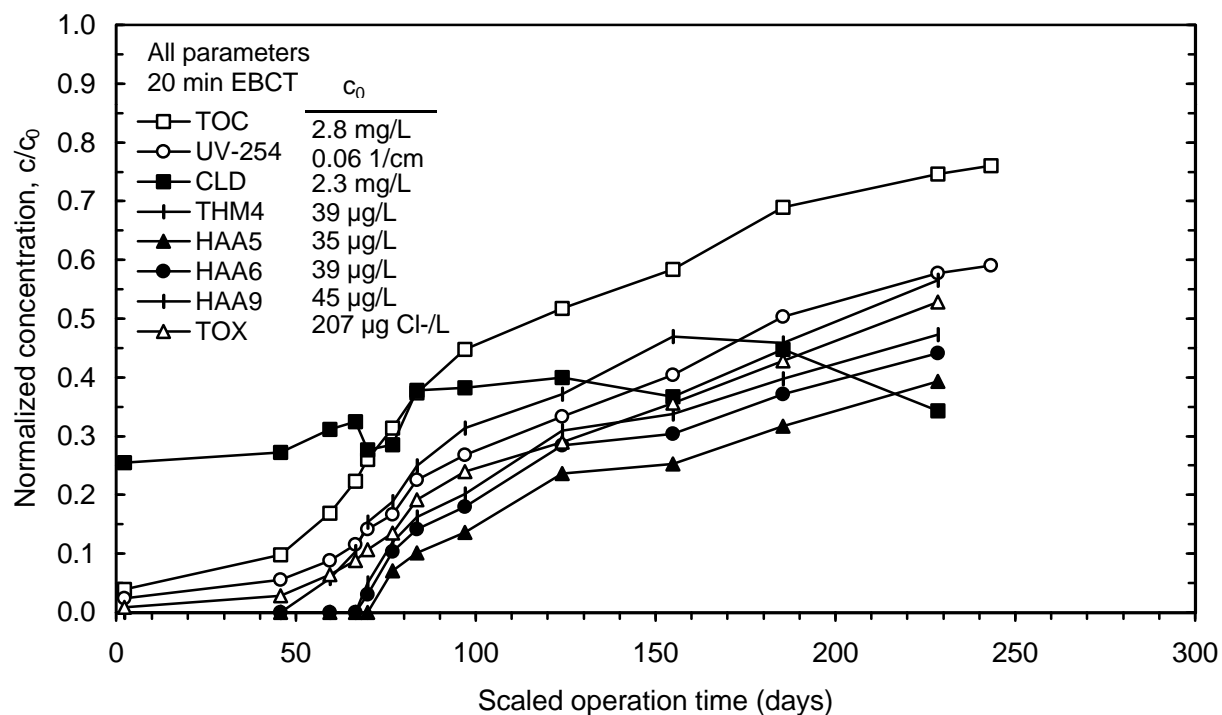
**Figure 220 Normalized breakthrough patterns (10 minute EBCT) during session 2, September**



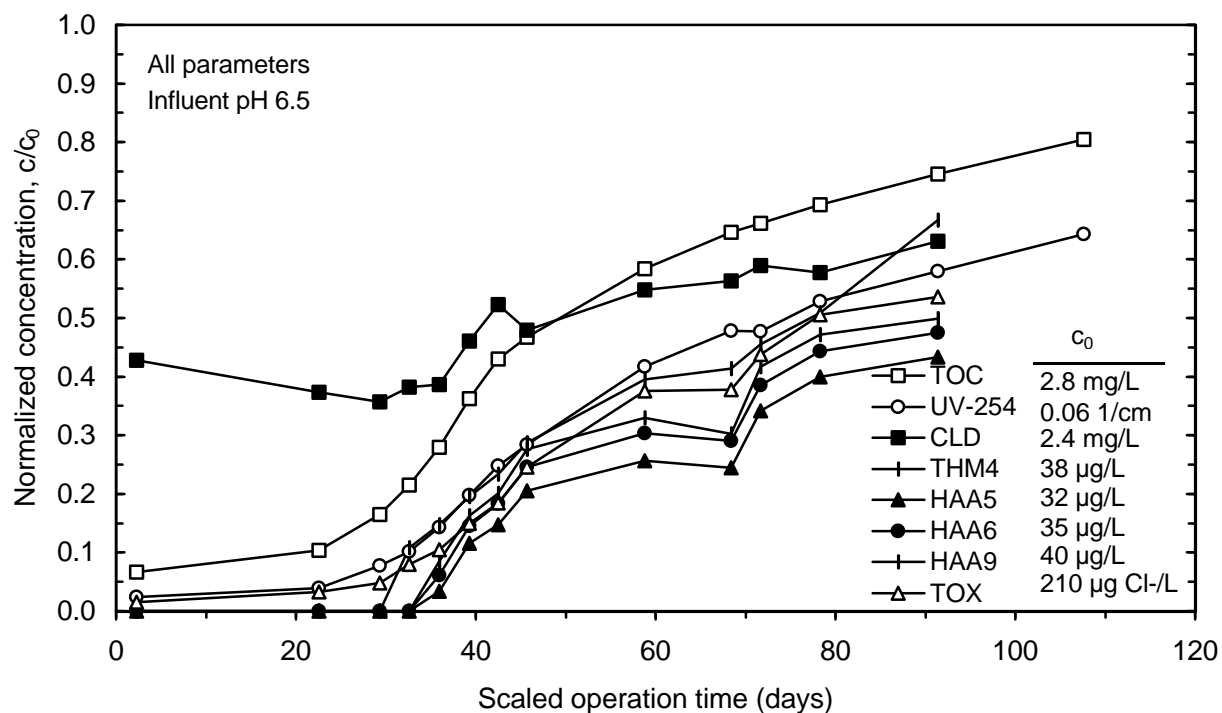
**Figure 221 Normalized breakthrough patterns (20 minute EBCT) during session 2, September**



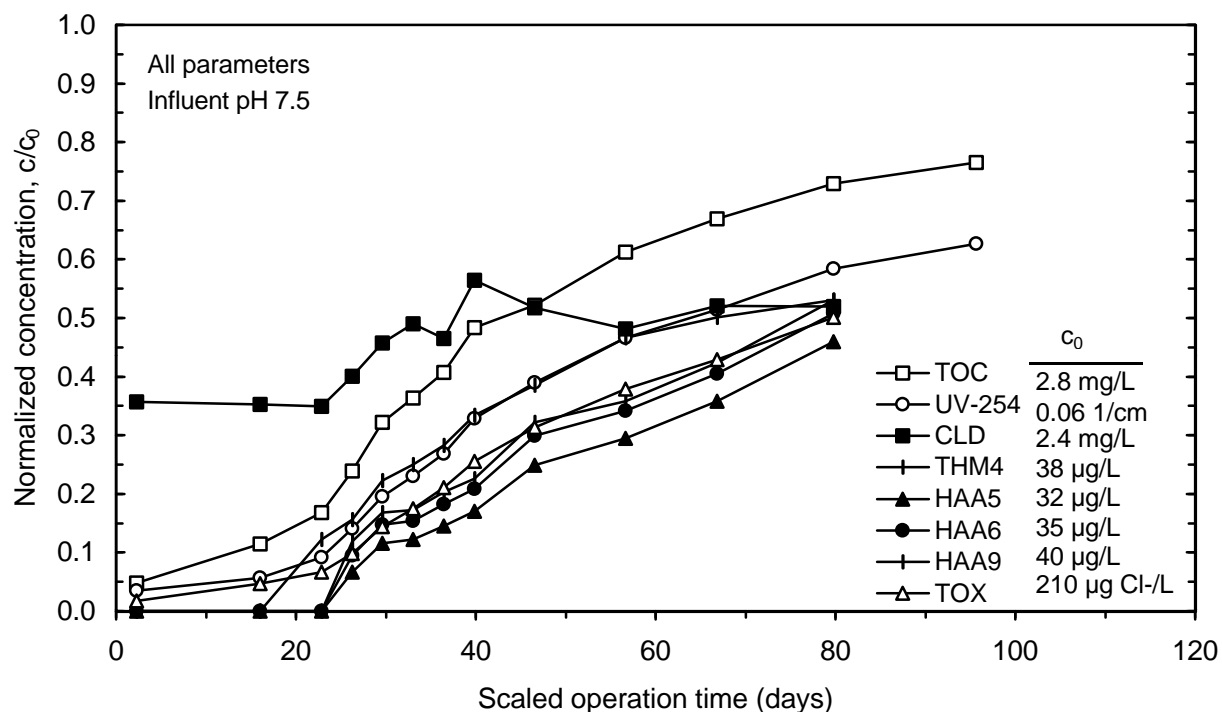
**Figure 222 Normalized breakthrough patterns (10 minute EBCT) during session 3, November**



**Figure 223 Normalized breakthrough patterns (20 minute EBCT) during session 3, November**



**Figure 224 Normalized breakthrough patterns (influent pH 6.5, 10 min EBCT) during session 4, November-inf pH study**



**Figure 225 Normalized breakthrough patterns (influent pH 7.5, 10 min EBCT) during session 4, November-inf pH study**



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# *13*

## *TOC-DBP and UV<sub>254</sub>-DBP Relationships*

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## 13 TOC-DBP and UV<sub>254</sub>-DBP Relationships

Paired concentration plots of GAC effluent SDS-THM4, SDS-HAA5, SDS-HAA6, SDS-HAA9, and SDS-TOX against GAC effluent TOC and UV<sub>254</sub> were generated on a concentration and on a normalized (percent breakthrough) basis. These plots are summarized in Figures 226 through 229. Both EBCTs evaluated and all sessions are presented on the same plots. In general, TOC and UV<sub>254</sub> served as good predictors of GAC effluent DBP formation regardless of season, EBCT, or influent pH. The graphs summarized in Figure 226 show that the correlation between TOC and SDS-THM4 during the September session yielded higher levels of formed THM4 per mg TOC than the runs performed during March and November. The March session (with the lowest incubation temperature and shorter incubation time) yielded the lowest concentration of formed SDS-THM4 per mg TOC. Although there is more scatter in the data, the relationship between TOC and SDS-HAA formation also shows higher formed HAA per mg TOC during the September session, and lower levels during the March session. This trend is again evident with SDS-TOX. Similar results were observed for the correlations between UV<sub>254</sub> and SDS-DBPs, shown in Figure 227.

In the paired normalized concentration data plots shown in Figures 228 and 229, a line with a slope of 1 and y-intercept of 0 is also plotted. The general trend of the data in comparison to this line indicates whether the percent breakthrough of the surrogate parameter (TOC or UV<sub>254</sub>) directly predicts the percent breakthrough of the formed DBP (data falls on the line), serves as a conservative indicator of the formed DBP breakthrough (data falls below the line), or under predicts the breakthrough of the formed DBP (data falls above the line). As shown in Figure 228, TOC under predicted normalized SDS-THM4 breakthrough. However, TOC served as a conservative predictor of SDS-THM4, SDS-HAA, and SDS-TOX, except for SDS-HAA during the March session. Normalized UV<sub>254</sub> served as a direct predictor of normalized SDS-THM4 and SDS-TOX (Figure 229) regardless of season, EBCT, or influent pH.

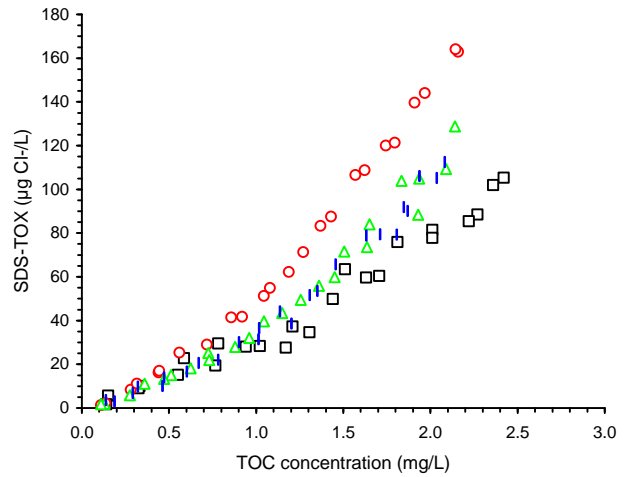
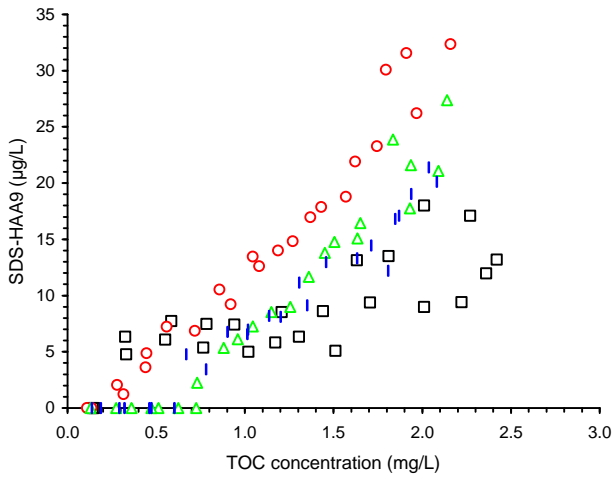
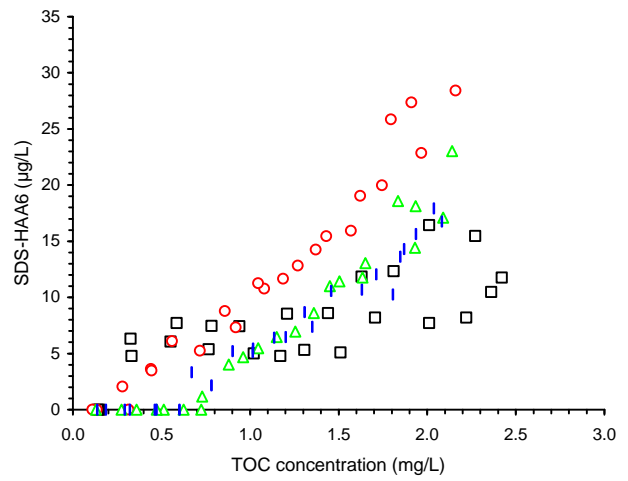
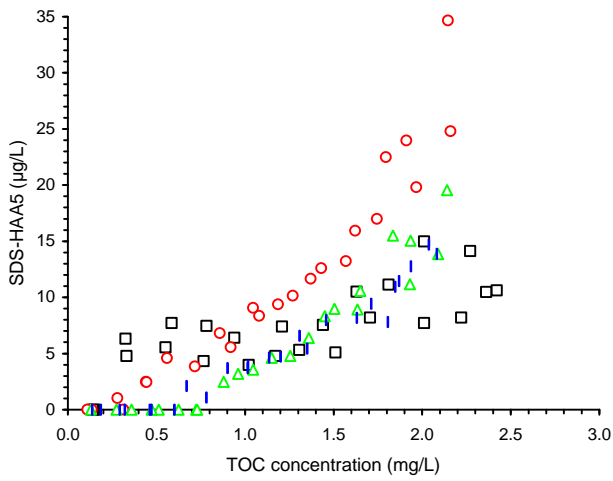
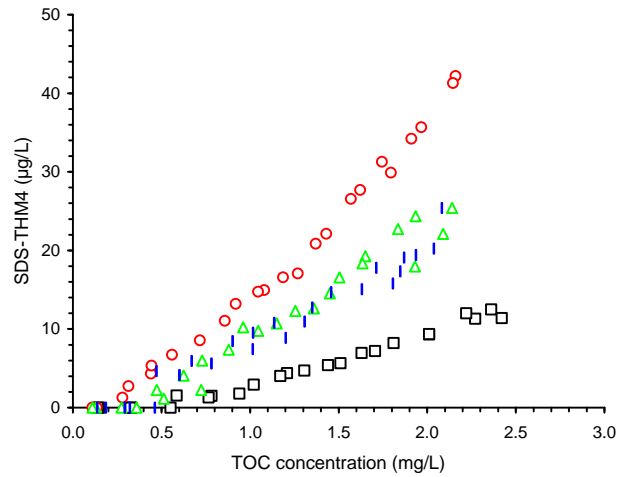
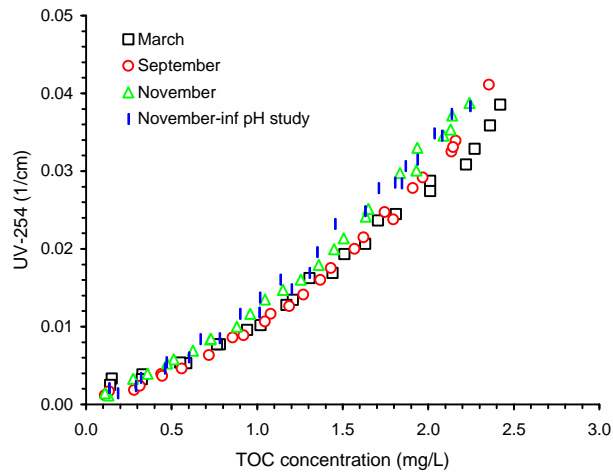


Figure 226 Correlation based on GAC effluent TOC concentration for both 10 and 20 minute EBCT contactors and all sessions

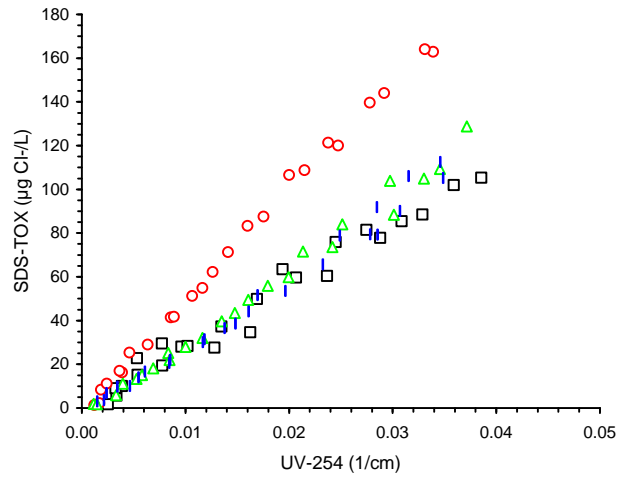
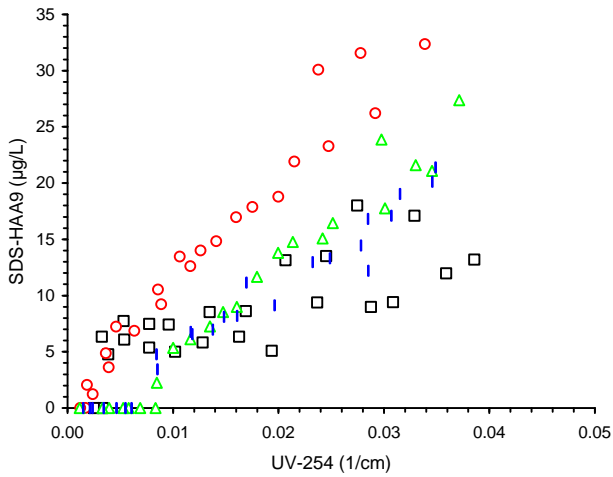
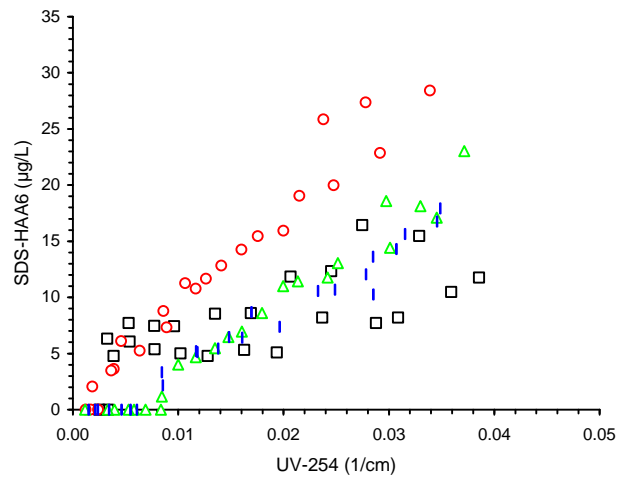
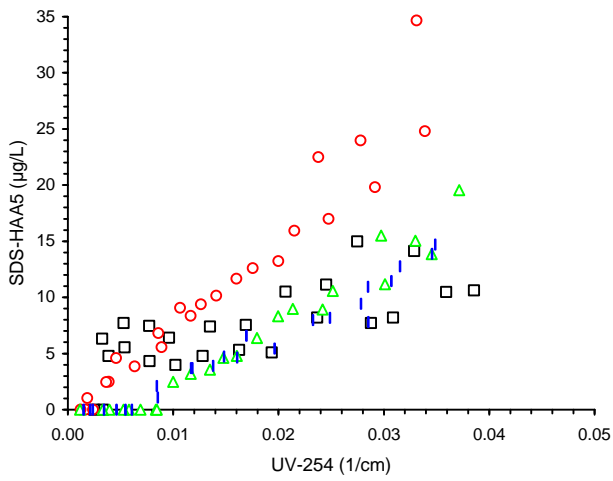
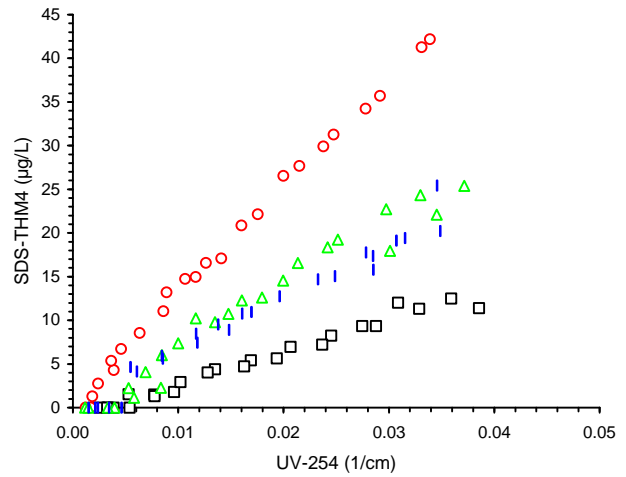
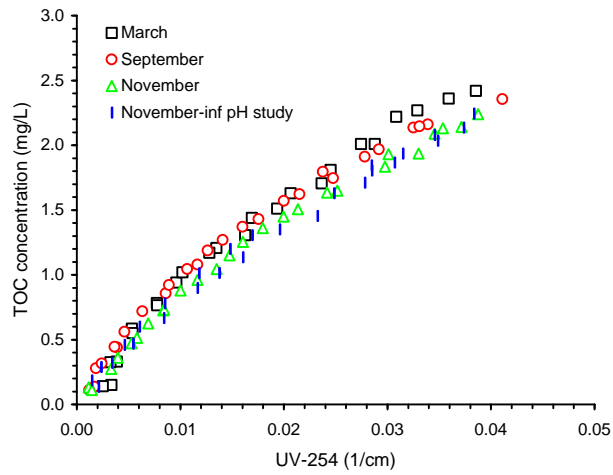
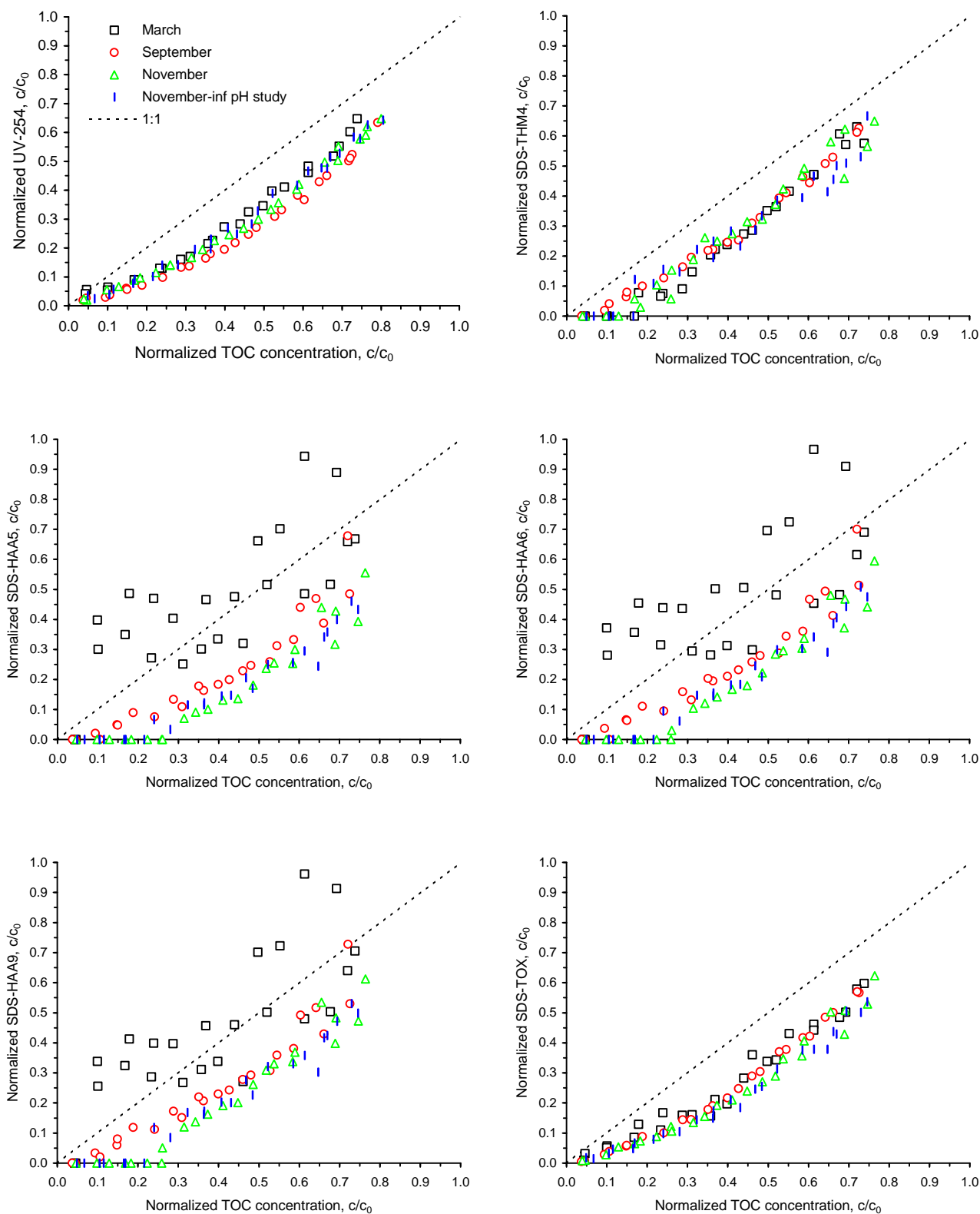


Figure 227 Correlation based on GAC effluent UV-254 for both 10 and 20 minute EBCT contactors and all sessions



**Figure 228** Correlation based on normalized GAC effluent TOC concentration for both 10 and 20 minute EBCT contactors and all ses

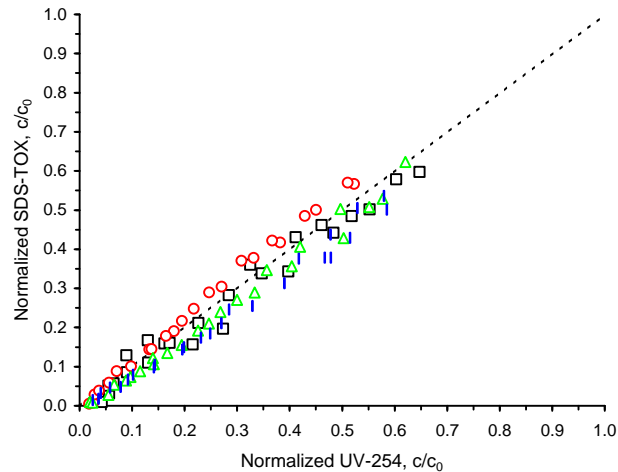
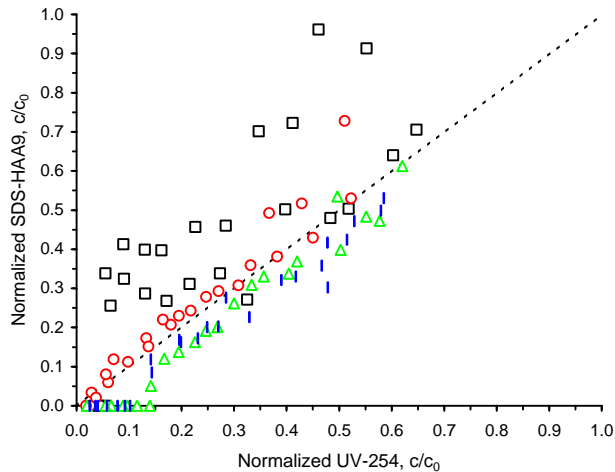
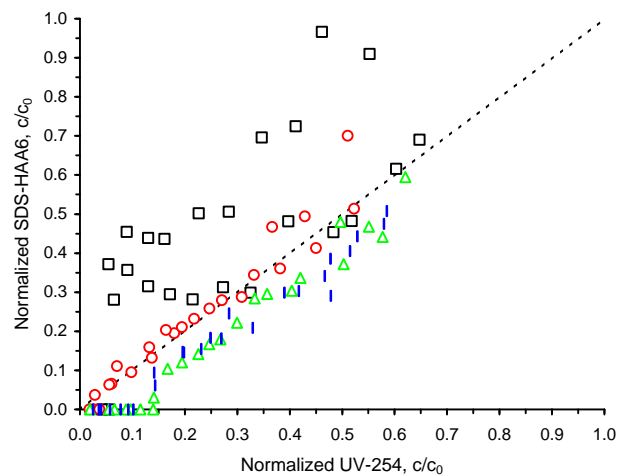
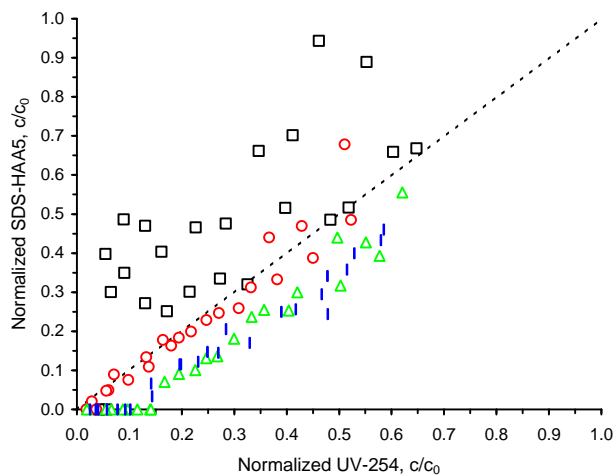
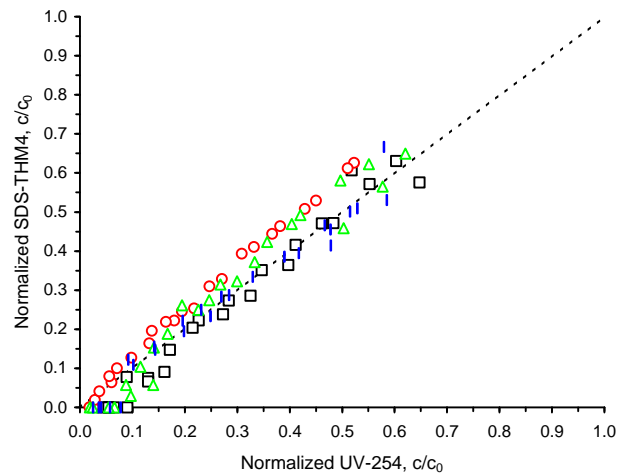
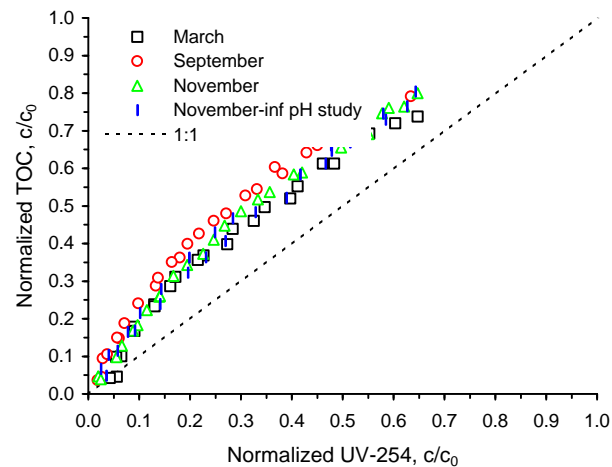


Figure 229 Correlation based on normalized GAC effluent UV-254 for both 10 and 20 minute EBCT contactors and all sessions

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# *14*

## *TOC Breakthrough Performance Evaluation*

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## 14 TOC Breakthrough Performance Evaluation

Based on a correlation that relates influent TOC concentration to bed volumes to 50 percent TOC breakthrough,  $BV_{50}$  (Summers et al. 1994; Hooper et al. 1996), the GAC performance of the East River Station water source pretreatment can be evaluated. The correlation is given by the following equation:

$$BV_{50} = \frac{18,000}{TOC_0} \quad (9)$$

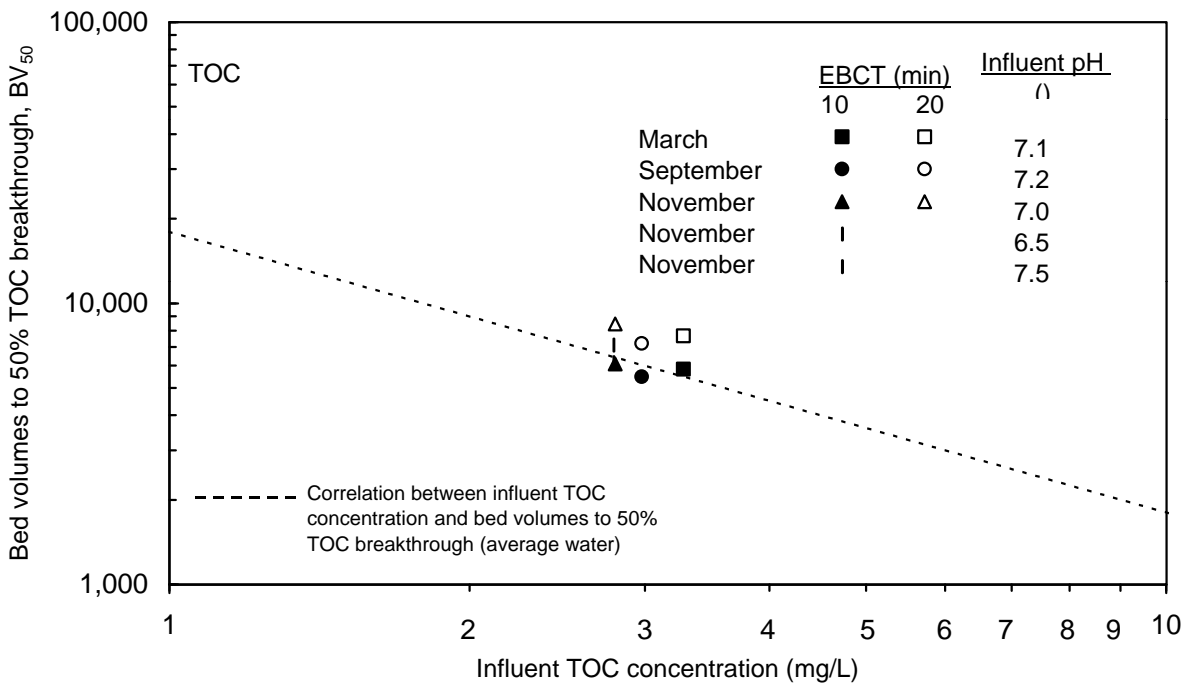
where  $TOC_0$  is the mean influent TOC concentration, in mg/L. For all EBCTs and quarters evaluated, the  $BV_{50}$  obtained during each run was plotted in Figure 230. The performance of an average water is given by the dashed line, which represents Equation 9. Figure 230 shows that in general, GAC performance was close to that predicted by Equation 9.

For the three seasonal sessions, the  $BV_{50}$  value ranged from 5,480 to 6,080 bed volumes for the 10 minute EBCT contactors. Based on the influent TOC concentrations of each session, the performance based on  $BV_{50}$  was well predicted by Equation 9, on average 3 percent below that predicted by Equation 9. The September and November runs performed slightly poorer than expected, by 9 and 5 percent, respectively, while the March run performed slightly better (6 percent) than expected.

For the 20 minute EBCT contactor runs the  $BV_{50}$  ranged from 7,200 to 8,440 bed volumes during the three seasonal sessions. Therefore, the run times were an average 30 percent higher than that expected, based on the correlation between influent TOC and  $BV_{50}$ . The performance for the 20 minute EBCT runs ranged between 19 to 40 percent better than expected.

GAC performance improved with decreasing pH. At a 10 minute EBCT, the  $BV_{50}$  value improved with decreasing influent pH, from 5 percent below to 10 percent above the expected  $BV_{50}$ , as the influent pH was decreased from 7.5 to 6.5.





**Figure 230 Comparison between GAC performance during treatment study testing and average water GAC performance**

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# *15*

## *Cost Information and Analysis*

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## 15 Cost Information and Analysis

A comparative cost analysis was performed based on the data obtained during the treatment study using an EPA cost model (Clark and Adams, 1991). The cost analysis was performed with and without the cost of on-site spent carbon reactivation. Costs were evaluated using steel pressure contactors and were determined in cents/1,000 gal for both capital and operations and maintenance (O&M) costs. Based on the maximum plant capacity of 30 MGD 12 steel pressure contactors were required (20 ft diameter; 314 ft<sup>2</sup>). Hydraulic loading at plant capacity is 5.9 gpm/ft<sup>2</sup>. Plant production varies throughout the year, and the average production during 1998, 17.8 MGD, was used for modeling purposes. Hydraulic loading under average plant flow conditions ranged from 3.5 gpm/ft<sup>2</sup>. The economic input data to the model are summarized in Table 56.

On-site GAC reactivation was initially assumed for cost modeling. An average reactivation cost was determined based on reactivation by fluidized bed, infrared, and multihearth technologies. Total costs reflect an average of reactivation costs by the three technologies: individual costs for each reactivation technology are not reported.

The cost model sizes the contactors based on the plant capacity flow. The EBCT input into the model is the EBCT under plant capacity conditions. Therefore, under average flow conditions, the EBCT in each contactor will be higher, leading to longer intervals between GAC reactivation and lower O&M costs, and the costs reported here are conservative estimates.

The estimated capital costs are based on the economic input values, EBCT, and spent carbon reactivation demand. A cost of 80 cents/lb GAC was assumed. The O&M costs are determined based on the service life of each contactor. Based on effluent blending and extrapolation procedures, the placeholders for Stage 2 DBP MCLs were only exceeded during the September session. For the remaining sessions, the maximum run time (including extrapolation) was utilized to estimate costs. Table 57 summarizes the run times used as input to the cost model.

Table 58 summarizes the GAC cost analysis results including on-site spent carbon reactivation. Capital, O&M, and total costs, given in cents/1,000 gal water treated, are included for all runs. Seasonal variability in water quality had some impact on total costs as is seen by the variability in total costs. For example, total costs for 10 minute EBCT contactors ranged from 46 to 53 cents/1,000 gal. Costs were highest based on the September session data, and lowest based on the November session data.

In general, the costs for GAC treatment were lower for 10 minute EBCT contactors, mainly due to the lower capital costs associated with the smaller contactors. The decrease in O&M costs achieved with 20 minute EBCT contactors did not offset the higher capital costs. Total costs for 20 minute EBCT contactors were on average 36 percent higher than those for 10 minute EBCT contactors. Table 59 summarizes the cost of GAC treatment not including the cost of GAC replacement.

During the November session, three 10 minute EBCT contactors were operated at varying influent pH levels (6.5, 7.0, 7.5) to determine the effect of influent pH in this range on GAC

performance. The cost analysis results, summarized in Tables 58 and 59, show very little impact of influent pH on total costs. Total costs based on the three runs ranged from 46 to 48 cents/1,000 gal.

A bar graph comparing GAC treatment costs for both EBCTs evaluated, including on-site reactivation, is shown in Figure 231. The error bars shown represent the standard deviation calculated from the costs of each session. A bar graph summary of the cost analysis results for the influent pH study is shown in Figure 232. These data also include on-site carbon reactivation. The total costs estimated based on the pH study results ranged from 46 to 48 cents/1,000 gal, showing that based on the results obtained and the cost model used, GAC influent pH ranging between 6.5 and 7.5 will have a small effect on total costs of GAC treatment. The cost analysis results for which GAC replacement costs were not included are shown in Figures 233 and 234.

Parameter	Value
Capital recovery interest rate (%)	9.2
Capital recovery period (years)	27
Overhead & profit factor (% of construction costs)	15
Special sitework factor (% of construction costs)	7.5
Construction contingencies (% of construction costs)	5
Engineering fee factor (% of construction costs)	15
ENR construction cost index (CCI base year 1913) and date	6,006 (May 1999)
Producers Price Index (PPI base year 1967=100) and date	371 (April 1999)
Labor rate + fringe (\$/manhour)	28.7
Labor overhead factor (% of labor)	58.6
Electric rate (\$/kWh)	0.470
Fuel oil rate (\$/gallon)	0.70
Natural gas rate (\$/cu.ft.)	0.2875
Process water rate (\$/1,000 gal)	0.1832
Modifications to existing plant (% of construction cost)	15

**Table 56 Economic input data to cost model**

Session	Influent pH	EBCT (min)	Run time (days) for contact configuration	
			Single	Multiple (more than 10)
March	7.1	10	*	225#
	7.1	20	*	571#
September	7.2	10	51	113†
	7.2	20	132	287†
November	7.0	10	*	240#
	7.0	20	*	571#
November (Influent pH study)	6.5	10	*	229#
	7.5	10	*	199#

\*Did not exceed run time criteria during run

#Did not exceed run time criteria during breakthrough curve extrapolation; maximum run time value used

†Run time estimate based on breakthrough curve extrapolation

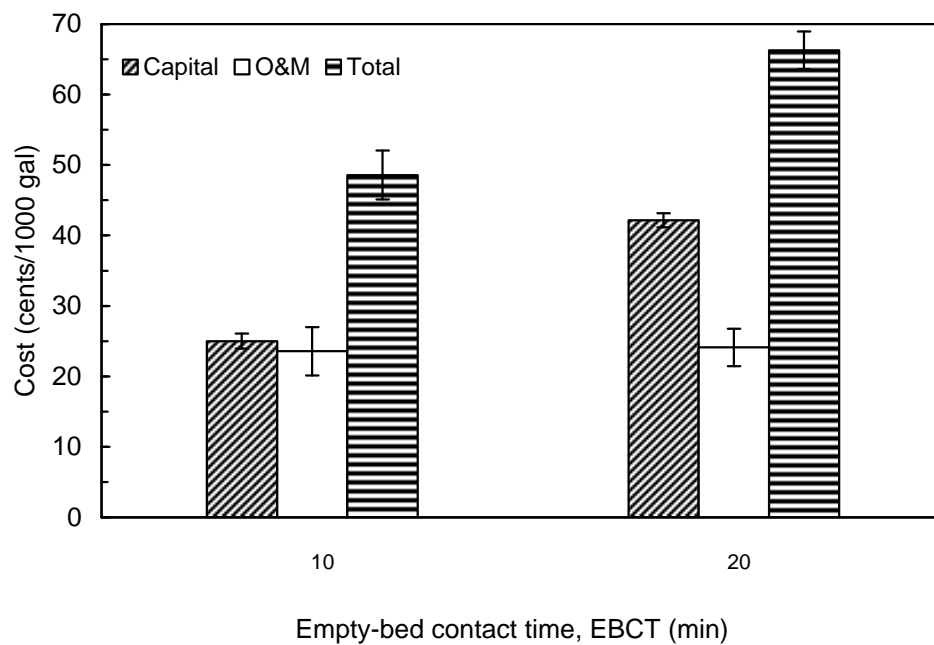
**Table 57 Summary of GAC run times used to estimate GAC treatment costs**

Session	Influent pH	EBCT (min)	Cost (cents/1,000 gal)		
			Capital	O&M	Total
March	7.1	10	25	22	47
	7.1	20	42	23	65
September	7.2	10	26	27	53
	7.2	20	43	27	69
November	7.0	10	25	22	46
	7.0	20	42	23	65
November (Influent pH study)	6.5	10	25	22	47
	7.5	10	25	23	48

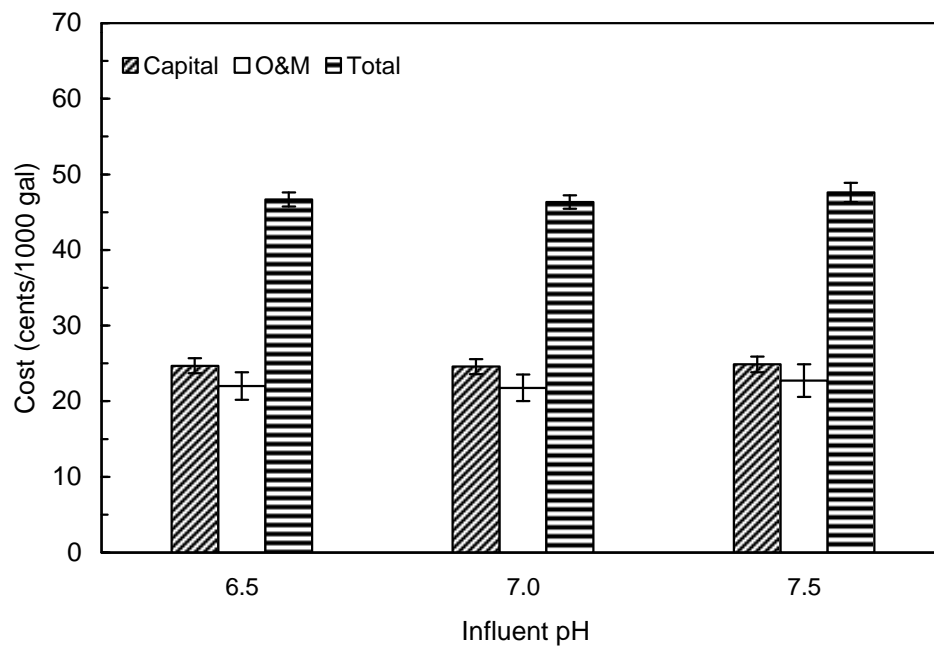
**Table 58 Summary of GAC adsorption costs including on-site reactivation**

Session	Influent pH	EBCT (min)	Cost (cents/1,000 gal)		
			Capital	O&M	Total
March	7.1	10	20	15	34
	7.1	20	37	16	53
September	7.2	10	20	16	35
	7.2	20	37	17	54
November	7.0	10	20	15	34
	7.0	20	37	16	53
November (Influent pH study)	6.5	10	20	15	34
	7.5	10	20	15	34

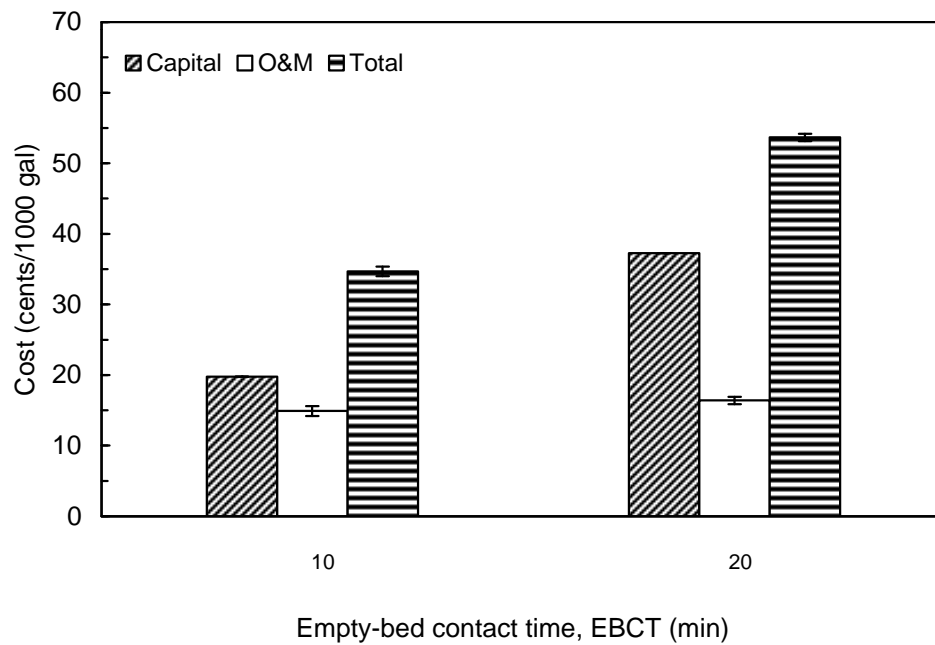
**Table 59 Summary of GAC adsorption costs (not including GAC replacement costs)**



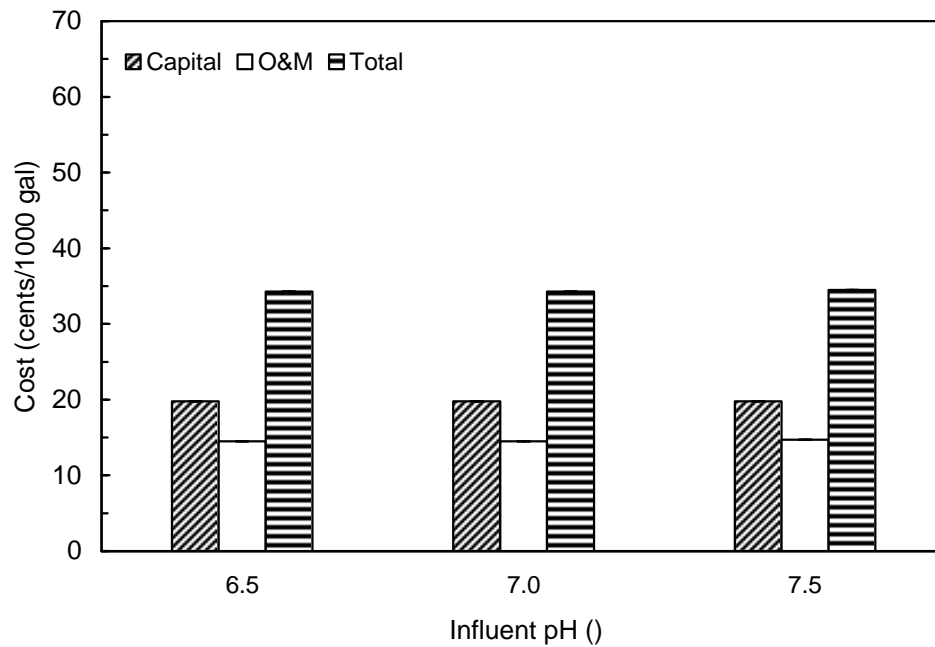
**Figure 231 Average costs for GAC adsorption with steel pressure contactors and on-site reactivation**



**Figure 232 Impact of pH on costs for GAC adsorption with steel pressure contactors and on-site reactivation during the November session**



**Figure 233 Average costs for GAC adsorption with steel pressure contactors (not including GAC replacement costs)**



**Figure 234 Impact of pH on costs for GAC adsorption with steel pressure contactors during the November session (not including reactivation costs)**



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# *16*

## *Summary of Significant Results*

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## 16 Summary of Significant Results

GAC reactivation frequency is typically based on compliance with Stage 1 or the placeholders for Stage 2 DBP MCLs. During this study, only two of the eight contactors operated exceeded the placeholders for Stage 2 DBP MCL. For these runs, (September session 10 and 20 minute EBCT contactors) the THM4 MCL was exceeded after 51 and 132 full-scale equivalent days of operation. In practice, multiple contactors are operated in staggered fashion and their effluents are blended prior to chlorination. Therefore, run times to a given effluent criterion are extended as compared to a single contactor, because the poorer quality water from older contactors is blended with water from new contactors. Based on this configuration, the placeholders for Stage 2 DBP MCL were exceeded during only two runs, even after an extrapolation procedure was applied. For the runs that did not exceed the placeholder for Stage 2 DBP MCL, the maximum extrapolated run time ranged from 6.5 to 7.9 months for the 10 minute EBCT contactors, and was 19 months for the 20 minute EBCT contactors.

The total costs for GAC treatment was estimated using an EPA model, which included capital and O&M costs, based on GAC reactivation frequencies. For 10 minute EBCT contactors, the estimate for total costs for GAC treatment, including on-site reactivation, averaged 49 cents/1,000 gal for steel pressure contactors. For 20 minute EBCT contactors, total costs averaged 66 cents/1,000 gal steel pressure contactors. The costs for 20 minute EBCT contactors were higher due to the higher capital costs associated with the larger contactors.

Influent TOC concentration varied from 2.8 to 3.3 mg/L during the three sessions evaluated for seasonal variability, and bromide concentration varied from BMRL to 34 µg/L. GAC treatment does not remove bromide, while TOC is adsorbed, resulting in higher GAC effluent bromide to TOC ratios as compared to the GAC influent. Due to this increase, GAC effluent formed DBPs may undergo shifts in speciation to higher concentrations of the more brominated DBP species. In some cases, such as for bromodichloromethane, effluent concentrations were measured higher than influent levels. It is important to track the breakthrough behavior of specific DBP species, because some may be of potential health concern and a MCL could be set for a specific DBP species.

For the 10 minute EBCT contactors, mean GAC performance based on BV<sub>50</sub> values was only slightly below that expected for an average water: BV<sub>50</sub> values ranged from 9 percent poorer than expected to 6 percent better than expected. For the 20 minute EBCT contactors, BV<sub>50</sub> values averaged 30 percent higher than expected.

By plotting effluent concentrations divided by their respective influent concentrations, a normalized breakthrough evaluation can be performed. This evaluation yields insight into the relative breakthrough patterns of TOC, UV<sub>254</sub>, and SDS-DBPs, indicating whether DBP surrogates can serve as direct or conservative indicators of SDS-DBP breakthrough. The evaluation performed during this study showed that TOC usually served as a conservative indicator of SDS-DBP breakthrough. During the March session only, normalized SDS-HAA breakthrough occurred earlier than normalized TOC breakthrough. During all sessions, TOC served as a conservative indicator for SDS-THM4 and SDS-TOX breakthrough. UV<sub>254</sub> typically served as an excellent direct indicator of SDS-TOX breakthrough.

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# *17*

*QA/QC Summary*

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## 17 QA/QC Summary

All analyses performed during the treatment study followed the methods and QA/QC procedures required by the *DBP/ICR Analytical Methods Manual*. A summary of the data analyzed during this treatment study and all the required QA/QC information is summarized in electronic form in portable document format at the end of this report. The EPA has requested that the results of laboratory duplicate analyses, laboratory fortified matrix spike analyses, and any performance evaluation (PE) analyses be reported in the *Treatment Study Summary Report Spreadsheet*, an electronic Excel workbook supplied by EPA. The required data has been input into this file, and an electronic version of it is included at the end of this report.

As required by the ICR, three field duplicates were collected from each RSSCT. The results of the duplicate analyses are summarized in Table 60.

### 17.1 Calibration Procedures

Calibration procedures for bromide, haloacetic acids, total organic carbon, total organic halide, and trihalomethanes analyzed during this study are summarized in the following sections.

#### 17.1.1 Bromide (EPA Method 300.0 A)

Five calibration standards and a blank are prepared by adding accurately measured volumes of ICR stock standard to volumetric flask and diluting to volume with reagent water. The calibration standards range from 0.02 to 0.50 mg/L. Using a 200  $\mu$ L injection volume, the peak area responses against the concentration are tabulated and a linear curve is established. The calibration correlation coefficient must be equal to or greater than 0.995. After establishing the calibration the fourth calibration standard is analyzed. The recovery must be within 90-110 percent of the true value. Next a second source standard at the MID level is analyzed and the recovery must be within 90-110 percent of the true value prior to proceeding with ICR protocol.

#### 17.1.2 Haloacetic Acids (EPA Method 552.2)

An initial calibration curve is extracted and analyzed for each set of samples to be analyzed for haloacetic acids. The concentrations of each of the levels of aqueous calibration standards are given in Table 61.

Level 1 represents concentrations near the MDL for each analyte. The concentrations of the remaining levels define the working range of the detector. Levels 5 and 6 are specified by the *DBP/ICR Analytical Methods Manual* to be used as continuing calibration checks.

Each analysis run is started with a methyl tert-butyl ether (MtBE) solvent blank. This is a check on the extraction solvent as well as on the instrument system. If this run is acceptable, the extracts of the seven levels of the calibration curve are analyzed (2- $\mu$ L injection volume). The Chemstation Chromatography Software System is used to generate a calibration curve by

plotting the areas against the concentrations of the seven calibration extracts. The curve is defined as first order; correlation coefficients must be greater than 0.9900.

#### 17.1.3 Total Organic Carbon (Standard Method 5310 C)

The instrument calibration accuracy is verified daily by analysis of a 4.00 mg/L as carbon standard solution of potassium hydrogen phthalate. Recovery of the standard must be between 99 and 101 percent. When outside of this range, the slope of a linear regression between standard amount and area count and the origin is adjusted and the standard is reanalyzed to ensure a recovery between 99 and 101 percent. Calibration check standards and samples are then analyzed as described in the *DBP/ICR Analytical Methods Manual*.

#### 17.1.4 Total Organic Halide (Standard Method 5320 B)

An instrument calibration verification is performed yearly. The 2,4,6-trichlorophenol standard is injected directly onto the nitrate-washed method blank. Concentrations of 0.5, 1, 2.5, 5, 10, and 20 µg as Cl<sup>-</sup> are included in the curve. A first order curve with correlation coefficient greater than 0.99 must be obtained, and is only used to verify instrument performance.

At the beginning of each daily run, and after cell cleaning during the day, three NaCl injections of 5 µg as Cl<sup>-</sup> are made directly into the titration cell. This serves as a cell performance check. Recovery of the NaCl standard must be within 3 percent of the historic mean. Typically, recovery is 95 to 105 percent.

#### 17.1.5 Trihalomethanes (EPA Method 551.1)

An initial calibration curve is extracted and analyzed for each set of samples to be analyzed for trihalomethanes. The concentrations of each of the levels of aqueous calibration standards are given in Table 62.

Level 1 represents concentrations near the MDL for each analyte. The concentrations of the remaining levels define the working range of the detector. Levels 4 and 5 are specified by the *DBP/ICR Analytical Methods Manual* to be used as continuing calibration checks.

Each analysis run is started with a MtBE solvent blank. This is a check on the extraction solvent as well as on the instrument system. If this run is acceptable, the extracts of the six levels of the calibration curve are analyzed (2.0-µL injection volume). The Chemstation Chromatography Software System is used to generate a calibration curve by plotting the areas against the concentrations of the six calibration extracts. The curve is defined as first order; correlation coefficients must be greater than 0.99.

Analyte	Count	Mean RPD	Percentiles		
			25th	50th	75th
TOC	24	1.5	0.6	0.8	1.5
UV-254	24	1.2	0.2	0.7	1.5
pH	24	0.4	0.3	0.4	0.6
Temperature	24	0.3	0.0	0.0	0.4
SDS-TOX	24	5.3	0.7	2.9	5.9
SDS-THM4	23	12.4	2.0	3.5	5.6
SDS-HAA5	22	10.5	5.7	9.2	17.1
SDS-HAA6	22	10.7	4.5	9.5	16.8
SDS-HAA9	22	10.8	3.4	10.9	17.6
SDS-chlorine residual	24	6.1	1.2	2.5	7.9
<b><i>THM Species</i></b>					
SDS-CHCl <sub>3</sub>	21	5.1	2.3	3.5	7.9
SDS-BDCM	18	15.3	3.1	3.8	5.3
SDS-DBCM	22	12.9	2.6	3.3	6.4
SDS-CHBr <sub>3</sub>	0	NA	NA	NA	NA
<b><i>HAA Species</i></b>					
SDS-MCAA	0	NA	NA	NA	NA
SDS-DCAA	22	7.6	3.6	6.3	9.2
SDS-TCAA	19	13.2	7.2	11.1	20.1
SDS-MBAA	0	NA	NA	NA	NA
SDS-DBAA	9	50.1	1.9	7.2	19.4
SDS-BCAA	19	17.4	3.5	5.7	9.2
SDS-TBAA	0	NA	NA	NA	NA
SDS-CDBAA	0	NA	NA	NA	NA
SDS-DCBAA	19	12.1	3.4	7.9	17.4

RPD: relative percent difference

NA: not applicable

**Table 60 Summary of field duplicate precision for all runs**

Level	Concentration (µg/L)
1	0.5
2	1.0
3	2.0
4	4.0
5	20.
6	40.
7	80.

**Table 61 Haloacetic acid aqueous calibration standard concentrations (EPA Method 552.2)**

Level	Concentration (µg/L)
1	0.5
2	1.0
3	5.0
4	20.
5	40.
6	80.

**Table 62 Trihalomethane aqueous calibration standard concentrations (EPA Method 551.1)**

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# *18*

## *References*



## 18 References

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*Appendix: Summary of  
Treatment Study Data*

# Summers & Hooper, Inc.

## RSSCT Sampling Summary Report

Study title: ICR RSSCT #1

Client: Iowa-American Water Company Study#: 96

												SDS Chlorination Conditions*											
No.	Sample ID	Client Sample ID	Start Date/Time		End Date/Time		Stop T	Run L	F-S L	TOC	UV254	Temp	pH	Dose	Res.	Dem	Temp	pH	Time	Alk.	Hard-Tot	Hard-CA	Turb.
							(days)	(days)	(days)	(mg/L)	(1/cm)	(°C)		(mg/L)	(mg/L)	(mg/L)	(°C)		hrs	(mg/L)	(mg/L as CaCO3)		(ntu)
Effluent C		EBCT: 10 min		Carbon Type: Bituminous				Influent pH: 7.07		Scaling Factor: 13.5													
1	9803-176	96.10.Eff-1	3/17/98	14:16	3/17/98	22:32		0.21	3	0.15	0.003	21.6	7.4	1.93	0.68	1.25	6.9	7.44	2.9				
2	9803-194	96.10.Eff-6d	3/18/98	19:22	3/18/98	23:37		1.34	18	0.33	0.004	22.7	7.7	1.96	0.75	1.21	6.9	7.41	3.0				
3	9803-196	96.10.Eff-8	3/19/98	3:54	3/19/98	8:13		1.70	23	0.58	0.005	21.3	7.7	2.01	0.72	1.29	6.9	7.33	3.0				
4	9803-203	96.10.Eff-9	3/19/98	8:13	3/19/98	12:23		1.88	25	0.79	0.008	22.4	7.7	2.04	0.72	1.32	6.9	7.33	3.0				
4d	9803-204	96.10.Eff-9d	3/19/98	8:13	3/19/98	12:23		1.88	25	0.78	0.008	22.5	7.7	2.04	0.71	1.33	6.9	7.34	3.0				
5	9803-205	96.10.Eff-10	3/19/98	12:23	3/19/98	14:43		2.01	27	0.94	0.010	23.4	7.7	2.07	0.72	1.35	6.9	7.36	3.1				
6	9803-209	96.10.Eff-12	3/19/98	18:43	3/19/98	22:52		2.31	31	1.21	0.014	23.3	7.7	2.22	0.79	1.43	6.8	7.34	3.2				
6d	9803-210	96.10.Eff-12d	3/19/98	18:43	3/19/98	22:52		2.31	31	1.21	0.013	23.3	7.7	2.22	0.80	1.42	6.8	7.36	3.3				
7	9803-212	96.10.Eff-14	3/20/98	3:03	3/20/98	7:14		2.66	36	1.44	0.017	21.1	7.7	2.28	0.82	1.46	6.8	7.34	3.3				
8	9803-225	96.10.Eff-16	3/20/98	11:28	3/20/98	13:52		2.98	40	1.63	0.021	22.0	7.7	2.33	0.81	1.52	6.8	7.37	3.3				
9	9803-231	96.10.Eff-19	3/20/98	22:09	3/21/98	2:20		3.46	47	1.81	0.025	21.1	7.7	2.38	0.81	1.57	6.8	7.36	3.3				
10	9803-246	96.10.Eff-22	3/21/98	10:44	3/21/98	14:52		3.98	54	2.01	0.027	21.6	7.7	2.43	0.88	1.55	6.8	7.34	3.3				
11	9803-261	96.10.Eff-26	3/22/98	9:10	3/22/98	13:21		4.92	66	2.28	0.033	22.0	7.7	2.50	0.83	1.67	6.8	7.34	3.3				
11d	9803-262	96.10.Eff-26d	3/22/98	9:10	3/22/98	13:21		4.92	66	2.26	0.033	22.0	7.7	2.49	0.81	1.68	6.8	7.36	3.4				
12	9803-278	96.10.Eff-30	3/24/98	3:08	3/24/98	7:22		6.67	90	2.42	0.039	21.1	7.6	2.43	0.66	1.77	4.9	7.29	3.1				
13	9803-289	96.10.Eff-31	3/25/98	6:55	3/25/98	9:14		7.78	105	2.55		21.5	7.8										
Effluent C		EBCT: 20 min		Carbon Type: Bituminous				Influent pH: 7.07		Scaling Factor: 13.5													
1	9803-175	96.20.Eff-1	3/17/98	14:16	3/17/98	19:44	0.00	0.15	2	0.14	0.003	22.5	8.1	1.93	0.66	1.27	6.9	7.42	3.1				
2	9803-240	96.20.Eff-9	3/21/98	3:39	3/21/98	8:23	0.00	3.69	50	0.32	0.003	21.6	7.7	1.98	0.77	1.21	6.8	7.36	3.3				
3	9803-252	96.20.Eff-12	3/21/98	17:58	3/21/98	22:41	0.00	4.29	58	0.56	0.005	22.0	7.6	2.05	0.76	1.29	6.8	7.35	3.3				
3d	9803-253	96.20.Eff-12d	3/21/98	17:58	3/21/98	22:41	0.00	4.29	58	0.54	0.005	21.9	7.6	2.04	0.74	1.30	6.8	7.37	3.3				
4	9803-255	96.20.Eff-14	3/22/98	3:19	3/22/98	8:03	0.00	4.68	63	0.77	0.008	22.0	7.6	2.10	0.76	1.34	6.8	7.39	3.3				
5	9803-263	96.20.Eff-16	3/22/98	12:45	3/22/98	17:26	0.00	5.07	69	1.02	0.010	21.9	7.7	2.17	0.77	1.40	6.8	7.39	3.3				
6	9803-268	96.20.Eff-19	3/23/98	2:45	3/23/98	7:24	0.00	5.65	76	1.17	0.013	21.7	7.6	2.21	0.73	1.48	6.8	7.39	3.3				
7	9803-274	96.20.Eff-21	3/23/98	20:03	3/24/98	0:47	0.00	6.38	86	1.30	0.016	21.0	7.5	2.20	0.73	1.47	5.6	7.36	3.2				
7d	9803-275	96.20.Eff-21d	3/23/98	20:03	3/24/98	0:47	0.00	6.38	86	1.31	0.016	21.0	7.4	2.20	0.72	1.48	5.6	7.33	3.3				
8	9803-286	96.20.Eff-24	3/24/98	10:05	3/24/98	14:54	0.00	6.96	94	1.51	0.019	21.7	7.5	2.24	0.70	1.54	5.6	7.34	3.2				
9	9803-299	96.20.Eff-27	3/25/98	19:04	3/25/98	23:40	0.00	8.33	113	1.71	0.024	22.9	8.0	2.28	0.70	1.58	5.6	7.33	3.3				
10	9803-322	96.20.Eff-31	3/27/98	7:59	3/27/98	12:31	0.00	9.87	133	1.98	0.029	25.3	8.0	2.36	0.84	1.52	5.1	7.30	3.0				
10d	9803-323	96.20.Eff-31d	3/27/98	7:59	3/27/98	12:31	0.00	9.87	133	2.04	0.029	25.4	8.0	2.38	0.83	1.55	5.1	7.33	3.0				
11	9803-344	96.20.Eff-38	3/30/98	9:49	3/30/98	14:27	0.00	12.95	175	2.22	0.031	24.7	8.3	2.42	1.02	1.40	5.1	7.30	3.0				
12	9804-57	96.20.Eff-43	4/3/98	8:14	4/3/98	12:57	0.00	16.88	228	2.36	0.036	21.0	8.8	2.40	0.99	1.41	4.9	7.36	3.0				
13	9804-75	96.20.Eff-44	4/4/98	12:01	4/4/98	14:24	0.00	17.99	243	2.45		21.7	8.7										

# Summers & Hooper, Inc.

## RSSCT Sampling Summary Report

**Study title:** ICR RSSCT #1

**Client:** Iowa-American Water Company    **Study#:** 96

#	SamplesID	ClientSampleID	F-S L	TOC	TOX	Trihalomethanes (µg/L)					Haloacetic Acids (µg/L)										NH3-N	Brom
			(days)	(mg/L)	(µg Cl-/L)	CF	BDCM	DBCM	BF	TTHM	MCAA	DCAA	TCAA	MBAA	DBAA	BCAA	BDCAA	DBCAA	TBAA	HAA6	HAA9	(mg/L)
Effluent C		EBCT: 10 min	Carbon Type: Bituminous			Influent pH: 7.07					Scaling Factor: 13.5											
1	9803-176	96.10.Eff-1	3	0.15	6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2	9803-194	96.10.Eff-6d	18	0.33	10	ND	ND	ND	ND	ND	ND	5	ND	ND	ND	ND	ND	ND	ND	5	5	
3	9803-196	96.10.Eff-8	23	0.58	23	1.5	ND	ND	ND	1.5	ND	8	ND	ND	ND	ND	ND	ND	ND	8	8	
4	9803-203	96.10.Eff-9	25	0.79	36	1.4	ND	ND	ND	1.4	ND	8	ND	ND	ND	ND	ND	ND	ND	8	8	
4d	9803-204	96.10.Eff-9d	25	0.78	23	1.5	ND	ND	ND	1.5	ND	7	ND	ND	ND	ND	ND	ND	ND	7	7	
5	9803-205	96.10.Eff-10	27	0.94	28	1.8	ND	ND	ND	1.8	ND	6	ND	ND	ND	1	ND	ND	ND	7	7	
6	9803-209	96.10.Eff-12	31	1.21	37	3.0	ND	1.4	ND	4.4	ND	6	1	ND	ND	1	ND	ND	ND	8	8	
6d	9803-210	96.10.Eff-12d	31	1.21	37	2.9	ND	1.5	ND	4.4	ND	6	1	ND	ND	1	ND	ND	ND	9	9	
7	9803-212	96.10.Eff-14	36	1.44	50	3.6	ND	1.8	ND	5.4	ND	5	2	ND	ND	1	ND	ND	ND	9	9	
8	9803-225	96.10.Eff-16	40	1.63	60	4.8	ND	2.2	ND	7.0	ND	7	4	ND	ND	1	1	ND	ND	12	13	
9	9803-231	96.10.Eff-19	47	1.81	76	5.7	ND	2.5	ND	8.2	ND	6	5	ND	ND	1	1	ND	ND	12	14	
10	9803-246	96.10.Eff-22	54	2.01	81	6.6	ND	2.8	ND	9.3	ND	7	8	ND	ND	1	2	ND	ND	16	18	
11	9803-261	96.10.Eff-26	66	2.28	87	8.4	ND	3.0	ND	11.4	ND	8	8	ND	ND	1	2	ND	ND	17	19	
11d	9803-262	96.10.Eff-26d	66	2.26	90	8.2	ND	3.0	ND	11.2	ND	6	6	ND	ND	1	2	ND	ND	14	15	
12	9803-278	96.10.Eff-30	90	2.42	105	8.7	ND	2.7	ND	11.4	ND	5	6	ND	ND	1	1	ND	ND	12	13	
13	9803-289	96.10.Eff-31	105	2.55																		
Effluent C		EBCT: 20 min	Carbon Type: Bituminous			Influent pH: 7.07					Scaling Factor: 13.5											
1	9803-175	96.20.Eff-1	2	0.14	2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2	9803-240	96.20.Eff-9	50	0.32	9	ND	ND	ND	ND	ND	ND	6	ND	ND	ND	ND	ND	ND	ND	6	6	
3	9803-252	96.20.Eff-12	58	0.56	15	ND	ND	ND	ND	ND	ND	5	ND	ND	ND	ND	ND	ND	ND	5	5	
3d	9803-253	96.20.Eff-12d	58	0.54	15	ND	ND	ND	ND	ND	ND	6	ND	ND	ND	1	ND	ND	ND	7	7	
4	9803-255	96.20.Eff-14	63	0.77	20	1.3	ND	ND	ND	1.3	ND	4	ND	ND	ND	1	ND	ND	ND	5	5	
5	9803-263	96.20.Eff-16	69	1.02	28	1.9	ND	1.0	ND	2.9	ND	4	ND	ND	ND	1	ND	ND	ND	5	5	
6	9803-268	96.20.Eff-19	76	1.17	28	2.6	ND	1.4	ND	4.0	ND	3	1	ND	ND	ND	1	ND	ND	5	6	
7	9803-274	96.20.Eff-21	86	1.30	32	3.3	ND	1.7	ND	5.0	ND	2	3	ND	ND	ND	1	ND	ND	5	6	
7d	9803-275	96.20.Eff-21d	86	1.31	37	3.0	ND	1.5	ND	4.5	ND	3	3	ND	ND	ND	1	ND	ND	6	7	
8	9803-286	96.20.Eff-24	94	1.51	64	3.8	ND	1.9	ND	5.7	ND	2	3	ND	ND	ND	ND	ND	ND	5	5	
9	9803-299	96.20.Eff-27	113	1.71	61	4.9	ND	2.3	ND	7.2	ND	3	5	ND	ND	ND	1	ND	ND	8	9	
10	9803-322	96.20.Eff-31	133	1.98	76	6.6	ND	2.7	ND	9.4	ND	3	5	ND	ND	ND	1	ND	ND	9	10	
10d	9803-323	96.20.Eff-31d	133	2.04	80	6.5	ND	2.8	ND	9.3	ND	3	4	ND	ND	ND	1	ND	ND	7	8	
11	9803-344	96.20.Eff-38	175	2.22	86	8.9	ND	3.1	ND	12.0	ND	3	5	ND	ND	ND	1	ND	ND	8	9	
12	9804-57	96.20.Eff-43	228	2.36	102	9.3	ND	3.2	ND	12.5	ND	4	7	ND	ND	ND	2	ND	ND	10	12	
13	9804-75	96.20.Eff-44	243	2.45																		

# Summers & Hooper, Inc.

## RSSCT Sampling Summary Report

**Study title:** ICR RSSCT #1

**Client:** Iowa-American Water Company **Study#:** 96

													SDS Chlorination Conditions*										
No.	Sample ID	Client Sample ID	Start Date/Time		End Date/Time		Stop T (days)	Run L (days)	F-S L (days)	TOC (mg/L)	UV254 (1/cm)	Temp (°C)	pH	Dose (mg/L)	Res. (mg/L)	Dem (mg/L)	Temp (°C)	pH	Time hrs	Alk. (mg/L)	Hard-Tot (mg/L as CaCO3)	Hard-CA	Turb. (ntu)
Influent A		EBCT:	Carbon Type:		Influent pH: 7.07		Scaling Factor: 13.5																
1	9803-170	96.INF.A-1	3/17/98	14:40	3/17/98	14:40		0.06	1											107	174	142	
2	9803-297	96.INF.A-2	3/26/98	7:00	3/26/98	7:00		8.74	118											106	175	144	
Influent B		EBCT:	Carbon Type:		Influent pH: 7.07		Scaling Factor: 13.5																
1	9803-171	96.INF.B-1	3/17/98	14:45	3/17/98	14:45		0.06	1	3.43		21.5	7.1	2.75	0.67	2.08	6.9	7.35	3.1				0.10
2	9803-206	96.INF.B-2	3/19/98	15:20	3/19/98	15:20		2.09	28	3.41		16.6	7.1										
3	9803-241	96.INF.B-3	3/21/98	9:00	3/21/98	9:00		3.82	52	3.25		16.0	7.0										
4	9803-298	96.INF.B-4	3/26/98	7:05	3/26/98	7:05		8.74	118	3.15	0.060	17.9	7.1	2.66	0.66	2.00	4.9	7.24	3.1				0.10
5	9803-332	96.INF.B-5	3/28/98	16:30	3/28/98	16:30		11.14	151	3.24		19.6	7.1										
6	9804-69	96.INF.B-6	4/4/98	8:00	4/4/98	8:00		17.78	240	3.21		16.5	7.1	2.79	0.92	1.87	4.9	7.27	3.1				0.10
PreStudy		EBCT:	Carbon Type:		Influent pH: 0		Scaling Factor: 0																
1	9803-88	Settled Water	3/9/98	11:45						3.26													
2	9803-115	Settled	3/11/98	11:00						3.86													
3	9803-116	Settled and Decanted	3/11/98	2:50						4.07													
4	9803-117	Filtered	3/11/98	10:15						2.73													
5	9803-87	Raw Water	3/9/98	11:30						5.52													
6	9803-147	Barrel Pre-filter	3/14/98	9:20	3/14/98	9:20				3.75													
7	9803-148	Barrel Post-filter	3/14/98	10:00	3/14/98	10:00				3.47													

**\*Target SDS Chlorination Conditions**

**Free Cl2 Residual:** 0.75 mg/L **pH:** 7.3 **Temperature:** 5.3 °C **Holding time:** 3.0 hrs

**Study Comments**

# Summers & Hooper, Inc.

## RSSCT Sampling Summary Report

**Study title:** ICR RSSCT #1

**Client:** Iowa-American Water Company **Study#:** 96

#	SamplesID	ClientSampleID	F-S L (days)	TOC (mg/L)	TOX (µg Cl-/L)	Trihalomethanes (µg/L)					Haloacetic Acids (µg/L)										NH3-N (mg/L)	Brom (µg/L)		
						CF	BDCM	DBCM	BF	TTHM	MCAA	DCAA	TCAA	MBAA	DBAA	BCAA	BDCAA	DBCAA	TBAA	HAA6			HAA9	
Influent A		EBCT:	Carbon Type:			Influent pH: 7.07					Scaling Factor: 13.5													
1	9803-170	96.INF.A-1		1																		0.13	ND	
2	9803-297	96.INF.A-2		118																		0.13	ND	
Influent B		EBCT:	Carbon Type:			Influent pH: 7.07					Scaling Factor: 13.5													
1	9803-171	96.INF.B-1		1	3.43	172	17.4	ND	4.7	ND	22.1	2	9	8	ND	ND	1	2	ND	ND	20	22		
2	9803-206	96.INF.B-2		28	3.41																			
3	9803-241	96.INF.B-3		52	3.25																			
4	9803-298	96.INF.B-4		118	3.15	176	14.7	ND	4.2	ND	18.9	ND	6	8	ND	ND	1	1	ND	ND	15	17		
5	9803-332	96.INF.B-5		151	3.24																			
6	9804-69	96.INF.B-6		240	3.21	181	14.5	ND	3.9	ND	18.4	ND	6	9	ND	ND	1	2	ND	ND	16	18		
PreStudy		EBCT:	Carbon Type:			Influent pH: 0					Scaling Factor: 0													
1	9803-88	Settled Water			3.26																			
2	9803-115	Settled			3.86																			
3	9803-116	Settled and Decanted			4.07																			
4	9803-117	Filtered			2.73																			
5	9803-87	Raw Water			5.52																			
6	9803-147	Barrel Pre-filter			3.75																			
7	9803-148	Barrel Post-filter			3.47																			

# Summers & Hooper, Inc.

## RSSCT Sampling Summary Report

**Study title:** ICR RSSCT #2

**Client:** Iowa-American Water Company    **Study#:** 150

													SDS Chlorination Conditions*										
No.	Sample ID	Client Sample ID	Start Date/Time		End Date/Time		Stop T (days)	Run L (days)	F-S L (days)	TOC (mg/L)	UV254 (1/cm)	Temp (°C)	pH	Dose (mg/L)	Res. (mg/L)	Dem (mg/L)	Temp (°C)	pH	Time hrs	Alk. (mg/L)	Hard-Tot (mg/L as CaCO3)	Hard-CA (mg/L)	Turb. (ntu)
Effluent C		EBCT: 10 min	Carbon Type: Bituminous			Influent pH: 7.1		Scaling Factor: 13.5															
1	9809-684	150.10.Eff-1	9/30/98	14:02	9/30/98	18:59		0.16	2	0.14	0.002	21.1	7.8	2.52	0.88	1.64	19.8	7.42	24.0				
2	9809-685	150.10.Eff-2	10/1/98	16:34	10/1/98	21:59		1.28	17	0.28	0.002	21.5	7.9	2.59	0.78	1.81	19.8	7.36	24.0				
3	9809-686	150.10.Eff-3	10/1/98	21:59	10/2/98	3:24		1.50	20	0.44	0.004	22.0	7.9	2.68	0.81	1.87	19.8	7.36	24.0				
4	9809-687	150.10.Eff-4	10/2/98	3:24	10/2/98	8:54		1.73	23	0.56	0.005	21.3	7.6	2.74	0.72	2.02	19.9	7.41	23.9				
5	9809-688	150.10.Eff-5	10/2/98	8:54	10/2/98	14:19		1.96	26	0.85	0.008	21.6	7.8	2.98	0.90	2.08	19.9	7.45	23.9				
5d	9809-714	150.10.Eff-5d	10/2/98	8:54	10/2/98	14:19		1.96	26	0.86	0.009	22.0	7.8	2.98	0.90	2.08	19.9	7.45	23.9				
6	9809-689	150.10.Eff-6	10/2/98	14:19	10/2/98	17:14		2.13	29	1.08	0.012	21.5		3.16	0.92	2.24	19.9	7.45	23.9				
7	9809-691	150.10.Eff-8	10/2/98	22:31	10/3/98	1:21		2.47	33	1.27	0.014	22.2	7.9	3.31	1.01	2.30	19.9	7.44	23.9				
8	9809-692	150.10.Eff-9	10/3/98	1:21	10/3/98	6:45		2.64	36	1.43	0.018	21.5	7.8	3.44	0.99	2.45	19.9	7.43	23.9				
9	9809-695	150.10.Eff-12	10/3/98	15:02	10/3/98	20:28		3.21	43	1.62	0.021	22.1	7.9	3.59	0.92	2.67	19.9	7.47	23.9				
9d	9809-716	150.10.Eff-12d	10/3/98	15:02	10/3/98	20:28		3.21	43	1.63	0.022	22.1	7.9	3.59	1.01	2.58	19.9	7.47	24.0				
10	9809-696	150.10.Eff-13	10/4/98	1:55	10/4/98	7:24		3.67	50	1.75	0.025	21.5	7.8	3.41	0.79	2.62	20.0	7.45	23.9				
11	9809-698	150.10.Eff-15	10/4/98	18:20	10/4/98	23:39		4.35	59	1.97	0.029	22.1	7.9	3.56	0.72	2.84	20.0	7.46	23.9				
11d	9809-717	150.10.Eff-15d	10/4/98	18:20	10/4/98	23:39		4.35	59	1.96	0.029	22.1	7.9	3.56	0.77	2.79	20.0	7.46	24.0				
12	9809-701	150.10.Eff-18	10/5/98	21:30	10/6/98	2:46		5.48	74	2.16	0.034	21.5	7.9	3.67	0.81	2.86	20.0	7.44	24.0				
13	9809-702	150.10.Eff-19	10/7/98	0:38	10/7/98	6:08		6.61	89	2.36	0.041	21.2	7.8										
Effluent C		EBCT: 20 min	Carbon Type: Bituminous			Influent pH: 7.1		Scaling Factor: 13.5															
1	9809-724	150.20.Eff-1	9/30/98	14:00	9/30/98	18:57		0.16	2	0.11	0.001	21.8	8.0	2.50	0.89	1.61	19.8	7.41	24.0				
2	9809-725	150.20.Eff-2	10/3/98	21:57	10/4/98	3:23		3.50	47	0.32	0.002	21.3	7.9	2.52	0.69	1.83	20.0	7.46	24.0				
3	9809-727	150.20.Eff-4	10/4/98	8:53	10/4/98	14:18		3.96	53	0.45	0.004	21.9	7.8	2.61	0.75	1.86	20.0	7.45	24.0				
4	9809-728	150.20.Eff-5	10/4/98	19:42	10/5/98	1:13		4.41	60	0.71	0.006	21.7	8.0	2.78	0.82	1.96	20.0	7.46	24.0				
4d	9809-754	150.20.Eff-5d	10/4/98	19:42	10/5/98	1:13		4.41	60	0.72	0.006	21.7	7.9	2.78	0.80	1.98	20.0	7.41	24.1				
5	9809-730	150.20.Eff-7	10/5/98	6:44	10/5/98	12:21		4.87	66	0.92	0.009	21.4	7.8	2.90	0.81	2.09	20.0	7.39	24.1				
6	9809-732	150.20.Eff-9	10/5/98	17:53	10/5/98	23:24		5.33	72	1.04	0.011	21.4	7.9	2.98	0.80	2.18	20.0	7.39	24.1				
7	9809-734	150.20.Eff-11	10/6/98	5:01	10/6/98	10:33		5.80	78	1.19	0.013	21.4	7.9	3.07	0.88	2.19	20.0	7.37	24.2				
7d	9809-757	150.20.Eff-11d	10/6/98	5:01	10/6/98	10:33		5.80	78	1.19	0.013	21.4	7.8	3.07	0.89	2.18	20.0	7.38	24.2				
8	9809-736	150.20.Eff-13	10/7/98	3:00	10/7/98	8:32		6.71	91	1.37	0.016	21.0	7.8	3.18	0.84	2.34	20.0	7.34	24.3				
9	9809-738	150.20.Eff-15	10/8/98	6:34	10/8/98	12:03		7.86	106	1.57	0.020	21.1	7.8	3.27	0.84	2.43	20.0	7.38	23.5				
10	9809-739	150.20.Eff-16	10/9/98	10:08	10/9/98	15:30		9.01	122	1.79	0.024	21.2	7.9	3.39	0.88	2.51	20.0	7.40	24.0				
10d	9809-758	150.20.Eff-16d	10/9/98	10:08	10/9/98	15:30		9.01	122	1.81	0.024	21.2	7.9	3.39	0.88	2.51	20.0	7.40	24.1				
11	9809-742	150.20.Eff-19	10/10/98	23:49	10/11/98	5:09		10.58	143	1.91	0.028	21.2	7.8	3.46	0.90	2.56	20.0	7.41	23.2				
12	9809-743	150.20.Eff-20	10/13/98	5:16	10/13/98	10:41		12.80	173	2.13	0.033	21.2	7.8										

# Summers & Hooper, Inc.

## RSSCT Sampling Summary Report

**Study title:** ICR RSSCT #2

**Client:** Iowa-American Water Company **Study#:** 150

#	SamplesID	ClientSampleID	F-S L	TOC	TOX	Trihalomethanes (µg/L)					Haloacetic Acids (µg/L)										NH3-N	Brom
			(days)	(mg/L)	(µg Cl-/L)	CF	BDCM	DBCM	BF	TTHM	MCAA	DCAA	TCAA	MBAA	DBAA	BCAA	BDCAA	DBCAA	TBAA	HAA6	HAA9	(mg/L)
Effluent C		EBCT: 10 min	Carbon Type: Bituminous			Influent pH: 7.1					Scaling Factor: 13.5											
1	9809-684	150.10.Eff-1	2	0.14	2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2	9809-685	150.10.Eff-2	17	0.28	8	1.3	ND	ND	ND	1.3	ND	ND	1	ND	ND	1	ND	ND	ND	2	2	
3	9809-686	150.10.Eff-3	20	0.44	16	1.7	1.1	1.4	ND	4.3	ND	1	1	ND	ND	1	ND	ND	ND	4	4	
4	9809-687	150.10.Eff-4	23	0.56	25	2.6	1.7	2.4	ND	6.7	ND	2	2	ND	1	2	1	ND	ND	6	7	
5	9809-688	150.10.Eff-5	26	0.85	40	4.7	2.4	3.8	ND	10.9	ND	3	3	ND	1	2	2	ND	ND	9	11	
5d	9809-714	150.10.Eff-5d	26	0.86	43	4.8	2.4	3.9	ND	11.2	ND	3	2	ND	1	2	2	ND	ND	8	10	
6	9809-689	150.10.Eff-6	29	1.08	55	6.7	2.8	5.5	ND	15.0	ND	4	3	ND	1	2	2	ND	ND	11	13	
7	9809-691	150.10.Eff-8	33	1.27	71	8.4	2.7	6.0	ND	17.1	ND	5	4	ND	1	3	2	ND	ND	13	15	
8	9809-692	150.10.Eff-9	36	1.43	88	11.8	2.9	7.4	ND	22.1	ND	6	5	ND	1	3	2	ND	ND	15	18	
9	9809-695	150.10.Eff-12	43	1.62	106	15.7	2.9	8.4	ND	27.0	ND	7	7	ND	1	3	2	ND	ND	19	21	
9d	9809-716	150.10.Eff-12d	43	1.63	111	16.0	3.2	9.1	ND	28.3	ND	8	7	ND	1	3	3	ND	ND	20	23	
10	9809-696	150.10.Eff-13	50	1.75	120	18.6	3.1	9.6	ND	31.3	ND	8	9	ND	ND	3	3	ND	ND	20	23	
11	9809-698	150.10.Eff-15	59	1.97	143	21.8	2.9	10.2	ND	34.9	ND	10	12	ND	ND	3	4	ND	ND	25	29	
11d	9809-717	150.10.Eff-15d	59	1.96	145	22.9	3.0	10.6	ND	36.4	ND	9	9	ND	ND	3	3	ND	ND	20	23	
12	9809-701	150.10.Eff-18	74	2.16	163	27.6	2.9	11.7	ND	42.2	ND	12	13	ND	ND	4	4	ND	ND	28	32	
13	9809-702	150.10.Eff-19	89	2.36																		
Effluent C		EBCT: 20 min	Carbon Type: Bituminous			Influent pH: 7.1					Scaling Factor: 13.5											
1	9809-724	150.20.Eff-1	2	0.11	1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2	9809-725	150.20.Eff-2	47	0.32	11	1.5	ND	1.2	ND	2.7	ND	ND	ND	ND	ND	ND	1	ND	ND	ND	1	
3	9809-727	150.20.Eff-4	53	0.45	17	2.1	1.4	1.8	ND	5.3	ND	1	1	ND	ND	1	1	ND	ND	3	5	
4	9809-728	150.20.Eff-5	60	0.71	29	3.7	2.1	2.9	ND	8.7	ND	2	2	ND	ND	1	2	ND	ND	5	7	
4d	9809-754	150.20.Eff-5d	60	0.72	29	3.6	2.0	2.8	ND	8.4	ND	2	2	ND	ND	1	2	ND	ND	5	7	
5	9809-730	150.20.Eff-7	66	0.92	42	6.0	2.8	4.4	ND	13.2	ND	3	3	ND	ND	2	2	ND	ND	7	9	
6	9809-732	150.20.Eff-9	72	1.04	51	7.1	2.8	4.8	ND	14.7	ND	4	4	ND	1	2	2	ND	ND	11	13	
7	9809-734	150.20.Eff-11	78	1.19	62	8.5	2.8	5.6	ND	16.9	ND	4	4	ND	ND	2	2	ND	ND	11	13	
7d	9809-757	150.20.Eff-11d	78	1.19	62	8.1	2.7	5.3	ND	16.2	ND	4	5	ND	1	2	2	ND	ND	12	15	
8	9809-736	150.20.Eff-13	91	1.37	83	10.8	3.2	6.9	ND	20.9	ND	6	5	ND	1	3	3	ND	ND	14	17	
9	9809-738	150.20.Eff-15	106	1.57	107	15.2	3.1	8.2	ND	26.5	ND	7	7	ND	ND	3	3	ND	ND	16	19	
10	9809-739	150.20.Eff-16	122	1.79	121	17.9	2.8	8.7	ND	29.4	ND	9	14	ND	1	4	5	ND	ND	28	33	
10d	9809-758	150.20.Eff-16d	122	1.81	122	18.5	2.9	9.0	ND	30.4	ND	9	12	ND	ND	3	4	ND	ND	24	27	
11	9809-742	150.20.Eff-19	143	1.91	140	21.8	2.7	9.7	ND	34.2	ND	10	14	ND	ND	3	4	ND	ND	27	32	
12	9809-743	150.20.Eff-20	173	2.13																		



# Summers & Hooper, Inc.

## RSSCT Sampling Summary Report

**Study title:** ICR RSSCT #2

**Client:** Iowa-American Water Company    **Study#:** 150

													SDS Chlorination Conditions*											
No.	Sample ID	Client Sample ID	Start Date/Time		End Date/Time		Stop T (days)	Run L (days)	F-S L (days)	TOC (mg/L)	UV254 (1/cm)	Temp (°C)	pH	Dose (mg/L)	Res. (mg/L)	Dem (mg/L)	Temp (°C)	pH	Time hrs	Alk. (mg/L)	Hard-Tot (mg/L as CaCO3)	Hard-CA	Turb. (ntu)	
13	9809-744	150.20.Eff-21	10/14/98	8:15	10/14/98	13:38		13.93	188	2.15	0.033	20.4	7.8	3.60	1.18	2.42	20.0	7.40	24.0					
Influent A		EBCT:	Carbon Type:		Influent pH: 7.1		Scaling Factor: 13.5																	
1	9809-764	150.Inf.A-1	9/30/98	15:05	9/30/98	15:05		0.10	1												133	217	122	
2	9809-765	150.Inf.A-2	10/6/98	15:00	10/6/98	15:00		6.10	82												120	204	117	
Influent B		EBCT:	Carbon Type:		Influent pH: 7.1		Scaling Factor: 13.5																	
1	9809-766	150.Inf.B-1	9/30/98	14:05	9/30/98	14:05		0.06	1	2.98	0.065	19.3	7.2	4.75	0.89	3.86	19.8	7.35	24.0					0.10
2	9809-767	150.Inf.B-2	10/3/98	13:40	10/3/98	13:40		3.04	41	2.96		17.2	7.2											
3	9809-768	150.Inf.B-3	10/4/98	19:40	10/4/98	19:40		4.29	58	2.99		18.2	7.2											
4	9809-769	150.Inf.B-4	10/6/98	15:00	10/6/98	15:00		6.10	82	3.00	0.065	17.3	7.2	4.65	0.79	3.86	20.0	7.29	24.3					0.15
5	9809-770	150.Inf.B-5	10/11/98	11:00	10/11/98	11:00		10.93	148	2.96		18.8	7.2											
6	9809-771	150.Inf.B-6	10/14/98	8:30	10/14/98	8:30		13.83	187	2.98	0.064	18.1	7.3	4.60	0.74	3.86	20.0	7.33	24.0					0.10
PreStudy		EBCT:	Carbon Type:		Influent pH: 0		Scaling Factor: 0																	
1	9809-670	Instantaneous DBPs	9/30/98	9:10																				
2	9809-417	Settled Iowa	9/22/98	1:20																				
3	9809-428	Raw.Iowa	9/23/98	12:25																				
4	9809-429	SettledDrum.Iowa	9/23/98	14:00																				
5	9809-430	Filtered.Iowa	9/23/98	12:35																				
6	9809-655	Iowa Settled on	9/27/98	8:30																				
7	9809-656	Iowa Filtered on	9/27/98	8:30																				

**\*Target SDS Chlorination Conditions**

**Free Cl2 Residual:** 0.75 mg/L    **pH:** 7.3    **Temperature:** 20.0 °C    **Holding time:** 24.0 hrs

**Study Comments**

# Summers & Hooper, Inc.

## RSSCT Sampling Summary Report

**Study title:** ICR RSSCT #2

**Client:** Iowa-American Water Company **Study#:** 150

#	SamplesID	ClientSampleID	F-S L	TOC	TOX	Trihalomethanes (µg/L)					Haloacetic Acids (µg/L)										NH3-N	Brom		
			(days)	(mg/L)	(µg Cl-/L)	CF	BDCM	DBCM	BF	TTHM	MCAA	DCAA	TCAA	MBAA	DBAA	BCAA	BDCAA	DBCAA	TBAA	HAA6	HAA9	(mg/L)	(µg/L)	
13	9809-744	150.20.Eff-21	188	2.15	164	27.6	2.5	11.2	ND	41.3	ND	13	21	ND	ND	4	6	ND	ND	39	44			
Influent A			EBCT:	Carbon Type:		Influent pH: 7.1			Scaling Factor: 13.5															
1	9809-764	150.Inf.A-1	1																			0.17	29	
2	9809-765	150.Inf.A-2	82																			0.14	28	
Influent B			EBCT:	Carbon Type:		Influent pH: 7.1			Scaling Factor: 13.5															
1	9809-766	150.Inf.B-1	1	2.98	287	53.5	2.1	15.3	ND	71.0	ND	19	26	ND	1	4	5	ND	ND	50	54			
2	9809-767	150.Inf.B-2	41	2.96																				
3	9809-768	150.Inf.B-3	58	2.99																				
4	9809-769	150.Inf.B-4	82	3.00	289	49.0	2.1	15.0	ND	66.1	ND	22	35	ND	ND	5	7	ND	ND	61	68			
5	9809-770	150.Inf.B-5	148	2.96																				
6	9809-771	150.Inf.B-6	187	2.98	288	48.1	2.3	14.7	ND	65.1	ND	20	31	ND	ND	4	6	ND	ND	55	61			
PreStudy			EBCT:	Carbon Type:		Influent pH: 0			Scaling Factor: 0															
1	9809-670	Instantaneous DBPs				ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			
2	9809-417	Settled Iowa		3.15																				
3	9809-428	Raw.Iowa		4.60																				
4	9809-429	SettledDrum.Iowa		3.16																				
5	9809-430	Filtered.Iowa		2.63																				
6	9809-655	Iowa Settled on Arrival		3.13																				
7	9809-656	Iowa Filtered on Arrival		2.98																				

# Summers & Hooper, Inc.

## RSSCT Sampling Summary Report

**Study title:** ICR RSSCT #3,4

**Client:** Iowa-American Water Company    **Study#:** 185

												SDS Chlorination Conditions*											
No.	Sample ID	Client Sample ID	Start Date/Time		End Date/Time		Stop T	Run L	F-S L	TOC	UV254	Temp	pH	Dose	Res.	Dem	Temp	pH	Time	Alk.	Hard-Tot	Hard-CA	Turb.
					(days)	(days)	(days)	(mg/L)	(1/cm)	(°C)			(mg/L)	(mg/L)	(mg/L)	(°C)		hrs	(mg/L)	(mg/L as CaCO3)		(ntu)	
Effluent C		EBCT: 10 min		Carbon Type: Bituminous			Influent pH: 6.5		Scaling Factor: 13.5														
1	9811-550	185.10.pH6.5.Eff-1	11/30/98	14:36	11/30/98	20:24		0.17	2	0.19	0.001	24.2	7.4	1.81	0.78	1.03	7.5	7.33	24.0				
2	9811-551	185.10.pH6.5.Eff-2	12/2/98	2:22	12/2/98	8:41		1.67	23	0.29	0.002	21.0	7.2	1.39	0.49	0.90	7.4	7.30	23.6				
3	9811-552	185.10.pH6.5.Eff-3	12/2/98	14:39	12/2/98	20:23		2.17	29	0.46	0.005	24.1	7.2	1.42	0.56	0.86	7.4	7.31	23.6				
4	9811-553	185.10.pH6.5.Eff-4	12/2/98	20:23	12/3/98	2:16		2.41	33	0.60	0.006	22.7	7.2	1.44	0.52	0.92	7.4	7.31	23.6				
5	9811-554	185.10.pH6.5.Eff-5	12/3/98	2:16	12/3/98	8:14		2.66	36	0.78	0.009	21.8	7.1	1.48	0.55	0.93	7.4	7.29	23.6				
6	9811-555	185.10.pH6.5.Eff-6	12/3/98	8:14	12/3/98	14:02		2.90	39	1.00	0.012	23.0	7.1	1.52	0.41	1.11	7.4	7.32	23.6				
6d	9811-580	185.10.pH6.5.Eff-6d	12/3/98	8:14	12/3/98	14:02		2.90	39	1.02	0.012	23.1	7.2	1.52	0.41	1.11	7.4	7.31	23.7				
7	9811-556	185.10.pH6.5.Eff-7	12/3/98	14:02	12/3/98	19:41		3.14	42	1.20	0.015	24.5	7.3	1.56	0.30	1.26	7.4	7.32	23.7				
8	9811-557	185.10.pH6.5.Eff-8	12/3/98	19:41	12/4/98	1:24		3.38	46	1.30	0.017	23.7	7.3	1.93	0.83	1.10	7.3	7.32	24.0				
8d	9811-581	185.10.pH6.5.Eff-8d	12/3/98	19:41	12/4/98	1:24		3.38	46	1.31	0.017	23.5	7.3	1.93	0.72	1.21	7.3	7.31	24.1				
9	9811-583	185.10.pH6.5.Eff-12d	12/4/98	18:57	12/5/98	0:30		4.35	59	1.63	0.025	23.7	7.3	2.01	0.69	1.32	7.3	7.32	24.1				
10	9811-564	185.10.pH6.5.Eff-15	12/5/98	11:57	12/5/98	17:37		5.06	68	1.80	0.029	23.2	7.3	1.49	0.14	1.35	7.5	7.33	23.9				
10d	9811-585	185.10.pH6.5.Eff-15d	12/5/98	11:57	12/5/98	17:37		5.06	68	1.81	0.029	23.0	7.4	1.49	0.13	1.36	7.5	7.35	23.9				
11	9811-565	185.10.pH6.5.Eff-16	12/5/98	17:37	12/5/98	23:40		5.30	72	1.85	0.028	22.1	7.3	2.08	0.66	1.42	7.3	7.28	24.2				
12	9811-567	185.10.pH6.5.Eff-18	12/6/98	5:26	12/6/98	11:14		5.79	78	1.94	0.032	22.0	7.1	2.10	0.71	1.39	7.3	7.27	24.3				
13	9811-569	185.10.pH6.5.Eff-20	12/7/98	4:44	12/7/98	10:37		6.76	91	2.08	0.035	21.7	7.1	2.14	0.62	1.52	7.3	7.26	24.3				
14	9811-571	185.10.pH6.5.Eff-22	12/8/98	10:55	12/8/98	13:59		7.96	108	2.25	0.038	21.1	7.3										
Effluent C		EBCT: 10 min		Carbon Type: Bituminous			Influent pH: 7		Scaling Factor: 13.5														
1	9811-461	185.10.Eff-1	11/20/98	13:52	11/20/98	19:52		0.17	2	0.13	0.001	24.6	8.0	1.61	0.68	0.93	7.7	7.49	24.3				
2	9811-464	185.10.Eff-4	11/22/98	2:38	11/22/98	8:49		1.71	23	0.36	0.004	23.0	7.7	1.76	0.85	0.91	7.7	7.39	24.4				
3	9811-465	185.10.Eff-5	11/22/98	8:49	11/22/98	15:00		1.97	27	0.52	0.006	23.6	7.7	1.86	0.80	1.06	7.7	7.38	24.4				
3d	9811-492	185.10.Eff-5d	11/22/98	8:49	11/22/98	15:00		1.97	27	0.51	0.006	23.6	7.7	1.86	0.82	1.04	7.7	7.38	24.4				
4	9811-466	185.10.Eff-6	11/22/98	15:00	11/22/98	21:07		2.22	30	0.72	0.008	23.3	7.7	2.00	0.90	1.10	7.7	7.38	24.5				
5	9811-467	185.10.Eff-7	11/22/98	21:07	11/23/98	3:05		2.48	33	0.96	0.012	23.2	7.7	2.04	0.84	1.20	7.2	7.36	24.0				
6	9811-468	185.10.Eff-8	11/23/98	3:05	11/23/98	9:09		2.73	37	1.15	0.015	23.2	7.6	2.16	1.13	1.03	7.2	7.37	24.1				
7	9811-469	185.10.Eff-9	11/23/98	9:09	11/23/98	15:16		2.98	40	1.35	0.018	23.8	7.6	2.29	0.97	1.32	7.2	7.38	24.1				
7d	9811-493	185.10.Eff-9d	11/23/98	9:09	11/23/98	15:16		2.98	40	1.37	0.018	23.8	7.7	2.29	0.97	1.32	7.2	7.35	24.1				
8	9811-471	185.10.Eff-11	11/23/98	21:23	11/24/98	3:36		3.49	47	1.50	0.021	22.9	7.8	2.39	1.01	1.38	7.2	7.34	24.1				
9	9811-473	185.10.Eff-13	11/24/98	9:48	11/24/98	15:56		4.01	54	1.65	0.025	24.4	7.7	2.47	1.11	1.36	7.2	7.36	24.1				
10	9811-476	185.10.Eff-16	11/25/98	10:30	11/25/98	16:54		5.04	68	1.82	0.030	23.7	8.0	2.59	1.06	1.53	7.2	7.37	24.1				
10d	9811-496	185.10.Eff-16d	11/25/98	10:30	11/25/98	16:54		5.04	68	1.85	0.030	23.7	7.9	2.59	0.84	1.75	7.2	7.37	24.1				
11	9811-478	185.10.Eff-18	11/26/98	5:27	11/26/98	11:42		5.83	79	1.94	0.033	22.7	7.7	2.27	0.57	1.70	8.0	7.37	24.2				
12	9811-480	185.10.Eff-20	11/27/98	12:03	11/27/98	18:02		7.10	96	2.14	0.037	24.5	7.8	2.34	0.62	1.72	8.0	7.37	24.2				

# Summers & Hooper, Inc.

## RSSCT Sampling Summary Report

**Study title:** ICR RSSCT #3,4

**Client:** Iowa-American Water Company **Study#:** 185

#	SamplesID	ClientSampleID	F-S L	TOC	TOX	Trihalomethanes (µg/L)					Haloacetic Acids (µg/L)										NH3-N	Brom
			(days)	(mg/L)	(µg Cl-/L)	CF	BDCM	DBCM	BF	TTHM	MCAA	DCAA	TCAA	MBAA	DBAA	BCAA	BDCAA	DBCAA	TBAA	HAA6	HAA9	(mg/L)
Effluent C		EBCT: 10 min	Carbon Type: Bituminous			Influent pH: 6.5					Scaling Factor: 13.5											
1	9811-550	185.10.pH6.5.Eff-1	2	0.19	3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2	9811-551	185.10.pH6.5.Eff-2	23	0.29	7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
3	9811-552	185.10.pH6.5.Eff-3	29	0.46	10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4	9811-553	185.10.pH6.5.Eff-4	33	0.60	17	1.2	1.6	1.3	ND	4.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5	9811-554	185.10.pH6.5.Eff-5	36	0.78	22	1.7	2.0	1.9	ND	5.6	ND	1	ND	ND	ND	1	1	ND	ND	2	3	
6	9811-555	185.10.pH6.5.Eff-6	39	1.00	32	2.1	2.6	2.6	ND	7.3	ND	1	1	ND	1	1	1	ND	ND	5	6	
6d	9811-580	185.10.pH6.5.Eff-6d	39	1.02	31	2.1	2.7	2.7	ND	7.6	ND	1	1	ND	1	1	1	ND	ND	5	7	
7	9811-556	185.10.pH6.5.Eff-7	42	1.20	39	2.6	3.0	3.3	ND	8.9	ND	2	2	ND	1	2	2	ND	ND	6	8	
8	9811-557	185.10.pH6.5.Eff-8	46	1.30	50	4.1	2.9	4.3	ND	11.3	ND	3	3	ND	1	2	3	ND	ND	9	11	
8d	9811-581	185.10.pH6.5.Eff-8d	46	1.31	53	3.8	2.8	4.0	ND	10.6	ND	3	3	ND	1	2	2	ND	ND	9	11	
9	9811-583	185.10.pH6.5.Eff-12d	59	1.63	79	6.2	3.0	5.8	ND	15.1	ND	4	4	ND	ND	3	3	ND	ND	11	13	
10	9811-564	185.10.pH6.5.Eff-15	68	1.80	80	6.5	3.1	6.2	ND	15.8	ND	4	4	ND	ND	3	2	ND	ND	11	13	
10d	9811-585	185.10.pH6.5.Eff-15d	68	1.81	78	6.6	3.0	6.2	ND	15.7	ND	4	3	ND	ND	2	2	ND	ND	10	12	
11	9811-565	185.10.pH6.5.Eff-16	72	1.85	92	7.8	3.0	6.6	ND	17.4	ND	5	6	ND	ND	3	3	ND	ND	14	17	
12	9811-567	185.10.pH6.5.Eff-18	78	1.94	106	9.3	2.9	7.2	ND	19.4	ND	6	7	ND	ND	3	3	ND	ND	16	19	
13	9811-569	185.10.pH6.5.Eff-20	91	2.08	113	12.8	3.4	9.2	ND	25.4	ND	7	7	ND	ND	3	3	ND	ND	17	20	
14	9811-571	185.10.pH6.5.Eff-22	108	2.25																		
Effluent C		EBCT: 10 min	Carbon Type: Bituminous			Influent pH: 7					Scaling Factor: 13.5											
1	9811-461	185.10.Eff-1	2	0.13	2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2	9811-464	185.10.Eff-4	23	0.36	11	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
3	9811-465	185.10.Eff-5	27	0.52	15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
3d	9811-492	185.10.Eff-5d	27	0.51	16	ND	1.2	1.1	ND	2.3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4	9811-466	185.10.Eff-6	30	0.72	25	ND	1.2	1.1	ND	2.3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5	9811-467	185.10.Eff-7	33	0.96	32	3.3	3.2	3.8	ND	10.2	ND	2	1	ND	ND	1	1	ND	ND	5	6	
6	9811-468	185.10.Eff-8	37	1.15	44	3.8	2.9	4.1	ND	10.7	ND	2	2	ND	ND	2	2	ND	ND	6	9	
7	9811-469	185.10.Eff-9	40	1.35	56	4.8	3.1	4.9	ND	12.9	ND	3	3	ND	ND	2	3	ND	ND	8	11	
7d	9811-493	185.10.Eff-9d	40	1.37	56	4.6	3.0	4.8	ND	12.4	ND	3	4	ND	ND	2	4	ND	ND	9	12	
8	9811-471	185.10.Eff-11	47	1.50	72	6.9	3.4	6.3	ND	16.6	ND	4	5	ND	ND	2	3	ND	ND	11	15	
9	9811-473	185.10.Eff-13	54	1.65	84	8.6	3.3	7.3	ND	19.3	ND	5	6	ND	ND	2	3	ND	ND	13	16	
10	9811-476	185.10.Eff-16	68	1.82	105	11.7	3.2	8.6	ND	23.5	ND	6	8	ND	ND	3	4	ND	ND	17	22	
10d	9811-496	185.10.Eff-16d	68	1.85	103	10.9	3.0	8.1	ND	21.9	ND	6	11	ND	ND	3	6	ND	ND	20	26	
11	9811-478	185.10.Eff-18	79	1.94	105	12.0	3.3	9.0	ND	24.3	ND	7	8	ND	ND	3	3	ND	ND	18	22	
12	9811-480	185.10.Eff-20	96	2.14	129	13.4	2.9	9.2	ND	25.4	ND	8	12	ND	ND	3	4	ND	ND	23	27	

# Summers & Hooper, Inc.

## RSSCT Sampling Summary Report

**Study title:** ICR RSSCT #3,4

**Client:** Iowa-American Water Company    **Study#:** 185

No.	Sample ID	Client Sample ID	Start Date/Time	End Date/Time	Stop T (days)	Run L (days)	F-S L (days)	TOC (mg/L)	UV254 (1/cm)	Temp (°C)	pH	SDS Chlorination Conditions*					Alk. (mg/L)	Hard-Tot (mg/L as CaCO3)	Hard-CA (mg/L as CaCO3)	Turb. (ntu)
												Dose (mg/L)	Res. (mg/L)	Dem (mg/L)	Temp (°C)	pH	Time hrs			
13	9811-481	185.10.Eff-21	11/28/98 18:15	11/29/98 0:15			8.36	113	2.24	0.039	23.2	7.7								
<b>Effluent C</b> <b>EBCT:</b> 10 min <b>Carbon Type:</b> Bituminous <b>Influent pH:</b> 7.5 <b>Scaling Factor:</b> 13.5																				
1	9811-596	185.10.pH7.5.Eff-1	11/30/98 14:36	11/30/98 20:24			0.17	2	0.14	0.002	24.1	8.4	1.77	0.91	0.86	7.5	7.40	24.0		
2	9811-597	185.10.pH7.5.Eff-2	12/1/98 14:53	12/1/98 20:46			1.18	16	0.32	0.003	23.7	8.2	1.90	1.05	0.85	7.5	7.36	24.1		
3	9811-599	185.10.pH7.5.Eff-4	12/2/98 2:52	12/2/98 9:05			1.69	23	0.47	0.005	20.9	8.1	2.00	1.16	0.84	7.5	7.34	24.1		
4	9811-600	185.10.pH7.5.Eff-5	12/2/98 9:05	12/2/98 15:01			1.94	26	0.66	0.008	22.5	8.1	1.46	0.58	0.88	7.4	7.35	23.7		
4d	9811-626	185.10.pH7.5.Eff-5d	12/2/98 9:05	12/2/98 15:01			1.94	26	0.68	0.008	22.6	8.1	1.46	0.41	1.05	7.4	7.37	23.7		
5	9811-601	185.10.pH7.5.Eff-6	12/2/98 15:01	12/2/98 20:57			2.19	30	0.90	0.012	23.6	8.1	1.50	0.40	1.10	7.4	7.36	23.7		
6	9811-602	185.10.pH7.5.Eff-7	12/2/98 20:57	12/3/98 3:01			2.44	33	1.02	0.014	22.3	8.1	1.52	0.34	1.18	7.4	7.37	23.7		
7	9811-603	185.10.pH7.5.Eff-8	12/3/98 3:01	12/3/98 9:15			2.70	36	1.13	0.016	21.6	8.1	1.55	0.43	1.12	7.4	7.40	23.7		
8	9811-604	185.10.pH7.5.Eff-9	12/3/98 9:15	12/3/98 15:09			2.95	40	1.35	0.020	23.5	8.1	1.59	0.23	1.36	7.4	7.37	23.7		
9	9811-606	185.10.pH7.5.Eff-11	12/3/98 21:01	12/4/98 2:59			3.44	47	1.46	0.023	23.0	8.1	1.61	0.34	1.27	7.4	7.36	23.8		
9d	9811-629	185.10.pH7.5.Eff-11d	12/3/98 21:01	12/4/98 2:59			3.44	47	1.44	0.023	22.8	8.1	1.61	0.39	1.22	7.4	7.35	23.8		
10	9811-608	185.10.pH7.5.Eff-13	12/4/98 15:06	12/4/98 20:58			4.19	57	1.71	0.028	23.6	8.1	1.48	0.32	1.16	7.5	7.39	23.9		
11	9811-610	185.10.pH7.5.Eff-15	12/5/98 9:05	12/5/98 15:01			4.94	67	1.86	0.031	22.7	8.1	1.51	0.27	1.24	7.5	7.39	23.9		
11d	9811-630	185.10.pH7.5.Eff-15d	12/5/98 9:05	12/5/98 15:01			4.94	67	1.88	0.031	22.7	8.1	1.51	0.24	1.27	7.5	7.39	23.9		
12	9811-612	185.10.pH7.5.Eff-17	12/6/98 8:11	12/6/98 13:53			5.90	80	2.04	0.035	22.1	8.1	1.54	0.29	1.25	7.5	7.31	23.9		
13	9811-613	185.10.pH7.5.Eff-18	12/7/98 13:40	12/7/98 16:41			7.07	96	2.13	0.037	23.0	8.2								
<b>Effluent C</b> <b>EBCT:</b> 20 min <b>Carbon Type:</b> Bituminous <b>Influent pH:</b> 7 <b>Scaling Factor:</b> 13.5																				
1	9811-502	185.20.Eff-1	11/20/98 13:52	11/20/98 19:30			0.17	2	0.11	0.001	23.5	8.0	1.48	0.90	0.58	7.7	7.46	24.5		
2	9811-505	185.20.Eff-4	11/23/98 18:42	11/24/98 0:53			3.38	46	0.28	0.003	22.1	7.8	1.61	0.99	0.62	7.2	7.36	24.1		
3	9811-509	185.20.Eff-8	11/24/98 19:15	11/25/98 1:22			4.40	60	0.46	0.005	22.6	7.7	1.73	0.99	0.74	7.2	7.37	24.1		
3d	9811-533	185.20.Eff-8d	11/24/98 19:15	11/25/98 1:22			4.40	60	0.49	0.005	22.5	7.8	1.73	1.05	0.68	7.2	7.38	24.2		
4	9811-511	185.20.Eff-10	11/25/98 7:38	11/25/98 13:51			4.92	67	0.63	0.007	22.1	7.7	1.83	1.09	0.74	7.2	7.33	24.2		
5	9811-512	185.20.Eff-11	11/25/98 13:51	11/25/98 19:55			5.18	70	0.73	0.008	22.7	7.9	1.52	0.89	0.63	8.0	7.38	24.2		
6	9811-513	185.20.Eff-12	11/26/98 2:06	11/26/98 8:17			5.69	77	0.88	0.010	21.6	7.8	1.56	0.91	0.65	8.0	7.37	24.1		
7	9811-514	185.20.Eff-13	11/26/98 14:20	11/26/98 20:13			6.19	84	1.04	0.014	22.3	7.9	1.62	0.75	0.87	8.0	7.38	24.1		
7d	9811-534	185.20.Eff-13d	11/26/98 14:20	11/26/98 20:13			6.19	84	1.06	0.013	22.3	7.9	1.62	0.77	0.85	8.0	7.39	24.2		
8	9811-518	185.20.Eff-17	11/27/98 14:01	11/27/98 19:55			7.18	97	1.25	0.016	23.3	7.9	1.68	0.81	0.87	8.0	7.39	24.1		
9	9811-525	185.20.Eff-24	11/29/98 13:55	11/29/98 19:48			9.17	124	1.45	0.020	22.6	7.8	1.74	0.83	0.91	8.0	7.34	24.1		
10	9811-529	185.20.Eff-28	12/1/98 20:14	12/2/98 2:26			11.44	155	1.64	0.024	21.6	7.8	1.70	0.86	0.84	7.5	7.35	24.1		
10d	9811-539	185.20.Eff-28d	12/1/98 20:14	12/2/98 2:26			11.44	155	1.63	0.024	21.6	7.8	1.70	0.87	0.83	7.5	7.36	24.2		
11	9811-531	185.20.Eff-30	12/4/98 2:50	12/4/98 9:03			13.72	185	1.93	0.030	23.1	7.7	1.70	0.68	1.02	7.4	7.34	23.8		

# Summers & Hooper, Inc.

## RSSCT Sampling Summary Report

**Study title:** ICR RSSCT #3,4

**Client:** Iowa-American Water Company **Study#:** 185

#	SamplesID	ClientSampleID	F-S L	TOC	TOX	Trihalomethanes (µg/L)					Haloacetic Acids (µg/L)										NH3-N	Brom				
			(days)	(mg/L)	(µg Cl-/L)	CF	BDCM	DBCM	BF	TTHM	MCAA	DCAA	TCAA	MBAA	DBAA	BCAA	BDCAA	DBCAA	TBAA	HAA6	HAA9	(mg/L)	(µg/L)			
13	9811-481	185.10.Eff-21	113	2.24																						
Effluent C			EBCT: 10 min		Carbon Type: Bituminous		Influent pH: 7.5			Scaling Factor: 13.5																
1	9811-596	185.10.pH7.5.Eff-1	2	0.14	4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND				
2	9811-597	185.10.pH7.5.Eff-2	16	0.32	10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND				
3	9811-599	185.10.pH7.5.Eff-4	23	0.47	14	1.5	1.5	1.6	ND	4.7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND				
4	9811-600	185.10.pH7.5.Eff-5	26	0.66	20	1.4	2.4	2.0	ND	5.9	ND	1	ND	ND	1	1	1	ND	ND	3	5					
4d	9811-626	185.10.pH7.5.Eff-5d	26	0.68	22	1.6	2.3	2.1	ND	6.0	ND	1	ND	ND	1	1	1	ND	ND	3	5					
5	9811-601	185.10.pH7.5.Eff-6	30	0.90	30	2.2	3.2	3.1	ND	8.5	ND	1	1	ND	1	2	2	ND	ND	5	7					
6	9811-602	185.10.pH7.5.Eff-7	33	1.02	37	2.8	3.1	3.7	ND	9.5	ND	2	1	ND	1	2	2	ND	ND	5	7					
7	9811-603	185.10.pH7.5.Eff-8	36	1.13	44	3.3	3.3	4.2	ND	10.8	ND	2	2	ND	1	2	2	ND	ND	6	8					
8	9811-604	185.10.pH7.5.Eff-9	40	1.35	54	4.0	4.0	4.8	ND	12.7	ND	2	2	ND	1	2	2	ND	ND	7	9					
9	9811-606	185.10.pH7.5.Eff-11	47	1.46	66	5.6	3.7	6.1	ND	15.4	ND	3	4	ND	1	3	3	ND	ND	11	14					
9d	9811-629	185.10.pH7.5.Eff-11d	47	1.44	66	5.1	3.2	5.7	ND	14.0	ND	3	3	ND	1	3	2	ND	ND	10	12					
10	9811-608	185.10.pH7.5.Eff-13	57	1.71	79	7.2	3.5	7.1	ND	17.8	ND	4	4	ND	1	3	2	ND	ND	12	14					
11	9811-610	185.10.pH7.5.Eff-15	67	1.86	93	8.4	3.3	7.6	ND	19.3	ND	5	5	ND	1	3	3	ND	ND	14	17					
11d	9811-630	185.10.pH7.5.Eff-15d	67	1.88	88	8.2	3.3	7.4	ND	18.9	ND	5	5	ND	1	3	3	ND	ND	14	17					
12	9811-612	185.10.pH7.5.Eff-17	80	2.04	105	9.4	3.0	7.8	ND	20.2	ND	6	7	ND	1	3	3	ND	ND	18	21					
13	9811-613	185.10.pH7.5.Eff-18	96	2.13																						
Effluent C			EBCT: 20 min		Carbon Type: Bituminous		Influent pH: 7			Scaling Factor: 13.5																
1	9811-502	185.20.Eff-1	2	0.11	2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND				
2	9811-505	185.20.Eff-4	46	0.28	6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND				
3	9811-509	185.20.Eff-8	60	0.46	14	ND	1.2	1.0	ND	2.3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND				
3d	9811-533	185.20.Eff-8d	60	0.49	13	ND	1.2	1.0	ND	2.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND				
4	9811-511	185.20.Eff-10	67	0.63	18	1.0	1.6	1.5	ND	4.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND				
5	9811-512	185.20.Eff-11	70	0.73	22	1.5	2.4	2.1	ND	6.0	ND	ND	ND	ND	ND	1	1	ND	ND	1	2					
6	9811-513	185.20.Eff-12	77	0.88	28	1.8	2.8	2.8	ND	7.4	ND	1	1	ND	ND	2	1	ND	ND	4	5					
7	9811-514	185.20.Eff-13	84	1.04	40	3.0	3.2	3.7	ND	9.9	ND	2	2	ND	ND	2	2	ND	ND	5	7					
7d	9811-534	185.20.Eff-13d	84	1.06	39	2.5	3.3	3.8	ND	9.6	ND	2	2	ND	ND	2	2	ND	ND	6	8					
8	9811-518	185.20.Eff-17	97	1.25	50	3.6	3.6	5.0	ND	12.3	ND	2	2	ND	ND	2	2	ND	ND	7	9					
9	9811-525	185.20.Eff-24	124	1.45	60	4.8	3.7	6.1	ND	14.5	ND	3	4	ND	1	3	3	ND	ND	11	14					
10	9811-529	185.20.Eff-28	155	1.64	74	7.2	3.7	7.6	ND	18.5	ND	4	5	ND	ND	3	3	ND	ND	12	15					
10d	9811-539	185.20.Eff-28d	155	1.63	73	7.2	3.5	7.5	ND	18.2	ND	4	5	ND	ND	3	3	ND	ND	11	15					
11	9811-531	185.20.Eff-30	185	1.93	88	7.0	3.6	7.4	ND	17.9	ND	5	5	ND	1	3	3	ND	ND	14	18					

# Summers & Hooper, Inc.

## RSSCT Sampling Summary Report

**Study title:** ICR RSSCT #3,4

**Client:** Iowa-American Water Company    **Study#:** 185

													SDS Chlorination Conditions*												
No.	Sample ID	Client Sample ID	Start Date/Time		End Date/Time		Stop T (days)	Run L (days)	F-S L (days)	TOC (mg/L)	UV254 (1/cm)	Temp (°C)	pH	Dose (mg/L)	Res. (mg/L)	Dem (mg/L)	Temp (°C)	pH	Time hrs	Alk. (mg/L)	Hard-Tot (mg/L as CaCO3)	Hard-CA	Turb. (ntu)		
12	9812-69	185.20.Eff-34	12/7/98	7:18	12/7/98	13:17			16.90	229	2.09	0.035	22.5	7.8	1.75	0.97	0.78	7.5	7.37	24.0					
13	9812-70	185.20.Eff-35	12/8/98	10:48	12/8/98	13:58			17.99	243	2.13	0.035	21.2	7.7											
Influent A		EBCT:	Carbon Type:		Influent pH: 6.5		Scaling Factor: 13.5																		
1	9811-590	185.Inf.pH6.5.A-1	11/30/98	14:30	11/30/98	14:30			0.05	1											104	223	138		
2	9811-591	185.Inf.pH6.5.A-2	12/7/98	13:35	12/7/98	13:35			7.01	95											71	208	126		
Influent A		EBCT:	Carbon Type:		Influent pH: 7		Scaling Factor: 13.5																		
1	9811-542	185.Inf.A-1	11/20/98	14:40	11/20/98	14:40			0.08	1											151	216	130		
2	9811-543	185.Inf.A-2	11/28/98	16:30	11/28/98	16:30			8.16	110											127	226	136		
Influent A		EBCT:	Carbon Type:		Influent pH: 7.5		Scaling Factor: 13.5																		
1	9811-636	185.Inf.pH7.5.A-1	11/30/98	14:40	11/30/98	14:40			0.05	1											164	224	138		
2	9811-637	185.Inf.pH7.5.A-2	12/7/98	8:35	12/7/98	8:35			6.80	92											158	217	131		
Influent B		EBCT:	Carbon Type:		Influent pH: 6.5		Scaling Factor: 13.5																		
1	9811-592	185.Inf.pH6.5.B-1	11/30/98	14:35	11/30/98	14:35			0.05	1	2.80	0.060	18.5	6.7	3.30	0.95	2.35	7.5	7.22	24.0				0.15	
2	9811-593	185.Inf.pH6.5.B-2	12/3/98	10:23	12/3/98	10:23			2.87	39	2.83		19.8	6.5											
3	9811-594	185.Inf.pH6.5.B-3	12/6/98	14:45	12/6/98	14:45			6.06	82	2.74		19.1	6.5											
4	9811-595	185.Inf.pH6.5.B-4	12/7/98	13:35	12/7/98	13:35			7.01	95	2.76	0.060	18.2	6.5	3.15	0.89	2.26	7.5	7.29	23.9				0.20	
Influent B		EBCT:	Carbon Type:		Influent pH: 7		Scaling Factor: 13.5																		
1	9811-544	185.Inf.B-1	11/20/98	14:35	11/20/98	14:35			0.08	1	2.91	0.060	18.4	7.3	3.40	1.09	2.31	7.7	7.32	24.5				0.15	
2	9811-545	185.Inf.B-2	11/22/98	13:40	11/22/98	13:40			2.04	28	2.72		18.0	7.0											
3	9811-546	185.Inf.B-3	11/25/98	13:00	11/25/98	13:00			5.01	68	2.80		18.2	7.0											
4	9811-547	185.Inf.B-4	11/28/98	14:30	11/28/98	14:30			8.08	109	2.79	0.060	18.2	7.0	3.00	0.66	2.34	8.0	7.29	24.1				0.25	
5	9811-548	185.Inf.B-5	12/3/98	10:20	12/3/98	10:20			12.90	174	2.81		19.4	7.0											
6	9811-549	185.Inf.B-6	12/8/98	8:45	12/8/98	8:45			17.84	241	2.77	0.060	18.2	7.0	3.10	0.92	2.18	7.5	7.29	24.0				0.20	
Influent B		EBCT:	Carbon Type:		Influent pH: 7.5		Scaling Factor: 13.5																		
1	9811-638	185.Inf.pH7.5.B-1	11/30/98	14:45	11/30/98	14:45			0.06	1	2.81	0.060	20.1	7.5	3.80	1.38	2.42	7.5	7.38	24.1				0.10	
2	9811-639	185.Inf.pH7.5.B-2	12/3/98	10:25	12/3/98	10:25			2.88	39	2.80		20.0	7.5											
3	9811-640	185.Inf.pH7.5.B-3	12/6/98	14:45	12/6/98	14:45			6.06	82	2.79		18.7	7.5											
4	9811-641	185.Inf.pH7.5.B-4	12/7/98	8:30	12/7/98	8:30			6.80	92	2.79	0.059	19.8	7.6	3.15	0.55	2.60	7.5	7.37	23.9				0.15	

# Summers & Hooper, Inc.

## RSSCT Sampling Summary Report

**Study title:** ICR RSSCT #3,4

**Client:** Iowa-American Water Company **Study#:** 185

#	SamplesID	ClientSampleID	F-S L	TOC	TOX	Trihalomethanes (µg/L)					Haloacetic Acids (µg/L)										NH3-N	Brom		
			(days)	(mg/L)	(µg Cl-/L)	CF	BDCM	DBCM	BF	TTHM	MCAA	DCAA	TCAA	MBAA	DBAA	BCAA	BDCAA	DBCAA	TBAA	HAA6	HAA9	(mg/L)	(µg/L)	
12	9812-69	185.20.Eff-34	229	2.09	109	10.0	3.4	8.7	ND	22.1	ND	7	7	ND	ND	3	4	ND	ND	17	21			
13	9812-70	185.20.Eff-35	243	2.13																				
Influent A			EBCT:	Carbon Type:		Influent pH: 6.5				Scaling Factor: 13.5														
1	9811-590	185.Inf.pH6.5.A-1	1																			ND	32	
2	9811-591	185.Inf.pH6.5.A-2	95																			ND	31	
Influent A			EBCT:	Carbon Type:		Influent pH: 7				Scaling Factor: 13.5														
1	9811-542	185.Inf.A-1	1																			0.06	34	
2	9811-543	185.Inf.A-2	110																			ND	33	
Influent A			EBCT:	Carbon Type:		Influent pH: 7.5				Scaling Factor: 13.5														
1	9811-636	185.Inf.pH7.5.A-1	1																			ND	31	
2	9811-637	185.Inf.pH7.5.A-2	92																			ND	31	
Influent B			EBCT:	Carbon Type:		Influent pH: 6.5				Scaling Factor: 13.5														
1	9811-592	185.Inf.pH6.5.B-1	1	2.80	221	23.4	1.8	9.8	ND	34.9	ND	12	17	ND	ND	3	4	ND	ND	32	37			
2	9811-593	185.Inf.pH6.5.B-2	39	2.83																				
3	9811-594	185.Inf.pH6.5.B-3	82	2.74																				
4	9811-595	185.Inf.pH6.5.B-4	95	2.76	205	23.5	2.5	10.6	ND	36.6	ND	13	18	ND	ND	3	5	ND	ND	35	40			
Influent B			EBCT:	Carbon Type:		Influent pH: 7				Scaling Factor: 13.5														
1	9811-544	185.Inf.B-1	1	2.91	213	28.7	2.0	12.0	ND	42.7	ND	14	26	ND	ND	4	8	ND	ND	44	52			
2	9811-545	185.Inf.B-2	28	2.72																				
3	9811-546	185.Inf.B-3	68	2.80																				
4	9811-547	185.Inf.B-4	109	2.79	202	25.0	2.0	11.1	ND	38.1	ND	13	20	ND	ND	3	5	ND	ND	36	41			
5	9811-548	185.Inf.B-5	174	2.81																				
6	9811-549	185.Inf.B-6	241	2.77	205	23.7	2.0	10.8	ND	36.5	ND	14	19	ND	ND	3	5	ND	ND	36	41			
Influent B			EBCT:	Carbon Type:		Influent pH: 7.5				Scaling Factor: 13.5														
1	9811-638	185.Inf.pH7.5.B-1	1	2.81	211	28.6	2.1	11.5	ND	42.1	ND	14	23	ND	ND	4	6	ND	ND	41	47			
2	9811-639	185.Inf.pH7.5.B-2	39	2.80																				
3	9811-640	185.Inf.pH7.5.B-3	82	2.79																				
4	9811-641	185.Inf.pH7.5.B-4	92	2.79	203	25.5	2.2	11.2	ND	38.9	ND	13	17	ND	ND	3	5	ND	ND	33	38			



# Summers & Hooper, Inc.

## RSSCT Sampling Summary Report

**Study title:** ICR RSSCT #3,4

**Client:** Iowa-American Water Company **Study#:** 185

												SDS Chlorination Conditions*									
No.	Sample ID	Client Sample ID	Start Date/Time	End Date/Time	Stop T (days)	Run L (days)	F-S L (days)	TOC (mg/L)	UV254 (1/cm)	Temp (°C)	pH	Dose (mg/L)	Res. (mg/L)	Dem (mg/L)	Temp (°C)	pH	Time hrs	Alk. (mg/L)	Hard-Tot (mg/L as CaCO3)	Hard-CA	Turb. (ntu)
PreStudy		EBCT:	Carbon Type:		Influent pH: 0			Scaling Factor: 0													
1	9811-642	Iowa Settled On Arrival	11/19/98	0:00				2.81													
2	9811-643	Iowa Filtered S&H	11/19/98	0:00				2.75													
3	9811-321	Iowa.Settled	11/16/98	11:30				2.86													
4	9811-341	Iowa.Filtered	11/17/98	0:00	11/17/98	0:00		2.27													
5	9811-339	Iowa.Raw	11/17/98	9:40	11/17/98	9:40		3.52													
6	9811-340	Iowa.Settled.Drum	11/17/98	10:45	11/17/98	10:45		2.88													

**\*Target SDS Chlorination Conditions**

**Free Cl2 Residual:** 0.75 mg/L **pH:** 7.3 **Temperature:** 7.0 °C **Holding time:** 24.0 hrs

**Study Comments**

# Summers & Hooper, Inc.

## RSSCT Sampling Summary Report

**Study title:** ICR RSSCT #3,4

**Client:** Iowa-American Water Company

**Study#:** 185

#	SamplesID	ClientSampleID	F-S L	TOC	TOX	Trihalomethanes (µg/L)					Haloacetic Acids (µg/L)										NH3-N	Brom
			(days)	(mg/L)	(µg Cl-/L)	CF	BDCM	DBCM	BF	TTHM	MCAA	DCAA	TCAA	MBAA	DBAA	BCAA	BDCAA	DBCAA	TBAA	HAA6	HAA9	(mg/L)
PreStudy		EBCT:	Carbon Type:			Influent pH: 0					Scaling Factor: 0											
1	9811-642	Iowa Settled On Arrival		2.81																		
2	9811-643	Iowa Filtered S&H		2.75																		
3	9811-321	Iowa.Settled		2.86																		
4	9811-341	Iowa.Filtered		2.27																		
5	9811-339	Iowa.Raw		3.52																		
6	9811-340	Iowa.Settled.Drum		2.88																		

## ***Laboratory Report***

**Client:**

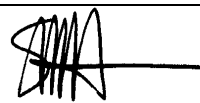
Mr. Joel Mohr  
Iowa-American Water Company  
230 E. 2<sup>nd</sup> Street  
P.O. Box 979  
Davenport, IA 52805

Phone: 319-322-0161 Fax: 319-322-2190

**Study Title:** ICR RSSCT #1

**Study #:** 96

**Reviewed By:** \_\_\_\_\_



Stuart M. Hooper

**Date Reviewed:** 6/23/99

**Laboratory Test Results**Page 1 of 36  
Printed on 6/23/99Mr. Joel Mohr  
Iowa-American Water Company  
230 East 2nd Street  
P.O. Box 979  
Davenport, IA 52805

Phone: 319-322-0161 Fax: 319-322-2190

Study#: 96  
Study Title: ICR RSSCT #1

Sample ID: Raw Water			S&H ID: 9803-87		Date Sampled: 3/9/98 11:30:00 AM						
#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
1	TOC-ICR	TOC	5.34	mg/L	SM 5310 C	1	0.50	3/9/98		3/10/98	7-0-208
2	TOC-ICR	TOC (Dupl)	5.70	mg/L	SM 5310 C	1	0.50	3/9/98		3/10/98	7-0-208
			5.52	mg/L	6.5 % RPD						

Sample ID: Settled Water		S&H ID: 9803-88		Date Sampled: 3/9/98 11:45:00 AM						
#	Analysis Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
3	TOC-ICR TOC	3.26	mg/L	SM 5310 C	1	0.50	3/9/98		3/10/98	7-0-208
4	TOC-ICR TOC (Dupl)	3.27	mg/L	SM 5310 C	1	0.50	3/9/98		3/10/98	7-0-208
		3.26	mg/L	0.3 % RPD						

Sample ID: Settled		S&H ID: 9803-115		Date Sampled: 3/11/98 11:00:00 AM						
#	Analysis Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
5	TOC-ICR TOC	3.83	mg/L	SM 5310 C	1	0.50	3/11/98		3/14/98	7-0-212
6	TOC-ICR TOC (Dupl)	3.88	mg/L	SM 5310 C	1	0.50	3/11/98		3/14/98	7-0-212
		3.86	mg/L	1.3 % RPD						

Sample ID: Settled and Decanted		S&H ID: 9803-116		Date Sampled: 3/11/98 2:50:00 AM						
#	Analysis Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
7	TOC-ICR TOC	4.05	mg/L	SM 5310 C	1	0.50	3/11/98		3/14/98	7-0-212
8	TOC-ICR TOC (Dupl)	4.10	mg/L	SM 5310 C	1	0.50	3/11/98		3/14/98	7-0-212
		4.07	mg/L	1.2 % RPD						

Sample ID: Filtered			S&H ID: 9803-117		Date Sampled: 3/11/98 10:15:00 AM						
#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
9	TOC-ICR	TOC	2.64	mg/L	SM 5310 C	1	0.50	3/11/98		3/14/98	7-0-212
10	TOC-ICR	TOC (Dupl)	2.81	mg/L	SM 5310 C	1	0.50	3/11/98		3/14/98	7-0-212
			2.73	mg/L	6.2 % RPD						

Sample ID: Barrel Pre-filter			S&H ID: 9803-147		Date Sampled: 3/14/98 9:20:00 AM						
#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
11	TOC-ICR	TOC	3.74	mg/L	SM 5310 C	1	0.50	3/14/98		3/14/98	7-0-212
12	TOC-ICR	TOC (Dupl)	3.76	mg/L	SM 5310 C	1	0.50	3/14/98		3/14/98	7-0-212
			3.75	mg/L	0.5 % RPD						

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 96  
Study Title: ICR RSSCT #1

Sample ID: Barrel Post-filter S&amp;H ID: 9803-148 Date Sampled: 3/14/98 10:00:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
13	TOC-ICR	TOC	3.45	mg/L	SM 5310 C	1	0.50	3/14/98		3/14/98	7-0-212
14	TOC-ICR	TOC (Dupl)	3.49	mg/L	SM 5310 C	1	0.50	3/14/98		3/14/98	7-0-212
			3.47	mg/L	1.2 % RPD						

Sample ID: 96.INF.A-1 S&amp;H ID: 9803-170 Date Sampled: 3/17/98 2:40:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
15	ALK	Alkalinity	105	mg/L	SM 2320 B	1	5	3/17/98		3/18/98	1-0-16
16	ALK	Alkalinity (Dupl)	108	mg/L	SM 2320 B	1	5	3/17/98		3/18/98	1-0-16
			107	mg/L	2.8 % RPD						
17	NH3	Ammonia Nitrogen	0.13	mg/L	EPA 350.1	1	0.05	3/17/98		3/31/98	MW75331
18	BR	Bromide	ND	mg/L	EPA 300.0 A	1	0.020	3/17/98		3/26/98	MW75171
19	CaHard	Calcium Hardness	142	mg/L CaCO3	SM 3500-Ca D	1	10	3/17/98		3/18/98	33-0-16
20	CaHard	Calcium Hardness (Dupl)	141	mg/L CaCO3	SM 3500-Ca D	1	10	3/17/98		3/18/98	33-0-16
			142	mg/L CaCO3	0.7 % RPD						
21	TotHard	Total Hardness	176	mg/L CaCO3	SM 2340 C	1	5	3/17/98		3/18/98	3-0-16
22	TotHard	Total Hardness (Dupl)	172	mg/L CaCO3	SM 2340 C	1	5	3/17/98		3/18/98	3-0-16
			174	mg/L CaCO3	2.3 % RPD						

Sample ID: 96.INF.B-1 S&amp;H ID: 9803-171 Date Sampled: 3/17/98 2:45:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
23	Cl2Dose	Chlorine Dose	2.75	mg/L as Cl2	SM 4500-Cl B	1	n/a	3/20/98		3/20/98	n/a
24	Cl2Res	Chlorine Residual	0.67	mg/L as Cl2	SM 4500-Cl F	1	0.10	3/20/98		3/20/98	n/a
25	HAA-ICR	1,2,3-Trichloropropane (IS) (Internal Standard)	101.2	%	EPA 552.2	1	1.0	3/20/98	3/25/98	3/25/98	0-100-0
26	HAA-ICR	2-Bromopropionic acid (Surrogate)	84.0	%	EPA 552.2	1	1.0	3/20/98	3/25/98	3/25/98	0-100-0
27	HAA-ICR	Bromochloroacetic acid	1.3	µg/L	EPA 552.2	1	1.0	3/20/98	3/25/98	3/25/98	0-100-0
28	HAA-ICR	Bromodichloroacetic acid	1.7	µg/L	EPA 552.2	1	1.0	3/20/98	3/25/98	3/25/98	0-100-0
29	HAA-ICR	Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	3/20/98	3/25/98	3/25/98	0-100-0
30	HAA-ICR	Dibromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	3/20/98	3/25/98	3/25/98	0-100-0
31	HAA-ICR	Dichloroacetic acid	8.9	µg/L	EPA 552.2	1	1.0	3/20/98	3/25/98	3/25/98	0-100-0
32	HAA-ICR	Monobromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	3/20/98	3/25/98	3/25/98	0-100-0
33	HAA-ICR	Monochloroacetic acid	2.2	µg/L	EPA 552.2	1	2.0	3/20/98	3/25/98	3/25/98	0-100-0
34	HAA-ICR	Tribromoacetic acid	ND	µg/L	EPA 552.2	1	4.0	3/20/98	3/25/98	3/25/98	0-100-0
35	HAA-ICR	Trichloroacetic acid	7.5	µg/L	EPA 552.2	1	1.0	3/20/98	3/25/98	3/25/98	0-100-0
36	pH	Cl2 pH - Final	7.4	Unit	SM 4500-H+ B	1	n/a	3/20/98		3/20/98	n/a
37	pH	Cl2 pH - Initial	7.3	Unit	SM 4500-H+ B	1	n/a	3/20/98		3/20/98	n/a

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 96  
Study Title: ICR RSSCT #1

38	pH	pH	7.1 Unit	SM 4500-H+ B	1	n/a	3/17/98	3/17/98	n/a
39	TEMP	Cl2 Temperature	6.9 °C	SM 2550 B	1	n/a	3/20/98	3/20/98	n/a
40	TEMP	Temperature	21.5 °C	SM 2550 B	1	n/a	3/17/98	3/17/98	n/a
41	TIME	Cl2 Incubation Time	3.1 hrs	n/a	1	n/a	3/20/98	3/20/98	n/a
42	TOC-ICR	TOC	3.39 mg/L	SM 5310 C	1	0.50	3/17/98	3/19/98	7-0-215
43	TOC-ICR	TOC (Dupl)	3.47 mg/L	SM 5310 C	1	0.50	3/17/98	3/19/98	7-0-215
			<b>3.43 mg/L</b>	<b>2.3 % RPD</b>					
44	TOX-ICR	TOX	169 µg Cl-/L	SM 5320 B	1	25	3/20/98	3/27/98	12-0-107
45	TOX-ICR	TOX (Dupl)	175 µg Cl-/L	SM 5320 B	1	25	3/20/98	3/27/98	12-0-107
			<b>172 µg Cl-/L</b>	<b>3.5 % RPD</b>					
46	THM-ICR	1,2,3-Trichloropropane (Surrogate)	99.6 %	EPA 551.1	1	1.0	3/20/98	4/1/98	4/1/98 0-101-0
47	THM-ICR	Bromodichloromethane	4.7 µg/L	EPA 551.1	1	1.0	3/20/98	4/1/98	4/1/98 0-101-0
48	THM-ICR	Bromoform	ND µg/L	EPA 551.1	1	1.0	3/20/98	4/1/98	4/1/98 0-101-0
49	THM-ICR	Chloroform	17.4 µg/L	EPA 551.1	1	1.0	3/20/98	4/1/98	4/1/98 0-101-0
50	THM-ICR	Dibromochloromethane	ND µg/L	EPA 551.1	1	1.0	3/20/98	4/1/98	4/1/98 0-101-0
51	TURB	Turbidity	0.10 ntu	SM 2130 B	1	0.05	3/17/98	3/17/98	9-0-8

Sample ID: 96.20.Eff-1

S&amp;H ID: 9803-175

Date Sampled: 3/17/98 7:44:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
52	Cl2Dose	Chlorine Dose	1.93	mg/L as Cl2	SM 4500-Cl B	1	n/a	3/20/98		3/20/98	n/a
53	Cl2Res	Chlorine Residual	0.66	mg/L as Cl2	SM 4500-Cl F	1	0.10	3/20/98		3/20/98	n/a
54	HAA-ICR	1,2,3-Trichloropropane (IS) (Internal Standard)	100.8	%	EPA 552.2	1	1.0	3/20/98	3/25/98	3/25/98	0-100-0
55	HAA-ICR	2-Bromopropionic acid (Surrogate)	95.6	%	EPA 552.2	1	1.0	3/20/98	3/25/98	3/25/98	0-100-0
56	HAA-ICR	Bromochloroacetic acid	ND	µg/L	EPA 552.2	1	1.0	3/20/98	3/25/98	3/25/98	0-100-0
57	HAA-ICR	Bromodichloroacetic acid	ND	µg/L	EPA 552.2	1	1.0	3/20/98	3/25/98	3/25/98	0-100-0
58	HAA-ICR	Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	3/20/98	3/25/98	3/25/98	0-100-0
59	HAA-ICR	Dibromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	3/20/98	3/25/98	3/25/98	0-100-0
60	HAA-ICR	Dichloroacetic acid	ND	µg/L	EPA 552.2	1	1.0	3/20/98	3/25/98	3/25/98	0-100-0
61	HAA-ICR	Monobromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	3/20/98	3/25/98	3/25/98	0-100-0
62	HAA-ICR	Monochloroacetic acid	ND	µg/L	EPA 552.2	1	2.0	3/20/98	3/25/98	3/25/98	0-100-0
63	HAA-ICR	Tribromoacetic acid	ND	µg/L	EPA 552.2	1	4.0	3/20/98	3/25/98	3/25/98	0-100-0
64	HAA-ICR	Trichloroacetic acid	ND	µg/L	EPA 552.2	1	1.0	3/20/98	3/25/98	3/25/98	0-100-0
65	pH	Cl2 pH - Final	7.5	Unit	SM 4500-H+ B	1	n/a	3/20/98		3/20/98	n/a
66	pH	Cl2 pH - Initial	7.4	Unit	SM 4500-H+ B	1	n/a	3/20/98		3/20/98	n/a
67	pH	pH	8.1	Unit	SM 4500-H+ B	1	n/a	3/17/98		3/17/98	n/a
68	TEMP	Cl2 Temperature	6.9	°C	SM 2550 B	1	n/a	3/20/98		3/20/98	n/a
69	TEMP	Temperature	22.5	°C	SM 2550 B	1	n/a	3/17/98		3/17/98	n/a

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 96  
Study Title: ICR RSSCT #1

70	TIME	Cl2 Incubation Time	3.1 hrs	n/a	1	n/a	3/20/98	3/20/98	n/a
71	TOC-ICR	TOC	ND mg/L	SM 5310 C	1	0.50	3/17/98	3/19/98	7-0-215
72	TOC-ICR	TOC (Dupl)	ND mg/L	SM 5310 C	1	0.50	3/17/98	3/19/98	7-0-215
			<b>ND mg/L</b>						
73	TOX-ICR	TOX	ND µg Cl-/L	SM 5320 B	1	25	3/20/98	3/27/98	12-0-107
74	TOX-ICR	TOX (Dupl)	ND µg Cl-/L	SM 5320 B	1	25	3/20/98	3/27/98	12-0-107
			<b>ND µg Cl-/L</b>						
75	THM-ICR	1,2,3-Trichloropropane (Surrogate)	104.4 %	EPA 551.1	1	1.0	3/20/98	4/1/98	4/1/98 0-101-0
76	THM-ICR	Bromodichloromethane	ND µg/L	EPA 551.1	1	1.0	3/20/98	4/1/98	4/1/98 0-101-0
77	THM-ICR	Bromoform	ND µg/L	EPA 551.1	1	1.0	3/20/98	4/1/98	4/1/98 0-101-0
78	THM-ICR	Chloroform	ND µg/L	EPA 551.1	1	1.0	3/20/98	4/1/98	4/1/98 0-101-0
79	THM-ICR	Dibromochloromethane	ND µg/L	EPA 551.1	1	1.0	3/20/98	4/1/98	4/1/98 0-101-0
80	UV-ICR	UV	ND 1/cm	SM 5910 B	1	0.009	3/17/98	3/18/98	8-0-146
81	UV-ICR	UV (Dupl)	ND 1/cm	SM 5910 B	1	0.009	3/17/98	3/18/98	8-0-146
			<b>ND 1/cm</b>						

Sample ID: 96.10.Eff-1

S&amp;H ID: 9803-176

Date Sampled: 3/17/98 10:32:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
82	Cl2Dose	Chlorine Dose	1.93	mg/L as Cl2	SM 4500-Cl B	1	n/a	3/20/98		3/20/98	n/a
83	Cl2Res	Chlorine Residual	0.68	mg/L as Cl2	SM 4500-Cl F	1	0.10	3/20/98		3/20/98	n/a
84	HAA-ICR	1,2,3-Trichloropropane (IS) (Internal Standard)	99.2	%	EPA 552.2	1	1.0	3/20/98	3/25/98	3/26/98	0-100-0
85	HAA-ICR	2-Bromopropionic acid (Surrogate)	85.2	%	EPA 552.2	1	1.0	3/20/98	3/25/98	3/26/98	0-100-0
86	HAA-ICR	Bromochloroacetic acid	ND	µg/L	EPA 552.2	1	1.0	3/20/98	3/25/98	3/26/98	0-100-0
87	HAA-ICR	Bromodichloroacetic acid	ND	µg/L	EPA 552.2	1	1.0	3/20/98	3/25/98	3/26/98	0-100-0
88	HAA-ICR	Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	3/20/98	3/25/98	3/26/98	0-100-0
89	HAA-ICR	Dibromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	3/20/98	3/25/98	3/26/98	0-100-0
90	HAA-ICR	Dichloroacetic acid	ND	µg/L	EPA 552.2	1	1.0	3/20/98	3/25/98	3/26/98	0-100-0
91	HAA-ICR	Monobromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	3/20/98	3/25/98	3/26/98	0-100-0
92	HAA-ICR	Monochloroacetic acid	ND	µg/L	EPA 552.2	1	2.0	3/20/98	3/25/98	3/26/98	0-100-0
93	HAA-ICR	Tribromoacetic acid	ND	µg/L	EPA 552.2	1	4.0	3/20/98	3/25/98	3/26/98	0-100-0
94	HAA-ICR	Trichloroacetic acid	ND	µg/L	EPA 552.2	1	1.0	3/20/98	3/25/98	3/26/98	0-100-0
95	pH	Cl2 pH - Final	7.5	Unit	SM 4500-H+ B	1	n/a	3/20/98		3/20/98	n/a
96	pH	Cl2 pH - Initial	7.4	Unit	SM 4500-H+ B	1	n/a	3/20/98		3/20/98	n/a
97	pH	pH	7.4	Unit	SM 4500-H+ B	1	n/a	3/17/98		3/17/98	n/a
98	TEMP	Cl2 Temperature	6.9	°C	SM 2550 B	1	n/a	3/20/98		3/20/98	n/a
99	TEMP	Temperature	21.6	°C	SM 2550 B	1	n/a	3/17/98		3/17/98	n/a
100	TIME	Cl2 Incubation Time	2.9	hrs	n/a	1	n/a	3/20/98		3/20/98	n/a
101	TOC-ICR	TOC	ND	mg/L	SM 5310 C	1	0.50	3/17/98		3/19/98	7-0-215

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 96  
Study Title: ICR RSSCT #1

102	TOC-ICR TOC (Dupl)	ND mg/L ND mg/L	SM 5310 C	1	0.50	3/17/98	3/19/98	7-0-215
103	TOX-ICR TOX	ND µg Cl-/L	SM 5320 B	1	25	3/20/98	3/27/98	12-0-107
104	TOX-ICR TOX (Dupl)	ND µg Cl-/L ND µg Cl-/L	SM 5320 B	1	25	3/20/98	3/27/98	12-0-107
105	THM-ICR 1,2,3-Trichloropropane (Surrogate)	106.4 %	EPA 551.1	1	1.0	3/20/98	4/1/98	4/1/98 0-101-0
106	THM-ICR Bromodichloromethane	ND µg/L	EPA 551.1	1	1.0	3/20/98	4/1/98	4/1/98 0-101-0
107	THM-ICR Bromoform	ND µg/L	EPA 551.1	1	1.0	3/20/98	4/1/98	4/1/98 0-101-0
108	THM-ICR Chloroform	ND µg/L	EPA 551.1	1	1.0	3/20/98	4/1/98	4/1/98 0-101-0
109	THM-ICR Dibromochloromethane	ND µg/L	EPA 551.1	1	1.0	3/20/98	4/1/98	4/1/98 0-101-0
110	UV-ICR UV	ND 1/cm	SM 5910 B	1	0.009	3/17/98	3/18/98	8-0-146
111	UV-ICR UV (Dupl)	ND 1/cm ND 1/cm	SM 5910 B	1	0.009	3/17/98	3/18/98	8-0-146

Sample ID: 96.10.Eff-6d

S&amp;H ID: 9803-194

Date Sampled: 3/18/98 11:37:00 PM

#	Analysis Type	Result Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
112	Cl2Dose Chlorine Dose	1.96 mg/L as Cl2	SM 4500-Cl B	1	n/a	3/20/98		3/20/98	n/a
113	Cl2Res Chlorine Residual	0.75 mg/L as Cl2	SM 4500-Cl F	1	0.10	3/20/98		3/20/98	n/a
114	HAA-ICR 1,2,3-Trichloropropane (IS) (Internal Standard)	100.8 %	EPA 552.2	1	1.0	3/20/98	3/25/98	3/26/98	0-100-0
115	HAA-ICR 2-Bromopropionic acid (Surrogate)	100.8 %	EPA 552.2	1	1.0	3/20/98	3/25/98	3/26/98	0-100-0
116	HAA-ICR Bromochloroacetic acid	ND µg/L	EPA 552.2	1	1.0	3/20/98	3/25/98	3/26/98	0-100-0
117	HAA-ICR Bromodichloroacetic acid	ND µg/L	EPA 552.2	1	1.0	3/20/98	3/25/98	3/26/98	0-100-0
118	HAA-ICR Chlorodibromoacetic acid	ND µg/L	EPA 552.2	1	2.0	3/20/98	3/25/98	3/26/98	0-100-0
119	HAA-ICR Dibromoacetic acid	ND µg/L	EPA 552.2	1	1.0	3/20/98	3/25/98	3/26/98	0-100-0
120	HAA-ICR Dichloroacetic acid	4.8 µg/L	EPA 552.2	1	1.0	3/20/98	3/25/98	3/26/98	0-100-0
121	HAA-ICR Monobromoacetic acid	ND µg/L	EPA 552.2	1	1.0	3/20/98	3/25/98	3/26/98	0-100-0
122	HAA-ICR Monochloroacetic acid	ND µg/L	EPA 552.2	1	2.0	3/20/98	3/25/98	3/26/98	0-100-0
123	HAA-ICR Tribromoacetic acid	ND µg/L	EPA 552.2	1	4.0	3/20/98	3/25/98	3/26/98	0-100-0
124	HAA-ICR Trichloroacetic acid	ND µg/L	EPA 552.2	1	1.0	3/20/98	3/25/98	3/26/98	0-100-0
125	pH Cl2 pH - Final	7.5 Unit	SM 4500-H+ B	1	n/a	3/20/98		3/20/98	n/a
126	pH Cl2 pH - Initial	7.4 Unit	SM 4500-H+ B	1	n/a	3/20/98		3/20/98	n/a
127	pH pH	7.7 Unit	SM 4500-H+ B	1	n/a	3/18/98		3/18/98	n/a
128	TEMP Cl2 Temperature	6.9 °C	SM 2550 B	1	n/a	3/20/98		3/20/98	n/a
129	TEMP Temperature	22.7 °C	SM 2550 B	1	n/a	3/18/98		3/18/98	n/a
130	TIME Cl2 Incubation Time	3.0 hrs	n/a	1	n/a	3/20/98		3/20/98	n/a
131	TOC-ICR TOC	ND mg/L	SM 5310 C	1	0.50	3/18/98		3/19/98	7-0-215
132	TOC-ICR TOC (Dupl)	ND mg/L ND mg/L	SM 5310 C	1	0.50	3/18/98		3/19/98	7-0-215

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.



**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 96  
Study Title: ICR RSSCT #1

133	TOX-ICR TOX	ND µg Cl-/L	SM 5320 B	1	25	3/20/98	3/27/98	12-0-107
134	TOX-ICR TOX (Dupl)	ND µg Cl-/L	SM 5320 B	1	25	3/20/98	3/27/98	12-0-107
		<b>ND µg Cl-/L</b>						
135	THM-ICR 1,2,3-Trichloropropane (Surrogate)	104.0 %	EPA 551.1	1	1.0	3/20/98	4/1/98	4/1/98 0-101-0
136	THM-ICR Bromodichloromethane	ND µg/L	EPA 551.1	1	1.0	3/20/98	4/1/98	4/1/98 0-101-0
137	THM-ICR Bromoform	ND µg/L	EPA 551.1	1	1.0	3/20/98	4/1/98	4/1/98 0-101-0
138	THM-ICR Chloroform	ND µg/L	EPA 551.1	1	1.0	3/20/98	4/1/98	4/1/98 0-101-0
139	THM-ICR Dibromochloromethane	ND µg/L	EPA 551.1	1	1.0	3/20/98	4/1/98	4/1/98 0-101-0
140	UV-ICR UV	ND 1/cm	SM 5910 B	1	0.009	3/18/98	3/20/98	8-0-147
141	UV-ICR UV (Dupl)	ND 1/cm	SM 5910 B	1	0.009	3/18/98	3/20/98	8-0-147
		<b>ND 1/cm</b>						

Sample ID: 96.10.Eff-8

S&amp;H ID: 9803-196

Date Sampled: 3/19/98 8:13:00 AM

#	Analysis Type	Result Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
142	Cl2Dose Chlorine Dose	2.01 mg/L as Cl2	SM 4500-Cl B	1	n/a	3/20/98		3/20/98	n/a
143	Cl2Res Chlorine Residual	0.72 mg/L as Cl2	SM 4500-Cl F	1	0.10	3/20/98		3/20/98	n/a
144	HAA-ICR 1,2,3-Trichloropropane (IS) (Internal Standard)	98.4 %	EPA 552.2	1	1.0	3/20/98	3/25/98	3/26/98	0-100-0
145	HAA-ICR 2-Bromopropionic acid (Surrogate)	102.4 %	EPA 552.2	1	1.0	3/20/98	3/25/98	3/26/98	0-100-0
146	HAA-ICR Bromochloroacetic acid	ND µg/L	EPA 552.2	1	1.0	3/20/98	3/25/98	3/26/98	0-100-0
147	HAA-ICR Bromodichloroacetic acid	ND µg/L	EPA 552.2	1	1.0	3/20/98	3/25/98	3/26/98	0-100-0
148	HAA-ICR Chlorodibromoacetic acid	ND µg/L	EPA 552.2	1	2.0	3/20/98	3/25/98	3/26/98	0-100-0
149	HAA-ICR Dibromoacetic acid	ND µg/L	EPA 552.2	1	1.0	3/20/98	3/25/98	3/26/98	0-100-0
150	HAA-ICR Dichloroacetic acid	7.7 µg/L	EPA 552.2	1	1.0	3/20/98	3/25/98	3/26/98	0-100-0
151	HAA-ICR Monobromoacetic acid	ND µg/L	EPA 552.2	1	1.0	3/20/98	3/25/98	3/26/98	0-100-0
152	HAA-ICR Monochloroacetic acid	ND µg/L	EPA 552.2	1	2.0	3/20/98	3/25/98	3/26/98	0-100-0
153	HAA-ICR Tribromoacetic acid	ND µg/L	EPA 552.2	1	4.0	3/20/98	3/25/98	3/26/98	0-100-0
154	HAA-ICR Trichloroacetic acid	ND µg/L	EPA 552.2	1	1.0	3/20/98	3/25/98	3/26/98	0-100-0
155	pH Cl2 pH - Final	7.4 Unit	SM 4500-H+ B	1	n/a	3/20/98		3/20/98	n/a
156	pH Cl2 pH - Initial	7.3 Unit	SM 4500-H+ B	1	n/a	3/20/98		3/20/98	n/a
157	pH pH	7.7 Unit	SM 4500-H+ B	1	n/a	3/19/98		3/19/98	n/a
158	TEMP Cl2 Temperature	6.9 °C	SM 2550 B	1	n/a	3/20/98		3/20/98	n/a
159	TEMP Temperature	21.3 °C	SM 2550 B	1	n/a	3/19/98		3/19/98	n/a
160	TIME Cl2 Incubation Time	3.0 hrs	n/a	1	n/a	3/20/98		3/20/98	n/a
161	TOC-ICR TOC	0.57 mg/L	SM 5310 C	1	0.50	3/19/98		3/19/98	7-0-215
162	TOC-ICR TOC (Dupl)	0.60 mg/L	SM 5310 C	1	0.50	3/19/98		3/19/98	7-0-215
		<b>0.58 mg/L</b>	<b>5.2 % RPD</b>						
163	TOX-ICR TOX	ND µg Cl-/L	SM 5320 B	1	25	3/20/98		3/27/98	12-0-107
164	TOX-ICR TOX (Dupl)	ND µg Cl-/L	SM 5320 B	1	25	3/20/98		3/27/98	12-0-107

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 96  
Study Title: ICR RSSCT #1

		ND	µg Cl-/L							
165	THM-ICR 1,2,3-Trichloropropane (Surrogate)	102.0	%	EPA 551.1	1	1.0	3/20/98	4/1/98	4/1/98	0-101-0
166	THM-ICR Bromodichloromethane	ND	µg/L	EPA 551.1	1	1.0	3/20/98	4/1/98	4/1/98	0-101-0
167	THM-ICR Bromoform	ND	µg/L	EPA 551.1	1	1.0	3/20/98	4/1/98	4/1/98	0-101-0
168	THM-ICR Chloroform	1.5	µg/L	EPA 551.1	1	1.0	3/20/98	4/1/98	4/1/98	0-101-0
169	THM-ICR Dibromochloromethane	ND	µg/L	EPA 551.1	1	1.0	3/20/98	4/1/98	4/1/98	0-101-0
170	UV-ICR UV	ND	1/cm	SM 5910 B	1	0.009	3/19/98		3/20/98	8-0-147
171	UV-ICR UV (Dupl)	ND	1/cm	SM 5910 B	1	0.009	3/19/98		3/20/98	8-0-147
		ND	1/cm							

Sample ID: 96.10.Eff-9		S&H ID: 9803-203		Date Sampled: 3/19/98 12:23:00 PM						
#	Analysis Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
172	Cl2Dose Chlorine Dose	2.04	mg/L as Cl2	SM 4500-Cl B	1	n/a	3/20/98		3/20/98	n/a
173	Cl2Res Chlorine Residual	0.72	mg/L as Cl2	SM 4500-Cl F	1	0.10	3/20/98		3/20/98	n/a
174	HAA-ICR 1,2,3-Trichloropropane (IS) (Internal Standard)	100.8	%	EPA 552.2	1	1.0	3/20/98	3/25/98	3/26/98	0-100-0
175	HAA-ICR 2-Bromopropionic acid (Surrogate)	99.2	%	EPA 552.2	1	1.0	3/20/98	3/25/98	3/26/98	0-100-0
176	HAA-ICR Bromochloroacetic acid	ND	µg/L	EPA 552.2	1	1.0	3/20/98	3/25/98	3/26/98	0-100-0
177	HAA-ICR Bromodichloroacetic acid	ND	µg/L	EPA 552.2	1	1.0	3/20/98	3/25/98	3/26/98	0-100-0
178	HAA-ICR Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	3/20/98	3/25/98	3/26/98	0-100-0
179	HAA-ICR Dibromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	3/20/98	3/25/98	3/26/98	0-100-0
180	HAA-ICR Dichloroacetic acid	7.9	µg/L	EPA 552.2	1	1.0	3/20/98	3/25/98	3/26/98	0-100-0
181	HAA-ICR Monobromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	3/20/98	3/25/98	3/26/98	0-100-0
182	HAA-ICR Monochloroacetic acid	ND	µg/L	EPA 552.2	1	2.0	3/20/98	3/25/98	3/26/98	0-100-0
183	HAA-ICR Tribromoacetic acid	ND	µg/L	EPA 552.2	1	4.0	3/20/98	3/25/98	3/26/98	0-100-0
184	HAA-ICR Trichloroacetic acid	ND	µg/L	EPA 552.2	1	1.0	3/20/98	3/25/98	3/26/98	0-100-0
185	pH Cl2 pH - Final	7.4	Unit	SM 4500-H+ B	1	n/a	3/20/98		3/20/98	n/a
186	pH Cl2 pH - Initial	7.3	Unit	SM 4500-H+ B	1	n/a	3/20/98		3/20/98	n/a
187	pH pH	7.7	Unit	SM 4500-H+ B	1	n/a	3/19/98		3/19/98	n/a
188	TEMP Cl2 Temperature	6.9	°C	SM 2550 B	1	n/a	3/20/98		3/20/98	n/a
189	TEMP Temperature	22.4	°C	SM 2550 B	1	n/a	3/19/98		3/19/98	n/a
190	TIME Cl2 Incubation Time	3.0	hrs	n/a	1	n/a	3/20/98		3/20/98	n/a
191	TOC-ICR TOC	0.78	mg/L	SM 5310 C	1	0.50	3/19/98		3/19/98	7-0-215
192	TOC-ICR TOC (Dupl)	0.79	mg/L	SM 5310 C	1	0.50	3/19/98		3/19/98	7-0-215
		0.79	mg/L	1.3 % RPD						
193	TOX-ICR TOX	34	µg Cl-/L	SM 5320 B	1	25	3/20/98		3/27/98	12-0-107
194	TOX-ICR TOX (Dupl)	39	µg Cl-/L	SM 5320 B	1	25	3/20/98		3/27/98	12-0-107
		37	µg Cl-/L	13.5 % RPD						

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 96  
Study Title: ICR RSSCT #1

195	THM-ICR 1,2,3-Trichloropropane (Surrogate)	100.4 %	EPA 551.1	1	1.0	3/20/98	4/1/98	4/1/98	0-101-0
196	THM-ICR Bromodichloromethane	ND µg/L	EPA 551.1	1	1.0	3/20/98	4/1/98	4/1/98	0-101-0
197	THM-ICR Bromoform	ND µg/L	EPA 551.1	1	1.0	3/20/98	4/1/98	4/1/98	0-101-0
198	THM-ICR Chloroform	1.4 µg/L	EPA 551.1	1	1.0	3/20/98	4/1/98	4/1/98	0-101-0
199	THM-ICR Dibromochloromethane	ND µg/L	EPA 551.1	1	1.0	3/20/98	4/1/98	4/1/98	0-101-0
200	UV-ICR UV	ND 1/cm	SM 5910 B	1	0.009	3/19/98		3/20/98	8-0-147
201	UV-ICR UV (Dupl)	ND 1/cm	SM 5910 B	1	0.009	3/19/98		3/20/98	8-0-147
		<b>ND 1/cm</b>							

Sample ID: 96.10.Eff-9d

S&amp;H ID: 9803-204

Date Sampled: 3/19/98 12:23:00 PM

#	Analysis Type	Result Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
202	Cl2Dose Chlorine Dose	2.04 mg/L as Cl2	SM 4500-Cl B	1	n/a	3/20/98		3/20/98	n/a
203	Cl2Res Chlorine Residual	0.71 mg/L as Cl2	SM 4500-Cl F	1	0.10	3/20/98		3/20/98	n/a
204	HAA-ICR 1,2,3-Trichloropropane (IS) (Internal Standard)	103.6 %	EPA 552.2	1	1.0	3/20/98	3/25/98	3/26/98	0-100-0
205	HAA-ICR 2-Bromopropionic acid (Surrogate)	96.4 %	EPA 552.2	1	1.0	3/20/98	3/25/98	3/26/98	0-100-0
206	HAA-ICR Bromochloroacetic acid	ND µg/L	EPA 552.2	1	1.0	3/20/98	3/25/98	3/26/98	0-100-0
207	HAA-ICR Bromodichloroacetic acid	ND µg/L	EPA 552.2	1	1.0	3/20/98	3/25/98	3/26/98	0-100-0
208	HAA-ICR Chlorodibromoacetic acid	ND µg/L	EPA 552.2	1	2.0	3/20/98	3/25/98	3/26/98	0-100-0
209	HAA-ICR Dibromoacetic acid	ND µg/L	EPA 552.2	1	1.0	3/20/98	3/25/98	3/26/98	0-100-0
210	HAA-ICR Dichloroacetic acid	7.0 µg/L	EPA 552.2	1	1.0	3/20/98	3/25/98	3/26/98	0-100-0
211	HAA-ICR Monobromoacetic acid	ND µg/L	EPA 552.2	1	1.0	3/20/98	3/25/98	3/26/98	0-100-0
212	HAA-ICR Monochloroacetic acid	ND µg/L	EPA 552.2	1	2.0	3/20/98	3/25/98	3/26/98	0-100-0
213	HAA-ICR Tribromoacetic acid	ND µg/L	EPA 552.2	1	4.0	3/20/98	3/25/98	3/26/98	0-100-0
214	HAA-ICR Trichloroacetic acid	ND µg/L	EPA 552.2	1	1.0	3/20/98	3/25/98	3/26/98	0-100-0
215	pH Cl2 pH - Final	7.4 Unit	SM 4500-H+ B	1	n/a	3/20/98		3/20/98	n/a
216	pH Cl2 pH - Initial	7.3 Unit	SM 4500-H+ B	1	n/a	3/20/98		3/20/98	n/a
217	pH pH	7.7 Unit	SM 4500-H+ B	1	n/a	3/19/98		3/19/98	n/a
218	TEMP Cl2 Temperature	6.9 °C	SM 2550 B	1	n/a	3/20/98		3/20/98	n/a
219	TEMP Temperature	22.5 °C	SM 2550 B	1	n/a	3/19/98		3/19/98	n/a
220	TIME Cl2 Incubation Time	3.0 hrs	n/a	1	n/a	3/20/98		3/20/98	n/a
221	TOC-ICR TOC	0.80 mg/L	SM 5310 C	1	0.50	3/19/98		3/20/98	7-0-216
222	TOC-ICR TOC (Dupl)	0.76 mg/L	SM 5310 C	1	0.50	3/19/98		3/20/98	7-0-216
		<b>0.78 mg/L</b>	<b>5.1 % RPD</b>						
223	TOX-ICR TOX	ND µg Cl-/L	SM 5320 B	1	25	3/20/98		3/27/98	12-0-107
224	TOX-ICR TOX (Dupl)	25 µg Cl-/L	SM 5320 B	1	25	3/20/98		3/27/98	12-0-107
		<b>ND µg Cl-/L</b>							
225	THM-ICR 1,2,3-Trichloropropane (Surrogate)	108.0 %	EPA 551.1	1	1.0	3/20/98	4/1/98	4/1/98	0-101-0

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 96  
Study Title: ICR RSSCT #1

226	THM-ICR Bromodichloromethane	ND µg/L	EPA 551.1	1	1.0	3/20/98	4/1/98	4/1/98	0-101-0
227	THM-ICR Bromoform	ND µg/L	EPA 551.1	1	1.0	3/20/98	4/1/98	4/1/98	0-101-0
228	THM-ICR Chloroform	1.5 µg/L	EPA 551.1	1	1.0	3/20/98	4/1/98	4/1/98	0-101-0
229	THM-ICR Dibromochloromethane	ND µg/L	EPA 551.1	1	1.0	3/20/98	4/1/98	4/1/98	0-101-0
230	UV-ICR UV	ND 1/cm	SM 5910 B	1	0.009	3/19/98		3/20/98	8-0-147
231	UV-ICR UV (Dupl)	ND 1/cm	SM 5910 B	1	0.009	3/19/98		3/20/98	8-0-147
		<b>ND 1/cm</b>							

Sample ID: 96.10.Eff-10

S&amp;H ID: 9803-205

Date Sampled: 3/19/98 2:43:00 PM

#	Analysis Type	Result Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
232	Cl2Dose Chlorine Dose	2.07 mg/L as Cl2	SM 4500-Cl B	1	n/a	3/20/98		3/20/98	n/a
233	Cl2Res Chlorine Residual	0.72 mg/L as Cl2	SM 4500-Cl F	1	0.10	3/20/98		3/20/98	n/a
234	HAA-ICR 1,2,3-Trichloropropane (IS) (Internal Standard)	106.4 %	EPA 552.2	1	1.0	3/20/98	3/25/98	3/26/98	0-100-0
235	HAA-ICR 2-Bromopropionic acid (Surrogate)	88.8 %	EPA 552.2	1	1.0	3/20/98	3/25/98	3/26/98	0-100-0
236	HAA-ICR Bromochloroacetic acid	1.0 µg/L	EPA 552.2	1	1.0	3/20/98	3/25/98	3/26/98	0-100-0
237	HAA-ICR Bromodichloroacetic acid	ND µg/L	EPA 552.2	1	1.0	3/20/98	3/25/98	3/26/98	0-100-0
238	HAA-ICR Chlorodibromoacetic acid	ND µg/L	EPA 552.2	1	2.0	3/20/98	3/25/98	3/26/98	0-100-0
239	HAA-ICR Dibromoacetic acid	ND µg/L	EPA 552.2	1	1.0	3/20/98	3/25/98	3/26/98	0-100-0
240	HAA-ICR Dichloroacetic acid	6.4 µg/L	EPA 552.2	1	1.0	3/20/98	3/25/98	3/26/98	0-100-0
241	HAA-ICR Monobromoacetic acid	ND µg/L	EPA 552.2	1	1.0	3/20/98	3/25/98	3/26/98	0-100-0
242	HAA-ICR Monochloroacetic acid	ND µg/L	EPA 552.2	1	2.0	3/20/98	3/25/98	3/26/98	0-100-0
243	HAA-ICR Tribromoacetic acid	ND µg/L	EPA 552.2	1	4.0	3/20/98	3/25/98	3/26/98	0-100-0
244	HAA-ICR Trichloroacetic acid	ND µg/L	EPA 552.2	1	1.0	3/20/98	3/25/98	3/26/98	0-100-0
245	pH Cl2 pH - Final	7.4 Unit	SM 4500-H+ B	1	n/a	3/20/98		3/20/98	n/a
246	pH Cl2 pH - Initial	7.3 Unit	SM 4500-H+ B	1	n/a	3/20/98		3/20/98	n/a
247	pH pH	7.8 Unit	SM 4500-H+ B	1	n/a	3/19/98		3/19/98	n/a
248	TEMP Cl2 Temperature	6.9 °C	SM 2550 B	1	n/a	3/20/98		3/20/98	n/a
249	TEMP Temperature	23.4 °C	SM 2550 B	1	n/a	3/19/98		3/19/98	n/a
250	TIME Cl2 Incubation Time	3.1 hrs	n/a	1	n/a	3/20/98		3/20/98	n/a
251	TOC-ICR TOC	0.92 mg/L	SM 5310 C	1	0.50	3/19/98		3/19/98	7-0-215
252	TOC-ICR TOC (Dupl)	0.96 mg/L	SM 5310 C	1	0.50	3/19/98		3/19/98	7-0-215
		<b>0.94 mg/L</b>	<b>4.3 % RPD</b>						
253	TOX-ICR TOX	30 µg Cl-/L	SM 5320 B	1	25	3/20/98		3/30/98	12-0-108
254	TOX-ICR TOX (Dupl)	26 µg Cl-/L	SM 5320 B	1	25	3/20/98		3/30/98	12-0-108
		<b>28 µg Cl-/L</b>	<b>14.3 % RPD</b>						
255	THM-ICR 1,2,3-Trichloropropane (Surrogate)	103.2 %	EPA 551.1	1	1.0	3/20/98	4/1/98	4/1/98	0-101-0
256	THM-ICR Bromodichloromethane	ND µg/L	EPA 551.1	1	1.0	3/20/98	4/1/98	4/1/98	0-101-0
257	THM-ICR Bromoform	ND µg/L	EPA 551.1	1	1.0	3/20/98	4/1/98	4/1/98	0-101-0

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 96  
Study Title: ICR RSSCT #1

258	THM-ICR Chloroform	1.8 µg/L	EPA 551.1	1	1.0	3/20/98	4/1/98	4/1/98	0-101-0
259	THM-ICR Dibromochloromethane	ND µg/L	EPA 551.1	1	1.0	3/20/98	4/1/98	4/1/98	0-101-0
260	UV-ICR UV	0.010 1/cm	SM 5910 B	1	0.009	3/19/98		3/20/98	8-0-147
261	UV-ICR UV (Dupl)	0.010 1/cm	SM 5910 B	1	0.009	3/19/98		3/20/98	8-0-147
		<b>0.010 1/cm</b>	<b>0.0 % RPD</b>						

Sample ID: 96.INF.B-2 S&amp;H ID: 9803-206 Date Sampled: 3/19/98 3:20:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
262	pH	pH	7.1	Unit	SM 4500-H+ B	1	n/a	3/19/98		3/19/98	n/a
263	TEMP	Temperature	16.6	°C	SM 2550 B	1	n/a	3/19/98		3/19/98	n/a
264	TOC-ICR	TOC	3.40	mg/L	SM 5310 C	1	0.50	3/19/98		3/19/98	7-0-215
265	TOC-ICR	TOC (Dupl)	3.41	mg/L	SM 5310 C	1	0.50	3/19/98		3/19/98	7-0-215
			<b>3.41 mg/L</b>		<b>0.3 % RPD</b>						

Sample ID: 96.10.Eff-12 S&amp;H ID: 9803-209 Date Sampled: 3/19/98 10:52:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
266	Cl2Dose	Chlorine Dose	2.22	mg/L as Cl2	SM 4500-Cl B	1	n/a	3/24/98		3/24/98	n/a
267	Cl2Res	Chlorine Residual	0.79	mg/L as Cl2	SM 4500-Cl F	1	0.10	3/24/98		3/24/98	n/a
268	HAA-ICR	1,2,3-Trichloropropane (IS) (Internal Standard)	107.6	%	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
269	HAA-ICR	2-Bromopropionic acid (Surrogate)	86.8	%	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
270	HAA-ICR	Bromochloroacetic acid	1.1	µg/L	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
271	HAA-ICR	Bromodichloroacetic acid	ND	µg/L	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
272	HAA-ICR	Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	3/24/98	3/25/98	3/26/98	0-100-0
273	HAA-ICR	Dibromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
274	HAA-ICR	Dichloroacetic acid	5.8	µg/L	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
275	HAA-ICR	Monobromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
276	HAA-ICR	Monochloroacetic acid	ND	µg/L	EPA 552.2	1	2.0	3/24/98	3/25/98	3/26/98	0-100-0
277	HAA-ICR	Tribromoacetic acid	ND	µg/L	EPA 552.2	1	4.0	3/24/98	3/25/98	3/26/98	0-100-0
278	HAA-ICR	Trichloroacetic acid	1.5	µg/L	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
279	pH	Cl2 pH - Final	7.4	Unit	SM 4500-H+ B	1	n/a	3/24/98		3/24/98	n/a
280	pH	Cl2 pH - Initial	7.3	Unit	SM 4500-H+ B	1	n/a	3/24/98		3/24/98	n/a
281	pH	pH	7.7	Unit	SM 4500-H+ B	1	n/a	3/19/98		3/19/98	n/a
282	TEMP	Cl2 Temperature	6.8	°C	SM 2550 B	1	n/a	3/24/98		3/24/98	n/a
283	TEMP	Temperature	23.3	°C	SM 2550 B	1	n/a	3/19/98		3/19/98	n/a
284	TIME	Cl2 Incubation Time	3.2	hrs	n/a	1	n/a	3/24/98		3/24/98	n/a
285	TOC-ICR	TOC	1.19	mg/L	SM 5310 C	1	0.50	3/19/98		3/22/98	7-0-217
286	TOC-ICR	TOC (Dupl)	1.23	mg/L	SM 5310 C	1	0.50	3/19/98		3/22/98	7-0-217
			<b>1.21 mg/L</b>		<b>3.3 % RPD</b>						

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 96  
Study Title: ICR RSSCT #1

287	TOX-ICR TOX	37 µg Cl-/L	SM 5320 B	1	25	3/24/98		3/30/98	12-0-108
288	TOX-ICR TOX (Dupl)	38 µg Cl-/L	SM 5320 B	1	25	3/24/98		3/30/98	12-0-108
		<b>38 µg Cl-/L</b>	<b>2.6 % RPD</b>						
289	THM-ICR 1,2,3-Trichloropropane (Surrogate)	106.4 %	EPA 551.1	1	1.0	3/24/98	4/1/98	4/1/98	0-101-0
290	THM-ICR Bromodichloromethane	1.4 µg/L	EPA 551.1	1	1.0	3/24/98	4/1/98	4/1/98	0-101-0
291	THM-ICR Bromoform	ND µg/L	EPA 551.1	1	1.0	3/24/98	4/1/98	4/1/98	0-101-0
292	THM-ICR Chloroform	3.0 µg/L	EPA 551.1	1	1.0	3/24/98	4/1/98	4/1/98	0-101-0
293	THM-ICR Dibromochloromethane	ND µg/L	EPA 551.1	1	1.0	3/24/98	4/1/98	4/1/98	0-101-0
294	UV-ICR UV	0.013 1/cm	SM 5910 B	1	0.009	3/19/98		3/20/98	8-0-147
295	UV-ICR UV (Dupl)	0.014 1/cm	SM 5910 B	1	0.009	3/19/98		3/20/98	8-0-147
		<b>0.014 1/cm</b>	<b>7.1 % RPD</b>						

Sample ID: 96.10.Eff-12d

S&amp;H ID: 9803-210

Date Sampled: 3/19/98 10:52:00 PM

#	Analysis Type	Result Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
296	Cl2Dose Chlorine Dose	2.22 mg/L as Cl2	SM 4500-Cl B	1	n/a	3/24/98		3/24/98	n/a
297	Cl2Res Chlorine Residual	0.80 mg/L as Cl2	SM 4500-Cl F	1	0.10	3/24/98		3/24/98	n/a
298	HAA-ICR 1,2,3-Trichloropropane (IS) (Internal Standard)	104.8 %	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
299	HAA-ICR 2-Bromopropionic acid (Surrogate)	87.2 %	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
300	HAA-ICR Bromochloroacetic acid	1.2 µg/L	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
301	HAA-ICR Bromodichloroacetic acid	ND µg/L	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
302	HAA-ICR Chlorodibromoacetic acid	ND µg/L	EPA 552.2	1	2.0	3/24/98	3/25/98	3/26/98	0-100-0
303	HAA-ICR Dibromoacetic acid	ND µg/L	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
304	HAA-ICR Dichloroacetic acid	6.0 µg/L	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
305	HAA-ICR Monobromoacetic acid	ND µg/L	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
306	HAA-ICR Monochloroacetic acid	ND µg/L	EPA 552.2	1	2.0	3/24/98	3/25/98	3/26/98	0-100-0
307	HAA-ICR Tribromoacetic acid	ND µg/L	EPA 552.2	1	4.0	3/24/98	3/25/98	3/26/98	0-100-0
308	HAA-ICR Trichloroacetic acid	1.5 µg/L	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
309	pH Cl2 pH - Final	7.4 Unit	SM 4500-H+ B	1	n/a	3/24/98		3/24/98	n/a
310	pH Cl2 pH - Initial	7.3 Unit	SM 4500-H+ B	1	n/a	3/24/98		3/24/98	n/a
311	pH pH	7.7 Unit	SM 4500-H+ B	1	n/a	3/19/98		3/19/98	n/a
312	TEMP Cl2 Temperature	6.8 °C	SM 2550 B	1	n/a	3/24/98		3/24/98	n/a
313	TEMP Temperature	23.3 °C	SM 2550 B	1	n/a	3/19/98		3/19/98	n/a
314	TIME Cl2 Incubation Time	3.3 hrs	n/a	1	n/a	3/24/98		3/24/98	n/a
315	TOC-ICR TOC	1.20 mg/L	SM 5310 C	1	0.50	3/19/98		3/22/98	7-0-217
316	TOC-ICR TOC (Dupl)	1.21 mg/L	SM 5310 C	1	0.50	3/19/98		3/22/98	7-0-217
		<b>1.21 mg/L</b>	<b>0.8 % RPD</b>						
317	TOX-ICR TOX	38 µg Cl-/L	SM 5320 B	1	25	3/24/98		3/30/98	12-0-108
318	TOX-ICR TOX (Dupl)	37 µg Cl-/L	SM 5320 B	1	25	3/24/98		3/30/98	12-0-108

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 96  
Study Title: ICR RSSCT #1

		38 µg Cl-/L	2.6 % RPD						
319	THM-ICR 1,2,3-Trichloropropane (Surrogate)	111.6 %	EPA 551.1	1	1.0	3/24/98	4/1/98	4/1/98	0-101-0
320	THM-ICR 1,2,3-Trichloropropane (Surrogate) (Lab Dupl)	93.2 %	EPA 551.1	1	1.0	3/24/98	4/1/98	4/1/98	0-101-0
		102.4 %	18.0 % RPD						
321	THM-ICR Bromodichloromethane	1.5 µg/L	EPA 551.1	1	1.0	3/24/98	4/1/98	4/1/98	0-101-0
322	THM-ICR Bromodichloromethane (Lab Dupl)	1.5 µg/L	EPA 551.1	1	1.0	3/24/98	4/1/98	4/1/98	0-101-0
		1.5 µg/L	0.0 % RPD						
323	THM-ICR Bromoform	ND µg/L	EPA 551.1	1	1.0	3/24/98	4/1/98	4/1/98	0-101-0
324	THM-ICR Bromoform (Lab Dupl)	ND µg/L	EPA 551.1	1	1.0	3/24/98	4/1/98	4/1/98	0-101-0
		ND µg/L							
325	THM-ICR Chloroform	3.0 µg/L	EPA 551.1	1	1.0	3/24/98	4/1/98	4/1/98	0-101-0
326	THM-ICR Chloroform (Lab Dupl)	2.9 µg/L	EPA 551.1	1	1.0	3/24/98	4/1/98	4/1/98	0-101-0
		3.0 µg/L	3.3 % RPD						
327	THM-ICR Dibromochloromethane	ND µg/L	EPA 551.1	1	1.0	3/24/98	4/1/98	4/1/98	0-101-0
328	THM-ICR Dibromochloromethane (Lab Dupl)	ND µg/L	EPA 551.1	1	1.0	3/24/98	4/1/98	4/1/98	0-101-0
		ND µg/L							
329	UV-ICR UV	0.013 1/cm	SM 5910 B	1	0.009	3/19/98		3/20/98	8-0-147
330	UV-ICR UV (Dupl)	0.014 1/cm	SM 5910 B	1	0.009	3/19/98		3/20/98	8-0-147
		0.014 1/cm	7.1 % RPD						

Sample ID: 96.10.Eff-14

S&amp;H ID: 9803-212

Date Sampled: 3/20/98 7:14:00 AM

#	Analysis Type	Result Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
331	Cl2Dose Chlorine Dose	2.28 mg/L as Cl2	SM 4500-Cl B	1	n/a	3/24/98		3/24/98	n/a
332	Cl2Res Chlorine Residual	0.82 mg/L as Cl2	SM 4500-Cl F	1	0.10	3/24/98		3/24/98	n/a
333	HAA-ICR 1,2,3-Trichloropropane (IS) (Internal Standard)	103.6 %	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
334	HAA-ICR 2-Bromopropionic acid (Surrogate)	85.2 %	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
335	HAA-ICR Bromochloroacetic acid	1.1 µg/L	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
336	HAA-ICR Bromodichloroacetic acid	ND µg/L	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
337	HAA-ICR Chlorodibromoacetic acid	ND µg/L	EPA 552.2	1	2.0	3/24/98	3/25/98	3/26/98	0-100-0
338	HAA-ICR Dibromoacetic acid	ND µg/L	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
339	HAA-ICR Dichloroacetic acid	5.2 µg/L	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
340	HAA-ICR Monobromoacetic acid	ND µg/L	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
341	HAA-ICR Monochloroacetic acid	ND µg/L	EPA 552.2	1	2.0	3/24/98	3/25/98	3/26/98	0-100-0
342	HAA-ICR Tribromoacetic acid	ND µg/L	EPA 552.2	1	4.0	3/24/98	3/25/98	3/26/98	0-100-0
343	HAA-ICR Trichloroacetic acid	2.4 µg/L	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
344	pH Cl2 pH - Final	7.4 Unit	SM 4500-H+ B	1	n/a	3/24/98		3/24/98	n/a
345	pH Cl2 pH - Initial	7.3 Unit	SM 4500-H+ B	1	n/a	3/24/98		3/24/98	n/a
346	pH pH	7.7 Unit	SM 4500-H+ B	1	n/a	3/20/98		3/20/98	n/a

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 96  
Study Title: ICR RSSCT #1

347	TEMP	Cl2 Temperature	6.8 °C	SM 2550 B	1	n/a	3/24/98	3/24/98	n/a
348	TEMP	Temperature	21.1 °C	SM 2550 B	1	n/a	3/20/98	3/20/98	n/a
349	TIME	Cl2 Incubation Time	3.3 hrs	n/a	1	n/a	3/24/98	3/24/98	n/a
350	TOC-ICR	TOC	1.42 mg/L	SM 5310 C	1	0.50	3/20/98	3/20/98	7-0-216
351	TOC-ICR	TOC (Dupl)	1.46 mg/L	SM 5310 C	1	0.50	3/20/98	3/20/98	7-0-216
			<b>1.44 mg/L</b>	<b>2.8 % RPD</b>					
352	TOX-ICR	TOX	49 µg Cl-/L	SM 5320 B	1	25	3/24/98	3/30/98	12-0-108
353	TOX-ICR	TOX (Dupl)	51 µg Cl-/L	SM 5320 B	1	25	3/24/98	3/30/98	12-0-108
			<b>50 µg Cl-/L</b>	<b>4.0 % RPD</b>					
354	THM-ICR	1,2,3-Trichloropropane (Surrogate)	102.0 %	EPA 551.1	1	1.0	3/24/98	4/1/98	4/1/98 0-101-0
355	THM-ICR	Bromodichloromethane	1.8 µg/L	EPA 551.1	1	1.0	3/24/98	4/1/98	4/1/98 0-101-0
356	THM-ICR	Bromoform	ND µg/L	EPA 551.1	1	1.0	3/24/98	4/1/98	4/1/98 0-101-0
357	THM-ICR	Chloroform	3.6 µg/L	EPA 551.1	1	1.0	3/24/98	4/1/98	4/1/98 0-101-0
358	THM-ICR	Dibromochloromethane	ND µg/L	EPA 551.1	1	1.0	3/24/98	4/1/98	4/1/98 0-101-0
359	UV-ICR	UV	0.017 1/cm	SM 5910 B	1	0.009	3/20/98	3/20/98	8-0-147
360	UV-ICR	UV (Dupl)	0.017 1/cm	SM 5910 B	1	0.009	3/20/98	3/20/98	8-0-147
			<b>0.017 1/cm</b>	<b>0.0 % RPD</b>					

Sample ID: 96.10.Eff-16

S&amp;H ID: 9803-225

Date Sampled: 3/20/98 1:52:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
361	Cl2Dose	Chlorine Dose	2.33	mg/L as Cl2	SM 4500-Cl B	1	n/a	3/24/98		3/24/98	n/a
362	Cl2Res	Chlorine Residual	0.81	mg/L as Cl2	SM 4500-Cl F	1	0.10	3/24/98		3/24/98	n/a
363	HAA-ICR	1,2,3-Trichloropropane (IS) (Internal Standard)	103.6	%	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
364	HAA-ICR	2-Bromopropionic acid (Surrogate)	99.2	%	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
365	HAA-ICR	Bromochloroacetic acid	1.3	µg/L	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
366	HAA-ICR	Bromodichloroacetic acid	1.3	µg/L	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
367	HAA-ICR	Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	3/24/98	3/25/98	3/26/98	0-100-0
368	HAA-ICR	Dibromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
369	HAA-ICR	Dichloroacetic acid	6.5	µg/L	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
370	HAA-ICR	Monobromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
371	HAA-ICR	Monochloroacetic acid	ND	µg/L	EPA 552.2	1	2.0	3/24/98	3/25/98	3/26/98	0-100-0
372	HAA-ICR	Tribromoacetic acid	ND	µg/L	EPA 552.2	1	4.0	3/24/98	3/25/98	3/26/98	0-100-0
373	HAA-ICR	Trichloroacetic acid	4.0	µg/L	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
374	pH	Cl2 pH - Final	7.4	Unit	SM 4500-H+ B	1	n/a	3/24/98		3/24/98	n/a
375	pH	Cl2 pH - Initial	7.3	Unit	SM 4500-H+ B	1	n/a	3/24/98		3/24/98	n/a
376	pH	pH	7.7	Unit	SM 4500-H+ B	1	n/a	3/20/98		3/20/98	n/a
377	TEMP	Cl2 Temperature	6.8	°C	SM 2550 B	1	n/a	3/24/98		3/24/98	n/a
378	TEMP	Temperature	22.0	°C	SM 2550 B	1	n/a	3/20/98		3/20/98	n/a

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.



**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 96  
Study Title: ICR RSSCT #1

379	TIME	Cl2 Incubation Time	3.3 hrs	n/a	1	n/a	3/24/98	3/24/98	n/a
380	TOC-ICR	TOC	1.65 mg/L	SM 5310 C	1	0.50	3/20/98	3/22/98	7-0-217
381	TOC-ICR	TOC (Dupl)	1.61 mg/L	SM 5310 C	1	0.50	3/20/98	3/22/98	7-0-217
			<b>1.63 mg/L</b>	<b>2.5 % RPD</b>					
382	TOX-ICR	TOX	61 µg Cl-/L	SM 5320 B	1	25	3/24/98	3/31/98	12-0-109
383	TOX-ICR	TOX (Dupl)	58 µg Cl-/L	SM 5320 B	1	25	3/24/98	3/31/98	12-0-109
			<b>60 µg Cl-/L</b>	<b>5.0 % RPD</b>					
384	THM-ICR	1,2,3-Trichloropropane (Surrogate)	105.6 %	EPA 551.1	1	1.0	3/24/98	4/1/98	4/1/98 0-101-0
385	THM-ICR	Bromodichloromethane	2.2 µg/L	EPA 551.1	1	1.0	3/24/98	4/1/98	4/1/98 0-101-0
386	THM-ICR	Bromoform	ND µg/L	EPA 551.1	1	1.0	3/24/98	4/1/98	4/1/98 0-101-0
387	THM-ICR	Chloroform	4.8 µg/L	EPA 551.1	1	1.0	3/24/98	4/1/98	4/1/98 0-101-0
388	THM-ICR	Dibromochloromethane	ND µg/L	EPA 551.1	1	1.0	3/24/98	4/1/98	4/1/98 0-101-0
389	UV-ICR	UV	0.020 1/cm	SM 5910 B	1	0.009	3/20/98	3/21/98	8-0-148
390	UV-ICR	UV (Dupl)	0.021 1/cm	SM 5910 B	1	0.009	3/20/98	3/21/98	8-0-148
			<b>0.021 1/cm</b>	<b>4.8 % RPD</b>					

Sample ID: 96.10.Eff-19

S&amp;H ID: 9803-231

Date Sampled: 3/21/98 2:20:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
391	Cl2Dose	Chlorine Dose	2.38	mg/L as Cl2	SM 4500-Cl B	1	n/a	3/24/98		3/24/98	n/a
392	Cl2Res	Chlorine Residual	0.81	mg/L as Cl2	SM 4500-Cl F	1	0.10	3/24/98		3/24/98	n/a
393	HAA-ICR	1,2,3-Trichloropropane (IS) (Internal Standard)	102.0	%	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
394	HAA-ICR	2-Bromopropionic acid (Surrogate)	100.4	%	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
395	HAA-ICR	Bromochloroacetic acid	1.2	µg/L	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
396	HAA-ICR	Bromodichloroacetic acid	1.2	µg/L	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
397	HAA-ICR	Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	3/24/98	3/25/98	3/26/98	0-100-0
398	HAA-ICR	Dibromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
399	HAA-ICR	Dichloroacetic acid	6.4	µg/L	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
400	HAA-ICR	Monobromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
401	HAA-ICR	Monochloroacetic acid	ND	µg/L	EPA 552.2	1	2.0	3/24/98	3/25/98	3/26/98	0-100-0
402	HAA-ICR	Tribromoacetic acid	ND	µg/L	EPA 552.2	1	4.0	3/24/98	3/25/98	3/26/98	0-100-0
403	HAA-ICR	Trichloroacetic acid	4.7	µg/L	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
404	pH	Cl2 pH - Final	7.4	Unit	SM 4500-H+ B	1	n/a	3/24/98		3/24/98	n/a
405	pH	Cl2 pH - Initial	7.3	Unit	SM 4500-H+ B	1	n/a	3/24/98		3/24/98	n/a
406	pH	pH	7.7	Unit	SM 4500-H+ B	1	n/a	3/21/98		3/21/98	n/a
407	TEMP	Cl2 Temperature	6.8	°C	SM 2550 B	1	n/a	3/24/98		3/24/98	n/a
408	TEMP	Temperature	21.1	°C	SM 2550 B	1	n/a	3/21/98		3/21/98	n/a
409	TIME	Cl2 Incubation Time	3.3	hrs	n/a	1	n/a	3/24/98		3/24/98	n/a

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 96  
Study Title: ICR RSSCT #1

410	TOC-ICR TOC	1.80 mg/L	SM 5310 C	1	0.50	3/21/98		3/22/98	7-0-217
411	TOC-ICR TOC (Dupl)	1.82 mg/L	SM 5310 C	1	0.50	3/21/98		3/22/98	7-0-217
		<b>1.81 mg/L</b>	<b>1.1 % RPD</b>						
412	TOX-ICR TOX	75 µg Cl-/L	SM 5320 B	1	25	3/24/98		4/2/98	12-0-110
413	TOX-ICR TOX (Dupl)	77 µg Cl-/L	SM 5320 B	1	25	3/24/98		4/2/98	12-0-110
		<b>76 µg Cl-/L</b>	<b>2.6 % RPD</b>						
414	THM-ICR 1,2,3-Trichloropropane (Surrogate)	99.6 %	EPA 551.1	1	1.0	3/24/98	4/1/98	4/1/98	0-101-0
415	THM-ICR Bromodichloromethane	2.5 µg/L	EPA 551.1	1	1.0	3/24/98	4/1/98	4/1/98	0-101-0
416	THM-ICR Bromoform	ND µg/L	EPA 551.1	1	1.0	3/24/98	4/1/98	4/1/98	0-101-0
417	THM-ICR Chloroform	5.7 µg/L	EPA 551.1	1	1.0	3/24/98	4/1/98	4/1/98	0-101-0
418	THM-ICR Dibromochloromethane	ND µg/L	EPA 551.1	1	1.0	3/24/98	4/1/98	4/1/98	0-101-0
419	UV-ICR UV	0.024 1/cm	SM 5910 B	1	0.009	3/21/98		3/21/98	8-0-148
420	UV-ICR UV (Dupl)	0.025 1/cm	SM 5910 B	1	0.009	3/21/98		3/21/98	8-0-148
		<b>0.025 1/cm</b>	<b>4.0 % RPD</b>						

Sample ID: 96.20.Eff-9

S&amp;H ID: 9803-240

Date Sampled: 3/21/98 8:23:00 AM

#	Analysis Type	Result Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
421	Cl2Dose Chlorine Dose	1.98 mg/L as Cl2	SM 4500-Cl B	1	n/a	3/24/98		3/24/98	n/a
422	Cl2Res Chlorine Residual	0.77 mg/L as Cl2	SM 4500-Cl F	1	0.10	3/24/98		3/24/98	n/a
423	HAA-ICR 1,2,3-Trichloropropane (IS) (Internal Standard)	104.0 %	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
424	HAA-ICR 2-Bromopropionic acid (Surrogate)	90.0 %	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
425	HAA-ICR Bromochloroacetic acid	ND µg/L	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
426	HAA-ICR Bromodichloroacetic acid	ND µg/L	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
427	HAA-ICR Chlorodibromoacetic acid	ND µg/L	EPA 552.2	1	2.0	3/24/98	3/25/98	3/26/98	0-100-0
428	HAA-ICR Dibromoacetic acid	ND µg/L	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
429	HAA-ICR Dichloroacetic acid	6.3 µg/L	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
430	HAA-ICR Monobromoacetic acid	ND µg/L	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
431	HAA-ICR Monochloroacetic acid	ND µg/L	EPA 552.2	1	2.0	3/24/98	3/25/98	3/26/98	0-100-0
432	HAA-ICR Tribromoacetic acid	ND µg/L	EPA 552.2	1	4.0	3/24/98	3/25/98	3/26/98	0-100-0
433	HAA-ICR Trichloroacetic acid	ND µg/L	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
434	pH Cl2 pH - Final	7.4 Unit	SM 4500-H+ B	1	n/a	3/24/98		3/24/98	n/a
435	pH Cl2 pH - Initial	7.3 Unit	SM 4500-H+ B	1	n/a	3/24/98		3/24/98	n/a
436	pH pH	7.8 Unit	SM 4500-H+ B	1	n/a	3/21/98		3/21/98	n/a
437	TEMP Cl2 Temperature	6.8 °C	SM 2550 B	1	n/a	3/24/98		3/24/98	n/a
438	TEMP Temperature	21.6 °C	SM 2550 B	1	n/a	3/21/98		3/21/98	n/a
439	TIME Cl2 Incubation Time	3.3 hrs	n/a	1	n/a	3/24/98		3/24/98	n/a
440	TOC-ICR TOC	ND mg/L	SM 5310 C	1	0.50	3/21/98		3/21/98	7-0-217
441	TOC-ICR TOC (Dupl)	ND mg/L	SM 5310 C	1	0.50	3/21/98		3/21/98	7-0-217

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 96  
Study Title: ICR RSSCT #1

		ND mg/L						
442	TOX-ICR TOX	ND µg Cl-/L	SM 5320 B	1	25	3/24/98	3/31/98	12-0-109
443	TOX-ICR TOX (Dupl)	ND µg Cl-/L	SM 5320 B	1	25	3/24/98	3/31/98	12-0-109
		ND µg Cl-/L						
444	THM-ICR 1,2,3-Trichloropropane (Surrogate)	102.8 %	EPA 551.1	1	1.0	3/24/98	4/1/98	4/1/98 0-101-0
445	THM-ICR Bromodichloromethane	ND µg/L	EPA 551.1	1	1.0	3/24/98	4/1/98	4/1/98 0-101-0
446	THM-ICR Bromoform	ND µg/L	EPA 551.1	1	1.0	3/24/98	4/1/98	4/1/98 0-101-0
447	THM-ICR Chloroform	ND µg/L	EPA 551.1	1	1.0	3/24/98	4/1/98	4/1/98 0-101-0
448	THM-ICR Dibromochloromethane	ND µg/L	EPA 551.1	1	1.0	3/24/98	4/1/98	4/1/98 0-101-0
449	UV-ICR UV	ND 1/cm	SM 5910 B	1	0.009	3/21/98	3/22/98	8-0-149
450	UV-ICR UV (Dupl)	ND 1/cm	SM 5910 B	1	0.009	3/21/98	3/22/98	8-0-149
		ND 1/cm						

Sample ID: 96.INF.B-3

S&amp;H ID: 9803-241

Date Sampled: 3/21/98 9:00:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
451	pH	pH	7.0	Unit	SM 4500-H+ B	1	n/a	3/21/98		3/21/98	n/a
452	TEMP	Temperature	16.0	°C	SM 2550 B	1	n/a	3/21/98		3/21/98	n/a
453	TOC-ICR TOC		3.19	mg/L	SM 5310 C	1	0.50	3/21/98		3/22/98	7-0-218
454	TOC-ICR TOC (Dupl)		3.30	mg/L	SM 5310 C	1	0.50	3/21/98		3/22/98	7-0-218
			3.25	mg/L	3.4 % RPD						

Sample ID: 96.10.Eff-22

S&amp;H ID: 9803-246

Date Sampled: 3/21/98 2:52:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
455	Cl2Dose	Chlorine Dose	2.43	mg/L as Cl2	SM 4500-Cl B	1	n/a	3/24/98		3/24/98	n/a
456	Cl2Res	Chlorine Residual	0.88	mg/L as Cl2	SM 4500-Cl F	1	0.10	3/24/98		3/24/98	n/a
457	HAA-ICR 1,2,3-Trichloropropane (IS) (Internal Standard)		100.4	%	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
458	HAA-ICR 2-Bromopropionic acid (Surrogate)		102.8	%	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
459	HAA-ICR Bromochloroacetic acid		1.5	µg/L	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
460	HAA-ICR Bromodichloroacetic acid		1.6	µg/L	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
461	HAA-ICR Chlorodibromoacetic acid		ND	µg/L	EPA 552.2	1	2.0	3/24/98	3/25/98	3/26/98	0-100-0
462	HAA-ICR Dibromoacetic acid		ND	µg/L	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
463	HAA-ICR Dichloroacetic acid		7.5	µg/L	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
464	HAA-ICR Monobromoacetic acid		ND	µg/L	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
465	HAA-ICR Monochloroacetic acid		ND	µg/L	EPA 552.2	1	2.0	3/24/98	3/25/98	3/26/98	0-100-0
466	HAA-ICR Tribromoacetic acid		ND	µg/L	EPA 552.2	1	4.0	3/24/98	3/25/98	3/26/98	0-100-0
467	HAA-ICR Trichloroacetic acid		7.5	µg/L	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
468	pH	Cl2 pH - Final	7.4	Unit	SM 4500-H+ B	1	n/a	3/24/98		3/24/98	n/a

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 96  
Study Title: ICR RSSCT #1

469	pH	Cl2 pH - Initial	7.3 Unit	SM 4500-H+ B	1	n/a	3/24/98	3/24/98	n/a
470	pH	pH	7.7 Unit	SM 4500-H+ B	1	n/a	3/21/98	3/21/98	n/a
471	TEMP	Cl2 Temperature	6.8 °C	SM 2550 B	1	n/a	3/24/98	3/24/98	n/a
472	TEMP	Temperature	21.6 °C	SM 2550 B	1	n/a	3/21/98	3/21/98	n/a
473	TIME	Cl2 Incubation Time	3.3 hrs	n/a	1	n/a	3/24/98	3/24/98	n/a
474	TOC-ICR	TOC	1.97 mg/L	SM 5310 C	1	0.50	3/21/98	3/22/98	7-0-218
475	TOC-ICR	TOC (Dupl)	2.05 mg/L	SM 5310 C	1	0.50	3/21/98	3/22/98	7-0-218
			<b>2.01 mg/L</b>	<b>4.0 % RPD</b>					
476	TOX-ICR	TOX	83 µg Cl-/L	SM 5320 B	1	25	3/24/98	3/31/98	12-0-109
477	TOX-ICR	TOX (Dupl)	80 µg Cl-/L	SM 5320 B	1	25	3/24/98	3/31/98	12-0-109
			<b>82 µg Cl-/L</b>	<b>3.7 % RPD</b>					
478	THM-ICR	1,2,3-Trichloropropane (Surrogate)	104.0 %	EPA 551.1	1	1.0	3/24/98	4/1/98	4/1/98 0-101-0
479	THM-ICR	Bromodichloromethane	2.8 µg/L	EPA 551.1	1	1.0	3/24/98	4/1/98	4/1/98 0-101-0
480	THM-ICR	Bromoform	ND µg/L	EPA 551.1	1	1.0	3/24/98	4/1/98	4/1/98 0-101-0
481	THM-ICR	Chloroform	6.6 µg/L	EPA 551.1	1	1.0	3/24/98	4/1/98	4/1/98 0-101-0
482	THM-ICR	Dibromochloromethane	ND µg/L	EPA 551.1	1	1.0	3/24/98	4/1/98	4/1/98 0-101-0
483	UV-ICR	UV	0.028 1/cm	SM 5910 B	1	0.009	3/21/98	3/23/98	8-0-150
484	UV-ICR	UV (Dupl)	0.027 1/cm	SM 5910 B	1	0.009	3/21/98	3/23/98	8-0-150
			<b>0.028 1/cm</b>	<b>3.6 % RPD</b>					

Sample ID: 96.20.Eff-12 S&amp;H ID: 9803-252 Date Sampled: 3/21/98 10:41:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
485	Cl2Dose	Chlorine Dose	2.05	mg/L as Cl2	SM 4500-Cl B	1	n/a	3/24/98		3/24/98	n/a
486	Cl2Res	Chlorine Residual	0.76	mg/L as Cl2	SM 4500-Cl F	1	0.10	3/24/98		3/24/98	n/a
487	HAA-ICR	1,2,3-Trichloropropane (IS) (Internal Standard)	101.6	%	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
488	HAA-ICR	2-Bromopropionic acid (Surrogate)	90.4	%	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
489	HAA-ICR	Bromochloroacetic acid	ND	µg/L	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
490	HAA-ICR	Bromodichloroacetic acid	ND	µg/L	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
491	HAA-ICR	Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	3/24/98	3/25/98	3/26/98	0-100-0
492	HAA-ICR	Dibromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
493	HAA-ICR	Dichloroacetic acid	5.4	µg/L	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
494	HAA-ICR	Monobromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
495	HAA-ICR	Monochloroacetic acid	ND	µg/L	EPA 552.2	1	2.0	3/24/98	3/25/98	3/26/98	0-100-0
496	HAA-ICR	Tribromoacetic acid	ND	µg/L	EPA 552.2	1	4.0	3/24/98	3/25/98	3/26/98	0-100-0
497	HAA-ICR	Trichloroacetic acid	ND	µg/L	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
498	pH	Cl2 pH - Final	7.4	Unit	SM 4500-H+ B	1	n/a	3/24/98		3/24/98	n/a
499	pH	Cl2 pH - Initial	7.3	Unit	SM 4500-H+ B	1	n/a	3/24/98		3/24/98	n/a
500	pH	pH	7.6	Unit	SM 4500-H+ B	1	n/a	3/21/98		3/21/98	n/a

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 96  
Study Title: ICR RSSCT #1

501	TEMP	Cl2 Temperature	6.8 °C	SM 2550 B	1	n/a	3/24/98	3/24/98	n/a
502	TEMP	Temperature	22.0 °C	SM 2550 B	1	n/a	3/21/98	3/21/98	n/a
503	TIME	Cl2 Incubation Time	3.3 hrs	n/a	1	n/a	3/24/98	3/24/98	n/a
504	TOC-ICR	TOC	0.58 mg/L	SM 5310 C	1	0.50	3/21/98	3/22/98	7-0-218
505	TOC-ICR	TOC (Dupl)	0.55 mg/L	SM 5310 C	1	0.50	3/21/98	3/22/98	7-0-218
			<b>0.56 mg/L</b>	<b>5.4 % RPD</b>					
506	TOX-ICR	TOX	ND µg Cl-/L	SM 5320 B	1	25	3/24/98	3/31/98	12-0-109
507	TOX-ICR	TOX (Dupl)	ND µg Cl-/L	SM 5320 B	1	25	3/24/98	3/31/98	12-0-109
			<b>ND µg Cl-/L</b>						
508	THM-ICR	1,2,3-Trichloropropane (Surrogate)	103.2 %	EPA 551.1	1	1.0	3/24/98	4/1/98	4/1/98 0-101-0
509	THM-ICR	Bromodichloromethane	ND µg/L	EPA 551.1	1	1.0	3/24/98	4/1/98	4/1/98 0-101-0
510	THM-ICR	Bromoform	ND µg/L	EPA 551.1	1	1.0	3/24/98	4/1/98	4/1/98 0-101-0
511	THM-ICR	Chloroform	ND µg/L	EPA 551.1	1	1.0	3/24/98	4/1/98	4/1/98 0-101-0
512	THM-ICR	Dibromochloromethane	ND µg/L	EPA 551.1	1	1.0	3/24/98	4/1/98	4/1/98 0-101-0
513	UV-ICR	UV	ND 1/cm	SM 5910 B	1	0.009	3/21/98	3/23/98	8-0-150
514	UV-ICR	UV (Dupl)	ND 1/cm	SM 5910 B	1	0.009	3/21/98	3/23/98	8-0-150
			<b>ND 1/cm</b>						

Sample ID: 96.20.Eff-12d

S&amp;H ID: 9803-253

Date Sampled: 3/21/98 10:41:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
515	Cl2Dose	Chlorine Dose	2.04	mg/L as Cl2	SM 4500-Cl B	1	n/a	3/24/98		3/24/98	n/a
516	Cl2Res	Chlorine Residual	0.74	mg/L as Cl2	SM 4500-Cl F	1	0.10	3/24/98		3/24/98	n/a
517	HAA-ICR	1,2,3-Trichloropropane (IS) (Internal Standard)	100.8	%	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
518	HAA-ICR	2-Bromopropionic acid (Surrogate)	102.0	%	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
519	HAA-ICR	Bromochloroacetic acid	1.0	µg/L	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
520	HAA-ICR	Bromodichloroacetic acid	ND	µg/L	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
521	HAA-ICR	Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	3/24/98	3/25/98	3/26/98	0-100-0
522	HAA-ICR	Dibromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
523	HAA-ICR	Dichloroacetic acid	5.7	µg/L	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
524	HAA-ICR	Monobromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
525	HAA-ICR	Monochloroacetic acid	ND	µg/L	EPA 552.2	1	2.0	3/24/98	3/25/98	3/26/98	0-100-0
526	HAA-ICR	Tribromoacetic acid	ND	µg/L	EPA 552.2	1	4.0	3/24/98	3/25/98	3/26/98	0-100-0
527	HAA-ICR	Trichloroacetic acid	ND	µg/L	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
528	pH	Cl2 pH - Final	7.4	Unit	SM 4500-H+ B	1	n/a	3/24/98		3/24/98	n/a
529	pH	Cl2 pH - Initial	7.3	Unit	SM 4500-H+ B	1	n/a	3/24/98		3/24/98	n/a
530	pH	pH	7.6	Unit	SM 4500-H+ B	1	n/a	3/21/98		3/21/98	n/a
531	TEMP	Cl2 Temperature	6.8	°C	SM 2550 B	1	n/a	3/24/98		3/24/98	n/a
532	TEMP	Temperature	21.9	°C	SM 2550 B	1	n/a	3/21/98		3/21/98	n/a

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 96  
Study Title: ICR RSSCT #1

533	TIME	Cl2 Incubation Time	3.3 hrs	n/a	1	n/a	3/24/98	3/24/98	n/a
534	TOC-ICR	TOC	0.54 mg/L	SM 5310 C	1	0.50	3/21/98	3/22/98	7-0-218
535	TOC-ICR	TOC (Dupl)	0.53 mg/L	SM 5310 C	1	0.50	3/21/98	3/22/98	7-0-218
			<b>0.54 mg/L</b>	<b>1.9 % RPD</b>					
536	TOX-ICR	TOX	ND µg Cl-/L	SM 5320 B	1	25	3/24/98	3/31/98	12-0-109
537	TOX-ICR	TOX (Dupl)	ND µg Cl-/L	SM 5320 B	1	25	3/24/98	3/31/98	12-0-109
			<b>ND µg Cl-/L</b>						
538	THM-ICR	1,2,3-Trichloropropane (Surrogate)	94.0 %	EPA 551.1	1	1.0	3/24/98	4/1/98	4/1/98 0-101-0
539	THM-ICR	Bromodichloromethane	ND µg/L	EPA 551.1	1	1.0	3/24/98	4/1/98	4/1/98 0-101-0
540	THM-ICR	Bromoform	ND µg/L	EPA 551.1	1	1.0	3/24/98	4/1/98	4/1/98 0-101-0
541	THM-ICR	Chloroform	ND µg/L	EPA 551.1	1	1.0	3/24/98	4/1/98	4/1/98 0-101-0
542	THM-ICR	Dibromochloromethane	ND µg/L	EPA 551.1	1	1.0	3/24/98	4/1/98	4/1/98 0-101-0
543	UV-ICR	UV	ND 1/cm	SM 5910 B	1	0.009	3/21/98	3/23/98	8-0-150
544	UV-ICR	UV (Dupl)	ND 1/cm	SM 5910 B	1	0.009	3/21/98	3/23/98	8-0-150
			<b>ND 1/cm</b>						

Sample ID: 96.20.Eff-14

S&amp;H ID: 9803-255

Date Sampled: 3/22/98 8:03:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
545	Cl2Dose	Chlorine Dose	2.10	mg/L as Cl2	SM 4500-Cl B	1	n/a	3/24/98		3/24/98	n/a
546	Cl2Res	Chlorine Residual	0.76	mg/L as Cl2	SM 4500-Cl F	1	0.10	3/24/98		3/24/98	n/a
547	HAA-ICR	1,2,3-Trichloropropane (IS) (Internal Standard)	104.0	%	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
548	HAA-ICR	2-Bromopropionic acid (Surrogate)	98.8	%	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
549	HAA-ICR	Bromochloroacetic acid	1.1	µg/L	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
550	HAA-ICR	Bromodichloroacetic acid	ND	µg/L	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
551	HAA-ICR	Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	3/24/98	3/25/98	3/26/98	0-100-0
552	HAA-ICR	Dibromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
553	HAA-ICR	Dichloroacetic acid	4.3	µg/L	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
554	HAA-ICR	Monobromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
555	HAA-ICR	Monochloroacetic acid	ND	µg/L	EPA 552.2	1	2.0	3/24/98	3/25/98	3/26/98	0-100-0
556	HAA-ICR	Tribromoacetic acid	ND	µg/L	EPA 552.2	1	4.0	3/24/98	3/25/98	3/26/98	0-100-0
557	HAA-ICR	Trichloroacetic acid	ND	µg/L	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
558	pH	Cl2 pH - Final	7.4	Unit	SM 4500-H+ B	1	n/a	3/24/98		3/24/98	n/a
559	pH	Cl2 pH - Initial	7.4	Unit	SM 4500-H+ B	1	n/a	3/24/98		3/24/98	n/a
560	pH	pH	7.6	Unit	SM 4500-H+ B	1	n/a	3/22/98		3/22/98	n/a
561	TEMP	Cl2 Temperature	6.8	°C	SM 2550 B	1	n/a	3/24/98		3/24/98	n/a
562	TEMP	Temperature	22.0	°C	SM 2550 B	1	n/a	3/22/98		3/22/98	n/a
563	TIME	Cl2 Incubation Time	3.3	hrs	n/a	1	n/a	3/24/98		3/24/98	n/a

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 96  
Study Title: ICR RSSCT #1

564	TOC-ICR TOC	0.75 mg/L	SM 5310 C	1	0.50	3/22/98	3/22/98	7-0-218
565	TOC-ICR TOC (Dupl)	0.78 mg/L	SM 5310 C	1	0.50	3/22/98	3/22/98	7-0-218
		<b>0.77 mg/L</b>	<b>3.9 % RPD</b>					
566	TOX-ICR TOX	ND µg Cl-/L	SM 5320 B	1	25	3/24/98	3/31/98	12-0-109
567	TOX-ICR TOX (Dupl)	ND µg Cl-/L	SM 5320 B	1	25	3/24/98	3/31/98	12-0-109
		<b>ND µg Cl-/L</b>						
568	THM-ICR 1,2,3-Trichloropropane (Surrogate)	101.2 %	EPA 551.1	1	1.0	3/24/98	4/1/98	4/1/98 0-101-0
569	THM-ICR Bromodichloromethane	ND µg/L	EPA 551.1	1	1.0	3/24/98	4/1/98	4/1/98 0-101-0
570	THM-ICR Bromoform	ND µg/L	EPA 551.1	1	1.0	3/24/98	4/1/98	4/1/98 0-101-0
571	THM-ICR Chloroform	1.3 µg/L	EPA 551.1	1	1.0	3/24/98	4/1/98	4/1/98 0-101-0
572	THM-ICR Dibromochloromethane	ND µg/L	EPA 551.1	1	1.0	3/24/98	4/1/98	4/1/98 0-101-0
573	UV-ICR UV	ND 1/cm	SM 5910 B	1	0.009	3/22/98	3/23/98	8-0-150
574	UV-ICR UV (Dupl)	ND 1/cm	SM 5910 B	1	0.009	3/22/98	3/23/98	8-0-150
		<b>ND 1/cm</b>						

Sample ID: 96.10.Eff-26

S&amp;H ID: 9803-261

Date Sampled: 3/22/98 1:21:00 PM

#	Analysis Type	Result Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
575	Cl2Dose Chlorine Dose	2.50 mg/L as Cl2	SM 4500-Cl B	1	n/a	3/24/98		3/24/98	n/a
576	Cl2Res Chlorine Residual	0.83 mg/L as Cl2	SM 4500-Cl F	1	0.10	3/24/98		3/24/98	n/a
577	HAA-ICR 1,2,3-Trichloropropane (IS) (Internal Standard)	101.6 %	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
578	HAA-ICR 2-Bromopropionic acid (Surrogate)	104.0 %	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
579	HAA-ICR Bromochloroacetic acid	1.5 µg/L	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
580	HAA-ICR Bromodichloroacetic acid	1.7 µg/L	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
581	HAA-ICR Chlorodibromoacetic acid	ND µg/L	EPA 552.2	1	2.0	3/24/98	3/25/98	3/26/98	0-100-0
582	HAA-ICR Dibromoacetic acid	ND µg/L	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
583	HAA-ICR Dichloroacetic acid	7.8 µg/L	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
584	HAA-ICR Monobromoacetic acid	ND µg/L	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
585	HAA-ICR Monochloroacetic acid	ND µg/L	EPA 552.2	1	2.0	3/24/98	3/25/98	3/26/98	0-100-0
586	HAA-ICR Tribromoacetic acid	ND µg/L	EPA 552.2	1	4.0	3/24/98	3/25/98	3/26/98	0-100-0
587	HAA-ICR Trichloroacetic acid	8.0 µg/L	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
588	pH Cl2 pH - Final	7.4 Unit	SM 4500-H+ B	1	n/a	3/24/98		3/24/98	n/a
589	pH Cl2 pH - Initial	7.3 Unit	SM 4500-H+ B	1	n/a	3/24/98		3/24/98	n/a
590	pH pH	7.7 Unit	SM 4500-H+ B	1	n/a	3/22/98		3/22/98	n/a
591	TEMP Cl2 Temperature	6.8 °C	SM 2550 B	1	n/a	3/24/98		3/24/98	n/a
592	TEMP Temperature	22.0 °C	SM 2550 B	1	n/a	3/22/98		3/22/98	n/a
593	TIME Cl2 Incubation Time	3.3 hrs	n/a	1	n/a	3/24/98		3/24/98	n/a
594	TOC-ICR TOC	2.26 mg/L	SM 5310 C	1	0.50	3/22/98		3/22/98	7-0-218
595	TOC-ICR TOC (Dupl)	2.30 mg/L	SM 5310 C	1	0.50	3/22/98		3/22/98	7-0-218

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 96  
Study Title: ICR RSSCT #1

		<b>2.28 mg/L</b>	<b>1.8 % RPD</b>						
596	TOX-ICR TOX	89 µg Cl-/L	SM 5320 B	1	25	3/24/98		4/2/98	12-0-110
597	TOX-ICR TOX (Dupl)	85 µg Cl-/L	SM 5320 B	1	25	3/24/98		4/2/98	12-0-110
		<b>87 µg Cl-/L</b>	<b>4.6 % RPD</b>						
598	THM-ICR 1,2,3-Trichloropropane (Surrogate)	96.0 %	EPA 551.1	1	1.0	3/24/98	4/1/98	4/1/98	0-101-0
599	THM-ICR Bromodichloromethane	3.0 µg/L	EPA 551.1	1	1.0	3/24/98	4/1/98	4/1/98	0-101-0
600	THM-ICR Bromoform	ND µg/L	EPA 551.1	1	1.0	3/24/98	4/1/98	4/1/98	0-101-0
601	THM-ICR Chloroform	8.4 µg/L	EPA 551.1	1	1.0	3/24/98	4/1/98	4/1/98	0-101-0
602	THM-ICR Dibromochloromethane	ND µg/L	EPA 551.1	1	1.0	3/24/98	4/1/98	4/1/98	0-101-0
603	UV-ICR UV	0.033 1/cm	SM 5910 B	1	0.009	3/22/98		3/23/98	8-0-150
604	UV-ICR UV (Dupl)	0.033 1/cm	SM 5910 B	1	0.009	3/22/98		3/23/98	8-0-150
		<b>0.033 1/cm</b>	<b>0.0 % RPD</b>						

Sample ID: 96.10.Eff-26d

S&amp;H ID: 9803-262

Date Sampled: 3/22/98 1:21:00 PM

#	Analysis Type	Result Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
605	Cl2Dose Chlorine Dose	2.49 mg/L as Cl2	SM 4500-Cl B	1	n/a	3/24/98		3/24/98	n/a
606	Cl2Res Chlorine Residual	0.81 mg/L as Cl2	SM 4500-Cl F	1	0.10	3/24/98		3/24/98	n/a
607	HAA-ICR 1,2,3-Trichloropropane (IS) (Internal Standard)	97.2 %	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
608	HAA-ICR 2-Bromopropionic acid (Surrogate)	89.6 %	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
609	HAA-ICR Bromochloroacetic acid	1.2 µg/L	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
610	HAA-ICR Bromodichloroacetic acid	1.5 µg/L	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
611	HAA-ICR Chlorodibromoacetic acid	ND µg/L	EPA 552.2	1	2.0	3/24/98	3/25/98	3/26/98	0-100-0
612	HAA-ICR Dibromoacetic acid	ND µg/L	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
613	HAA-ICR Dichloroacetic acid	6.4 µg/L	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
614	HAA-ICR Monobromoacetic acid	ND µg/L	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
615	HAA-ICR Monochloroacetic acid	ND µg/L	EPA 552.2	1	2.0	3/24/98	3/25/98	3/26/98	0-100-0
616	HAA-ICR Tribromoacetic acid	ND µg/L	EPA 552.2	1	4.0	3/24/98	3/25/98	3/26/98	0-100-0
617	HAA-ICR Trichloroacetic acid	6.1 µg/L	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
618	pH Cl2 pH - Final	7.4 Unit	SM 4500-H+ B	1	n/a	3/24/98		3/24/98	n/a
619	pH Cl2 pH - Initial	7.3 Unit	SM 4500-H+ B	1	n/a	3/24/98		3/24/98	n/a
620	pH pH	7.7 Unit	SM 4500-H+ B	1	n/a	3/22/98		3/22/98	n/a
621	TEMP Cl2 Temperature	6.8 °C	SM 2550 B	1	n/a	3/24/98		3/24/98	n/a
622	TEMP Temperature	22.0 °C	SM 2550 B	1	n/a	3/22/98		3/22/98	n/a
623	TIME Cl2 Incubation Time	3.4 hrs	n/a	1	n/a	3/24/98		3/24/98	n/a
624	TOC-ICR TOC	2.29 mg/L	SM 5310 C	1	0.50	3/22/98		3/22/98	7-0-218
625	TOC-ICR TOC (Dupl)	2.23 mg/L	SM 5310 C	1	0.50	3/22/98		3/22/98	7-0-218
		<b>2.26 mg/L</b>	<b>2.7 % RPD</b>						
626	TOX-ICR TOX	87 µg Cl-/L	SM 5320 B	1	25	3/24/98		4/2/98	12-0-110

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.



**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 96  
Study Title: ICR RSSCT #1

627	TOX-ICR TOX (Dupl)	93 µg Cl-/L 90 µg Cl-/L	SM 5320 B 6.7 % RPD	1	25	3/24/98	4/2/98	12-0-110
628	THM-ICR 1,2,3-Trichloropropane (Surrogate)	97.6 %	EPA 551.1	1	1.0	3/24/98	4/1/98	4/1/98 0-101-0
629	THM-ICR Bromodichloromethane	3.0 µg/L	EPA 551.1	1	1.0	3/24/98	4/1/98	4/1/98 0-101-0
630	THM-ICR Bromoform	ND µg/L	EPA 551.1	1	1.0	3/24/98	4/1/98	4/1/98 0-101-0
631	THM-ICR Chloroform	8.2 µg/L	EPA 551.1	1	1.0	3/24/98	4/1/98	4/1/98 0-101-0
632	THM-ICR Dibromochloromethane	ND µg/L	EPA 551.1	1	1.0	3/24/98	4/1/98	4/1/98 0-101-0
633	UV-ICR UV	0.033 1/cm	SM 5910 B	1	0.009	3/22/98	3/23/98	8-0-150
634	UV-ICR UV (Dupl)	0.033 1/cm 0.033 1/cm	SM 5910 B 0.0 % RPD	1	0.009	3/22/98	3/23/98	8-0-150

Sample ID: 96.20.Eff-16

S&amp;H ID: 9803-263

Date Sampled: 3/22/98 5:26:00 PM

#	Analysis Type	Result Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
635	Cl2Dose Chlorine Dose	2.17 mg/L as Cl2	SM 4500-Cl B	1	n/a	3/24/98		3/24/98	n/a
636	Cl2Res Chlorine Residual	0.77 mg/L as Cl2	SM 4500-Cl F	1	0.10	3/24/98		3/24/98	n/a
637	HAA-ICR 1,2,3-Trichloropropane (IS) (Internal Standard)	95.6 %	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
638	HAA-ICR 2-Bromopropionic acid (Surrogate)	108.4 %	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
639	HAA-ICR Bromochloroacetic acid	1.0 µg/L	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
640	HAA-ICR Bromodichloroacetic acid	ND µg/L	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
641	HAA-ICR Chlorodibromoacetic acid	ND µg/L	EPA 552.2	1	2.0	3/24/98	3/25/98	3/26/98	0-100-0
642	HAA-ICR Dibromoacetic acid	ND µg/L	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
643	HAA-ICR Dichloroacetic acid	4.0 µg/L	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
644	HAA-ICR Monobromoacetic acid	ND µg/L	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
645	HAA-ICR Monochloroacetic acid	ND µg/L	EPA 552.2	1	2.0	3/24/98	3/25/98	3/26/98	0-100-0
646	HAA-ICR Tribromoacetic acid	ND µg/L	EPA 552.2	1	4.0	3/24/98	3/25/98	3/26/98	0-100-0
647	HAA-ICR Trichloroacetic acid	ND µg/L	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
648	pH Cl2 pH - Final	7.4 Unit	SM 4500-H+ B	1	n/a	3/24/98		3/24/98	n/a
649	pH Cl2 pH - Initial	7.4 Unit	SM 4500-H+ B	1	n/a	3/24/98		3/24/98	n/a
650	pH pH	7.8 Unit	SM 4500-H+ B	1	n/a	3/22/98		3/22/98	n/a
651	TEMP Cl2 Temperature	6.8 °C	SM 2550 B	1	n/a	3/24/98		3/24/98	n/a
652	TEMP Temperature	21.9 °C	SM 2550 B	1	n/a	3/22/98		3/22/98	n/a
653	TIME Cl2 Incubation Time	3.3 hrs	n/a	1	n/a	3/24/98		3/24/98	n/a
654	TOC-ICR TOC	1.03 mg/L	SM 5310 C	1	0.50	3/22/98		3/22/98	7-0-218
655	TOC-ICR TOC (Dupl)	1.01 mg/L 1.02 mg/L	SM 5310 C 2.0 % RPD	1	0.50	3/22/98		3/22/98	7-0-218
656	TOX-ICR TOX	25 µg Cl-/L	SM 5320 B	1	25	3/24/98		3/31/98	12-0-109
657	TOX-ICR TOX (Dupl)	31 µg Cl-/L 28 µg Cl-/L	SM 5320 B 21.4 % RPD	1	25	3/24/98		3/31/98	12-0-109

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 96  
Study Title: ICR RSSCT #1

658	THM-ICR 1,2,3-Trichloropropane (Surrogate)	102.4 %	EPA 551.1	1	1.0	3/24/98	4/1/98	4/1/98	0-101-0
659	THM-ICR Bromodichloromethane	1.0 µg/L	EPA 551.1	1	1.0	3/24/98	4/1/98	4/1/98	0-101-0
660	THM-ICR Bromoform	ND µg/L	EPA 551.1	1	1.0	3/24/98	4/1/98	4/1/98	0-101-0
661	THM-ICR Chloroform	1.9 µg/L	EPA 551.1	1	1.0	3/24/98	4/1/98	4/1/98	0-101-0
662	THM-ICR Dibromochloromethane	ND µg/L	EPA 551.1	1	1.0	3/24/98	4/1/98	4/1/98	0-101-0
663	UV-ICR UV	0.010 1/cm	SM 5910 B	1	0.009	3/22/98		3/23/98	8-0-150
664	UV-ICR UV (Dupl)	0.010 1/cm	SM 5910 B	1	0.009	3/22/98		3/23/98	8-0-150
		<b>0.010 1/cm</b>	<b>0.0 % RPD</b>						

Sample ID: 96.20.Eff-19

S&amp;H ID: 9803-268

Date Sampled: 3/23/98 7:24:00 AM

#	Analysis Type	Result Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
665	Cl2Dose Chlorine Dose	2.21 mg/L as Cl2	SM 4500-Cl B	1	n/a	3/24/98		3/24/98	n/a
666	Cl2Res Chlorine Residual	0.73 mg/L as Cl2	SM 4500-Cl F	1	0.10	3/24/98		3/24/98	n/a
667	HAA-ICR 1,2,3-Trichloropropane (IS) (Internal Standard)	91.6 %	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
668	HAA-ICR 2-Bromopropionic acid (Surrogate)	92.0 %	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
669	HAA-ICR Bromochloroacetic acid	ND µg/L	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
670	HAA-ICR Bromodichloroacetic acid	1.0 µg/L	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
671	HAA-ICR Chlorodibromoacetic acid	ND µg/L	EPA 552.2	1	2.0	3/24/98	3/25/98	3/26/98	0-100-0
672	HAA-ICR Dibromoacetic acid	ND µg/L	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
673	HAA-ICR Dichloroacetic acid	3.3 µg/L	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
674	HAA-ICR Monobromoacetic acid	ND µg/L	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
675	HAA-ICR Monochloroacetic acid	ND µg/L	EPA 552.2	1	2.0	3/24/98	3/25/98	3/26/98	0-100-0
676	HAA-ICR Tribromoacetic acid	ND µg/L	EPA 552.2	1	4.0	3/24/98	3/25/98	3/26/98	0-100-0
677	HAA-ICR Trichloroacetic acid	1.5 µg/L	EPA 552.2	1	1.0	3/24/98	3/25/98	3/26/98	0-100-0
678	pH Cl2 pH - Final	7.4 Unit	SM 4500-H+ B	1	n/a	3/24/98		3/24/98	n/a
679	pH Cl2 pH - Initial	7.4 Unit	SM 4500-H+ B	1	n/a	3/24/98		3/24/98	n/a
680	pH pH	7.6 Unit	SM 4500-H+ B	1	n/a	3/23/98		3/23/98	n/a
681	TEMP Cl2 Temperature	6.8 °C	SM 2550 B	1	n/a	3/24/98		3/24/98	n/a
682	TEMP Temperature	21.7 °C	SM 2550 B	1	n/a	3/23/98		3/23/98	n/a
683	TIME Cl2 Incubation Time	3.3 hrs	n/a	1	n/a	3/24/98		3/24/98	n/a
684	TOC-ICR TOC	1.17 mg/L	SM 5310 C	1	0.50	3/23/98		3/23/98	7-0-219
685	TOC-ICR TOC (Dupl)	1.17 mg/L	SM 5310 C	1	0.50	3/23/98		3/23/98	7-0-219
		<b>1.17 mg/L</b>	<b>0.0 % RPD</b>						
686	TOX-ICR TOX	26 µg Cl-/L	SM 5320 B	1	25	3/24/98		4/2/98	12-0-110
687	TOX-ICR TOX (Dupl)	30 µg Cl-/L	SM 5320 B	1	25	3/24/98		4/2/98	12-0-110
		<b>28 µg Cl-/L</b>	<b>14.3 % RPD</b>						
688	THM-ICR 1,2,3-Trichloropropane (Surrogate)	108.4 %	EPA 551.1	1	1.0	3/24/98	4/1/98	4/1/98	0-101-0

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 96  
Study Title: ICR RSSCT #1

689	THM-ICR Bromodichloromethane	1.4 µg/L	EPA 551.1	1	1.0	3/24/98	4/1/98	4/1/98	0-101-0
690	THM-ICR Bromoform	ND µg/L	EPA 551.1	1	1.0	3/24/98	4/1/98	4/1/98	0-101-0
691	THM-ICR Chloroform	2.6 µg/L	EPA 551.1	1	1.0	3/24/98	4/1/98	4/1/98	0-101-0
692	THM-ICR Dibromochloromethane	ND µg/L	EPA 551.1	1	1.0	3/24/98	4/1/98	4/1/98	0-101-0
693	UV-ICR UV	0.013 1/cm	SM 5910 B	1	0.009	3/23/98		3/23/98	8-0-150
694	UV-ICR UV (Dupl)	0.013 1/cm	SM 5910 B	1	0.009	3/23/98		3/23/98	8-0-150
		<b>0.013 1/cm</b>	<b>0.0 % RPD</b>						

Sample ID: 96.20.Eff-21

S&amp;H ID: 9803-274

Date Sampled: 3/24/98 12:47:00 AM

#	Analysis Type	Result Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
695	Cl2Dose Chlorine Dose	2.20 mg/L as Cl2	SM 4500-Cl B	1	n/a	3/28/98		3/28/98	n/a
696	Cl2Res Chlorine Residual	0.73 mg/L as Cl2	SM 4500-Cl F	1	0.10	3/28/98		3/28/98	n/a
697	HAA-ICR 1,2,3-Trichloropropane (IS) (Internal Standard)	104.4 %	EPA 552.2	1	1.0	3/28/98	4/8/98	4/8/98	0-103-0
698	HAA-ICR 2-Bromopropionic acid (Surrogate)	103.6 %	EPA 552.2	1	1.0	3/28/98	4/8/98	4/8/98	0-103-0
699	HAA-ICR Bromochloroacetic acid	ND µg/L	EPA 552.2	1	1.0	3/28/98	4/8/98	4/8/98	0-103-0
700	HAA-ICR Bromodichloroacetic acid	1.0 µg/L	EPA 552.2	1	1.0	3/28/98	4/8/98	4/8/98	0-103-0
701	HAA-ICR Chlorodibromoacetic acid	ND µg/L	EPA 552.2	1	2.0	3/28/98	4/8/98	4/8/98	0-103-0
702	HAA-ICR Dibromoacetic acid	ND µg/L	EPA 552.2	1	1.0	3/28/98	4/8/98	4/8/98	0-103-0
703	HAA-ICR Dichloroacetic acid	2.3 µg/L	EPA 552.2	1	1.0	3/28/98	4/8/98	4/8/98	0-103-0
704	HAA-ICR Monobromoacetic acid	ND µg/L	EPA 552.2	1	1.0	3/28/98	4/8/98	4/8/98	0-103-0
705	HAA-ICR Monochloroacetic acid	ND µg/L	EPA 552.2	1	2.0	3/28/98	4/8/98	4/8/98	0-103-0
706	HAA-ICR Tribromoacetic acid	ND µg/L	EPA 552.2	1	4.0	3/28/98	4/8/98	4/8/98	0-103-0
707	HAA-ICR Trichloroacetic acid	2.6 µg/L	EPA 552.2	1	1.0	3/28/98	4/8/98	4/8/98	0-103-0
708	pH Cl2 pH - Final	7.4 Unit	SM 4500-H+ B	1	n/a	3/28/98		3/28/98	n/a
709	pH Cl2 pH - Initial	7.3 Unit	SM 4500-H+ B	1	n/a	3/28/98		3/28/98	n/a
710	pH pH	7.5 Unit	SM 4500-H+ B	1	n/a	3/24/98		3/24/98	n/a
711	TEMP Cl2 Temperature	5.6 °C	SM 2550 B	1	n/a	3/28/98		3/28/98	n/a
712	TEMP Temperature	21.0 °C	SM 2550 B	1	n/a	3/24/98		3/24/98	n/a
713	TIME Cl2 Incubation Time	3.2 hrs	n/a	1	n/a	3/28/98		3/28/98	n/a
714	TOC-ICR TOC	1.31 mg/L	SM 5310 C	1	0.50	3/24/98		3/26/98	7-0-222
715	TOC-ICR TOC (Dupl)	1.29 mg/L	SM 5310 C	1	0.50	3/24/98		3/26/98	7-0-222
		<b>1.30 mg/L</b>	<b>1.5 % RPD</b>						
716	TOX-ICR TOX	31 µg Cl-/L	SM 5320 B	1	25	3/28/98		4/2/98	12-0-110
717	TOX-ICR TOX (Dupl)	34 µg Cl-/L	SM 5320 B	1	25	3/28/98		4/2/98	12-0-110
		<b>33 µg Cl-/L</b>	<b>9.1 % RPD</b>						
718	THM-ICR 1,2,3-Trichloropropane (Surrogate)	105.6 %	EPA 551.1	1	1.0	3/28/98	4/1/98	4/1/98	0-101-0
719	THM-ICR Bromodichloromethane	1.7 µg/L	EPA 551.1	1	1.0	3/28/98	4/1/98	4/1/98	0-101-0
720	THM-ICR Bromoform	ND µg/L	EPA 551.1	1	1.0	3/28/98	4/1/98	4/1/98	0-101-0

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 96  
Study Title: ICR RSSCT #1

721	THM-ICR Chloroform	3.3 µg/L	EPA 551.1	1	1.0	3/28/98	4/1/98	4/1/98	0-101-0
722	THM-ICR Dibromochloromethane	ND µg/L	EPA 551.1	1	1.0	3/28/98	4/1/98	4/1/98	0-101-0
723	UV-ICR UV	0.016 1/cm	SM 5910 B	1	0.009	3/24/98		3/25/98	8-0-151
724	UV-ICR UV (Dupl)	0.016 1/cm	SM 5910 B	1	0.009	3/24/98		3/25/98	8-0-151
		<b>0.016 1/cm</b>	<b>0.0 % RPD</b>						

Sample ID: 96.20.Eff-21d S&amp;H ID: 9803-275 Date Sampled: 3/24/98 12:47:00 AM

#	Analysis Type	Result Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
725	Cl2Dose Chlorine Dose	2.20 mg/L as Cl2	SM 4500-Cl B	1	n/a	3/28/98		3/28/98	n/a
726	Cl2Res Chlorine Residual	0.72 mg/L as Cl2	SM 4500-Cl F	1	0.10	3/28/98		3/28/98	n/a
727	HAA-ICR 1,2,3-Trichloropropane (IS) (Internal Standard)	106.0 %	EPA 552.2	1	1.0	3/28/98	4/8/98	4/8/98	0-103-0
728	HAA-ICR 2-Bromopropionic acid (Surrogate)	105.6 %	EPA 552.2	1	1.0	3/28/98	4/8/98	4/8/98	0-103-0
729	HAA-ICR Bromochloroacetic acid	ND µg/L	EPA 552.2	1	1.0	3/28/98	4/8/98	4/8/98	0-103-0
730	HAA-ICR Bromodichloroacetic acid	1.0 µg/L	EPA 552.2	1	1.0	3/28/98	4/8/98	4/8/98	0-103-0
731	HAA-ICR Chlorodibromoacetic acid	ND µg/L	EPA 552.2	1	2.0	3/28/98	4/8/98	4/8/98	0-103-0
732	HAA-ICR Dibromoacetic acid	ND µg/L	EPA 552.2	1	1.0	3/28/98	4/8/98	4/8/98	0-103-0
733	HAA-ICR Dichloroacetic acid	2.5 µg/L	EPA 552.2	1	1.0	3/28/98	4/8/98	4/8/98	0-103-0
734	HAA-ICR Monobromoacetic acid	ND µg/L	EPA 552.2	1	1.0	3/28/98	4/8/98	4/8/98	0-103-0
735	HAA-ICR Monochloroacetic acid	ND µg/L	EPA 552.2	1	2.0	3/28/98	4/8/98	4/8/98	0-103-0
736	HAA-ICR Tribromoacetic acid	ND µg/L	EPA 552.2	1	4.0	3/28/98	4/8/98	4/8/98	0-103-0
737	HAA-ICR Trichloroacetic acid	3.3 µg/L	EPA 552.2	1	1.0	3/28/98	4/8/98	4/8/98	0-103-0
738	pH Cl2 pH - Final	7.4 Unit	SM 4500-H+ B	1	n/a	3/28/98		3/28/98	n/a
739	pH Cl2 pH - Initial	7.3 Unit	SM 4500-H+ B	1	n/a	3/28/98		3/28/98	n/a
740	pH pH	7.4 Unit	SM 4500-H+ B	1	n/a	3/24/98		3/24/98	n/a
741	TEMP Cl2 Temperature	5.6 °C	SM 2550 B	1	n/a	3/28/98		3/28/98	n/a
742	TEMP Temperature	21.0 °C	SM 2550 B	1	n/a	3/24/98		3/24/98	n/a
743	TIME Cl2 Incubation Time	3.3 hrs	n/a	1	n/a	3/28/98		3/28/98	n/a
744	TOC-ICR TOC	1.31 mg/L	SM 5310 C	1	0.50	3/24/98		3/26/98	7-0-222
745	TOC-ICR TOC (Dupl)	1.31 mg/L	SM 5310 C	1	0.50	3/24/98		3/26/98	7-0-222
		<b>1.31 mg/L</b>	<b>0.0 % RPD</b>						
746	TOX-ICR TOX	33 µg Cl-/L	SM 5320 B	1	25	3/28/98		4/2/98	12-0-110
747	TOX-ICR TOX (Dupl)	41 µg Cl-/L	SM 5320 B	1	25	3/28/98		4/2/98	12-0-110
		<b>37 µg Cl-/L</b>	<b>21.6 % RPD</b>						
748	THM-ICR 1,2,3-Trichloropropane (Surrogate)	108.4 %	EPA 551.1	1	1.0	3/28/98	4/1/98	4/1/98	0-101-0
749	THM-ICR Bromodichloromethane	1.5 µg/L	EPA 551.1	1	1.0	3/28/98	4/1/98	4/1/98	0-101-0
750	THM-ICR Bromoform	ND µg/L	EPA 551.1	1	1.0	3/28/98	4/1/98	4/1/98	0-101-0
751	THM-ICR Chloroform	3.0 µg/L	EPA 551.1	1	1.0	3/28/98	4/1/98	4/1/98	0-101-0
752	THM-ICR Dibromochloromethane	ND µg/L	EPA 551.1	1	1.0	3/28/98	4/1/98	4/1/98	0-101-0

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 96  
Study Title: ICR RSSCT #1

753	UV-ICR	UV	0.016	1/cm	SM 5910 B	1	0.009	3/24/98	3/25/98	8-0-151
754	UV-ICR	UV (Dupl)	0.016	1/cm	SM 5910 B	1	0.009	3/24/98	3/25/98	8-0-151
			<b>0.016</b>	<b>1/cm</b>	<b>0.0 % RPD</b>					

Sample ID: 96.10.Eff-30

S&amp;H ID: 9803-278

Date Sampled: 3/24/98 7:22:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
755	Cl2Dose	Chlorine Dose	2.43	mg/L as Cl2	SM 4500-Cl B	1	n/a	3/29/98		3/29/98	n/a
756	Cl2Res	Chlorine Residual	0.66	mg/L as Cl2	SM 4500-Cl F	1	0.10	3/29/98		3/29/98	n/a
757	HAA-ICR	1,2,3-Trichloropropane (IS) (Internal Standard)	106.0	%	EPA 552.2	1	1.0	3/29/98	4/8/98	4/8/98	0-103-0
758	HAA-ICR	1,2,3-Trichloropropane (IS) (Internal Standard) (Lab Dupl)	108.0	%	EPA 552.2	1	1.0	3/29/98	4/8/98	4/8/98	0-103-0
			<b>107.0</b>	<b>%</b>	<b>1.9 % RPD</b>						
759	HAA-ICR	2-Bromopropionic acid (Surrogate)	106.0	%	EPA 552.2	1	1.0	3/29/98	4/8/98	4/8/98	0-103-0
760	HAA-ICR	2-Bromopropionic acid (Surrogate) (Lab Dupl)	98.0	%	EPA 552.2	1	1.0	3/29/98	4/8/98	4/8/98	0-103-0
			<b>102.0</b>	<b>%</b>	<b>7.8 % RPD</b>						
761	HAA-ICR	Bromochloroacetic acid	1.3	µg/L	EPA 552.2	1	1.0	3/29/98	4/8/98	4/8/98	0-103-0
762	HAA-ICR	Bromochloroacetic acid (Lab Dupl)	1.0	µg/L	EPA 552.2	1	1.0	3/29/98	4/8/98	4/8/98	0-103-0
			<b>1.1</b>	<b>µg/L</b>	<b>27.3 % RPD</b>						
763	HAA-ICR	Bromodichloroacetic acid	1.5	µg/L	EPA 552.2	1	1.0	3/29/98	4/8/98	4/8/98	0-103-0
764	HAA-ICR	Bromodichloroacetic acid (Lab Dupl)	1.4	µg/L	EPA 552.2	1	1.0	3/29/98	4/8/98	4/8/98	0-103-0
			<b>1.5</b>	<b>µg/L</b>	<b>6.7 % RPD</b>						
765	HAA-ICR	Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	3/29/98	4/8/98	4/8/98	0-103-0
766	HAA-ICR	Chlorodibromoacetic acid (Lab Dupl)	ND	µg/L	EPA 552.2	1	2.0	3/29/98	4/8/98	4/8/98	0-103-0
			<b>ND</b>	<b>µg/L</b>							
767	HAA-ICR	Dibromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	3/29/98	4/8/98	4/8/98	0-103-0
768	HAA-ICR	Dibromoacetic acid (Lab Dupl)	ND	µg/L	EPA 552.2	1	1.0	3/29/98	4/8/98	4/8/98	0-103-0
			<b>ND</b>	<b>µg/L</b>							
769	HAA-ICR	Dichloroacetic acid	5.1	µg/L	EPA 552.2	1	1.0	3/29/98	4/8/98	4/8/98	0-103-0
770	HAA-ICR	Dichloroacetic acid (Lab Dupl)	4.0	µg/L	EPA 552.2	1	1.0	3/29/98	4/8/98	4/8/98	0-103-0
			<b>4.5</b>	<b>µg/L</b>	<b>24.4 % RPD</b>						
771	HAA-ICR	Monobromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	3/29/98	4/8/98	4/8/98	0-103-0
772	HAA-ICR	Monobromoacetic acid (Lab Dupl)	ND	µg/L	EPA 552.2	1	1.0	3/29/98	4/8/98	4/8/98	0-103-0
			<b>ND</b>	<b>µg/L</b>							
773	HAA-ICR	Monochloroacetic acid	ND	µg/L	EPA 552.2	1	2.0	3/29/98	4/8/98	4/8/98	0-103-0
774	HAA-ICR	Monochloroacetic acid (Lab Dupl)	ND	µg/L	EPA 552.2	1	2.0	3/29/98	4/8/98	4/8/98	0-103-0
			<b>ND</b>	<b>µg/L</b>							
775	HAA-ICR	Tribromoacetic acid	ND	µg/L	EPA 552.2	1	4.0	3/29/98	4/8/98	4/8/98	0-103-0

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 96  
Study Title: ICR RSSCT #1

776	HAA-ICR	Tribromoacetic acid (Lab Dupl)	ND µg/L	EPA 552.2	1	4.0	3/29/98	4/8/98	4/8/98	0-103-0
			<b>ND µg/L</b>							
777	HAA-ICR	Trichloroacetic acid	7.0 µg/L	EPA 552.2	1	1.0	3/29/98	4/8/98	4/8/98	0-103-0
778	HAA-ICR	Trichloroacetic acid (Lab Dupl)	5.2 µg/L	EPA 552.2	1	1.0	3/29/98	4/8/98	4/8/98	0-103-0
			<b>6.1 µg/L</b>	<b>29.5 % RPD</b>						
779	pH	Cl2 pH - Final	7.3 Unit	SM 4500-H+ B	1	n/a	3/29/98		3/29/98	n/a
780	pH	Cl2 pH - Initial	7.3 Unit	SM 4500-H+ B	1	n/a	3/29/98		3/29/98	n/a
781	pH	pH	7.6 Unit	SM 4500-H+ B	1	n/a	3/24/98		3/24/98	n/a
782	TEMP	Cl2 Temperature	4.9 °C	SM 2550 B	1	n/a	3/29/98		3/29/98	n/a
783	TEMP	Temperature	21.1 °C	SM 2550 B	1	n/a	3/24/98		3/24/98	n/a
784	TIME	Cl2 Incubation Time	3.1 hrs	n/a	1	n/a	3/29/98		3/29/98	n/a
785	TOC-ICR	TOC	2.40 mg/L	SM 5310 C	1	0.50	3/24/98		3/26/98	7-0-222
786	TOC-ICR	TOC (Dupl)	2.44 mg/L	SM 5310 C	1	0.50	3/24/98		3/26/98	7-0-222
			<b>2.42 mg/L</b>	<b>1.7 % RPD</b>						
787	TOX-ICR	TOX	105 µg Cl-/L	SM 5320 B	1	25	3/29/98		4/3/98	12-0-111
788	TOX-ICR	TOX (Dupl)	106 µg Cl-/L	SM 5320 B	1	25	3/29/98		4/3/98	12-0-111
			<b>106 µg Cl-/L</b>	<b>0.9 % RPD</b>						
789	THM-ICR	1,2,3-Trichloropropane (Surrogate)	97.2 %	EPA 551.1	1	1.0	3/29/98	4/1/98	4/1/98	0-101-0
790	THM-ICR	Bromodichloromethane	2.7 µg/L	EPA 551.1	1	1.0	3/29/98	4/1/98	4/1/98	0-101-0
791	THM-ICR	Bromoform	ND µg/L	EPA 551.1	1	1.0	3/29/98	4/1/98	4/1/98	0-101-0
792	THM-ICR	Chloroform	8.7 µg/L	EPA 551.1	1	1.0	3/29/98	4/1/98	4/1/98	0-101-0
793	THM-ICR	Dibromochloromethane	ND µg/L	EPA 551.1	1	1.0	3/29/98	4/1/98	4/1/98	0-101-0
794	UV-ICR	UV	0.039 1/cm	SM 5910 B	1	0.009	3/24/98		3/25/98	8-0-151
795	UV-ICR	UV (Dupl)	0.038 1/cm	SM 5910 B	1	0.009	3/24/98		3/25/98	8-0-151
			<b>0.039 1/cm</b>	<b>2.6 % RPD</b>						

Sample ID: 96.20.Eff-24

S&amp;H ID: 9803-286

Date Sampled: 3/24/98 2:54:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
796	Cl2Dose	Chlorine Dose	2.24	mg/L as Cl2	SM 4500-Cl B	1	n/a	3/28/98		3/28/98	n/a
797	Cl2Res	Chlorine Residual	0.70	mg/L as Cl2	SM 4500-Cl F	1	0.10	3/28/98		3/28/98	n/a
798	HAA-ICR	1,2,3-Trichloropropane (IS) (Internal Standard)	108.0	%	EPA 552.2	1	1.0	3/28/98	4/8/98	4/8/98	0-103-0
799	HAA-ICR	2-Bromopropionic acid (Surrogate)	96.8	%	EPA 552.2	1	1.0	3/28/98	4/8/98	4/8/98	0-103-0
800	HAA-ICR	Bromochloroacetic acid	ND	µg/L	EPA 552.2	1	1.0	3/28/98	4/8/98	4/8/98	0-103-0
801	HAA-ICR	Bromodichloroacetic acid	ND	µg/L	EPA 552.2	1	1.0	3/28/98	4/8/98	4/8/98	0-103-0
802	HAA-ICR	Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	3/28/98	4/8/98	4/8/98	0-103-0
803	HAA-ICR	Dibromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	3/28/98	4/8/98	4/8/98	0-103-0
804	HAA-ICR	Dichloroacetic acid	2.1	µg/L	EPA 552.2	1	1.0	3/28/98	4/8/98	4/8/98	0-103-0

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 96  
Study Title: ICR RSSCT #1

805	HAA-ICR	Monobromoacetic acid	ND µg/L	EPA 552.2	1	1.0	3/28/98	4/8/98	4/8/98	0-103-0
806	HAA-ICR	Monochloroacetic acid	ND µg/L	EPA 552.2	1	2.0	3/28/98	4/8/98	4/8/98	0-103-0
807	HAA-ICR	Tribromoacetic acid	ND µg/L	EPA 552.2	1	4.0	3/28/98	4/8/98	4/8/98	0-103-0
808	HAA-ICR	Trichloroacetic acid	3.0 µg/L	EPA 552.2	1	1.0	3/28/98	4/8/98	4/8/98	0-103-0
809	pH	Cl2 pH - Final	7.4 Unit	SM 4500-H+ B	1	n/a	3/28/98		3/28/98	n/a
810	pH	Cl2 pH - Initial	7.3 Unit	SM 4500-H+ B	1	n/a	3/28/98		3/28/98	n/a
811	pH	pH	7.5 Unit	SM 4500-H+ B	1	n/a	3/24/98		3/24/98	n/a
812	TEMP	Cl2 Temperature	5.6 °C	SM 2550 B	1	n/a	3/28/98		3/28/98	n/a
813	TEMP	Temperature	21.7 °C	SM 2550 B	1	n/a	3/24/98		3/24/98	n/a
814	TIME	Cl2 Incubation Time	3.2 hrs	n/a	1	n/a	3/28/98		3/28/98	n/a
815	TOC-ICR	TOC	1.51 mg/L	SM 5310 C	1	0.50	3/24/98		3/26/98	7-0-222
816	TOC-ICR	TOC (Dupl)	1.51 mg/L	SM 5310 C	1	0.50	3/24/98		3/26/98	7-0-222
			<b>1.51 mg/L</b>	<b>0.0 % RPD</b>						
817	TOX-ICR	TOX	70 µg Cl-/L	SM 5320 B	1	25	3/28/98		4/3/98	12-0-111
818	TOX-ICR	TOX (Dupl)	58 µg Cl-/L	SM 5320 B	1	25	3/28/98		4/3/98	12-0-111
			<b>64 µg Cl-/L</b>	<b>18.7 % RPD</b>						
819	THM-ICR	1,2,3-Trichloropropane (Surrogate)	109.6 %	EPA 551.1	1	1.0	3/28/98	4/1/98	4/1/98	0-101-0
820	THM-ICR	Bromodichloromethane	1.9 µg/L	EPA 551.1	1	1.0	3/28/98	4/1/98	4/1/98	0-101-0
821	THM-ICR	Bromoform	ND µg/L	EPA 551.1	1	1.0	3/28/98	4/1/98	4/1/98	0-101-0
822	THM-ICR	Chloroform	3.8 µg/L	EPA 551.1	1	1.0	3/28/98	4/1/98	4/1/98	0-101-0
823	THM-ICR	Dibromochloromethane	ND µg/L	EPA 551.1	1	1.0	3/28/98	4/1/98	4/1/98	0-101-0
824	UV-ICR	UV	0.019 1/cm	SM 5910 B	1	0.009	3/24/98		3/25/98	8-0-151
825	UV-ICR	UV (Dupl)	0.019 1/cm	SM 5910 B	1	0.009	3/24/98		3/25/98	8-0-151
			<b>0.019 1/cm</b>	<b>0.0 % RPD</b>						

Sample ID: 96.10.Eff-31

S&amp;H ID: 9803-289

Date Sampled: 3/25/98 9:14:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
826	pH	pH	7.8	Unit	SM 4500-H+ B	1	n/a	3/25/98		3/25/98	n/a
827	TEMP	Temperature	21.5	°C	SM 2550 B	1	n/a	3/25/98		3/25/98	n/a
828	TOC-ICR	TOC	2.52	mg/L	SM 5310 C	1	0.50	3/25/98		3/25/98	7-0-221
829	TOC-ICR	TOC (Dupl)	2.58	mg/L	SM 5310 C	1	0.50	3/25/98		3/25/98	7-0-221
			<b>2.55 mg/L</b>		<b>2.4 % RPD</b>						

Sample ID: 96.INF.A-2

S&amp;H ID: 9803-297

Date Sampled: 3/26/98 7:00:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
830	ALK	Alkalinity	106	mg/L	SM 2320 B	1	5	3/26/98		3/26/98	1-0-16
831	ALK	Alkalinity (Dupl)	106	mg/L	SM 2320 B	1	5	3/26/98		3/26/98	1-0-16
			<b>106 mg/L</b>		<b>0.0 % RPD</b>						
832	NH3	Ammonia Nitrogen	0.13	mg/L	EPA 350.1	1	0.05	3/26/98		4/14/98	MW75858

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 96  
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833	BR	Bromide	ND mg/L	EPA 300.0 A	1	0.020	3/26/98	4/8/98	MW75802
834	CaHard	Calcium Hardness	141 mg/L CaCO3	SM 3500-Ca D	1	10	3/26/98	3/26/98	33-0-16
835	CaHard	Calcium Hardness (Dupl)	146 mg/L CaCO3	SM 3500-Ca D	1	10	3/26/98	3/26/98	33-0-16
			<b>144 mg/L CaCO3</b>	<b>3.5 % RPD</b>					
836	TotHard	Total Hardness	172 mg/L CaCO3	SM 2340 C	1	5	3/26/98	3/26/98	3-0-16
837	TotHard	Total Hardness (Dupl)	177 mg/L CaCO3	SM 2340 C	1	5	3/26/98	3/26/98	3-0-16
			<b>175 mg/L CaCO3</b>	<b>2.9 % RPD</b>					

Sample ID: 96.INF.B-4

S&amp;H ID: 9803-298

Date Sampled: 3/26/98 7:05:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
838	Cl2Dose	Chlorine Dose	2.66	mg/L as Cl2	SM 4500-Cl B	1	n/a	3/29/98		3/29/98	n/a
839	Cl2Res	Chlorine Residual	0.66	mg/L as Cl2	SM 4500-Cl F	1	0.10	3/29/98		3/29/98	n/a
840	HAA-ICR	1,2,3-Trichloropropane (IS) (Internal Standard)	108.0	%	EPA 552.2	1	1.0	3/29/98	4/8/98	4/8/98	0-103-0
841	HAA-ICR	2-Bromopropionic acid (Surrogate)	102.0	%	EPA 552.2	1	1.0	3/29/98	4/8/98	4/8/98	0-103-0
842	HAA-ICR	Bromochloroacetic acid	1.1	µg/L	EPA 552.2	1	1.0	3/29/98	4/8/98	4/8/98	0-103-0
843	HAA-ICR	Bromodichloroacetic acid	1.5	µg/L	EPA 552.2	1	1.0	3/29/98	4/8/98	4/8/98	0-103-0
844	HAA-ICR	Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	3/29/98	4/8/98	4/8/98	0-103-0
845	HAA-ICR	Dibromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	3/29/98	4/8/98	4/8/98	0-103-0
846	HAA-ICR	Dichloroacetic acid	6.4	µg/L	EPA 552.2	1	1.0	3/29/98	4/8/98	4/8/98	0-103-0
847	HAA-ICR	Monobromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	3/29/98	4/8/98	4/8/98	0-103-0
848	HAA-ICR	Monochloroacetic acid	ND	µg/L	EPA 552.2	1	2.0	3/29/98	4/8/98	4/8/98	0-103-0
849	HAA-ICR	Tribromoacetic acid	ND	µg/L	EPA 552.2	1	4.0	3/29/98	4/8/98	4/8/98	0-103-0
850	HAA-ICR	Trichloroacetic acid	7.8	µg/L	EPA 552.2	1	1.0	3/29/98	4/8/98	4/8/98	0-103-0
851	pH	Cl2 pH - Final	7.3	Unit	SM 4500-H+ B	1	n/a	3/29/98		3/29/98	n/a
852	pH	Cl2 pH - Initial	7.2	Unit	SM 4500-H+ B	1	n/a	3/29/98		3/29/98	n/a
853	pH	pH	7.1	Unit	SM 4500-H+ B	1	n/a	3/26/98		3/26/98	n/a
854	TEMP	Cl2 Temperature	4.9	°C	SM 2550 B	1	n/a	3/29/98		3/29/98	n/a
855	TEMP	Temperature	17.9	°C	SM 2550 B	1	n/a	3/26/98		3/26/98	n/a
856	TIME	Cl2 Incubation Time	3.1	hrs	n/a	1	n/a	3/29/98		3/29/98	n/a
857	TOC-ICR	TOC	3.10	mg/L	SM 5310 C	1	0.50	3/26/98		3/26/98	7-0-222
858	TOC-ICR	TOC (Dupl)	3.19 mg/L		SM 5310 C	1	0.50	3/26/98		3/26/98	7-0-222
			<b>3.15 mg/L</b>		<b>2.9 % RPD</b>						
859	TOX-ICR	TOX	168	µg Cl-/L	SM 5320 B	1	25	3/29/98		4/3/98	12-0-111
860	TOX-ICR	TOX (Dupl)	184 µg Cl-/L		SM 5320 B	1	25	3/29/98		4/3/98	12-0-111
			<b>176 µg Cl-/L</b>		<b>9.1 % RPD</b>						
861	THM-ICR	1,2,3-Trichloropropane (Surrogate)	110.8	%	EPA 551.1	1	1.0	3/29/98	4/1/98	4/1/98	0-101-0
862	THM-ICR	Bromodichloromethane	4.2	µg/L	EPA 551.1	1	1.0	3/29/98	4/1/98	4/1/98	0-101-0
863	THM-ICR	Bromoform	ND	µg/L	EPA 551.1	1	1.0	3/29/98	4/1/98	4/1/98	0-101-0

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.



**Laboratory Test Results**Mr. Joel Mohr  
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864	THM-ICR	Chloroform	14.7	µg/L	EPA 551.1	1	1.0	3/29/98	4/1/98	4/1/98	0-101-0
865	THM-ICR	Dibromochloromethane	ND	µg/L	EPA 551.1	1	1.0	3/29/98	4/1/98	4/1/98	0-101-0
866	TURB	Turbidity	0.10	ntu	SM 2130 B	1	0.05	3/26/98		3/26/98	9-0-8
867	UV-ICR	UV	0.059	1/cm	SM 5910 B	1	0.009	3/26/98		3/27/98	8-0-152
868	UV-ICR	UV (Dupl)	0.060	1/cm	SM 5910 B	1	0.009	3/26/98		3/27/98	8-0-152
			<b>0.059</b>	<b>1/cm</b>	<b>1.7 % RPD</b>						
<hr/>											
Sample ID: 96.20.Eff-27			S&H ID: 9803-299			Date Sampled: 3/25/98 11:40:00 PM					
#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
869	Cl2Dose	Chlorine Dose	2.28	mg/L as Cl2	SM 4500-Cl B	1	n/a	3/28/98		3/28/98	n/a
870	Cl2Res	Chlorine Residual	0.70	mg/L as Cl2	SM 4500-Cl F	1	0.10	3/28/98		3/28/98	n/a
871	HAA-ICR	1,2,3-Trichloropropane (IS) (Internal Standard)	106.8	%	EPA 552.2	1	1.0	3/28/98	4/8/98	4/8/98	0-103-0
872	HAA-ICR	2-Bromopropionic acid (Surrogate)	107.2	%	EPA 552.2	1	1.0	3/28/98	4/8/98	4/8/98	0-103-0
873	HAA-ICR	Bromochloroacetic acid	ND	µg/L	EPA 552.2	1	1.0	3/28/98	4/8/98	4/8/98	0-103-0
874	HAA-ICR	Bromodichloroacetic acid	1.2	µg/L	EPA 552.2	1	1.0	3/28/98	4/8/98	4/8/98	0-103-0
875	HAA-ICR	Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	3/28/98	4/8/98	4/8/98	0-103-0
876	HAA-ICR	Dibromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	3/28/98	4/8/98	4/8/98	0-103-0
877	HAA-ICR	Dichloroacetic acid	3.1	µg/L	EPA 552.2	1	1.0	3/28/98	4/8/98	4/8/98	0-103-0
878	HAA-ICR	Monobromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	3/28/98	4/8/98	4/8/98	0-103-0
879	HAA-ICR	Monochloroacetic acid	ND	µg/L	EPA 552.2	1	2.0	3/28/98	4/8/98	4/8/98	0-103-0
880	HAA-ICR	Tribromoacetic acid	ND	µg/L	EPA 552.2	1	4.0	3/28/98	4/8/98	4/8/98	0-103-0
881	HAA-ICR	Trichloroacetic acid	5.1	µg/L	EPA 552.2	1	1.0	3/28/98	4/8/98	4/8/98	0-103-0
882	pH	Cl2 pH - Final	7.4	Unit	SM 4500-H+ B	1	n/a	3/28/98		3/28/98	n/a
883	pH	Cl2 pH - Initial	7.3	Unit	SM 4500-H+ B	1	n/a	3/28/98		3/28/98	n/a
884	pH	pH	8.0	Unit	SM 4500-H+ B	1	n/a	3/25/98		3/25/98	n/a
885	TEMP	Cl2 Temperature	5.6	°C	SM 2550 B	1	n/a	3/28/98		3/28/98	n/a
886	TEMP	Temperature	22.9	°C	SM 2550 B	1	n/a	3/25/98		3/25/98	n/a
887	TIME	Cl2 Incubation Time	3.3	hrs	n/a	1	n/a	3/28/98		3/28/98	n/a
888	TOC-ICR	TOC	1.71	mg/L	SM 5310 C	1	0.50	3/25/98		3/26/98	7-0-222
889	TOC-ICR	TOC (Dupl)	1.70	mg/L	SM 5310 C	1	0.50	3/25/98		3/26/98	7-0-222
			<b>1.71</b>	<b>mg/L</b>	<b>0.6 % RPD</b>						
890	TOX-ICR	TOX	60	µg Cl-/L	SM 5320 B	1	25	3/28/98		4/3/98	12-0-111
891	TOX-ICR	TOX (Dupl)	61	µg Cl-/L	SM 5320 B	1	25	3/28/98		4/3/98	12-0-111
			<b>61</b>	<b>µg Cl-/L</b>	<b>1.6 % RPD</b>						
892	THM-ICR	1,2,3-Trichloropropane (Surrogate)	114.8	%	EPA 551.1	1	1.0	3/28/98	4/1/98	4/1/98	0-101-0
893	THM-ICR	Bromodichloromethane	2.3	µg/L	EPA 551.1	1	1.0	3/28/98	4/1/98	4/1/98	0-101-0
894	THM-ICR	Bromoform	ND	µg/L	EPA 551.1	1	1.0	3/28/98	4/1/98	4/1/98	0-101-0
895	THM-ICR	Chloroform	4.9	µg/L	EPA 551.1	1	1.0	3/28/98	4/1/98	4/1/98	0-101-0

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 96  
Study Title: ICR RSSCT #1

896	THM-ICR	Dibromochloromethane	ND	µg/L	EPA 551.1	1	1.0	3/28/98	4/1/98	4/1/98	0-101-0
897	UV-ICR	UV	0.024	1/cm	SM 5910 B	1	0.009	3/25/98		3/27/98	8-0-152
898	UV-ICR	UV (Dupl)	0.024	1/cm	SM 5910 B	1	0.009	3/25/98		3/27/98	8-0-152
			<b>0.024</b>	<b>1/cm</b>	<b>0.0 % RPD</b>						
<hr/>											
Sample ID: 96.20.Eff-31			S&H ID: 9803-322			Date Sampled: 3/27/98 12:31:00 PM					
#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
899	Cl2Dose	Chlorine Dose	2.36	mg/L as Cl2	SM 4500-Cl B	1	n/a	4/1/98		4/1/98	n/a
900	Cl2Res	Chlorine Residual	0.84	mg/L as Cl2	SM 4500-Cl F	1	0.10	4/1/98		4/1/98	n/a
901	HAA-ICR	1,2,3-Trichloropropane (IS) (Internal Standard)	106.4	%	EPA 552.2	1	1.0	4/1/98	4/8/98	4/8/98	0-103-0
902	HAA-ICR	2-Bromopropionic acid (Surrogate)	103.6	%	EPA 552.2	1	1.0	4/1/98	4/8/98	4/8/98	0-103-0
903	HAA-ICR	Bromochloroacetic acid	ND	µg/L	EPA 552.2	1	1.0	4/1/98	4/8/98	4/8/98	0-103-0
904	HAA-ICR	Bromodichloroacetic acid	1.3	µg/L	EPA 552.2	1	1.0	4/1/98	4/8/98	4/8/98	0-103-0
905	HAA-ICR	Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	4/1/98	4/8/98	4/8/98	0-103-0
906	HAA-ICR	Dibromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	4/1/98	4/8/98	4/8/98	0-103-0
907	HAA-ICR	Dichloroacetic acid	3.4	µg/L	EPA 552.2	1	1.0	4/1/98	4/8/98	4/8/98	0-103-0
908	HAA-ICR	Monobromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	4/1/98	4/8/98	4/8/98	0-103-0
909	HAA-ICR	Monochloroacetic acid	ND	µg/L	EPA 552.2	1	2.0	4/1/98	4/8/98	4/8/98	0-103-0
910	HAA-ICR	Tribromoacetic acid	ND	µg/L	EPA 552.2	1	4.0	4/1/98	4/8/98	4/8/98	0-103-0
911	HAA-ICR	Trichloroacetic acid	5.1	µg/L	EPA 552.2	1	1.0	4/1/98	4/8/98	4/8/98	0-103-0
912	pH	Cl2 pH - Final	7.4	Unit	SM 4500-H+ B	1	n/a	4/1/98		4/1/98	n/a
913	pH	Cl2 pH - Initial	7.2	Unit	SM 4500-H+ B	1	n/a	4/1/98		4/1/98	n/a
914	pH	pH	8.0	Unit	SM 4500-H+ B	1	n/a	3/27/98		3/27/98	n/a
915	TEMP	Cl2 Temperature	5.1	°C	SM 2550 B	1	n/a	4/1/98		4/1/98	n/a
916	TEMP	Temperature	25.3	°C	SM 2550 B	1	n/a	3/27/98		3/27/98	n/a
917	TIME	Cl2 Incubation Time	3.0	hrs	n/a	1	n/a	4/1/98		4/1/98	n/a
918	TOC-ICR	TOC	1.98	mg/L	SM 5310 C	1	0.50	3/27/98		3/27/98	7-0-223
919	TOC-ICR	TOC (Dupl)	1.98	mg/L	SM 5310 C	1	0.50	3/27/98		3/27/98	7-0-223
			<b>1.98</b>	<b>mg/L</b>	<b>0.0 % RPD</b>						
920	TOX-ICR	TOX (Dupl)	70	µg Cl-/L	SM 5320 B	1	25	4/1/98		4/3/98	12-0-111
921	TOX-ICR	TOX (Dupl)	82	µg Cl-/L	SM 5320 B	1	25	4/1/98		4/3/98	12-0-111
			<b>76</b>	<b>µg Cl-/L</b>	<b>15.8 % RPD</b>						
922	THM-ICR	1,2,3-Trichloropropane (Surrogate)	100.4	%	EPA 551.1	1	1.0	4/1/98	4/7/98	4/7/98	0-102-0
923	THM-ICR	1,2,3-Trichloropropane (Surrogate) (Lab Dupl)	105.2	%	EPA 551.1	1	1.0	4/1/98	4/7/98	4/7/98	0-102-0
			<b>102.8</b>	<b>%</b>	<b>4.7 % RPD</b>						
924	THM-ICR	Bromodichloromethane	2.6	µg/L	EPA 551.1	1	1.0	4/1/98	4/7/98	4/7/98	0-102-0
925	THM-ICR	Bromodichloromethane (Lab Dupl)	2.8	µg/L	EPA 551.1	1	1.0	4/1/98	4/7/98	4/7/98	0-102-0

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 96  
Study Title: ICR RSSCT #1

		<b>2.7 µg/L</b>	<b>7.4 % RPD</b>						
926	THM-ICR Bromoform	ND µg/L	EPA 551.1	1	1.0	4/1/98	4/7/98	4/7/98	0-102-0
927	THM-ICR Bromoform (Lab Dupl)	ND µg/L	EPA 551.1	1	1.0	4/1/98	4/7/98	4/7/98	0-102-0
		<b>ND µg/L</b>							
928	THM-ICR Chloroform	6.5 µg/L	EPA 551.1	1	1.0	4/1/98	4/7/98	4/7/98	0-102-0
929	THM-ICR Chloroform (Lab Dupl)	6.7 µg/L	EPA 551.1	1	1.0	4/1/98	4/7/98	4/7/98	0-102-0
		<b>6.6 µg/L</b>	<b>3.0 % RPD</b>						
930	THM-ICR Dibromochloromethane	ND µg/L	EPA 551.1	1	1.0	4/1/98	4/7/98	4/7/98	0-102-0
931	THM-ICR Dibromochloromethane (Lab Dupl)	ND µg/L	EPA 551.1	1	1.0	4/1/98	4/7/98	4/7/98	0-102-0
		<b>ND µg/L</b>							
932	UV-ICR UV	0.028 1/cm	SM 5910 B	1	0.009	3/27/98		3/27/98	8-0-152
933	UV-ICR UV (Dupl)	0.029 1/cm	SM 5910 B	1	0.009	3/27/98		3/27/98	8-0-152
		<b>0.029 1/cm</b>	<b>3.4 % RPD</b>						

Sample ID: 96.20.Eff-31d

S&amp;H ID: 9803-323

Date Sampled: 3/27/98 12:31:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
934	Cl2Dose	Chlorine Dose	2.38	mg/L as Cl2	SM 4500-Cl B	1	n/a	4/1/98		4/1/98	n/a
935	Cl2Res	Chlorine Residual	0.83	mg/L as Cl2	SM 4500-Cl F	1	0.10	4/1/98		4/1/98	n/a
936	HAA-ICR	1,2,3-Trichloropropane (IS) (Internal Standard)	105.6	%	EPA 552.2	1	1.0	4/1/98	4/8/98	4/8/98	0-103-0
937	HAA-ICR	2-Bromopropionic acid (Surrogate)	96.4	%	EPA 552.2	1	1.0	4/1/98	4/8/98	4/8/98	0-103-0
938	HAA-ICR	Bromochloroacetic acid	ND	µg/L	EPA 552.2	1	1.0	4/1/98	4/8/98	4/8/98	0-103-0
939	HAA-ICR	Bromodichloroacetic acid	1.2	µg/L	EPA 552.2	1	1.0	4/1/98	4/8/98	4/8/98	0-103-0
940	HAA-ICR	Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	4/1/98	4/8/98	4/8/98	0-103-0
941	HAA-ICR	Dibromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	4/1/98	4/8/98	4/8/98	0-103-0
942	HAA-ICR	Dichloroacetic acid	2.8	µg/L	EPA 552.2	1	1.0	4/1/98	4/8/98	4/8/98	0-103-0
943	HAA-ICR	Monobromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	4/1/98	4/8/98	4/8/98	0-103-0
944	HAA-ICR	Monochloroacetic acid	ND	µg/L	EPA 552.2	1	2.0	4/1/98	4/8/98	4/8/98	0-103-0
945	HAA-ICR	Tribromoacetic acid	ND	µg/L	EPA 552.2	1	4.0	4/1/98	4/8/98	4/8/98	0-103-0
946	HAA-ICR	Trichloroacetic acid	4.1	µg/L	EPA 552.2	1	1.0	4/1/98	4/8/98	4/8/98	0-103-0
947	pH	Cl2 pH - Final	7.4	Unit	SM 4500-H+ B	1	n/a	4/1/98		4/1/98	n/a
948	pH	Cl2 pH - Initial	7.3	Unit	SM 4500-H+ B	1	n/a	4/1/98		4/1/98	n/a
949	pH	pH	8.0	Unit	SM 4500-H+ B	1	n/a	3/27/98		3/27/98	n/a
950	TEMP	Cl2 Temperature	5.1	°C	SM 2550 B	1	n/a	4/1/98		4/1/98	n/a
951	TEMP	Temperature	25.4	°C	SM 2550 B	1	n/a	3/27/98		3/27/98	n/a
952	TIME	Cl2 Incubation Time	3.0	hrs	n/a	1	n/a	4/1/98		4/1/98	n/a
953	TOC-ICR	TOC	2.03	mg/L	SM 5310 C	1	0.50	3/27/98		3/27/98	7-0-223
954	TOC-ICR	TOC (Dupl)	2.05	mg/L	SM 5310 C	1	0.50	3/27/98		3/27/98	7-0-223
			<b>2.04 mg/L</b>		<b>1.0 % RPD</b>						
955	TOX-ICR	TOX	84	µg Cl-/L	SM 5320 B	1	25	4/1/98		4/3/98	12-0-111

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 96  
Study Title: ICR RSSCT #1

956	TOX-ICR TOX (Dupl)	76 µg Cl-/L 80 µg Cl-/L	SM 5320 B 10.0 % RPD	1	25	4/1/98		4/3/98	12-0-111
957	THM-ICR 1,2,3-Trichloropropane (Surrogate)	105.6 %	EPA 551.1	1	1.0	4/1/98	4/7/98	4/7/98	0-102-0
958	THM-ICR Bromodichloromethane	2.8 µg/L	EPA 551.1	1	1.0	4/1/98	4/7/98	4/7/98	0-102-0
959	THM-ICR Bromoform	ND µg/L	EPA 551.1	1	1.0	4/1/98	4/7/98	4/7/98	0-102-0
960	THM-ICR Chloroform	6.5 µg/L	EPA 551.1	1	1.0	4/1/98	4/7/98	4/7/98	0-102-0
961	THM-ICR Dibromochloromethane	ND µg/L	EPA 551.1	1	1.0	4/1/98	4/7/98	4/7/98	0-102-0
962	UV-ICR UV	0.029 1/cm	SM 5910 B	1	0.009	3/27/98		3/27/98	8-0-152
963	UV-ICR UV (Dupl)	0.029 1/cm 0.029 1/cm	SM 5910 B 0.0 % RPD	1	0.009	3/27/98		3/27/98	8-0-152

Sample ID: 96.INF.B-5

S&amp;H ID: 9803-332

Date Sampled: 3/28/98 4:30:00 PM

#	Analysis Type	Result Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
964	pH pH	7.1 Unit	SM 4500-H+ B	1	n/a	3/28/98		3/28/98	n/a
965	TEMP Temperature	19.6 °C	SM 2550 B	1	n/a	3/28/98		3/28/98	n/a
966	TOC-ICR TOC	3.16 mg/L	SM 5310 C	1	0.50	3/28/98		3/29/98	7-0-224
967	TOC-ICR TOC (Dupl)	3.31 mg/L 3.24 mg/L	SM 5310 C 4.6 % RPD	1	0.50	3/28/98		3/29/98	7-0-224

Sample ID: 96.20.Eff-38

S&amp;H ID: 9803-344

Date Sampled: 3/30/98 2:27:00 PM

#	Analysis Type	Result Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
968	Cl2Dose Chlorine Dose	2.42 mg/L as Cl2	SM 4500-Cl B	1	n/a	4/1/98		4/1/98	n/a
969	Cl2Res Chlorine Residual	1.02 mg/L as Cl2	SM 4500-Cl F	1	0.10	4/1/98		4/1/98	n/a
970	HAA-ICR 1,2,3-Trichloropropane (IS) (Internal Standard)	106.0 %	EPA 552.2	1	1.0	4/1/98	4/8/98	4/8/98	0-103-0
971	HAA-ICR 2-Bromopropionic acid (Surrogate)	99.6 %	EPA 552.2	1	1.0	4/1/98	4/8/98	4/8/98	0-103-0
972	HAA-ICR Bromochloroacetic acid	ND µg/L	EPA 552.2	1	1.0	4/1/98	4/8/98	4/8/98	0-103-0
973	HAA-ICR Bromodichloroacetic acid	1.2 µg/L	EPA 552.2	1	1.0	4/1/98	4/8/98	4/8/98	0-103-0
974	HAA-ICR Chlorodibromoacetic acid	ND µg/L	EPA 552.2	1	2.0	4/1/98	4/8/98	4/8/98	0-103-0
975	HAA-ICR Dibromoacetic acid	ND µg/L	EPA 552.2	1	1.0	4/1/98	4/8/98	4/8/98	0-103-0
976	HAA-ICR Dichloroacetic acid	3.3 µg/L	EPA 552.2	1	1.0	4/1/98	4/8/98	4/8/98	0-103-0
977	HAA-ICR Monobromoacetic acid	ND µg/L	EPA 552.2	1	1.0	4/1/98	4/8/98	4/8/98	0-103-0
978	HAA-ICR Monochloroacetic acid	ND µg/L	EPA 552.2	1	2.0	4/1/98	4/8/98	4/8/98	0-103-0
979	HAA-ICR Tribromoacetic acid	ND µg/L	EPA 552.2	1	4.0	4/1/98	4/8/98	4/8/98	0-103-0
980	HAA-ICR Trichloroacetic acid	4.9 µg/L	EPA 552.2	1	1.0	4/1/98	4/8/98	4/8/98	0-103-0
981	pH Cl2 pH - Final	7.3 Unit	SM 4500-H+ B	1	n/a	4/1/98		4/1/98	n/a
982	pH Cl2 pH - Initial	7.3 Unit	SM 4500-H+ B	1	n/a	4/1/98		4/1/98	n/a
983	pH pH	8.3 Unit	SM 4500-H+ B	1	n/a	3/30/98		3/30/98	n/a

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 96  
Study Title: ICR RSSCT #1

984	TEMP	Cl2 Temperature	5.1 °C	SM 2550 B	1	n/a	4/1/98	4/1/98	n/a
985	TEMP	Temperature	24.7 °C	SM 2550 B	1	n/a	3/30/98	3/30/98	n/a
986	TIME	Cl2 Incubation Time	3.0 hrs	n/a	1	n/a	4/1/98	4/1/98	n/a
987	TOC-ICR	TOC	2.21 mg/L	SM 5310 C	1	0.50	3/30/98	3/31/98	7-0-225
988	TOC-ICR	TOC (Dupl)	2.23 mg/L	SM 5310 C	1	0.50	3/30/98	3/31/98	7-0-225
			<b>2.22 mg/L</b>	<b>0.9 % RPD</b>					
989	TOX-ICR	TOX	89 µg Cl-/L	SM 5320 B	1	25	4/1/98	4/3/98	12-0-111
990	TOX-ICR	TOX (Dupl)	82 µg Cl-/L	SM 5320 B	1	25	4/1/98	4/3/98	12-0-111
			<b>86 µg Cl-/L</b>	<b>8.1 % RPD</b>					
991	THM-ICR	1,2,3-Trichloropropane (Surrogate)	90.0 %	EPA 551.1	1	1.0	4/1/98	4/7/98	4/7/98 0-102-0
992	THM-ICR	Bromodichloromethane	3.1 µg/L	EPA 551.1	1	1.0	4/1/98	4/7/98	4/7/98 0-102-0
993	THM-ICR	Bromoform	ND µg/L	EPA 551.1	1	1.0	4/1/98	4/7/98	4/7/98 0-102-0
994	THM-ICR	Chloroform	8.9 µg/L	EPA 551.1	1	1.0	4/1/98	4/7/98	4/7/98 0-102-0
995	THM-ICR	Dibromochloromethane	ND µg/L	EPA 551.1	1	1.0	4/1/98	4/7/98	4/7/98 0-102-0
996	UV-ICR	UV	0.031 1/cm	SM 5910 B	1	0.009	3/30/98	4/1/98	8-0-154
997	UV-ICR	UV (Dupl)	0.031 1/cm	SM 5910 B	1	0.009	3/30/98	4/1/98	8-0-154
			<b>0.031 1/cm</b>	<b>0.0 % RPD</b>					

Sample ID: 96.20.Eff-43

S&amp;H ID: 9804-57

Date Sampled: 4/3/98 12:57:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
998	Cl2Dose	Chlorine Dose	2.40	mg/L as Cl2	SM 4500-Cl B	1	n/a	4/6/98		4/6/98	n/a
999	Cl2Res	Chlorine Residual	0.99	mg/L as Cl2	SM 4500-Cl F	1	0.10	4/6/98		4/6/98	n/a
1000	HAA-ICR	1,2,3-Trichloropropane (IS) (Internal Standard)	108.4	%	EPA 552.2	1	1.0	4/6/98	4/8/98	4/8/98	0-103-0
1001	HAA-ICR	2-Bromopropionic acid (Surrogate)	99.6	%	EPA 552.2	1	1.0	4/6/98	4/8/98	4/8/98	0-103-0
1002	HAA-ICR	Bromochloroacetic acid	ND	µg/L	EPA 552.2	1	1.0	4/6/98	4/8/98	4/8/98	0-103-0
1003	HAA-ICR	Bromodichloroacetic acid	1.5	µg/L	EPA 552.2	1	1.0	4/6/98	4/8/98	4/8/98	0-103-0
1004	HAA-ICR	Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	4/6/98	4/8/98	4/8/98	0-103-0
1005	HAA-ICR	Dibromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	4/6/98	4/8/98	4/8/98	0-103-0
1006	HAA-ICR	Dichloroacetic acid	3.8	µg/L	EPA 552.2	1	1.0	4/6/98	4/8/98	4/8/98	0-103-0
1007	HAA-ICR	Monobromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	4/6/98	4/8/98	4/8/98	0-103-0
1008	HAA-ICR	Monochloroacetic acid	ND	µg/L	EPA 552.2	1	2.0	4/6/98	4/8/98	4/8/98	0-103-0
1009	HAA-ICR	Tribromoacetic acid	ND	µg/L	EPA 552.2	1	4.0	4/6/98	4/8/98	4/8/98	0-103-0
1010	HAA-ICR	Trichloroacetic acid	6.7	µg/L	EPA 552.2	1	1.0	4/6/98	4/8/98	4/8/98	0-103-0
1011	pH	Cl2 pH - Final	7.4	Unit	SM 4500-H+ B	1	n/a	4/6/98		4/6/98	n/a
1012	pH	Cl2 pH - Initial	7.3	Unit	SM 4500-H+ B	1	n/a	4/6/98		4/6/98	n/a
1013	pH	pH	8.8	Unit	SM 4500-H+ B	1	n/a	4/3/98		4/3/98	n/a
1014	TEMP	Cl2 Temperature	4.9	°C	SM 2550 B	1	n/a	4/6/98		4/6/98	n/a
1015	TEMP	Temperature	21.0	°C	SM 2550 B	1	n/a	4/3/98		4/3/98	n/a

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 96  
Study Title: ICR RSSCT #1

1016	TIME	Cl2 Incubation Time	3.0 hrs	n/a	1	n/a	4/6/98	4/6/98	n/a
1017	TOC-ICR	TOC	2.34 mg/L	SM 5310 C	1	0.50	4/3/98	4/3/98	7-0-228
1018	TOC-ICR	TOC (Dupl)	2.37 mg/L	SM 5310 C	1	0.50	4/3/98	4/3/98	7-0-228
			<b>2.36 mg/L</b>	<b>1.3 % RPD</b>					
1019	TOX-ICR	TOX	103 µg Cl-/L	SM 5320 B	1	25	4/6/98	4/8/98	12-0-113
1020	TOX-ICR	TOX (Dupl)	101 µg Cl-/L	SM 5320 B	1	25	4/6/98	4/8/98	12-0-113
			<b>102 µg Cl-/L</b>	<b>2.0 % RPD</b>					
1021	THM-ICR	1,2,3-Trichloropropane (Surrogate)	97.2 %	EPA 551.1	1	1.0	4/6/98	4/7/98	4/7/98 0-102-0
1022	THM-ICR	Bromodichloromethane	3.2 µg/L	EPA 551.1	1	1.0	4/6/98	4/7/98	4/7/98 0-102-0
1023	THM-ICR	Bromoform	ND µg/L	EPA 551.1	1	1.0	4/6/98	4/7/98	4/7/98 0-102-0
1024	THM-ICR	Chloroform	9.3 µg/L	EPA 551.1	1	1.0	4/6/98	4/7/98	4/7/98 0-102-0
1025	THM-ICR	Dibromochloromethane	ND µg/L	EPA 551.1	1	1.0	4/6/98	4/7/98	4/7/98 0-102-0
1026	UV-ICR	UV	0.036 1/cm	SM 5910 B	1	0.009	4/3/98	4/4/98	8-0-157
1027	UV-ICR	UV (Dupl)	0.036 1/cm	SM 5910 B	1	0.009	4/3/98	4/4/98	8-0-157
			<b>0.036 1/cm</b>	<b>0.0 % RPD</b>					

Sample ID: 96.INF.B-6

S&amp;H ID: 9804-69

Date Sampled: 4/4/98 8:00:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
1028	Cl2Dose	Chlorine Dose	2.79	mg/L as Cl2	SM 4500-Cl B	1	n/a	4/6/98		4/6/98	n/a
1029	Cl2Res	Chlorine Residual	0.92	mg/L as Cl2	SM 4500-Cl F	1	0.10	4/6/98		4/6/98	n/a
1030	HAA-ICR	1,2,3-Trichloropropane (IS) (Internal Standard)	109.6	%	EPA 552.2	1	1.0	4/6/98	4/8/98	4/8/98	0-103-0
1031	HAA-ICR	2-Bromopropionic acid (Surrogate)	104.0	%	EPA 552.2	1	1.0	4/6/98	4/8/98	4/8/98	0-103-0
1032	HAA-ICR	Bromochloroacetic acid	1.0	µg/L	EPA 552.2	1	1.0	4/6/98	4/8/98	4/8/98	0-103-0
1033	HAA-ICR	Bromodichloroacetic acid	1.9	µg/L	EPA 552.2	1	1.0	4/6/98	4/8/98	4/8/98	0-103-0
1034	HAA-ICR	Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	4/6/98	4/8/98	4/8/98	0-103-0
1035	HAA-ICR	Dibromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	4/6/98	4/8/98	4/8/98	0-103-0
1036	HAA-ICR	Dichloroacetic acid	5.7	µg/L	EPA 552.2	1	1.0	4/6/98	4/8/98	4/8/98	0-103-0
1037	HAA-ICR	Monobromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	4/6/98	4/8/98	4/8/98	0-103-0
1038	HAA-ICR	Monochloroacetic acid	ND	µg/L	EPA 552.2	1	2.0	4/6/98	4/8/98	4/8/98	0-103-0
1039	HAA-ICR	Tribromoacetic acid	ND	µg/L	EPA 552.2	1	4.0	4/6/98	4/8/98	4/8/98	0-103-0
1040	HAA-ICR	Trichloroacetic acid	9.1	µg/L	EPA 552.2	1	1.0	4/6/98	4/8/98	4/8/98	0-103-0
1041	pH	Cl2 pH - Final	7.3	Unit	SM 4500-H+ B	1	n/a	4/6/98		4/6/98	n/a
1042	pH	Cl2 pH - Initial	7.2	Unit	SM 4500-H+ B	1	n/a	4/6/98		4/6/98	n/a
1043	pH	pH	7.1	Unit	SM 4500-H+ B	1	n/a	4/4/98		4/4/98	n/a
1044	TEMP	Cl2 Temperature	4.9	°C	SM 2550 B	1	n/a	4/6/98		4/6/98	n/a
1045	TEMP	Temperature	16.5	°C	SM 2550 B	1	n/a	4/4/98		4/4/98	n/a
1046	TIME	Cl2 Incubation Time	3.1	hrs	n/a	1	n/a	4/6/98		4/6/98	n/a

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 96  
Study Title: ICR RSSCT #1

1047	TOC-ICR TOC	3.12 mg/L	SM 5310 C	1	0.50	4/4/98	4/4/98	7-0-229
1048	TOC-ICR TOC (Dupl)	3.30 mg/L	SM 5310 C	1	0.50	4/4/98	4/4/98	7-0-229
		<b>3.21 mg/L</b>	<b>5.6 % RPD</b>					
1049	TOX-ICR TOX	182 µg Cl-/L	SM 5320 B	1	25	4/6/98	4/9/98	12-0-114
1050	TOX-ICR TOX (Dupl)	179 µg Cl-/L	SM 5320 B	1	25	4/6/98	4/9/98	12-0-114
		<b>181 µg Cl-/L</b>	<b>1.7 % RPD</b>					
1051	THM-ICR 1,2,3-Trichloropropane (Surrogate)	108.4 %	EPA 551.1	1	1.0	4/6/98	4/7/98	4/7/98 0-102-0
1052	THM-ICR Bromodichloromethane	3.9 µg/L	EPA 551.1	1	1.0	4/6/98	4/7/98	4/7/98 0-102-0
1053	THM-ICR Bromoform	ND µg/L	EPA 551.1	1	1.0	4/6/98	4/7/98	4/7/98 0-102-0
1054	THM-ICR Chloroform	14.5 µg/L	EPA 551.1	1	1.0	4/6/98	4/7/98	4/7/98 0-102-0
1055	THM-ICR Dibromochloromethane	ND µg/L	EPA 551.1	1	1.0	4/6/98	4/7/98	4/7/98 0-102-0
1056	TURB Turbidity	0.10 ntu	SM 2130 B	1	0.05	4/4/98		4/4/98 9-0-9

Sample ID: 96.20.Eff-44

S&amp;H ID: 9804-75

Date Sampled: 4/4/98 2:24:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
1057	pH	pH	8.7	Unit	SM 4500-H+ B	1	n/a	4/4/98		4/4/98	n/a
1058	TEMP	Temperature	21.7	°C	SM 2550 B	1	n/a	4/4/98		4/4/98	n/a
1059	TOC-ICR TOC		2.46	mg/L	SM 5310 C	1	0.50	4/4/98		4/4/98	7-0-229
1060	TOC-ICR TOC (Dupl)		2.44	mg/L	SM 5310 C	1	0.50	4/4/98		4/4/98	7-0-229
			<b>2.45 mg/L</b>		<b>0.8 % RPD</b>						

**End of laboratory test results**

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Quality Control Report**

Mr. Joel Mohr  
Iowa-American Water Company  
230 East 2nd Street  
P.O. Box 979  
Davenport, IA 52805

Phone: 319-322-0161 Fax: 319-322-2190

**Study#:** 96  
**Study Title:** ICR RSSCT #1

**Analysis:** ALK (Alkalinity)**Method:** SM 2320 B**QC Batch ID:** 1-0-16

										Acceptance Criteria	
<u>QC Type</u>		<u>Spike</u>	<u>Recovery</u>	<u>Unit</u>	<u>Yield</u>	<u>RPD</u>	<u>Date Run</u>	<u>S&amp;H ID</u>	<u>MRL</u>	<u>Range</u>	<u>RPD</u>
Matrix Spike	Matrix Spike	100	98	mg/L	98%		03/18/98	9803-170	5		
Matrix Spike (Dupl)	Matrix Spike	100	98	mg/L	98%		03/18/98	9803-170	5		
		<b>100</b>	<b>98</b>	<b>mg/L</b>	<b>98%</b>	<b>1.0 %</b>					
Method Blank	Method Blank		ND*	mg/L			03/18/98	9803-180	5		
Standard	Standard	100	100	mg/L	100%		03/18/98	9803-179	5		
Standard (Dupl)	Standard	100	100	mg/L	100%		03/18/98	9803-179	5		
		<b>100</b>	<b>100</b>	<b>mg/L</b>	<b>100%</b>	<b>0.0 %</b>					
Matrix Spike	Matrix Spike	100	98	mg/L	98%		03/26/98	9803-297	5		
Matrix Spike (Dupl)	Matrix Spike	100	97	mg/L	97%		03/26/98	9803-297	5		
		<b>100</b>	<b>98</b>	<b>mg/L</b>	<b>98%</b>	<b>1.0 %</b>					
Method Blank	Method Blank		ND*	mg/L			03/26/98	9803-306	5		
Standard	Standard	100	100	mg/L	100%		03/26/98	9803-307	5		
Standard (Dupl)	Standard	100	100	mg/L	100%		03/26/98	9803-307	5		
		<b>100</b>	<b>100</b>	<b>mg/L</b>	<b>100%</b>	<b>0.0 %</b>					

**Analysis:** TotHard (Total Hardness)**Method:** SM 2340 C**QC Batch ID:** 3-0-16

										Acceptance Criteria	
<u>QC Type</u>		<u>Spike</u>	<u>Recovery</u>	<u>Unit</u>	<u>Yield</u>	<u>RPD</u>	<u>Date Run</u>	<u>S&amp;H ID</u>	<u>MRL</u>	<u>Range</u>	<u>RPD</u>
Matrix Spike	Matrix Spike	248	258	mg/L CaCO <sub>3</sub>	104%		03/18/98	9803-170	5		
Matrix Spike (Dupl)	Matrix Spike	248	252	mg/L CaCO <sub>3</sub>	102%		03/18/98	9803-170	5		
		<b>248</b>	<b>255</b>	<b>mg/L CaCO<sub>3</sub></b>	<b>103%</b>	<b>2.4 %</b>					
Method Blank	Method Blank		ND*	mg/L CaCO <sub>3</sub>			03/18/98	9803-182	5		
Standard	Standard	100	101	mg/L CaCO <sub>3</sub>	101%		03/18/98	9803-181	5	90-110%	
Standard (Dupl)	Standard	100	100	mg/L CaCO <sub>3</sub>	100%		03/18/98	9803-181	5	90-110%	
		<b>100</b>	<b>100</b>	<b>mg/L CaCO<sub>3</sub></b>	<b>100%</b>	<b>1.0 %</b>				90-110%	10%
Matrix Spike	Matrix Spike	248	256	mg/L CaCO <sub>3</sub>	103%		03/26/98	9803-297	5		
Matrix Spike (Dupl)	Matrix Spike	248	254	mg/L CaCO <sub>3</sub>	102%		03/26/98	9803-297	5		
		<b>248</b>	<b>254</b>	<b>mg/L CaCO<sub>3</sub></b>	<b>102%</b>	<b>0.8 %</b>					
Method Blank	Method Blank		ND*	mg/L CaCO <sub>3</sub>			03/26/98	9803-308	5		
Standard	Standard	100	101	mg/L CaCO <sub>3</sub>	101%		03/26/98	9803-309	5	90-110%	
Standard (Dupl)	Standard	100	100	mg/L CaCO <sub>3</sub>	100%		03/26/98	9803-309	5	90-110%	
		<b>100</b>	<b>100</b>	<b>mg/L CaCO<sub>3</sub></b>	<b>100%</b>	<b>1.0 %</b>				90-110%	10%

ND: non-detect. \*Recovery is below 1/2 minimum reporting level (MRL). NA (not applicable): RPD calculation is not applicable.



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Analysis: TOC-ICR (Total Organic Carbon)

Method: SM 5310 C

QC Batch ID: 7-0-208

								Acceptance Criteria		
<u>QC Type</u>		<u>Spike</u>	<u>Recovery</u>	<u>Unit</u>	<u>Yield</u>	<u>RPD</u>	<u>S&amp;H ID</u>	<u>MRL</u>	<u>Range</u>	<u>RPD</u>
Matrix Spike	Matrix Spike	4.00	4.41	mg/L	110%		9803-83	0.5		
Matrix Spike (Dupl)	Matrix Spike	4.00	4.31	mg/L	108%		9803-83	0.5		
		<b>4.00</b>	<b>4.36</b>	<b>mg/L</b>	<b>109%</b>	<b>2.3 %</b>				
Method Blank	Method Blank		ND*	mg/L			9803-89	0.5		
Method Blank (Dupl)	Method Blank		ND*	mg/L			9803-89	0.5		
			<b>ND*</b>	<b>mg/L</b>						
Standard	Standard	0.50	0.53	mg/L	106%		9802-246	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.60	mg/L	120%		9802-246	0.5	50-150%	
		<b>0.50</b>	<b>0.57</b>	<b>mg/L</b>	<b>114%</b>	<b>12.3 %</b>			50-150%	20%
Standard	Standard	4.00	3.95	mg/L	99%		9802-266	0.5	90-110%	
Standard (Dupl)	Standard	4.00	3.95	mg/L	99%		9802-266	0.5	90-110%	
		<b>4.00</b>	<b>3.95</b>	<b>mg/L</b>	<b>99%</b>	<b>0.0 %</b>			90-110%	10%

Analysis: TOC-ICR (Total Organic Carbon)

Method: SM 5310 C

QC Batch ID: 7-0-212

								Acceptance Criteria		
<u>QC Type</u>		<u>Spike</u>	<u>Recovery</u>	<u>Unit</u>	<u>Yield</u>	<u>RPD</u>	<u>S&amp;H ID</u>	<u>MRL</u>	<u>Range</u>	<u>RPD</u>
Matrix Spike	Matrix Spike	4.00	3.71	mg/L	93%		9803-146	0.5		
Matrix Spike (Dupl)	Matrix Spike	4.00	3.64	mg/L	91%		9803-146	0.5		
		<b>4.00</b>	<b>3.67</b>	<b>mg/L</b>	<b>92%</b>	<b>2.2 %</b>				
Method Blank	Method Blank		ND*	mg/L			9803-145	0.5		
Method Blank (Dupl)	Method Blank		ND*	mg/L			9803-145	0.5		
			<b>ND*</b>	<b>mg/L</b>						
Standard	Standard	0.50	0.62	mg/L	124%		9803-143	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.58	mg/L	116%		9803-143	0.5	50-150%	
		<b>0.50</b>	<b>0.60</b>	<b>mg/L</b>	<b>120%</b>	<b>6.7 %</b>			50-150%	20%
Standard	Standard	4.00	4.01	mg/L	100%		9803-144	0.5	90-110%	
Standard (Dupl)	Standard	4.00	4.08	mg/L	102%		9803-144	0.5	90-110%	
		<b>4.00</b>	<b>4.05</b>	<b>mg/L</b>	<b>101%</b>	<b>1.7 %</b>			90-110%	10%

Analysis: TOC-ICR (Total Organic Carbon)

Method: SM 5310 C

QC Batch ID: 7-0-215

								Acceptance Criteria		
<u>QC Type</u>		<u>Spike</u>	<u>Recovery</u>	<u>Unit</u>	<u>Yield</u>	<u>RPD</u>	<u>S&amp;H ID</u>	<u>MRL</u>	<u>Range</u>	<u>RPD</u>
Matrix Spike	Matrix Spike	4.00	4.45	mg/L	111%		9803-191	0.5		
Matrix Spike (Dupl)	Matrix Spike	4.00	4.47	mg/L	112%		9803-191	0.5		
		<b>4.00</b>	<b>4.46</b>	<b>mg/L</b>	<b>112%</b>	<b>0.4 %</b>				
Method Blank	Method Blank		ND*	mg/L			9803-200	0.5		
Method Blank (Dupl)	Method Blank		ND*	mg/L			9803-200	0.5		
			<b>ND*</b>	<b>mg/L</b>						

ND: non-detect. \*Recovery is below 1/2 minimum reporting level (MRL). NA (not applicable): RPD calculation is not applicable.

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Standard	Standard	0.50	0.55 mg/L	110%		9803-143	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.55 mg/L	110%		9803-143	0.5	50-150%	
		<b>0.50</b>	<b>0.55 mg/L</b>	<b>110%</b>	<b>0.0 %</b>			50-150%	20%
Standard	Standard	4.00	4.08 mg/L	102%		9803-144	0.5	90-110%	
Standard (Dupl)	Standard	4.00	4.10 mg/L	102%		9803-144	0.5	90-110%	
		<b>4.00</b>	<b>4.09 mg/L</b>	<b>102%</b>	<b>0.5 %</b>			90-110%	10%
Standard	Standard	10.00	10.22 mg/L	102%		9803-173	0.5	90-110%	
Standard (Dupl)	Standard	10.00	10.31 mg/L	103%		9803-173	0.5	90-110%	
		<b>10.00</b>	<b>10.26 mg/L</b>	<b>103%</b>	<b>0.9 %</b>			90-110%	10%

Analysis: TOC-ICR (Total Organic Carbon)

Method: SM 5310 C

QC Batch ID: 7-0-216

										Acceptance Criteria
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range	RPD
Matrix Spike	Matrix Spike	4.00	4.28	mg/L	107%		9803-212	0.5		
Matrix Spike (Dupl)	Matrix Spike	4.00	4.22	mg/L	105%		9803-212	0.5		
		<b>4.00</b>	<b>4.25</b>	<b>mg/L</b>	<b>106%</b>	<b>1.4 %</b>				
Method Blank	Method Blank		ND*	mg/L			9803-216	0.5		
Method Blank (Dupl)	Method Blank		ND*	mg/L			9803-216	0.5		
			<b>ND*</b>	<b>mg/L</b>						
Standard	Standard	0.50	0.59 mg/L	118%			9803-143	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.65 mg/L	130%			9803-143	0.5	50-150%	
		<b>0.50</b>	<b>0.62</b>	<b>mg/L</b>	<b>124%</b>	<b>9.7 %</b>			50-150%	20%
Standard	Standard	4.00	4.19 mg/L	105%			9803-144	0.5	90-110%	
Standard (Dupl)	Standard	4.00	4.17 mg/L	104%			9803-144	0.5	90-110%	
		<b>4.00</b>	<b>4.18</b>	<b>mg/L</b>	<b>104%</b>	<b>0.5 %</b>			90-110%	10%

Analysis: TOC-ICR (Total Organic Carbon)

Method: SM 5310 C

QC Batch ID: 7-0-217

										Acceptance Criteria
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range	RPD
Matrix Spike	Matrix Spike	4.00	4.02	mg/L	100%		9803-249	0.5		
Matrix Spike (Dupl)	Matrix Spike	4.00	4.06	mg/L	101%		9803-249	0.5		
		<b>4.00</b>	<b>4.04</b>	<b>mg/L</b>	<b>101%</b>	<b>1.0 %</b>				
Method Blank	Method Blank		ND*	mg/L			9803-244	0.5		
Method Blank (Dupl)	Method Blank		ND*	mg/L			9803-244	0.5		
			<b>ND*</b>	<b>mg/L</b>						
Standard	Standard	0.50	0.54 mg/L	108%			9803-143	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.57 mg/L	114%			9803-143	0.5	50-150%	
		<b>0.50</b>	<b>0.55</b>	<b>mg/L</b>	<b>110%</b>	<b>5.5 %</b>			50-150%	20%
Standard	Standard	4.00	3.94 mg/L	98%			9803-236	0.5	90-110%	
Standard (Dupl)	Standard	4.00	4.02 mg/L	100%			9803-236	0.5	90-110%	
		<b>4.00</b>	<b>3.98</b>	<b>mg/L</b>	<b>100%</b>	<b>2.0 %</b>			90-110%	10%
Standard	Standard	10.00	9.89 mg/L	99%			9803-173	0.5	90-110%	

ND: non-detect. \*Recovery is below 1/2 minimum reporting level (MRL). NA (not applicable): RPD calculation is not applicable.

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Standard (Dupl)	Standard	10.00	10.03 mg/L	100%		9803-173	0.5	90-110%	
		<b>10.00</b>	<b>9.96 mg/L</b>	<b>100%</b>	<b>1.4 %</b>			90-110%	10%

Analysis: TOC-ICR (Total Organic Carbon)

Method: SM 5310 C

QC Batch ID: 7-0-218

C Batch ID: 7-0-218									Acceptance Criteria	
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range	RPD
Matrix Spike	Matrix Spike	4.00	3.99	mg/L	100%		9803-241	0.5		
Matrix Spike (Dupl)	Matrix Spike	4.00	4.22	mg/L	105%		9803-241	0.5		
		4.00	4.11	mg/L	103%	5.6 %				
Method Blank	Method Blank		ND*	mg/L			9803-258	0.5		
Method Blank (Dupl)	Method Blank		ND*	mg/L			9803-258	0.5		
			ND*	mg/L						
Standard	Standard	0.50	0.57	mg/L	114%		9803-143	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.65	mg/L	130%		9803-143	0.5	50-150%	
		0.50	0.61	mg/L	122%	13.1 %			50-150%	20%
Standard	Standard	4.00	4.08	mg/L	102%		9803-236	0.5	90-110%	
Standard (Dupl)	Standard	4.00	4.07	mg/L	102%		9803-236	0.5	90-110%	
		4.00	4.08	mg/L	102%	0.2 %			90-110%	10%
Standard	Standard	10.00	10.14	mg/L	101%		9803-173	0.5	90-110%	
Standard (Dupl)	Standard	10.00	10.18	mg/L	102%		9803-173	0.5	90-110%	
		10.00	10.16	mg/L	102%	0.4 %			90-110%	10%

Analysis: TOC-ICR (Total Organic Carbon)

Method: SM 5310 C

QC Batch ID: 7-0-219

C Batch ID: 7-0-219

									Acceptance Criteria	
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range	RPD
Matrix Spike	Matrix Spike	4.00	4.07	mg/L	102%		9803-268	0.5		
Matrix Spike (Dupl)	Matrix Spike	4.00	4.11	mg/L	103%		9803-268	0.5		
		4.00	4.09	mg/L	102%	1.0 %				
Method Blank	Method Blank		ND*	mg/L			9803-270	0.5		
Method Blank (Dupl)	Method Blank		ND*	mg/L			9803-270	0.5		
			ND*	mg/L						
Standard	Standard	0.50	0.59	mg/L	118%		9803-143	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.59	mg/L	118%		9803-143	0.5	50-150%	
		0.50	0.59	mg/L	118%	0.0 %			50-150%	20%
Standard	Standard	4.00	3.93	mg/L	98%		9803-236	0.5	90-110%	
Standard (Dupl)	Standard	4.00	3.95	mg/L	99%		9803-236	0.5	90-110%	
		4.00	3.94	mg/L	98%	0.5 %			90-110%	10%

Analysis: TOC-ICR (Total Organic Carbon)

Method: SM 5310 C

QC Batch ID: 7-0-221

C Batch ID: 7-0-221								Acceptance Criteria		
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range	RPD

ND: non-detect. \*Recovery is below 1/2 minimum reporting level (MRL). NA (not applicable): RPD calculation is not applicable.

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Matrix Spike	Matrix Spike	4.00	4.18 mg/L	104%	9803-288	0.5		
Matrix Spike (Dupl)	Matrix Spike	4.00	4.14 mg/L	103%	9803-288	0.5		
		<b>4.00</b>	<b>4.16 mg/L</b>	<b>104%</b>	<b>1.0 %</b>			
Method Blank	Method Blank		ND* mg/L		9803-290	0.5		
Method Blank (Dupl)	Method Blank		ND* mg/L		9803-290	0.5		
			<b>ND* mg/L</b>					
Standard	Standard	0.50	0.63 mg/L	126%	9803-143	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.63 mg/L	126%	9803-143	0.5	50-150%	
		<b>0.50</b>	<b>0.63 mg/L</b>	<b>126%</b>	<b>0.0 %</b>		50-150%	20%
Standard	Standard	4.00	4.09 mg/L	102%	9803-236	0.5	90-110%	
Standard (Dupl)	Standard	4.00	4.09 mg/L	102%	9803-236	0.5	90-110%	
		<b>4.00</b>	<b>4.09 mg/L</b>	<b>102%</b>	<b>0.0 %</b>		90-110%	10%

Analysis: TOC-ICR (Total Organic Carbon)

Method: SM 5310 C

QC Batch ID: 7-0-222

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range	RPD
Matrix Spike	Matrix Spike	4.00	4.28 mg/L	107%			9803-299	0.5		
Matrix Spike (Dupl)	Matrix Spike	4.00	4.23 mg/L	106%			9803-299	0.5		
		<b>4.00</b>	<b>4.26 mg/L</b>	<b>106%</b>	<b>1.4 %</b>					
Method Blank	Method Blank		ND* mg/L				9803-301	0.5		
Method Blank (Dupl)	Method Blank		ND* mg/L				9803-301	0.5		
			<b>ND* mg/L</b>							
Standard	Standard	0.50	0.55 mg/L	110%			9803-143	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.54 mg/L	108%			9803-143	0.5	50-150%	
		<b>0.50</b>	<b>0.55 mg/L</b>	<b>110%</b>	<b>1.8 %</b>				50-150%	20%
Standard	Standard	4.00	4.07 mg/L	102%			9803-236	0.5	90-110%	
Standard (Dupl)	Standard	4.00	4.05 mg/L	101%			9803-236	0.5	90-110%	
		<b>4.00</b>	<b>4.06 mg/L</b>	<b>101%</b>	<b>0.5 %</b>				90-110%	10%

Analysis: TOC-ICR (Total Organic Carbon)

Method: SM 5310 C

QC Batch ID: 7-0-223

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range	RPD
Matrix Spike	Matrix Spike	4.00	4.23 mg/L	106%			9803-312	0.5		
Matrix Spike (Dupl)	Matrix Spike	4.00	4.19 mg/L	105%			9803-312	0.5		
		<b>4.00</b>	<b>4.21 mg/L</b>	<b>105%</b>	<b>0.7 %</b>					
Method Blank	Method Blank		ND* mg/L				9803-314	0.5		
Method Blank (Dupl)	Method Blank		ND* mg/L				9803-314	0.5		
			<b>ND* mg/L</b>							
Standard	Standard	0.50	0.56 mg/L	112%			9803-235	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.57 mg/L	114%			9803-235	0.5	50-150%	
		<b>0.50</b>	<b>0.57 mg/L</b>	<b>114%</b>	<b>1.8 %</b>				50-150%	20%
Standard	Standard	4.00	4.10 mg/L	102%			9803-236	0.5	90-110%	

ND: non-detect. \*Recovery is below 1/2 minimum reporting level (MRL). NA (not applicable): RPD calculation is not applicable.

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Standard (Dupl)	Standard	4.00	4.05 mg/L	101%		9803-236	0.5	90-110%	
		<b>4.00</b>	<b>4.07 mg/L</b>	<b>102%</b>	<b>1.2 %</b>			90-110%	10%

Analysis: TOC-ICR (Total Organic Carbon)

Method: SM 5310 C

QC Batch ID: 7-0-224

		Acceptance Criteria							
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range RPD
Matrix Spike	Matrix Spike	4.00	4.30	mg/L	108%		9803-328	0.5	
Matrix Spike (Dupl)	Matrix Spike	4.00	4.30	mg/L	108%		9803-328	0.5	
		<b>4.00</b>	<b>4.30</b>	<b>mg/L</b>	<b>108%</b>	<b>0.0 %</b>			
Method Blank	Method Blank		ND*	mg/L			9803-333	0.5	
Method Blank (Dupl)	Method Blank		ND*	mg/L			9803-333	0.5	
			<b>ND*</b>	<b>mg/L</b>					
Standard	Standard	0.50	0.58	mg/L	116%		9803-143	0.5	50-150%
Standard (Dupl)	Standard	0.50	0.58	mg/L	116%		9803-143	0.5	50-150%
		<b>0.50</b>	<b>0.58</b>	<b>mg/L</b>	<b>116%</b>	<b>0.0 %</b>			50-150% 20%
Standard	Standard	4.00	4.13	mg/L	103%		9803-236	0.5	90-110%
Standard (Dupl)	Standard	4.00	4.08	mg/L	102%		9803-236	0.5	90-110%
		<b>4.00</b>	<b>4.10</b>	<b>mg/L</b>	<b>102%</b>	<b>1.2 %</b>			90-110% 10%

Analysis: TOC-ICR (Total Organic Carbon)

Method: SM 5310 C

QC Batch ID: 7-0-225

		Acceptance Criteria							
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range RPD
Matrix Spike	Matrix Spike	4.00	4.12	mg/L	103%		9803-344	0.5	
Matrix Spike (Dupl)	Matrix Spike	4.00	4.21	mg/L	105%		9803-344	0.5	
		<b>4.00</b>	<b>4.17</b>	<b>mg/L</b>	<b>104%</b>	<b>2.4 %</b>			
Method Blank	Method Blank		ND*	mg/L			9803-353	0.5	
Method Blank (Dupl)	Method Blank		ND*	mg/L			9803-353	0.5	
			<b>ND*</b>	<b>mg/L</b>					
Standard	Standard	0.50	0.55	mg/L	110%		9803-143	0.5	50-150%
Standard (Dupl)	Standard	0.50	0.52	mg/L	104%		9803-143	0.5	50-150%
		<b>0.50</b>	<b>0.53</b>	<b>mg/L</b>	<b>106%</b>	<b>5.7 %</b>			50-150% 20%
Standard	Standard	4.00	3.94	mg/L	98%		9803-236	0.5	90-110%
Standard (Dupl)	Standard	4.00	4.02	mg/L	100%		9803-236	0.5	90-110%
		<b>4.00</b>	<b>3.98</b>	<b>mg/L</b>	<b>100%</b>	<b>2.0 %</b>			90-110% 10%

Analysis: TOC-ICR (Total Organic Carbon)

Method: SM 5310 C

QC Batch ID: 7-0-228

		Acceptance Criteria							
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range RPD
Matrix Spike	Matrix Spike	4.00	4.11	mg/L	103%		9804-44	0.5	
Matrix Spike (Dupl)	Matrix Spike	4.00	4.07	mg/L	102%		9804-44	0.5	
		<b>4.00</b>	<b>4.09</b>	<b>mg/L</b>	<b>102%</b>	<b>1.0 %</b>			

ND: non-detect. \*Recovery is below 1/2 minimum reporting level (MRL). NA (not applicable): RPD calculation is not applicable.

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Method Blank	Method Blank		ND*	mg/L		9804-49	0.5		
Method Blank (Dupl)	Method Blank		ND*	mg/L		9804-49	0.5		
			<b>ND*</b>	<b>mg/L</b>					
Standard	Standard	0.50	0.60	mg/L	120%	9803-143	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.59	mg/L	118%	9803-143	0.5	50-150%	
		<b>0.50</b>	<b>0.59</b>	<b>mg/L</b>	<b>118%</b>			50-150%	20%
Standard	Standard	4.00	4.01	mg/L	100%	9803-236	0.5	90-110%	
Standard (Dupl)	Standard	4.00	4.04	mg/L	101%	9803-236	0.5	90-110%	
		<b>4.00</b>	<b>4.02</b>	<b>mg/L</b>	<b>100%</b>			90-110%	10%
Standard	Standard	10.00	9.95	mg/L	99%	9803-173	0.5	90-110%	
Standard (Dupl)	Standard	10.00	9.96	mg/L	100%	9803-173	0.5	90-110%	
		<b>10.00</b>	<b>9.95</b>	<b>mg/L</b>	<b>99%</b>			90-110%	10%

Analysis: TOC-ICR (Total Organic Carbon)

Method: SM 5310 C

QC Batch ID: 7-0-229

										Acceptance Criteria
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range	RPD
Matrix Spike	Matrix Spike	4.00	4.34	mg/L	109%		9804-67	0.5		
Matrix Spike (Dupl)	Matrix Spike	4.00	4.17	mg/L	104%		9804-67	0.5		
		<b>4.00</b>	<b>4.26</b>	<b>mg/L</b>	<b>106%</b>	<b>4.0 %</b>				
Method Blank	Method Blank		ND*	mg/L			9804-64	0.5		
Method Blank (Dupl)	Method Blank		ND*	mg/L			9804-64	0.5		
			<b>ND*</b>	<b>mg/L</b>						
Standard	Standard	0.50	0.55	mg/L	110%		9804-59	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.51	mg/L	102%		9804-59	0.5	50-150%	
		<b>0.50</b>	<b>0.53</b>	<b>mg/L</b>	<b>106%</b>	<b>7.5 %</b>			50-150%	20%
Standard	Standard	4.00	3.92	mg/L	98%		9804-60	0.5	90-110%	
Standard (Dupl)	Standard	4.00	3.97	mg/L	99%		9804-60	0.5	90-110%	
		<b>4.00</b>	<b>3.95</b>	<b>mg/L</b>	<b>99%</b>	<b>1.3 %</b>			90-110%	10%
Standard	Standard	10.00	9.96	mg/L	100%		9804-73	0.5	90-110%	
Standard (Dupl)	Standard	10.00	10.10	mg/L	101%		9804-73	0.5	90-110%	
		<b>10.00</b>	<b>10.03</b>	<b>mg/L</b>	<b>100%</b>	<b>1.4 %</b>			90-110%	10%

Analysis: UV-ICR (UV-254)

Method: SM 5910 B

QC Batch ID: 8-0-146

										Acceptance Criteria
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range	RPD
Method Blank	Method Blank		ND*	1/cm			9803-185	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9803-185	0.009		
			<b>ND*</b>	<b>1/cm</b>						
Method Blank	Method Blank		ND*	1/cm			9803-185	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9803-185	0.009		
			<b>ND*</b>	<b>1/cm</b>						
Standard	Standard	0.009	0.008	1/cm	89%		9803-41	0.009	75-125%	

ND: non-detect. \*Recovery is below 1/2 minimum reporting level (MRL). NA (not applicable): RPD calculation is not applicable.

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Standard (Dupl)	Standard	0.009	0.008	1/cm	89%		9803-41	0.009	75-125%	
		<b>0.009</b>	<b>0.008</b>	<b>1/cm</b>	<b>89%</b>	<b>0.0 %</b>			75-125%	20%
Standard	Standard	0.088	0.087	1/cm	99%		9803-42	0.009	85-115%	
Standard (Dupl)	Standard	0.088	0.088	1/cm	100%		9803-42	0.009	85-115%	
		<b>0.088</b>	<b>0.087</b>	<b>1/cm</b>	<b>99%</b>	<b>1.1 %</b>			85-115%	10%

Analysis: UV-ICR (UV-254)

Method: SM 5910 B

QC Batch ID: 8-0-147

										Acceptance Criteria
<u>QC Type</u>		<u>Spike</u>	<u>Recovery</u>	<u>Unit</u>	<u>Yield</u>	<u>RPD</u>	<u>S&amp;H ID</u>	<u>MRL</u>	<u>Range</u>	<u>RPD</u>
Method Blank	Method Blank		ND*	1/cm			9803-217	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9803-217	0.009		
			<b>ND*</b>	<b>1/cm</b>						
Method Blank	Method Blank		ND*	1/cm			9803-217	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9803-217	0.009		
			<b>ND*</b>	<b>1/cm</b>						
Standard	Standard	0.009	0.008	1/cm	89%		9803-41	0.009	75-125%	
Standard (Dupl)	Standard	0.009	0.008	1/cm	89%		9803-41	0.009	75-125%	
		<b>0.009</b>	<b>0.008</b>	<b>1/cm</b>	<b>89%</b>	<b>0.0 %</b>			75-125%	20%
Standard	Standard	0.088	0.087	1/cm	99%		9803-42	0.009	85-115%	
Standard (Dupl)	Standard	0.088	0.087	1/cm	99%		9803-42	0.009	85-115%	
		<b>0.088</b>	<b>0.087</b>	<b>1/cm</b>	<b>99%</b>	<b>0.0 %</b>			85-115%	10%

Analysis: UV-ICR (UV-254)

Method: SM 5910 B

QC Batch ID: 8-0-148

										Acceptance Criteria
<u>QC Type</u>		<u>Spike</u>	<u>Recovery</u>	<u>Unit</u>	<u>Yield</u>	<u>RPD</u>	<u>S&amp;H ID</u>	<u>MRL</u>	<u>Range</u>	<u>RPD</u>
Method Blank	Method Blank		ND*	1/cm			9803-242	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9803-242	0.009		
			<b>ND*</b>	<b>1/cm</b>						
Method Blank	Method Blank		ND*	1/cm			9803-242	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9803-242	0.009		
			<b>ND*</b>	<b>1/cm</b>						
Standard	Standard	0.009	0.008	1/cm	89%		9803-237	0.009	75-125%	
Standard (Dupl)	Standard	0.009	0.008	1/cm	89%		9803-237	0.009	75-125%	
		<b>0.009</b>	<b>0.008</b>	<b>1/cm</b>	<b>89%</b>	<b>0.0 %</b>			75-125%	20%
Standard	Standard	0.088	0.087	1/cm	99%		9803-238	0.009	85-115%	
Standard (Dupl)	Standard	0.088	0.086	1/cm	98%		9803-238	0.009	85-115%	
		<b>0.088</b>	<b>0.087</b>	<b>1/cm</b>	<b>99%</b>	<b>1.1 %</b>			85-115%	10%

Analysis: UV-ICR (UV-254)

Method: SM 5910 B

QC Batch ID: 8-0-149

										Acceptance Criteria
<u>QC Type</u>		<u>Spike</u>	<u>Recovery</u>	<u>Unit</u>	<u>Yield</u>	<u>RPD</u>	<u>S&amp;H ID</u>	<u>MRL</u>	<u>Range</u>	<u>RPD</u>

ND: non-detect. \*Recovery is below 1/2 minimum reporting level (MRL). NA (not applicable): RPD calculation is not applicable.

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Method Blank	Method Blank	ND*	1/cm			9803-259	0.009		
Method Blank (Dupl)	Method Blank	ND*	1/cm			9803-259	0.009		
		<b>ND*</b>	<b>1/cm</b>						
Method Blank	Method Blank	ND*	1/cm			9803-259	0.009		
Method Blank (Dupl)	Method Blank	ND*	1/cm			9803-259	0.009		
		<b>ND*</b>	<b>1/cm</b>						
Standard	Standard	0.009	0.008	1/cm	89%	9803-237	0.009	75-125%	
Standard (Dupl)	Standard	0.009	0.008	1/cm	89%	9803-237	0.009	75-125%	
		<b>0.009</b>	<b>0.008</b>	<b>1/cm</b>	<b>89%</b>			75-125%	20%
Standard	Standard	0.088	0.084	1/cm	95%	9803-238	0.009	85-115%	
Standard (Dupl)	Standard	0.088	0.085	1/cm	97%	9803-238	0.009	85-115%	
		<b>0.088</b>	<b>0.085</b>	<b>1/cm</b>	<b>97%</b>			85-115%	10%

Analysis: UV-ICR (UV-254)

Method: SM 5910 B

QC Batch ID: 8-0-150

										Acceptance Criteria
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range	RPD
Method Blank	Method Blank		ND*	1/cm			9803-271	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9803-271	0.009		
			<b>ND*</b>	<b>1/cm</b>						
Method Blank	Method Blank		ND*	1/cm			9803-271	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9803-271	0.009		
			<b>ND*</b>	<b>1/cm</b>						
Standard	Standard	0.009	0.007	1/cm	78%		9803-237	0.009	75-125%	
Standard (Dupl)	Standard	0.009	0.007	1/cm	78%		9803-237	0.009	75-125%	
		<b>0.009</b>	<b>0.007</b>	<b>1/cm</b>	<b>78%</b>	<b>0.0 %</b>			75-125%	20%
Standard	Standard	0.088	0.086	1/cm	98%		9803-238	0.009	85-115%	
Standard (Dupl)	Standard	0.088	0.086	1/cm	98%		9803-238	0.009	85-115%	
		<b>0.088</b>	<b>0.086</b>	<b>1/cm</b>	<b>98%</b>	<b>0.0 %</b>			85-115%	10%

Analysis: UV-ICR (UV-254)

Method: SM 5910 B

QC Batch ID: 8-0-151

										Acceptance Criteria
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range	RPD
Method Blank	Method Blank		ND*	1/cm			9803-291	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9803-291	0.009		
			<b>ND*</b>	<b>1/cm</b>						
Method Blank	Method Blank		ND*	1/cm			9803-291	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9803-291	0.009		
			<b>ND*</b>	<b>1/cm</b>						
Standard	Standard	0.009	0.008	1/cm	89%		9803-237	0.009	75-125%	
Standard (Dupl)	Standard	0.009	0.008	1/cm	89%		9803-237	0.009	75-125%	
		<b>0.009</b>	<b>0.008</b>	<b>1/cm</b>	<b>89%</b>	<b>0.0 %</b>			75-125%	20%
Standard	Standard	0.088	0.085	1/cm	97%		9803-238	0.009	85-115%	

ND: non-detect. \*Recovery is below 1/2 minimum reporting level (MRL). NA (not applicable): RPD calculation is not applicable.



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Standard (Dupl)	Standard	0.088	0.085	1/cm	97%		9803-238	0.009	85-115%	
		<b>0.088</b>	<b>0.085</b>	<b>1/cm</b>	<b>97%</b>	<b>0.0 %</b>			85-115%	10%

Analysis: UV-ICR (UV-254)

Method: SM 5910 B

QC Batch ID: 8-0-152

										Acceptance Criteria
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range	RPD
Method Blank	Method Blank		ND*	1/cm			9803-315	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9803-315	0.009		
			<b>ND*</b>	<b>1/cm</b>						
Method Blank	Method Blank		ND*	1/cm			9803-315	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9803-315	0.009		
			<b>ND*</b>	<b>1/cm</b>						
Standard	Standard	0.009	0.008	1/cm	89%		9803-237	0.009	75-125%	
Standard (Dupl)	Standard	0.009	0.008	1/cm	89%		9803-237	0.009	75-125%	
		<b>0.009</b>	<b>0.008</b>	<b>1/cm</b>	<b>89%</b>	<b>0.0 %</b>			75-125%	20%
Standard	Standard	0.088	0.088	1/cm	100%		9803-238	0.009	85-115%	
Standard (Dupl)	Standard	0.088	0.089	1/cm	101%		9803-238	0.009	85-115%	
		<b>0.088</b>	<b>0.088</b>	<b>1/cm</b>	<b>100%</b>	<b>1.1 %</b>			85-115%	10%

Analysis: UV-ICR (UV-254)

Method: SM 5910 B

QC Batch ID: 8-0-154

										Acceptance Criteria
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range	RPD
Method Blank	Method Blank		ND*	1/cm			9804-6	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9804-6	0.009		
			<b>ND*</b>	<b>1/cm</b>						
Method Blank	Method Blank		ND*	1/cm			9804-6	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9804-6	0.009		
			<b>ND*</b>	<b>1/cm</b>						
Standard	Standard	0.009	0.008	1/cm	89%		9803-237	0.009	75-125%	
Standard (Dupl)	Standard	0.009	0.008	1/cm	89%		9803-237	0.009	75-125%	
		<b>0.009</b>	<b>0.008</b>	<b>1/cm</b>	<b>89%</b>	<b>0.0 %</b>			75-125%	20%
Standard	Standard	0.088	0.086	1/cm	98%		9803-238	0.009	85-115%	
Standard (Dupl)	Standard	0.088	0.086	1/cm	98%		9803-238	0.009	85-115%	
		<b>0.088</b>	<b>0.086</b>	<b>1/cm</b>	<b>98%</b>	<b>0.0 %</b>			85-115%	10%

Analysis: UV-ICR (UV-254)

Method: SM 5910 B

QC Batch ID: 8-0-157

										Acceptance Criteria
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range	RPD
Method Blank	Method Blank		ND*	1/cm			9804-65	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9804-65	0.009		
			<b>ND*</b>	<b>1/cm</b>						

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Method Blank	Method Blank	ND*	1/cm			9804-65	0.009		
Method Blank (Dupl)	Method Blank	ND*	1/cm			9804-65	0.009		
		<b>ND*</b>	<b>1/cm</b>						
Standard	Standard	0.009	0.007	1/cm	78%	9803-237	0.009	75-125%	
Standard (Dupl)	Standard	0.009	0.007	1/cm	78%	9803-237	0.009	75-125%	
		<b>0.009</b>	<b>0.007</b>	<b>1/cm</b>	<b>78%</b>			75-125%	20%
					<b>0.0 %</b>				
Standard	Standard	0.088	0.085	1/cm	97%	9803-238	0.009	85-115%	
Standard (Dupl)	Standard	0.088	0.085	1/cm	97%	9803-238	0.009	85-115%	
		<b>0.088</b>	<b>0.085</b>	<b>1/cm</b>	<b>97%</b>			85-115%	10%
					<b>0.0 %</b>				

Analysis: TURB (Turbidity)

Method: SM 2130 B

QC Batch ID: 9-0-8

										Acceptance Criteria	
<u>QC Type</u>		<u>Spike</u>	<u>Recovery</u>	<u>Unit</u>	<u>Yield</u>	<u>RPD</u>	<u>Date Run</u>	<u>S&amp;H ID</u>	<u>MRL</u>	<u>Range</u>	<u>RPD</u>
Standard	Standard	4.51	4.56	ntu	101%		03/12/98	9902-79	0.05		
Standard	Standard	4.51	4.58	ntu	102%		03/17/98	9902-79	0.05		
Standard	Standard	4.51	4.56	ntu	101%		03/20/98	9902-79	0.05		
Standard	Standard	4.51	4.56	ntu	101%		03/26/98	9902-79	0.05		

Analysis: TURB (Turbidity)

Method: SM 2130 B

QC Batch ID: 9-0-9

										Acceptance Criteria	
<u>QC Type</u>		<u>Spike</u>	<u>Recovery</u>	<u>Unit</u>	<u>Yield</u>	<u>RPD</u>	<u>Date Run</u>	<u>S&amp;H ID</u>	<u>MRL</u>	<u>Range</u>	<u>RPD</u>
Standard	Standard	4.51	4.61	ntu	102%		03/31/98	9902-79	0.05		
Standard	Standard	4.51	4.57	ntu	101%		04/04/98	9902-79	0.05		
Standard	Standard	4.51	4.56	ntu	101%		04/09/98	9902-79	0.05		
Standard	Standard	4.51	4.57	ntu	101%		04/10/98	9902-79	0.05		
Standard	Standard	4.51	4.59	ntu	102%		04/13/98	9902-79	0.05		
Standard	Standard	4.51	4.59	ntu	102%		04/13/98	9902-79	0.05		
Standard	Standard	4.51	4.62	ntu	102%		04/17/98	9902-79	0.05		
Standard	Standard	4.51	4.58	ntu	102%		04/22/98	9902-79	0.05		

Analysis: TOX-ICR (Total Organic Halide)

Method: SM 5320 B

QC Batch ID: 12-0-107

										Acceptance Criteria	
<u>QC Type</u>		<u>Spike</u>	<u>Recovery</u>	<u>Unit</u>	<u>Yield</u>	<u>RPD</u>		<u>S&amp;H ID</u>	<u>MRL</u>	<u>Range</u>	<u>RPD</u>
Standard - TCP Aqueous	Standard	25	21	µg Cl-/L	84%			9803-318	25	75-125%	
Standard - TCP Aqueous	Standard	200	201	µg Cl-/L	100%			9803-319	25	85-115%	
System Blank	Blank		ND*	µg Cl-/L				9803-317	25		

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Analysis: TOX-ICR (Total Organic Halide)

Method: SM 5320 B

QC Batch ID: 12-0-108

								Acceptance Criteria	
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range
Standard - TCP Aqueous	Standard	25	26	µg Cl-/L	104%		9803-340	25	75-125%
Standard - TCP Aqueous	Standard	200	208	µg Cl-/L	104%		9803-341	25	85-115%
System Blank	Blank		ND*	µg Cl-/L			9803-339	25	

Analysis: TOX-ICR (Total Organic Halide)

Method: SM 5320 B

QC Batch ID: 12-0-109

								Acceptance Criteria	
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range
Standard - TCP Aqueous	Standard	25	26	µg Cl-/L	104%		9803-348	25	75-125%
Standard - TCP Aqueous	Standard	200	203	µg Cl-/L	101%		9803-347	25	85-115%
System Blank	Blank		ND*	µg Cl-/L			9803-349	25	

Analysis: TOX-ICR (Total Organic Halide)

Method: SM 5320 B

QC Batch ID: 12-0-110

								Acceptance Criteria	
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range
Matrix Spike	Matrix Spike	200	199	µg Cl-/L	100%		9803-274	25	
Matrix Spike (Dupl)	Matrix Spike	200	223	µg Cl-/L	112%		9803-274	25	
		200	211	µg Cl-/L	105%	10.9 %			
Standard - TCP Aqueous	Standard	25	30	µg Cl-/L	120%		9804-30	25	75-125%
Standard - TCP Aqueous (Dupl)	Standard	200	191	µg Cl-/L	95%		9804-31	25	85-115%
System Blank	Blank		ND*	µg Cl-/L			9804-32	25	

Analysis: TOX-ICR (Total Organic Halide)

Method: SM 5320 B

QC Batch ID: 12-0-111

								Acceptance Criteria	
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range
Standard - TCP Aqueous	Standard	25	27	µg Cl-/L	108%		9804-53	25	75-125%
Standard - TCP Aqueous	Standard	200	209	µg Cl-/L	104%		9804-52	25	85-115%
System Blank	Blank		ND*	µg Cl-/L			9804-54	25	

Analysis: TOX-ICR (Total Organic Halide)

Method: SM 5320 B

QC Batch ID: 12-0-113

								Acceptance Criteria	
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range
Standard - TCP Aqueous	Standard	25	26	µg Cl-/L	104%		9804-128	25	75-125%
Standard - TCP Aqueous	Standard	200	225	µg Cl-/L	113%		9804-127	25	85-115%

ND: non-detect. \*Recovery is below 1/2 minimum reporting level (MRL). NA (not applicable): RPD calculation is not applicable.

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System Blank	Blank	ND*	µg Cl-/L	9804-129	25
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**Analysis:** TOX-ICR (Total Organic Halide)**Method:** SM 5320 B**QC Batch ID:** 12-0-114

<b>QC Type</b>		<b>Spike</b>	<b>Recovery</b>	<b>Unit</b>	<b>Yield</b>	<b>RPD</b>	<b>S&amp;H ID</b>	<b>MRL</b>	<b>Range</b>	<b>RPD</b>
Matrix Spike	Matrix Spike	200	222	µg Cl-/L	111%		9804-88	25		
Matrix Spike (Dupl)	Matrix Spike	200	210	µg Cl-/L	105%		9804-88	25		
		<b>200</b>	<b>216</b>	<b>µg Cl-/L</b>	<b>108%</b>	<b>5.6 %</b>				
Standard - TCP Aqueous	Standard	25	27	µg Cl-/L	108%		9804-143	25	75-125%	
Standard - TCP Aqueous	Standard	200	214	µg Cl-/L	107%		9804-142	25	85-115%	
System Blank	Blank	ND*		µg Cl-/L			9804-144	25		

**Acceptance  
Criteria****Analysis:** CaHard (Calcium Hardness)**Method:** SM 3500-Ca D**QC Batch ID:** 33-0-16

<b>QC Type</b>		<b>Spike</b>	<b>Recovery</b>	<b>Unit</b>	<b>Yield</b>	<b>RPD</b>	<b>Date Run</b>	<b>S&amp;H ID</b>	<b>MRL</b>	<b>Range</b>	<b>RPD</b>
Matrix Spike	Matrix Spike	257	248	mg/L CaCO3	96%		03/18/98	9803-170	10		
Matrix Spike (Dupl)	Matrix Spike	257	250	mg/L CaCO3	97%		03/18/98	9803-170	10		
		<b>257</b>	<b>248</b>	<b>mg/L CaCO3</b>	<b>96%</b>	<b>0.8 %</b>					
Method Blank	Method Blank		ND*	mg/L CaCO3			03/18/98	9803-184	10		
Standard	Standard	100	99	mg/L CaCO3	99%		03/18/98	9803-183	10	90-110%	
Standard (Dupl)	Standard	100	101	mg/L CaCO3	101%		03/18/98	9803-183	10	90-110%	
		<b>100</b>	<b>100</b>	<b>mg/L CaCO3</b>	<b>100%</b>	<b>2.0 %</b>				90-110%	10%
Matrix Spike	Matrix Spike	257	250	mg/L CaCO3	97%		03/26/98	9803-297	10		
Matrix Spike (Dupl)	Matrix Spike	257	250	mg/L CaCO3	97%		03/26/98	9803-297	10		
		<b>257</b>	<b>250</b>	<b>mg/L CaCO3</b>	<b>97%</b>	<b>0.0 %</b>					
Method Blank	Method Blank		ND*	mg/L CaCO3			03/26/98	9803-310	10		
Standard	Standard	100	99	mg/L CaCO3	99%		03/26/98	9803-311	10	90-110%	
Standard (Dupl)	Standard	100	100	mg/L CaCO3	100%		03/26/98	9803-311	10	90-110%	
		<b>100</b>	<b>99</b>	<b>mg/L CaCO3</b>	<b>99%</b>	<b>1.0 %</b>				90-110%	10%

**Acceptance  
Criteria****Analysis:** THM-ICR (Trihalomethanes (ICR))**Method:** EPA 551.1**QC Batch ID:** 0-101-0

<b>QC Type</b>		<b>Spike</b>	<b>Recovery</b>	<b>Unit</b>	<b>Yield</b>	<b>RPD</b>	<b>S&amp;H ID</b>	<b>MRL</b>	<b>Range</b>	<b>RPD</b>
Bromodichloromethane	Duplicate	1.5	1.5	µg/L		0.0%	9803-210	1		
Bromodichloromethane	Matrix Spike	40.0	42.2	µg/L	106%		9803-255	1		
Bromodichloromethane	Method Blank		ND*	µg/L			9803-355	1		
Bromodichloromethane	Secondary Source Std	20.0	21.0	µg/L	105%		9803-356	1	70-130%	
Bromodichloromethane	Standard	20.0	19.7	µg/L	98%		9803-357	1	80-120%	

**Acceptance  
Criteria**

ND: non-detect. \*Recovery is below 1/2 minimum reporting level (MRL). NA (not applicable): RPD calculation is not applicable.

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Bromodichloromethane	Standard	20.0	20.4 µg/L	102%	9803-357	1	80-120%
Bromodichloromethane	Standard	40.0	42.5 µg/L	106%	9803-358	1	80-120%
Bromodichloromethane	Standard	40.0	43.4 µg/L	109%	9803-358	1	80-120%
Bromoform	Duplicate	ND	ND µg/L	NA	9803-210	1	
Bromoform	Matrix Spike	40.0	41.9 µg/L	105%	9803-255	1	
Bromoform	Method Blank		ND* µg/L		9803-355	1	
Bromoform	Secondary Source Std	20.0	20.0 µg/L	100%	9803-356	1	70-130%
Bromoform	Standard	20.0	20.1 µg/L	101%	9803-357	1	80-120%
Bromoform	Standard	20.0	19.1 µg/L	96%	9803-357	1	80-120%
Bromoform	Standard	40.0	41.9 µg/L	105%	9803-358	1	80-120%
Bromoform	Standard	40.0	44.7 µg/L	112%	9803-358	1	80-120%
Chloroform	Duplicate	3.0	2.9 µg/L	3.4%	9803-210	1	
Chloroform	Matrix Spike	40.0	41.2 µg/L	103%	9803-255	1	
Chloroform	Method Blank		ND* µg/L		9803-355	1	
Chloroform	Secondary Source Std	20.0	20.3 µg/L	102%	9803-356	1	70-130%
Chloroform	Standard	20.0	19.4 µg/L	97%	9803-357	1	80-120%
Chloroform	Standard	20.0	20.7 µg/L	103%	9803-357	1	80-120%
Chloroform	Standard	40.0	42.4 µg/L	106%	9803-358	1	80-120%
Chloroform	Standard	40.0	43.5 µg/L	109%	9803-358	1	80-120%
Dibromochloromethane	Duplicate	ND	ND µg/L	NA	9803-210	1	
Dibromochloromethane	Matrix Spike	40.0	42.9 µg/L	107%	9803-255	1	
Dibromochloromethane	Method Blank		ND* µg/L		9803-355	1	
Dibromochloromethane	Secondary Source Std	20.0	20.1 µg/L	101%	9803-356	1	70-130%
Dibromochloromethane	Standard	20.0	19.9 µg/L	99%	9803-357	1	80-120%
Dibromochloromethane	Standard	20.0	20.7 µg/L	103%	9803-357	1	80-120%
Dibromochloromethane	Standard	40.0	42.4 µg/L	106%	9803-358	1	80-120%
Dibromochloromethane	Standard	40.0	43.8 µg/L	110%	9803-358	1	80-120%

**Analysis:** THM-ICR (Trihalomethanes (ICR))**Method:** EPA 551.1**QC Batch ID:** 0-102-0

								Acceptance Criteria	
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL Range	RPD
Bromodichloromethane	Duplicate	2.6	2.8	µg/L		7.4%	9803-322	1	
Bromodichloromethane	Matrix Spike	40.0	41.6	µg/L	104%		9803-344	1	
Bromodichloromethane	Method Blank		ND*	µg/L			9804-120	1	

ND: non-detect. \*Recovery is below 1/2 minimum reporting level (MRL). NA (not applicable): RPD calculation is not applicable.

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Bromodichloromethane	Standard	20.0	20.5 µg/L	102%	9804-119	1	80-120%
Bromodichloromethane	Standard	40.0	42.8 µg/L	107%	9803-358	1	80-120%
Bromoform	Duplicate	ND	ND µg/L	NA	9803-322	1	
Bromoform	Matrix Spike	40.0	43.2 µg/L	108%	9803-344	1	
Bromoform	Method Blank		ND* µg/L		9804-120	1	
Bromoform	Standard	20.0	21.3 µg/L	106%	9804-119	1	80-120%
Bromoform	Standard	40.0	45.2 µg/L	113%	9803-358	1	80-120%
Chloroform	Duplicate	6.5	6.7 µg/L	3.0%	9803-322	1	
Chloroform	Matrix Spike	40.0	42.9 µg/L	107%	9803-344	1	
Chloroform	Method Blank		ND* µg/L		9804-120	1	
Chloroform	Standard	20.0	20.6 µg/L	103%	9804-119	1	80-120%
Chloroform	Standard	40.0	42.6 µg/L	106%	9803-358	1	80-120%
Dibromochloromethane	Duplicate	ND	ND µg/L	NA	9803-322	1	
Dibromochloromethane	Matrix Spike	40.0	41.8 µg/L	104%	9803-344	1	
Dibromochloromethane	Method Blank		ND* µg/L		9804-120	1	
Dibromochloromethane	Standard	20.0	20.7 µg/L	103%	9804-119	1	80-120%
Dibromochloromethane	Standard	40.0	44.2 µg/L	111%	9803-358	1	80-120%

**Analysis:** HAA-ICR (Haloacetic Acids)**Method:** EPA 552.2**QC Batch ID:** 0-100-0

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range	RPD
Bromochloroacetic acid	Duplicate	1.2	1.2	µg/L		0.0%	9803-201	1		
Bromochloroacetic acid	Matrix Spike	40.0	36.3	µg/L	91%		9803-252	1		
Bromochloroacetic acid	Method Blank		ND*	µg/L			9803-292	1		
Bromochloroacetic acid	Secondary Source Std	20.0	22.4	µg/L	112%		9803-293	1	70-130%	
Bromochloroacetic acid	Standard	20.0	22.4	µg/L	112%		9803-294	1	80-120%	
Bromochloroacetic acid	Standard	20.0	21.7	µg/L	109%		9803-294	1	80-120%	
Bromochloroacetic acid	Standard	40.0	40.0	µg/L	100%		9803-295	1	80-120%	
Bromodichloroacetic acid	Duplicate	ND	ND	µg/L		NA	9803-201	1		
Bromodichloroacetic acid	Matrix Spike	40.0	38.1	µg/L	95%		9803-252	1		
Bromodichloroacetic acid	Method Blank		ND*	µg/L			9803-292	1		
Bromodichloroacetic acid	Secondary Source Std		ND	µg/L			9803-293	1		
Bromodichloroacetic acid	Standard	20.0	21.5	µg/L	108%		9803-294	1	80-120%	
Bromodichloroacetic acid	Standard	20.0	21.9	µg/L	110%		9803-294	1	80-120%	

ND: non-detect. \*Recovery is below 1/2 minimum reporting level (MRL). NA (not applicable); RPD calculation is not applicable.

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Bromodichloroacetic acid	Standard	40.0	42.8 µg/L	107%	9803-295	1 80-120%
Chlorodibromoacetic acid	Duplicate	ND	ND µg/L	NA	9803-201	2
Chlorodibromoacetic acid	Matrix Spike	40.0	40.6 µg/L	102%	9803-252	2
Chlorodibromoacetic acid	Method Blank		ND* µg/L		9803-292	2
Chlorodibromoacetic acid	Secondary Source Std		ND µg/L		9803-293	2
Chlorodibromoacetic acid	Standard	20.0	22.1 µg/L	111%	9803-294	2 80-120%
Chlorodibromoacetic acid	Standard	20.0	23.0 µg/L	115%	9803-294	2 80-120%
Chlorodibromoacetic acid	Standard	40.0	42.0 µg/L	105%	9803-295	2 80-120%
Dibromoacetic acid	Duplicate	ND	ND µg/L	NA	9803-201	1
Dibromoacetic acid	Matrix Spike	40.0	33.4 µg/L	83%	9803-252	1
Dibromoacetic acid	Method Blank		ND* µg/L		9803-292	1
Dibromoacetic acid	Secondary Source Std	20.0	23.3 µg/L	117%	9803-293	1 70-130%
Dibromoacetic acid	Standard	20.0	23.0 µg/L	115%	9803-294	1 80-120%
Dibromoacetic acid	Standard	20.0	23.1 µg/L	116%	9803-294	1 80-120%
Dibromoacetic acid	Standard	40.0	39.3 µg/L	98%	9803-295	1 80-120%
Dichloroacetic acid	Duplicate	5.0	4.8 µg/L	4.1%	9803-201	1
Dichloroacetic acid	Matrix Spike	40.0	40.2 µg/L	101%	9803-252	1
Dichloroacetic acid	Method Blank		ND* µg/L		9803-292	1
Dichloroacetic acid	Secondary Source Std	20.0	21.3 µg/L	106%	9803-293	1 70-130%
Dichloroacetic acid	Standard	20.0	20.4 µg/L	102%	9803-294	1 80-120%
Dichloroacetic acid	Standard	20.0	20.5 µg/L	102%	9803-294	1 80-120%
Dichloroacetic acid	Standard	40.0	40.1 µg/L	100%	9803-295	1 80-120%
Monobromoacetic acid	Duplicate	ND	ND µg/L	NA	9803-201	1
Monobromoacetic acid	Matrix Spike	40.0	43.4 µg/L	109%	9803-252	1
Monobromoacetic acid	Method Blank		ND* µg/L		9803-292	1
Monobromoacetic acid	Secondary Source Std	20.0	20.9 µg/L	104%	9803-293	1 70-130%
Monobromoacetic acid	Standard	20.0	20.4 µg/L	102%	9803-294	1 80-120%
Monobromoacetic acid	Standard	20.0	19.7 µg/L	98%	9803-294	1 80-120%
Monobromoacetic acid	Standard	40.0	38.7 µg/L	97%	9803-295	1 80-120%
Monochloroacetic acid	Duplicate	ND	ND µg/L	NA	9803-201	2
Monochloroacetic acid	Matrix Spike	40.0	38.9 µg/L	97%	9803-252	2
Monochloroacetic acid	Method Blank		ND* µg/L		9803-292	2

ND: non-detect. \*Recovery is below 1/2 minimum reporting level (MRL). NA (not applicable): RPD calculation is not applicable.

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Monochloroacetic acid	Secondary Source Std	20.0	23.6 µg/L	118%	9803-293	2	70-130%
Monochloroacetic acid	Standard	20.0	19.3 µg/L	97%	9803-294	2	80-120%
Monochloroacetic acid	Standard	20.0	20.6 µg/L	103%	9803-294	2	80-120%
Monochloroacetic acid	Standard	40.0	40.8 µg/L	102%	9803-295	2	80-120%
Tribromoacetic acid	Duplicate	ND	ND µg/L	NA	9803-201	4	
Tribromoacetic acid	Matrix Spike	40.0	42.6 µg/L	106%	9803-252	4	
Tribromoacetic acid	Method Blank		ND* µg/L		9803-292	4	
Tribromoacetic acid	Secondary Source Std		ND µg/L		9803-293	4	
Tribromoacetic acid	Standard	20.0	22.6 µg/L	113%	9803-294	4	80-120%
Tribromoacetic acid	Standard	20.0	23.9 µg/L	119%	9803-294	4	80-120%
Tribromoacetic acid	Standard	40.0	39.6 µg/L	99%	9803-295	4	80-120%
Trichloroacetic acid	Duplicate	ND	ND µg/L	NA	9803-201	1	
Trichloroacetic acid	Matrix Spike	40.0	34.1 µg/L	85%	9803-252	1	
Trichloroacetic acid	Method Blank		ND* µg/L		9803-292	1	
Trichloroacetic acid	Secondary Source Std	20.0	22.6 µg/L	113%	9803-293	1	70-130%
Trichloroacetic acid	Standard	20.0	23.3 µg/L	117%	9803-294	1	80-120%
Trichloroacetic acid	Standard	20.0	23.1 µg/L	116%	9803-294	1	80-120%
Trichloroacetic acid	Standard	40.0	38.6 µg/L	97%	9803-295	1	80-120%

**Analysis:** HAA-ICR (Haloacetic Acids)**Method:** EPA 552.2**QC Batch ID:** 0-103-0

								Acceptance Criteria		
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range	RPD
Bromochloroacetic acid	Duplicate	1.3	1.0	µg/L		26.1%	9803-278	1		
Bromochloroacetic acid	Matrix Spike	40.0	39.8	µg/L	99%		9804-57	1		
Bromochloroacetic acid	Method Blank		ND*	µg/L			9804-132	1		
Bromochloroacetic acid	Standard	20.0	19.1	µg/L	96%		9804-133	1	80-120%	
Bromochloroacetic acid	Standard	20.0	22.5	µg/L	113%		9804-133	1	80-120%	
Bromochloroacetic acid	Standard	40.0	40.8	µg/L	102%		9803-295	1	80-120%	
Bromodichloroacetic acid	Duplicate	1.5	1.4	µg/L		6.9%	9803-278	1		
Bromodichloroacetic acid	Matrix Spike	40.0	38.7	µg/L	97%		9804-57	1		
Bromodichloroacetic acid	Method Blank		ND*	µg/L			9804-132	1		
Bromodichloroacetic acid	Standard	20.0	16.1	µg/L	81%		9804-133	1	80-120%	
Bromodichloroacetic acid	Standard	20.0	20.3	µg/L	102%		9804-133	1	80-120%	
Bromodichloroacetic acid	Standard	40.0	38.2	µg/L	96%		9803-295	1	80-120%	

ND: non-detect. \*Recovery is below 1/2 minimum reporting level (MRL). NA (not applicable): RPD calculation is not applicable.



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Chlorodibromoacetic acid	Duplicate	ND	ND	µg/L	NA	9803-278	2
Chlorodibromoacetic acid	Matrix Spike	40.0	39.6	µg/L	99%	9804-57	2
Chlorodibromoacetic acid	Method Blank		ND*	µg/L		9804-132	2
Chlorodibromoacetic acid	Standard	20.0	16.8	µg/L	84%	9804-133	2 80-120%
Chlorodibromoacetic acid	Standard	20.0	21.0	µg/L	105%	9804-133	2 80-120%
Chlorodibromoacetic acid	Standard	40.0	37.2	µg/L	93%	9803-295	2 80-120%
Dibromoacetic acid	Duplicate	ND	ND	µg/L	NA	9803-278	1
Dibromoacetic acid	Matrix Spike	40.0	36.4	µg/L	91%	9804-57	1
Dibromoacetic acid	Method Blank		ND*	µg/L		9804-132	1
Dibromoacetic acid	Standard	20.0	17.7	µg/L	89%	9804-133	1 80-120%
Dibromoacetic acid	Standard	20.0	22.7	µg/L	114%	9804-133	1 80-120%
Dibromoacetic acid	Standard	40.0	40.8	µg/L	102%	9803-295	1 80-120%
Dichloroacetic acid	Duplicate	5.1	4.0	µg/L	24.2%	9803-278	1
Dichloroacetic acid	Matrix Spike	40.0	42.0	µg/L	105%	9804-57	1
Dichloroacetic acid	Method Blank		ND*	µg/L		9804-132	1
Dichloroacetic acid	Standard	20.0	19.8	µg/L	99%	9804-133	1 80-120%
Dichloroacetic acid	Standard	20.0	21.4	µg/L	107%	9804-133	1 80-120%
Dichloroacetic acid	Standard	40.0	40.6	µg/L	102%	9803-295	1 80-120%
Monobromoacetic acid	Duplicate	ND	ND	µg/L	NA	9803-278	1
Monobromoacetic acid	Matrix Spike	40.0	45.3	µg/L	113%	9804-57	1
Monobromoacetic acid	Method Blank		ND*	µg/L		9804-132	1
Monobromoacetic acid	Standard	20.0	21.9	µg/L	110%	9804-133	1 80-120%
Monobromoacetic acid	Standard	20.0	19.6	µg/L	98%	9804-133	1 80-120%
Monobromoacetic acid	Standard	40.0	38.0	µg/L	95%	9803-295	1 80-120%
Monochloroacetic acid	Duplicate	ND	ND	µg/L	NA	9803-278	2
Monochloroacetic acid	Matrix Spike	40.0	40.8	µg/L	102%	9804-57	2
Monochloroacetic acid	Method Blank		ND*	µg/L		9804-132	2
Monochloroacetic acid	Standard	20.0	20.6	µg/L	103%	9804-133	2 80-120%
Monochloroacetic acid	Standard	20.0	20.7	µg/L	103%	9804-133	2 80-120%
Monochloroacetic acid	Standard	40.0	40.1	µg/L	100%	9803-295	2 80-120%
Tribromoacetic acid	Duplicate	ND	ND	µg/L	NA	9803-278	4
Tribromoacetic acid	Matrix Spike	40.0	43.1	µg/L	108%	9804-57	4
Tribromoacetic acid	Method Blank		ND*	µg/L		9804-132	4
Tribromoacetic acid	Standard	20.0	20.5	µg/L	102%	9804-133	4 80-120%
Tribromoacetic acid	Standard	20.0	22.7	µg/L	114%	9804-133	4 80-120%

ND: non-detect. \*Recovery is below 1/2 minimum reporting level (MRL). NA (not applicable): RPD calculation is not applicable.

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**Study Title:** ICR RSSCT #1

Tribromoacetic acid	Standard	40.0	36.2 µg/L	91%	9803-295	4 80-120%
Trichloroacetic acid	Duplicate	7.0	5.2 µg/L	29.5%	9803-278	1
Trichloroacetic acid	Matrix Spike	40.0	36.2 µg/L	91%	9804-57	1
Trichloroacetic acid	Method Blank		ND* µg/L		9804-132	1
Trichloroacetic acid	Standard	20.0	18.1 µg/L	91%	9804-133	1 80-120%
Trichloroacetic acid	Standard	20.0	22.3 µg/L	112%	9804-133	1 80-120%
Trichloroacetic acid	Standard	40.0	37.5 µg/L	94%	9803-295	1 80-120%

**End of quality control report**

**QC Results from Montgomery Watson Laboratories**

Page 1 of 2

Printed on 6/23/99 10:55:58 PM

Mr. Joel Mohr  
Iowa-American Water Company  
230 East 2nd Street  
P.O. Box 979  
Davenport, IA 52805

**Study#:** 96  
**Study Title:** ICR RSSCT #1

Phone: 319-322-0161 Fax: 319-322-2190

**QC Batch ID:** 75171**Report #:** 41592**Analysis:** BR**Method:** ML/EPA 300

<u>QC</u>	<u>Analyte</u>	<u>Spike</u>	<u>Recovery</u>	<u>Yield</u>	<u>RPD</u>	<u>Acceptance Criteria Range</u>
LCS1	Bromide	0.02	0.019	95.0%		(50 - 150)
LCS2	Bromide	0.1	0.1	100.0%		(90 - 110)
MBLK	Bromide	ND	ND			(70 - 130)
MS	Bromide	0.1	0.11	110.0%		(70 - 130)
MSD	Bromide	0.1	0.11	110.0%		(70 - 130)

**QC Batch ID:** 75331**Report #:** 41592**Analysis:** NH3**Method:** ML/EPA 350.1

<u>QC</u>	<u>Analyte</u>	<u>Spike</u>	<u>Recovery</u>	<u>Yield</u>	<u>RPD</u>	<u>Acceptance Criteria Range</u>
LCS1	Ammonia Nitrogen	1	0.98	98.0%		(80 - 120)
LCS2	Ammonia Nitrogen	1	0.98	98.0%		(80 - 120)
MBLK	Ammonia Nitrogen	ND	ND			
MS	Ammonia Nitrogen	1	1.15	115.0%		(80 - 120)
MSD	Ammonia Nitrogen	1	1.14	114.0%		(80 - 120)

**QC Batch ID:** 75802**Report #:** 41919**Analysis:** BR**Method:** ML/EPA 300

<u>QC</u>	<u>Analyte</u>	<u>Spike</u>	<u>Recovery</u>	<u>Yield</u>	<u>RPD</u>	<u>Acceptance Criteria Range</u>
LCS1	Bromide	0.02	0.021	105.0%		(50 - 150)
LCS2	Bromide	0.1	0.1	100.0%		(90 - 110)
MBLK	Bromide	ND	ND			(70 - 130)
MS	Bromide	0.1	0.109	109.0%		(70 - 130)
MSD	Bromide	0.1	0.109	109.0%		(70 - 130)

**QC Batch ID:** 75858**Report #:** 41919**Analysis:** NH3**Method:** ML/EPA 350.1

<u>QC</u>	<u>Analyte</u>	<u>Spike</u>	<u>Recovery</u>	<u>Yield</u>	<u>RPD</u>	<u>Acceptance Criteria Range</u>
LCS1	Ammonia Nitrogen	1	1.02	102.0%		(80 - 120)
LCS2	Ammonia Nitrogen	1	1.04	104.0%		(80 - 120)
MBLK	Ammonia Nitrogen	ND	ND			
MS	Ammonia Nitrogen	1	1.08	108.0%		(80 - 120)

ND (non-detect): Result is below 1/2 minimum reporting level (MRL).

QC Results from Montgomery Watson Laboratories

Mr. Joel Mohr  
Iowa-American Water Company

Study#: 96  
Study Title: ICR RSSCT #1

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MSD	Ammonia Nitrogen	1	1.08	108.0%	(80 - 120)
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End of MW QC report

**Comments**Page 1 of 1  
Printed on 6/23/99

Mr. Joel Mohr  
Iowa-American Water Company  
230 East 2nd Street  
P.O. Box 979  
Davenport, IA 52805

Phone: 319-322-0161 Fax: 319-322-2190

**Study#:** 96  
**Study Title:** ICR RSSCT #1

**Analysis comments****Analysis:** Turbidity**Method:** SM 2130 B

Reported turbidity data has been rounded following the requirements of SM 2130 B, reproduced in the table below (Standard Methods, 1995). Note that the reported digits are not necessarily significant.

<b>Turbidity Range</b>	<b>Report to Nearest</b>
0-1.0	0.05
1-10	0.1
10-40	1
40-100	5
100-400	10
400-1000	50
> 1000	100

**End of comments**

## ***Laboratory Report***

**Client:**

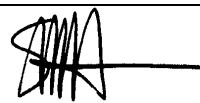
Mr. Joel Mohr  
Iowa-American Water Company  
230 E. 2<sup>nd</sup> Street  
P.O. Box 979  
Davenport, IA 52805

Phone: 319-322-0161 Fax: 319-322-2190

**Study Title:** ICR RSSCT #2

**Study #:** 150

**Reviewed By:** \_\_\_\_\_



Stuart M. Hooper

**Date Reviewed:** 6/23/99

**Laboratory Test Results**Page 1 of 37  
Printed on 6/23/99Mr. Joel Mohr  
Iowa-American Water Company  
230 East 2nd Street  
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Davenport, IA 52805

Phone: 319-322-0161 Fax: 319-322-2190

Study#: 150  
Study Title: ICR RSSCT #2

Sample ID: Settled Iowa			S&H ID: 9809-417		Date Sampled: 9/22/98 1:20:00 AM						
#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
1	TOC-ICR	TOC	3.15	mg/L	SM 5310 C	1	0.50	9/22/98		9/23/98	7-0-411
2	TOC-ICR	TOC (Dupl)	3.14	mg/L	SM 5310 C	1	0.50	9/22/98		9/23/98	7-0-411
			3.15	mg/L	0.3 % RPD						

Sample ID: Raw.Iowa		S&H ID: 9809-428		Date Sampled: 9/23/98 12:25:00 PM						
#	Analysis Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
3	TOC-ICR TOC	4.62	mg/L	SM 5310 C	1	0.50	9/23/98		10/6/98	7-0-423
4	TOC-ICR TOC (Dupl)	4.58	mg/L	SM 5310 C	1	0.50	9/23/98		10/6/98	7-0-423
		4.60	mg/L	0.9 % RPD						

Sample ID: SettledDrum.Iowa			S&H ID: 9809-429		Date Sampled: 9/23/98 2:00:00 PM						
#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
5	TOC-ICR	TOC	3.14	mg/L	SM 5310 C	1	0.50	9/23/98		10/6/98	7-0-423
6	TOC-ICR	TOC (Dupl)	3.18	mg/L	SM 5310 C	1	0.50	9/23/98		10/6/98	7-0-423
			3.16	mg/L	1.3 % RPD						

Sample ID: Filtered.Iowa			S&H ID: 9809-430		Date Sampled: 9/23/98 12:35:00 PM						
#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
7	TOC-ICR	TOC	2.67	mg/L	SM 5310 C	1	0.50	9/23/98		10/6/98	7-0-423
8	TOC-ICR	TOC (Dupl)	2.60	mg/L	SM 5310 C	1	0.50	9/23/98		10/6/98	7-0-423
			2.63	mg/L	2.7 % RPD						

Sample ID: Iowa Settled on Arrival		S&H ID: 9809-655		Date Sampled: 9/27/98 8:30:00 AM						
#	Analysis Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
9	TOC-ICR TOC	3.14	mg/L	SM 5310 C	1	0.50	9/27/98		10/6/98	7-0-423
10	TOC-ICR TOC (Dupl)	3.12	mg/L	SM 5310 C	1	0.50	9/27/98		10/6/98	7-0-423
		3.13	mg/L	0.6 % RPD						

Sample ID: Iowa Filtered on Arrival			S&H ID: 9809-656		Date Sampled: 9/27/98 8:30:00 AM						
#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
11	TOC-ICR	TOC	2.97	mg/L	SM 5310 C	1	0.50	9/27/98		10/6/98	7-0-423
12	TOC-ICR	TOC (Dupl)	2.98	mg/L	SM 5310 C	1	0.50	9/27/98		10/6/98	7-0-423
			2.98	mg/L	0.3 % RPD						

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 150  
Study Title: ICR RSSCT #2

Sample ID: Instantaneous DBPs		S&H ID: 9809-670		Date Sampled: 9/30/98 9:10:00 AM						
#	Analysis Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
13	HAA-ICR 1,2,3-Trichloropropane (IS) (Internal Standard)	88.0	%	EPA 552.2	1	1.0	9/30/98	9/30/98	10/1/98	0-222-0
14	HAA-ICR 2-Bromopropionic acid (Surrogate)	105.6	%	EPA 552.2	1	1.0	9/30/98	9/30/98	10/1/98	0-222-0
15	HAA-ICR Bromochloroacetic acid	ND	µg/L	EPA 552.2	1	1.0	9/30/98	9/30/98	10/1/98	0-222-0
16	HAA-ICR Bromodichloroacetic acid	ND	µg/L	EPA 552.2	1	1.0	9/30/98	9/30/98	10/1/98	0-222-0
17	HAA-ICR Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	9/30/98	9/30/98	10/1/98	0-222-0
18	HAA-ICR Dibromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	9/30/98	9/30/98	10/1/98	0-222-0
19	HAA-ICR Dichloroacetic acid	ND	µg/L	EPA 552.2	1	1.0	9/30/98	9/30/98	10/1/98	0-222-0
20	HAA-ICR Monobromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	9/30/98	9/30/98	10/1/98	0-222-0
21	HAA-ICR Monochloroacetic acid	ND	µg/L	EPA 552.2	1	2.0	9/30/98	9/30/98	10/1/98	0-222-0
22	HAA-ICR Tribromoacetic acid	ND	µg/L	EPA 552.2	1	4.0	9/30/98	9/30/98	10/1/98	0-222-0
23	HAA-ICR Trichloroacetic acid	ND	µg/L	EPA 552.2	1	1.0	9/30/98	9/30/98	10/1/98	0-222-0
24	THM-ICR 1,2,3-Trichloropropane (Surrogate)	105.2	%	EPA 551.1	1	1.0	9/30/98	10/2/98	10/2/98	0-223-0
25	THM-ICR Bromodichloromethane	ND	µg/L	EPA 551.1	1	1.0	9/30/98	10/2/98	10/2/98	0-223-0
26	THM-ICR Bromoform	ND	µg/L	EPA 551.1	1	1.0	9/30/98	10/2/98	10/2/98	0-223-0
27	THM-ICR Chloroform	ND	µg/L	EPA 551.1	1	1.0	9/30/98	10/2/98	10/2/98	0-223-0
28	THM-ICR Dibromochloromethane	ND	µg/L	EPA 551.1	1	1.0	9/30/98	10/2/98	10/2/98	0-223-0

Sample ID: 150.10.Eff-1		S&H ID: 9809-684		Date Sampled: 9/30/98 6:59:00 PM						
#	Analysis Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
29	Cl2Dose Chlorine Dose	2.52	mg/L as Cl2	SM 4500-Cl B	1	n/a	10/4/98		10/4/98	n/a
30	Cl2Res Chlorine Residual	0.88	mg/L as Cl2	SM 4500-Cl F	1	0.10	10/4/98		10/5/98	n/a
31	HAA-ICR 1,2,3-Trichloropropane (IS) (Internal Standard)	80.0	%	EPA 552.2	1	1.0	10/5/98	10/13/98	10/14/98	0-236-0
32	HAA-ICR 2-Bromopropionic acid (Surrogate)	100.8	%	EPA 552.2	1	1.0	10/5/98	10/13/98	10/14/98	0-236-0
33	HAA-ICR Bromochloroacetic acid	ND	µg/L	EPA 552.2	1	1.0	10/5/98	10/13/98	10/14/98	0-236-0
34	HAA-ICR Bromodichloroacetic acid	ND	µg/L	EPA 552.2	1	1.0	10/5/98	10/13/98	10/14/98	0-236-0
35	HAA-ICR Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	10/5/98	10/13/98	10/14/98	0-236-0
36	HAA-ICR Dibromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	10/5/98	10/13/98	10/14/98	0-236-0
37	HAA-ICR Dichloroacetic acid	ND	µg/L	EPA 552.2	1	1.0	10/5/98	10/13/98	10/14/98	0-236-0
38	HAA-ICR Monobromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	10/5/98	10/13/98	10/14/98	0-236-0
39	HAA-ICR Monochloroacetic acid	ND	µg/L	EPA 552.2	1	2.0	10/5/98	10/13/98	10/14/98	0-236-0
40	HAA-ICR Tribromoacetic acid	ND	µg/L	EPA 552.2	1	4.0	10/5/98	10/13/98	10/14/98	0-236-0
41	HAA-ICR Trichloroacetic acid	ND	µg/L	EPA 552.2	1	1.0	10/5/98	10/13/98	10/14/98	0-236-0
42	pH Cl2 pH - Final	7.5	Unit	SM 4500-H+ B	1	n/a	10/4/98		10/5/98	n/a

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.



**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 150  
Study Title: ICR RSSCT #2

43	pH	Cl2 pH - Initial	7.4 Unit	SM 4500-H+ B	1	n/a	10/4/98	10/4/98	n/a
44	pH	pH	7.8 Unit	SM 4500-H+ B	1	n/a	9/30/98	9/30/98	n/a
45	TEMP	Cl2 Temperature	19.8 °C	SM 2550 B	1	n/a	10/4/98	10/5/98	n/a
46	TEMP	Temperature	21.1 °C	SM 2550 B	1	n/a	9/30/98	9/30/98	n/a
47	TIME	Cl2 Incubation Time	24.0 hrs	n/a	1	n/a	10/4/98	10/5/98	n/a
48	TOC-ICR	TOC	ND mg/L	SM 5310 C	1	0.50	9/30/98	10/1/98	7-0-418
49	TOC-ICR	TOC (Dupl)	ND mg/L	SM 5310 C	1	0.50	9/30/98	10/1/98	7-0-418
			<b>ND mg/L</b>						
50	TOX-ICR	TOX	ND µg Cl-/L	SM 5320 B	1	25	10/5/98	10/12/98	12-0-223
51	TOX-ICR	TOX (Dupl)	ND µg Cl-/L	SM 5320 B	1	25	10/5/98	10/12/98	12-0-223
			<b>ND µg Cl-/L</b>						
52	THM-ICR	1,2,3-Trichloropropane (Surrogate)	97.2 %	EPA 551.1	1	1.0	10/5/98 10/16/98	10/16/98	0-238-0
53	THM-ICR	Bromodichloromethane	ND µg/L	EPA 551.1	1	1.0	10/5/98 10/16/98	10/16/98	0-238-0
54	THM-ICR	Bromoform	ND µg/L	EPA 551.1	1	1.0	10/5/98 10/16/98	10/16/98	0-238-0
55	THM-ICR	Chloroform	ND µg/L	EPA 551.1	1	1.0	10/5/98 10/16/98	10/16/98	0-238-0
56	THM-ICR	Dibromochloromethane	ND µg/L	EPA 551.1	1	1.0	10/5/98 10/16/98	10/16/98	0-238-0
57	UV-ICR	UV	ND 1/cm	SM 5910 B	1	0.009	9/30/98	10/1/98	8-0-312
58	UV-ICR	UV (Dupl)	ND 1/cm	SM 5910 B	1	0.009	9/30/98	10/1/98	8-0-312
			<b>ND 1/cm</b>						

Sample ID: 150.10.Eff-2

S&amp;H ID: 9809-685

Date Sampled: 10/1/98 9:59:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
59	Cl2Dose	Chlorine Dose	2.59	mg/L as Cl2	SM 4500-Cl B	1	n/a	10/4/98		10/4/98	n/a
60	Cl2Res	Chlorine Residual	0.78	mg/L as Cl2	SM 4500-Cl F	1	0.10	10/4/98		10/5/98	n/a
61	HAA-ICR	1,2,3-Trichloropropane (IS) (Internal Standard)	80.8	%	EPA 552.2	1	1.0	10/5/98 10/13/98		10/14/98	0-236-0
62	HAA-ICR	2-Bromopropionic acid (Surrogate)	100.0	%	EPA 552.2	1	1.0	10/5/98 10/13/98		10/14/98	0-236-0
63	HAA-ICR	Bromochloroacetic acid	1.0	µg/L	EPA 552.2	1	1.0	10/5/98 10/13/98		10/14/98	0-236-0
64	HAA-ICR	Bromodichloroacetic acid	ND	µg/L	EPA 552.2	1	1.0	10/5/98 10/13/98		10/14/98	0-236-0
65	HAA-ICR	Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	10/5/98 10/13/98		10/14/98	0-236-0
66	HAA-ICR	Dibromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	10/5/98 10/13/98		10/14/98	0-236-0
67	HAA-ICR	Dichloroacetic acid	ND	µg/L	EPA 552.2	1	1.0	10/5/98 10/13/98		10/14/98	0-236-0
68	HAA-ICR	Monobromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	10/5/98 10/13/98		10/14/98	0-236-0
69	HAA-ICR	Monochloroacetic acid	ND	µg/L	EPA 552.2	1	2.0	10/5/98 10/13/98		10/14/98	0-236-0
70	HAA-ICR	Tribromoacetic acid	ND	µg/L	EPA 552.2	1	4.0	10/5/98 10/13/98		10/14/98	0-236-0
71	HAA-ICR	Trichloroacetic acid	1.0	µg/L	EPA 552.2	1	1.0	10/5/98 10/13/98		10/14/98	0-236-0
72	pH	Cl2 pH - Final	7.4	Unit	SM 4500-H+ B	1	n/a	10/4/98		10/5/98	n/a
73	pH	Cl2 pH - Initial	7.3	Unit	SM 4500-H+ B	1	n/a	10/4/98		10/4/98	n/a
74	pH	pH	7.9	Unit	SM 4500-H+ B	1	n/a	10/1/98		10/1/98	n/a

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 150  
Study Title: ICR RSSCT #2

75	TEMP	Cl2 Temperature	19.8 °C	SM 2550 B	1	n/a	10/4/98	10/5/98	n/a
76	TEMP	Temperature	21.5 °C	SM 2550 B	1	n/a	10/1/98	10/1/98	n/a
77	TIME	Cl2 Incubation Time	24.0 hrs	n/a	1	n/a	10/4/98	10/5/98	n/a
78	TOC-ICR	TOC	ND mg/L	SM 5310 C	1	0.50	10/1/98	10/2/98	7-0-419
79	TOC-ICR	TOC (Dupl)	ND mg/L	SM 5310 C	1	0.50	10/1/98	10/2/98	7-0-419
			<b>ND mg/L</b>						
80	TOX-ICR	TOX	ND µg Cl-/L	SM 5320 B	1	25	10/5/98	10/12/98	12-0-223
81	TOX-ICR	TOX (Dupl)	ND µg Cl-/L	SM 5320 B	1	25	10/5/98	10/12/98	12-0-223
			<b>ND µg Cl-/L</b>						
82	THM-ICR	1,2,3-Trichloropropane (Surrogate)	98.8 %	EPA 551.1	1	1.0	10/5/98 10/16/98	10/16/98	0-238-0
83	THM-ICR	Bromodichloromethane	ND µg/L	EPA 551.1	1	1.0	10/5/98 10/16/98	10/16/98	0-238-0
84	THM-ICR	Bromoform	ND µg/L	EPA 551.1	1	1.0	10/5/98 10/16/98	10/16/98	0-238-0
85	THM-ICR	Chloroform	1.3 µg/L	EPA 551.1	1	1.0	10/5/98 10/16/98	10/16/98	0-238-0
86	THM-ICR	Dibromochloromethane	ND µg/L	EPA 551.1	1	1.0	10/5/98 10/16/98	10/16/98	0-238-0
87	UV-ICR	UV	ND 1/cm	SM 5910 B	1	0.009	10/1/98	10/2/98	8-0-313
88	UV-ICR	UV (Dupl)	ND 1/cm	SM 5910 B	1	0.009	10/1/98	10/2/98	8-0-313
			<b>ND 1/cm</b>						

Sample ID: 150.10.Eff-3

S&amp;H ID: 9809-686

Date Sampled: 10/2/98 3:24:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
89	Cl2Dose	Chlorine Dose	2.68	mg/L as Cl2	SM 4500-Cl B	1	n/a	10/4/98		10/4/98	n/a
90	Cl2Res	Chlorine Residual	0.81	mg/L as Cl2	SM 4500-Cl F	1	0.10	10/4/98		10/5/98	n/a
91	HAA-ICR	1,2,3-Trichloropropane (IS) (Internal Standard)	85.2	%	EPA 552.2	1	1.0	10/5/98 10/13/98		10/14/98	0-236-0
92	HAA-ICR	2-Bromopropionic acid (Surrogate)	97.2	%	EPA 552.2	1	1.0	10/5/98 10/13/98		10/14/98	0-236-0
93	HAA-ICR	Bromochloroacetic acid	1.1	µg/L	EPA 552.2	1	1.0	10/5/98 10/13/98		10/14/98	0-236-0
94	HAA-ICR	Bromodichloroacetic acid	ND	µg/L	EPA 552.2	1	1.0	10/5/98 10/13/98		10/14/98	0-236-0
95	HAA-ICR	Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	10/5/98 10/13/98		10/14/98	0-236-0
96	HAA-ICR	Dibromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	10/5/98 10/13/98		10/14/98	0-236-0
97	HAA-ICR	Dichloroacetic acid	1.3	µg/L	EPA 552.2	1	1.0	10/5/98 10/13/98		10/14/98	0-236-0
98	HAA-ICR	Monobromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	10/5/98 10/13/98		10/14/98	0-236-0
99	HAA-ICR	Monochloroacetic acid	ND	µg/L	EPA 552.2	1	2.0	10/5/98 10/13/98		10/14/98	0-236-0
100	HAA-ICR	Tribromoacetic acid	ND	µg/L	EPA 552.2	1	4.0	10/5/98 10/13/98		10/14/98	0-236-0
101	HAA-ICR	Trichloroacetic acid	1.2	µg/L	EPA 552.2	1	1.0	10/5/98 10/13/98		10/14/98	0-236-0
102	pH	Cl2 pH - Final	7.4	Unit	SM 4500-H+ B	1	n/a	10/4/98		10/5/98	n/a
103	pH	Cl2 pH - Initial	7.3	Unit	SM 4500-H+ B	1	n/a	10/4/98		10/4/98	n/a
104	pH	pH	7.9	Unit	SM 4500-H+ B	1	n/a	10/2/98		10/2/98	n/a
105	TEMP	Cl2 Temperature	19.8	°C	SM 2550 B	1	n/a	10/4/98		10/5/98	n/a

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 150  
Study Title: ICR RSSCT #2

106	TEMP	Temperature	22.0 °C	SM 2550 B	1	n/a	10/2/98	10/2/98	n/a
107	TIME	Cl2 Incubation Time	24.0 hrs	n/a	1	n/a	10/4/98	10/5/98	n/a
108	TOC-ICR	TOC	ND mg/L	SM 5310 C	1	0.50	10/2/98	10/2/98	7-0-419
109	TOC-ICR	TOC (Dupl)	ND mg/L	SM 5310 C	1	0.50	10/2/98	10/2/98	7-0-419
			<b>ND mg/L</b>						
110	TOX-ICR	TOX	ND µg Cl-/L	SM 5320 B	1	25	10/5/98	10/12/98	12-0-223
111	TOX-ICR	TOX (Dupl)	ND µg Cl-/L	SM 5320 B	1	25	10/5/98	10/12/98	12-0-223
			<b>ND µg Cl-/L</b>						
112	THM-ICR	1,2,3-Trichloropropane (Surrogate)	105.6 %	EPA 551.1	1	1.0	10/5/98 10/16/98	10/16/98	0-238-0
113	THM-ICR	Bromodichloromethane	1.4 µg/L	EPA 551.1	1	1.0	10/5/98 10/16/98	10/16/98	0-238-0
114	THM-ICR	Bromoform	ND µg/L	EPA 551.1	1	1.0	10/5/98 10/16/98	10/16/98	0-238-0
115	THM-ICR	Chloroform	1.7 µg/L	EPA 551.1	1	1.0	10/5/98 10/16/98	10/16/98	0-238-0
116	THM-ICR	Dibromochloromethane	1.1 µg/L	EPA 551.1	1	1.0	10/5/98 10/16/98	10/16/98	0-238-0
117	UV-ICR	UV	ND 1/cm	SM 5910 B	1	0.009	10/2/98	10/2/98	8-0-313
118	UV-ICR	UV (Dupl)	ND 1/cm	SM 5910 B	1	0.009	10/2/98	10/2/98	8-0-313
			<b>ND 1/cm</b>						

Sample ID: 150.10.Eff-4

S&amp;H ID: 9809-687

Date Sampled: 10/2/98 8:54:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
119	Cl2Dose	Chlorine Dose	2.74	mg/L as Cl2	SM 4500-Cl B	1	n/a	10/7/98		10/7/98	n/a
120	Cl2Res	Chlorine Residual	0.72	mg/L as Cl2	SM 4500-Cl F	1	0.10	10/7/98		10/8/98	n/a
121	HAA-ICR	1,2,3-Trichloropropane (IS) (Internal Standard)	81.6	%	EPA 552.2	1	1.0	10/8/98 10/13/98		10/15/98	0-236-0
122	HAA-ICR	2-Bromopropionic acid (Surrogate)	99.6	%	EPA 552.2	1	1.0	10/8/98 10/13/98		10/15/98	0-236-0
123	HAA-ICR	Bromochloroacetic acid	1.5	µg/L	EPA 552.2	1	1.0	10/8/98 10/13/98		10/15/98	0-236-0
124	HAA-ICR	Bromodichloroacetic acid	1.1	µg/L	EPA 552.2	1	1.0	10/8/98 10/13/98		10/15/98	0-236-0
125	HAA-ICR	Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	10/8/98 10/13/98		10/15/98	0-236-0
126	HAA-ICR	Dibromoacetic acid	1.1	µg/L	EPA 552.2	1	1.0	10/8/98 10/13/98		10/15/98	0-236-0
127	HAA-ICR	Dichloroacetic acid	1.9	µg/L	EPA 552.2	1	1.0	10/8/98 10/13/98		10/15/98	0-236-0
128	HAA-ICR	Monobromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	10/8/98 10/13/98		10/15/98	0-236-0
129	HAA-ICR	Monochloroacetic acid	ND	µg/L	EPA 552.2	1	2.0	10/8/98 10/13/98		10/15/98	0-236-0
130	HAA-ICR	Tribromoacetic acid	ND	µg/L	EPA 552.2	1	4.0	10/8/98 10/13/98		10/15/98	0-236-0
131	HAA-ICR	Trichloroacetic acid	1.6	µg/L	EPA 552.2	1	1.0	10/8/98 10/13/98		10/15/98	0-236-0
132	pH	Cl2 pH - Final	7.5	Unit	SM 4500-H+ B	1	n/a	10/7/98		10/8/98	n/a
133	pH	Cl2 pH - Initial	7.4	Unit	SM 4500-H+ B	1	n/a	10/7/98		10/7/98	n/a
134	pH	pH	7.6	Unit	SM 4500-H+ B	1	n/a	10/2/98		10/2/98	n/a
135	TEMP	Cl2 Temperature	19.9	°C	SM 2550 B	1	n/a	10/7/98		10/8/98	n/a
136	TEMP	Temperature	21.3	°C	SM 2550 B	1	n/a	10/2/98		10/2/98	n/a
137	TIME	Cl2 Incubation Time	23.9	hrs	n/a	1	n/a	10/7/98		10/8/98	n/a

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 150  
Study Title: ICR RSSCT #2

138	TOC-ICR TOC	0.56 mg/L	SM 5310 C	1	0.50	10/2/98	10/2/98	7-0-419
139	TOC-ICR TOC (Dupl)	0.56 mg/L	SM 5310 C	1	0.50	10/2/98	10/2/98	7-0-419
		<b>0.56 mg/L</b>	<b>0.0 % RPD</b>					
140	TOX-ICR TOX	26 µg Cl-/L	SM 5320 B	1	25	10/8/98	10/14/98	12-0-225
141	TOX-ICR TOX (Dupl)	25 µg Cl-/L	SM 5320 B	1	25	10/8/98	10/14/98	12-0-225
		<b>26 µg Cl-/L</b>	<b>3.8 % RPD</b>					
142	THM-ICR 1,2,3-Trichloropropane (Surrogate)	100.0 %	EPA 551.1	1	1.0	10/8/98	10/16/98	10/16/98 0-238-0
143	THM-ICR Bromodichloromethane	2.4 µg/L	EPA 551.1	1	1.0	10/8/98	10/16/98	10/16/98 0-238-0
144	THM-ICR Bromoform	ND µg/L	EPA 551.1	1	1.0	10/8/98	10/16/98	10/16/98 0-238-0
145	THM-ICR Chloroform	2.6 µg/L	EPA 551.1	1	1.0	10/8/98	10/16/98	10/16/98 0-238-0
146	THM-ICR Dibromochloromethane	1.7 µg/L	EPA 551.1	1	1.0	10/8/98	10/16/98	10/16/98 0-238-0
147	UV-ICR UV	ND 1/cm	SM 5910 B	1	0.009	10/2/98	10/2/98	8-0-313
148	UV-ICR UV (Dupl)	ND 1/cm	SM 5910 B	1	0.009	10/2/98	10/2/98	8-0-313
		<b>ND 1/cm</b>						

Sample ID: 150.10.Eff-5

S&amp;H ID: 9809-688

Date Sampled: 10/2/98 2:19:00 PM

#	Analysis Type	Result Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
149	Cl2Dose Chlorine Dose	2.98 mg/L as Cl2	SM 4500-Cl B	1	n/a	10/7/98		10/7/98	n/a
150	Cl2Res Chlorine Residual	0.90 mg/L as Cl2	SM 4500-Cl F	1	0.10	10/7/98		10/8/98	n/a
151	HAA-ICR 1,2,3-Trichloropropane (IS) (Internal Standard)	82.0 %	EPA 552.2	1	1.0	10/8/98	10/13/98	10/15/98	0-236-0
152	HAA-ICR 2-Bromopropionic acid (Surrogate)	103.2 %	EPA 552.2	1	1.0	10/8/98	10/13/98	10/15/98	0-236-0
153	HAA-ICR Bromochloroacetic acid	2.0 µg/L	EPA 552.2	1	1.0	10/8/98	10/13/98	10/15/98	0-236-0
154	HAA-ICR Bromodichloroacetic acid	1.6 µg/L	EPA 552.2	1	1.0	10/8/98	10/13/98	10/15/98	0-236-0
155	HAA-ICR Chlorodibromoacetic acid	ND µg/L	EPA 552.2	1	2.0	10/8/98	10/13/98	10/15/98	0-236-0
156	HAA-ICR Dibromoacetic acid	1.2 µg/L	EPA 552.2	1	1.0	10/8/98	10/13/98	10/15/98	0-236-0
157	HAA-ICR Dichloroacetic acid	3.2 µg/L	EPA 552.2	1	1.0	10/8/98	10/13/98	10/15/98	0-236-0
158	HAA-ICR Monobromoacetic acid	ND µg/L	EPA 552.2	1	1.0	10/8/98	10/13/98	10/15/98	0-236-0
159	HAA-ICR Monochloroacetic acid	ND µg/L	EPA 552.2	1	2.0	10/8/98	10/13/98	10/15/98	0-236-0
160	HAA-ICR Tribromoacetic acid	ND µg/L	EPA 552.2	1	4.0	10/8/98	10/13/98	10/15/98	0-236-0
161	HAA-ICR Trichloroacetic acid	2.7 µg/L	EPA 552.2	1	1.0	10/8/98	10/13/98	10/15/98	0-236-0
162	pH Cl2 pH - Final	7.5 Unit	SM 4500-H+ B	1	n/a	10/7/98		10/8/98	n/a
163	pH Cl2 pH - Initial	7.4 Unit	SM 4500-H+ B	1	n/a	10/7/98		10/7/98	n/a
164	pH pH	7.8 Unit	SM 4500-H+ B	1	n/a	10/2/98		10/2/98	n/a
165	TEMP Cl2 Temperature	19.9 °C	SM 2550 B	1	n/a	10/7/98		10/8/98	n/a
166	TEMP Temperature	21.6 °C	SM 2550 B	1	n/a	10/2/98		10/2/98	n/a
167	TIME Cl2 Incubation Time	23.9 hrs	n/a	1	n/a	10/7/98		10/8/98	n/a
168	TOC-ICR TOC	0.84 mg/L	SM 5310 C	1	0.50	10/2/98		10/2/98	7-0-419
169	TOC-ICR TOC (Dupl)	0.87 mg/L	SM 5310 C	1	0.50	10/2/98		10/2/98	7-0-419

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 150  
Study Title: ICR RSSCT #2

		0.85 mg/L	3.5 % RPD						
170	TOX-ICR TOX	39 µg Cl-/L	SM 5320 B	1	25	10/8/98	10/14/98	12-0-225	
171	TOX-ICR TOX (Dupl)	41 µg Cl-/L	SM 5320 B	1	25	10/8/98	10/14/98	12-0-225	
		40 µg Cl-/L	5.0 % RPD						
172	THM-ICR 1,2,3-Trichloropropane (Surrogate)	98.0 %	EPA 551.1	1	1.0	10/8/98 10/16/98	10/16/98	0-238-0	
173	THM-ICR Bromodichloromethane	3.8 µg/L	EPA 551.1	1	1.0	10/8/98 10/16/98	10/16/98	0-238-0	
174	THM-ICR Bromoform	ND µg/L	EPA 551.1	1	1.0	10/8/98 10/16/98	10/16/98	0-238-0	
175	THM-ICR Chloroform	4.7 µg/L	EPA 551.1	1	1.0	10/8/98 10/16/98	10/16/98	0-238-0	
176	THM-ICR Dibromochloromethane	2.4 µg/L	EPA 551.1	1	1.0	10/8/98 10/16/98	10/16/98	0-238-0	
177	UV-ICR UV	ND 1/cm	SM 5910 B	1	0.009	10/2/98	10/3/98	8-0-314	
178	UV-ICR UV (Dupl)	ND 1/cm	SM 5910 B	1	0.009	10/2/98	10/3/98	8-0-314	
		ND 1/cm							

Sample ID: 150.10.Eff-6

S&amp;H ID: 9809-689

Date Sampled: 10/2/98 5:14:00 PM

#	Analysis Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
179	Cl2Dose Chlorine Dose	3.16	mg/L as Cl2	SM 4500-Cl B	1	n/a	10/7/98		10/7/98	n/a
180	Cl2Res Chlorine Residual	0.92	mg/L as Cl2	SM 4500-Cl F	1	0.10	10/7/98		10/8/98	n/a
181	HAA-ICR 1,2,3-Trichloropropane (IS) (Internal Standard)	84.8	%	EPA 552.2	1	1.0	10/8/98 10/13/98		10/15/98	0-236-0
182	HAA-ICR 2-Bromopropionic acid (Surrogate)	98.8	%	EPA 552.2	1	1.0	10/8/98 10/13/98		10/15/98	0-236-0
183	HAA-ICR Bromochloroacetic acid	2.4	µg/L	EPA 552.2	1	1.0	10/8/98 10/13/98		10/15/98	0-236-0
184	HAA-ICR Bromodichloroacetic acid	1.8	µg/L	EPA 552.2	1	1.0	10/8/98 10/13/98		10/15/98	0-236-0
185	HAA-ICR Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	10/8/98 10/13/98		10/15/98	0-236-0
186	HAA-ICR Dibromoacetic acid	1.2	µg/L	EPA 552.2	1	1.0	10/8/98 10/13/98		10/15/98	0-236-0
187	HAA-ICR Dichloroacetic acid	4.0	µg/L	EPA 552.2	1	1.0	10/8/98 10/13/98		10/15/98	0-236-0
188	HAA-ICR Monobromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	10/8/98 10/13/98		10/15/98	0-236-0
189	HAA-ICR Monochloroacetic acid	ND	µg/L	EPA 552.2	1	2.0	10/8/98 10/13/98		10/15/98	0-236-0
190	HAA-ICR Tribromoacetic acid	ND	µg/L	EPA 552.2	1	4.0	10/8/98 10/13/98		10/15/98	0-236-0
191	HAA-ICR Trichloroacetic acid	3.2	µg/L	EPA 552.2	1	1.0	10/8/98 10/13/98		10/15/98	0-236-0
192	pH Cl2 pH - Final	7.5	Unit	SM 4500-H+ B	1	n/a	10/7/98		10/8/98	n/a
193	pH Cl2 pH - Initial	7.4	Unit	SM 4500-H+ B	1	n/a	10/7/98		10/7/98	n/a
194	TEMP Cl2 Temperature	19.9	°C	SM 2550 B	1	n/a	10/7/98		10/8/98	n/a
195	TEMP Temperature	21.5	°C	SM 2550 B	1	n/a	10/2/98		10/2/98	n/a
196	TIME Cl2 Incubation Time	23.9	hrs	n/a	1	n/a	10/7/98		10/8/98	n/a
197	TOC-ICR TOC	1.06	mg/L	SM 5310 C	1	0.50	10/2/98		10/2/98	7-0-419
198	TOC-ICR TOC (Dupl)	1.09	mg/L	SM 5310 C	1	0.50	10/2/98		10/2/98	7-0-419
		1.08 mg/L	2.8 % RPD							
199	TOX-ICR TOX	55 µg Cl-/L	SM 5320 B	1	25	10/8/98			10/14/98	12-0-225
200	TOX-ICR TOX (Dupl)	55 µg Cl-/L	SM 5320 B	1	25	10/8/98			10/14/98	12-0-225

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 150  
Study Title: ICR RSSCT #2

		55 µg Cl-/L	0.0 % RPD						
201	THM-ICR 1,2,3-Trichloropropane (Surrogate)	98.4 %	EPA 551.1	1	1.0	10/8/98	10/16/98	10/16/98	0-238-0
202	THM-ICR Bromodichloromethane	5.5 µg/L	EPA 551.1	1	1.0	10/8/98	10/16/98	10/16/98	0-238-0
203	THM-ICR Bromoform	ND µg/L	EPA 551.1	1	1.0	10/8/98	10/16/98	10/16/98	0-238-0
204	THM-ICR Chloroform	6.7 µg/L	EPA 551.1	1	1.0	10/8/98	10/16/98	10/16/98	0-238-0
205	THM-ICR Dibromochloromethane	2.8 µg/L	EPA 551.1	1	1.0	10/8/98	10/16/98	10/16/98	0-238-0
206	UV-ICR UV	0.012 1/cm	SM 5910 B	1	0.009	10/2/98		10/3/98	8-0-314
207	UV-ICR UV (Dupl)	0.012 1/cm	SM 5910 B	1	0.009	10/2/98		10/3/98	8-0-314
		0.012 1/cm	0.0 % RPD						

Sample ID: 150.10.Eff-8

S&amp;H ID: 9809-691

Date Sampled: 10/3/98 1:21:00 AM

#	Analysis Type	Result Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
208	Cl2Dose Chlorine Dose	3.31 mg/L as Cl2	SM 4500-Cl B	1	n/a	10/7/98		10/7/98	n/a
209	Cl2Res Chlorine Residual	1.01 mg/L as Cl2	SM 4500-Cl F	1	0.10	10/7/98		10/8/98	n/a
210	HAA-ICR 1,2,3-Trichloropropane (IS) (Internal Standard)	83.2 %	EPA 552.2	1	1.0	10/8/98	10/13/98	10/15/98	0-236-0
211	HAA-ICR 2-Bromopropionic acid (Surrogate)	98.8 %	EPA 552.2	1	1.0	10/8/98	10/13/98	10/15/98	0-236-0
212	HAA-ICR Bromochloroacetic acid	2.7 µg/L	EPA 552.2	1	1.0	10/8/98	10/13/98	10/15/98	0-236-0
213	HAA-ICR Bromodichloroacetic acid	2.0 µg/L	EPA 552.2	1	1.0	10/8/98	10/13/98	10/15/98	0-236-0
214	HAA-ICR Chlorodibromoacetic acid	ND µg/L	EPA 552.2	1	2.0	10/8/98	10/13/98	10/15/98	0-236-0
215	HAA-ICR Dibromoacetic acid	1.1 µg/L	EPA 552.2	1	1.0	10/8/98	10/13/98	10/15/98	0-236-0
216	HAA-ICR Dichloroacetic acid	4.9 µg/L	EPA 552.2	1	1.0	10/8/98	10/13/98	10/15/98	0-236-0
217	HAA-ICR Monobromoacetic acid	ND µg/L	EPA 552.2	1	1.0	10/8/98	10/13/98	10/15/98	0-236-0
218	HAA-ICR Monochloroacetic acid	ND µg/L	EPA 552.2	1	2.0	10/8/98	10/13/98	10/15/98	0-236-0
219	HAA-ICR Tribromoacetic acid	ND µg/L	EPA 552.2	1	4.0	10/8/98	10/13/98	10/15/98	0-236-0
220	HAA-ICR Trichloroacetic acid	4.1 µg/L	EPA 552.2	1	1.0	10/8/98	10/13/98	10/15/98	0-236-0
221	pH Cl2 pH - Final	7.5 Unit	SM 4500-H+ B	1	n/a	10/7/98		10/8/98	n/a
222	pH Cl2 pH - Initial	7.4 Unit	SM 4500-H+ B	1	n/a	10/7/98		10/7/98	n/a
223	pH pH	7.9 Unit	SM 4500-H+ B	1	n/a	10/3/98		10/3/98	n/a
224	TEMP Cl2 Temperature	19.9 °C	SM 2550 B	1	n/a	10/7/98		10/8/98	n/a
225	TEMP Temperature	22.2 °C	SM 2550 B	1	n/a	10/3/98		10/3/98	n/a
226	TIME Cl2 Incubation Time	23.9 hrs	n/a	1	n/a	10/7/98		10/8/98	n/a
227	TOC-ICR TOC	1.27 mg/L	SM 5310 C	1	0.50	10/3/98		10/3/98	7-0-420
228	TOC-ICR TOC (Dupl)	1.27 mg/L	SM 5310 C	1	0.50	10/3/98		10/3/98	7-0-420
		1.27 mg/L	0.0 % RPD						
229	TOX-ICR TOX	69 µg Cl-/L	SM 5320 B	1	25	10/8/98		10/14/98	12-0-225
230	TOX-ICR TOX (Dupl)	74 µg Cl-/L	SM 5320 B	1	25	10/8/98		10/14/98	12-0-225
		72 µg Cl-/L	6.9 % RPD						

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 150  
Study Title: ICR RSSCT #2

231	THM-ICR 1,2,3-Trichloropropane (Surrogate)	94.0 %	EPA 551.1	1	1.0	10/8/98	10/16/98	10/16/98	0-238-0
232	THM-ICR Bromodichloromethane	6.0 µg/L	EPA 551.1	1	1.0	10/8/98	10/16/98	10/16/98	0-238-0
233	THM-ICR Bromoform	ND µg/L	EPA 551.1	1	1.0	10/8/98	10/16/98	10/16/98	0-238-0
234	THM-ICR Chloroform	8.4 µg/L	EPA 551.1	1	1.0	10/8/98	10/16/98	10/16/98	0-238-0
235	THM-ICR Dibromochloromethane	2.7 µg/L	EPA 551.1	1	1.0	10/8/98	10/16/98	10/16/98	0-238-0
236	UV-ICR UV	0.014 1/cm	SM 5910 B	1	0.009	10/3/98		10/3/98	8-0-314
237	UV-ICR UV (Dupl)	0.014 1/cm	SM 5910 B	1	0.009	10/3/98		10/3/98	8-0-314
		<b>0.014 1/cm</b>	<b>0.0 % RPD</b>						

Sample ID: 150.10.Eff-9

S&amp;H ID: 9809-692

Date Sampled: 10/3/98 6:45:00 AM

#	Analysis Type	Result Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
238	Cl2Dose Chlorine Dose	3.44 mg/L as Cl2	SM 4500-Cl B	1	n/a	10/7/98		10/7/98	n/a
239	Cl2Res Chlorine Residual	0.99 mg/L as Cl2	SM 4500-Cl F	1	0.10	10/7/98		10/8/98	n/a
240	HAA-ICR 1,2,3-Trichloropropane (IS) (Internal Standard)	81.6 %	EPA 552.2	1	1.0	10/8/98	10/13/98	10/15/98	0-236-0
241	HAA-ICR 2-Bromopropionic acid (Surrogate)	101.2 %	EPA 552.2	1	1.0	10/8/98	10/13/98	10/15/98	0-236-0
242	HAA-ICR Bromochloroacetic acid	2.8 µg/L	EPA 552.2	1	1.0	10/8/98	10/13/98	10/15/98	0-236-0
243	HAA-ICR Bromodichloroacetic acid	2.4 µg/L	EPA 552.2	1	1.0	10/8/98	10/13/98	10/15/98	0-236-0
244	HAA-ICR Chlorodibromoacetic acid	ND µg/L	EPA 552.2	1	2.0	10/8/98	10/13/98	10/15/98	0-236-0
245	HAA-ICR Dibromoacetic acid	1.2 µg/L	EPA 552.2	1	1.0	10/8/98	10/13/98	10/15/98	0-236-0
246	HAA-ICR Dichloroacetic acid	6.0 µg/L	EPA 552.2	1	1.0	10/8/98	10/13/98	10/15/98	0-236-0
247	HAA-ICR Monobromoacetic acid	ND µg/L	EPA 552.2	1	1.0	10/8/98	10/13/98	10/15/98	0-236-0
248	HAA-ICR Monochloroacetic acid	ND µg/L	EPA 552.2	1	2.0	10/8/98	10/13/98	10/15/98	0-236-0
249	HAA-ICR Tribromoacetic acid	ND µg/L	EPA 552.2	1	4.0	10/8/98	10/13/98	10/15/98	0-236-0
250	HAA-ICR Trichloroacetic acid	5.4 µg/L	EPA 552.2	1	1.0	10/8/98	10/13/98	10/15/98	0-236-0
251	pH Cl2 pH - Final	7.5 Unit	SM 4500-H+ B	1	n/a	10/7/98		10/8/98	n/a
252	pH Cl2 pH - Initial	7.4 Unit	SM 4500-H+ B	1	n/a	10/7/98		10/7/98	n/a
253	pH pH	7.8 Unit	SM 4500-H+ B	1	n/a	10/3/98		10/3/98	n/a
254	TEMP Cl2 Temperature	19.9 °C	SM 2550 B	1	n/a	10/7/98		10/8/98	n/a
255	TEMP Temperature	21.5 °C	SM 2550 B	1	n/a	10/3/98		10/3/98	n/a
256	TIME Cl2 Incubation Time	23.9 hrs	n/a	1	n/a	10/7/98		10/8/98	n/a
257	TOC-ICR TOC	1.44 mg/L	SM 5310 C	1	0.50	10/3/98		10/3/98	7-0-420
258	TOC-ICR TOC (Dupl)	1.42 mg/L	SM 5310 C	1	0.50	10/3/98		10/3/98	7-0-420
		<b>1.43 mg/L</b>	<b>1.4 % RPD</b>						
259	TOX-ICR TOX	87 µg Cl-/L	SM 5320 B	1	25	10/8/98		10/15/98	12-0-226
260	TOX-ICR TOX (Dupl)	88 µg Cl-/L	SM 5320 B	1	25	10/8/98		10/15/98	12-0-226
		<b>88 µg Cl-/L</b>	<b>1.1 % RPD</b>						
261	THM-ICR 1,2,3-Trichloropropane (Surrogate)	96.0 %	EPA 551.1	1	1.0	10/8/98	10/16/98	10/16/98	0-238-0

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 150  
Study Title: ICR RSSCT #2

262	THM-ICR Bromodichloromethane	7.4 µg/L	EPA 551.1	1	1.0	10/8/98	10/16/98	10/16/98	0-238-0
263	THM-ICR Bromoform	ND µg/L	EPA 551.1	1	1.0	10/8/98	10/16/98	10/16/98	0-238-0
264	THM-ICR Chloroform	11.8 µg/L	EPA 551.1	1	1.0	10/8/98	10/16/98	10/16/98	0-238-0
265	THM-ICR Dibromochloromethane	2.9 µg/L	EPA 551.1	1	1.0	10/8/98	10/16/98	10/16/98	0-238-0
266	UV-ICR UV	0.018 1/cm	SM 5910 B	1	0.009	10/3/98		10/4/98	8-0-315
267	UV-ICR UV (Dupl)	0.018 1/cm	SM 5910 B	1	0.009	10/3/98		10/4/98	8-0-315
		<b>0.018 1/cm</b>	<b>0.0 % RPD</b>						

Sample ID: 150.10.Eff-12

S&amp;H ID: 9809-695

Date Sampled: 10/3/98 8:28:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
268	Cl2Dose	Chlorine Dose	3.59	mg/L as Cl2	SM 4500-Cl B	1	n/a	10/7/98		10/7/98	n/a
269	Cl2Res	Chlorine Residual	0.92	mg/L as Cl2	SM 4500-Cl F	1	0.10	10/7/98		10/8/98	n/a
270	HAA-ICR	1,2,3-Trichloropropane (IS) (Internal Standard)	84.0	%	EPA 552.2	1	1.0	10/8/98	10/13/98	10/15/98	0-236-0
271	HAA-ICR	2-Bromopropionic acid (Surrogate)	100.0	%	EPA 552.2	1	1.0	10/8/98	10/13/98	10/15/98	0-236-0
272	HAA-ICR	Bromochloroacetic acid	3.1	µg/L	EPA 552.2	1	1.0	10/8/98	10/13/98	10/15/98	0-236-0
273	HAA-ICR	Bromodichloroacetic acid	2.3	µg/L	EPA 552.2	1	1.0	10/8/98	10/13/98	10/15/98	0-236-0
274	HAA-ICR	Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	10/8/98	10/13/98	10/15/98	0-236-0
275	HAA-ICR	Dibromoacetic acid	1.2	µg/L	EPA 552.2	1	1.0	10/8/98	10/13/98	10/15/98	0-236-0
276	HAA-ICR	Dichloroacetic acid	7.5	µg/L	EPA 552.2	1	1.0	10/8/98	10/13/98	10/15/98	0-236-0
277	HAA-ICR	Monobromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	10/8/98	10/13/98	10/15/98	0-236-0
278	HAA-ICR	Monochloroacetic acid	ND	µg/L	EPA 552.2	1	2.0	10/8/98	10/13/98	10/15/98	0-236-0
279	HAA-ICR	Tribromoacetic acid	ND	µg/L	EPA 552.2	1	4.0	10/8/98	10/13/98	10/15/98	0-236-0
280	HAA-ICR	Trichloroacetic acid	6.8	µg/L	EPA 552.2	1	1.0	10/8/98	10/13/98	10/15/98	0-236-0
281	pH	Cl2 pH - Final	7.5	Unit	SM 4500-H+ B	1	n/a	10/7/98		10/8/98	n/a
282	pH	Cl2 pH - Initial	7.4	Unit	SM 4500-H+ B	1	n/a	10/7/98		10/7/98	n/a
283	pH	pH	7.9	Unit	SM 4500-H+ B	1	n/a	10/3/98		10/3/98	n/a
284	TEMP	Cl2 Temperature	19.9	°C	SM 2550 B	1	n/a	10/7/98		10/8/98	n/a
285	TEMP	Temperature	22.1	°C	SM 2550 B	1	n/a	10/3/98		10/3/98	n/a
286	TIME	Cl2 Incubation Time	23.9	hrs	n/a	1	n/a	10/7/98		10/8/98	n/a
287	TOC-ICR	TOC	1.62	mg/L	SM 5310 C	1	0.50	10/3/98		10/4/98	7-0-421
288	TOC-ICR	TOC (Dupl)	1.62	mg/L	SM 5310 C	1	0.50	10/3/98		10/4/98	7-0-421
			<b>1.62 mg/L</b>		<b>0.0 % RPD</b>						
289	TOX-ICR	TOX	108	µg Cl-/L	SM 5320 B	1	25	10/8/98		10/15/98	12-0-226
290	TOX-ICR	TOX (Dupl)	105	µg Cl-/L	SM 5320 B	1	25	10/8/98		10/15/98	12-0-226
			<b>107 µg Cl-/L</b>		<b>2.8 % RPD</b>						
291	THM-ICR	1,2,3-Trichloropropane (Surrogate)	101.2	%	EPA 551.1	1	1.0	10/8/98	10/16/98	10/16/98	0-238-0
292	THM-ICR	Bromodichloromethane	8.4	µg/L	EPA 551.1	1	1.0	10/8/98	10/16/98	10/16/98	0-238-0
293	THM-ICR	Bromoform	ND	µg/L	EPA 551.1	1	1.0	10/8/98	10/16/98	10/16/98	0-238-0

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.



**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 150  
Study Title: ICR RSSCT #2

294	THM-ICR Chloroform	15.7 µg/L	EPA 551.1	1	1.0	10/8/98	10/16/98	10/16/98	0-238-0
295	THM-ICR Dibromochloromethane	2.9 µg/L	EPA 551.1	1	1.0	10/8/98	10/16/98	10/16/98	0-238-0
296	UV-ICR UV	0.021 1/cm	SM 5910 B	1	0.009	10/3/98		10/4/98	8-0-315
297	UV-ICR UV (Dupl)	0.022 1/cm	SM 5910 B	1	0.009	10/3/98		10/4/98	8-0-315
		<b>0.021 1/cm</b>	<b>4.8 % RPD</b>						
<hr/>									
Sample ID: 150.10.Eff-13		S&H ID: 9809-696		Date Sampled: 10/4/98 7:24:00 AM					
#	Analysis Type	Result Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
298	Cl2Dose Chlorine Dose	3.41 mg/L as Cl2	SM 4500-Cl B	1	n/a	10/8/98		10/8/98	n/a
299	Cl2Res Chlorine Residual	0.79 mg/L as Cl2	SM 4500-Cl F	1	0.10	10/8/98		10/9/98	n/a
300	HAA-ICR 1,2,3-Trichloropropane (IS) (Internal Standard)	95.6 %	EPA 552.2	1	1.0	10/9/98	10/15/98	10/15/98	0-237-0
301	HAA-ICR 2-Bromopropionic acid (Surrogate)	102.4 %	EPA 552.2	1	1.0	10/9/98	10/15/98	10/15/98	0-237-0
302	HAA-ICR Bromochloroacetic acid	3.0 µg/L	EPA 552.2	1	1.0	10/9/98	10/15/98	10/15/98	0-237-0
303	HAA-ICR Bromodichloroacetic acid	3.3 µg/L	EPA 552.2	1	1.0	10/9/98	10/15/98	10/15/98	0-237-0
304	HAA-ICR Chlorodibromoacetic acid	ND µg/L	EPA 552.2	1	2.0	10/9/98	10/15/98	10/15/98	0-237-0
305	HAA-ICR Dibromoacetic acid	ND µg/L	EPA 552.2	1	1.0	10/9/98	10/15/98	10/15/98	0-237-0
306	HAA-ICR Dichloroacetic acid	8.3 µg/L	EPA 552.2	1	1.0	10/9/98	10/15/98	10/15/98	0-237-0
307	HAA-ICR Monobromoacetic acid	ND µg/L	EPA 552.2	1	1.0	10/9/98	10/15/98	10/15/98	0-237-0
308	HAA-ICR Monochloroacetic acid	ND µg/L	EPA 552.2	1	2.0	10/9/98	10/15/98	10/15/98	0-237-0
309	HAA-ICR Tribromoacetic acid	ND µg/L	EPA 552.2	1	4.0	10/9/98	10/15/98	10/15/98	0-237-0
310	HAA-ICR Trichloroacetic acid	8.6 µg/L	EPA 552.2	1	1.0	10/9/98	10/15/98	10/15/98	0-237-0
311	pH Cl2 pH - Final	7.5 Unit	SM 4500-H+ B	1	n/a	10/8/98		10/9/98	n/a
312	pH Cl2 pH - Initial	7.4 Unit	SM 4500-H+ B	1	n/a	10/8/98		10/8/98	n/a
313	pH pH	7.8 Unit	SM 4500-H+ B	1	n/a	10/4/98		10/4/98	n/a
314	TEMP Cl2 Temperature	20.0 °C	SM 2550 B	1	n/a	10/8/98		10/9/98	n/a
315	TEMP Temperature	21.5 °C	SM 2550 B	1	n/a	10/4/98		10/4/98	n/a
316	TIME Cl2 Incubation Time	23.9 hrs	n/a	1	n/a	10/8/98		10/9/98	n/a
317	TOC-ICR TOC	1.72 mg/L	SM 5310 C	1	0.50	10/4/98		10/4/98	7-0-421
318	TOC-ICR TOC (Dupl)	1.77 mg/L	SM 5310 C	1	0.50	10/4/98		10/4/98	7-0-421
		<b>1.75 mg/L</b>	<b>2.9 % RPD</b>						
319	TOX-ICR TOX	121 µg Cl-/L	SM 5320 B	1	25	10/9/98		10/19/98	12-0-228
320	TOX-ICR TOX (Dupl)	119 µg Cl-/L	SM 5320 B	1	25	10/9/98		10/19/98	12-0-228
		<b>120 µg Cl-/L</b>	<b>1.7 % RPD</b>						
321	THM-ICR 1,2,3-Trichloropropane (Surrogate)	100.4 %	EPA 551.1	1	1.0	10/9/98	10/16/98	10/16/98	0-238-0
322	THM-ICR Bromodichloromethane	9.6 µg/L	EPA 551.1	1	1.0	10/9/98	10/16/98	10/16/98	0-238-0
323	THM-ICR Bromoform	ND µg/L	EPA 551.1	1	1.0	10/9/98	10/16/98	10/16/98	0-238-0
324	THM-ICR Chloroform	18.6 µg/L	EPA 551.1	1	1.0	10/9/98	10/16/98	10/16/98	0-238-0
325	THM-ICR Dibromochloromethane	3.1 µg/L	EPA 551.1	1	1.0	10/9/98	10/16/98	10/16/98	0-238-0

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 150  
Study Title: ICR RSSCT #2

326	UV-ICR	UV	0.025	1/cm	SM 5910 B	1	0.009	10/4/98	10/4/98	8-0-315
327	UV-ICR	UV (Dupl)	0.025	1/cm	SM 5910 B	1	0.009	10/4/98	10/4/98	8-0-315
			<b>0.025</b>	<b>1/cm</b>	<b>0.0 % RPD</b>					
<hr/>										
Sample ID: 150.10.Eff-15			S&H ID: 9809-698		Date Sampled: 10/4/98 11:39:00 PM					
#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal. QC Batch
328	Cl2Dose	Chlorine Dose	3.56	mg/L as Cl2	SM 4500-Cl B	1	n/a	10/8/98		10/8/98 n/a
329	Cl2Res	Chlorine Residual	0.72	mg/L as Cl2	SM 4500-Cl F	1	0.10	10/8/98		10/9/98 n/a
330	HAA-ICR	1,2,3-Trichloropropane (IS) (Internal Standard)	95.6	%	EPA 552.2	1	1.0	10/9/98	10/15/98	10/15/98 0-237-0
331	HAA-ICR	2-Bromopropionic acid (Surrogate)	101.2	%	EPA 552.2	1	1.0	10/9/98	10/15/98	10/15/98 0-237-0
332	HAA-ICR	Bromochloroacetic acid	3.4	µg/L	EPA 552.2	1	1.0	10/9/98	10/15/98	10/15/98 0-237-0
333	HAA-ICR	Bromodichloroacetic acid	3.6	µg/L	EPA 552.2	1	1.0	10/9/98	10/15/98	10/15/98 0-237-0
334	HAA-ICR	Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	10/9/98	10/15/98	10/15/98 0-237-0
335	HAA-ICR	Dibromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	10/9/98	10/15/98	10/15/98 0-237-0
336	HAA-ICR	Dichloroacetic acid	10.5	µg/L	EPA 552.2	1	1.0	10/9/98	10/15/98	10/15/98 0-237-0
337	HAA-ICR	Monobromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	10/9/98	10/15/98	10/15/98 0-237-0
338	HAA-ICR	Monochloroacetic acid	ND	µg/L	EPA 552.2	1	2.0	10/9/98	10/15/98	10/15/98 0-237-0
339	HAA-ICR	Tribromoacetic acid	ND	µg/L	EPA 552.2	1	4.0	10/9/98	10/15/98	10/15/98 0-237-0
340	HAA-ICR	Trichloroacetic acid	11.5	µg/L	EPA 552.2	1	1.0	10/9/98	10/15/98	10/15/98 0-237-0
341	pH	Cl2 pH - Final	7.5	Unit	SM 4500-H+ B	1	n/a	10/8/98		10/9/98 n/a
342	pH	Cl2 pH - Initial	7.4	Unit	SM 4500-H+ B	1	n/a	10/8/98		10/8/98 n/a
343	pH	pH	7.9	Unit	SM 4500-H+ B	1	n/a	10/4/98		10/4/98 n/a
344	TEMP	Cl2 Temperature	20.0	°C	SM 2550 B	1	n/a	10/8/98		10/9/98 n/a
345	TEMP	Temperature	22.1	°C	SM 2550 B	1	n/a	10/4/98		10/4/98 n/a
346	TIME	Cl2 Incubation Time	23.9	hrs	n/a	1	n/a	10/8/98		10/9/98 n/a
347	TOC-ICR	TOC	1.96	mg/L	SM 5310 C	1	0.50	10/4/98		10/5/98 7-0-422
348	TOC-ICR	TOC (Dupl)	1.98	mg/L	SM 5310 C	1	0.50	10/4/98		10/5/98 7-0-422
			<b>1.97</b>	<b>mg/L</b>	<b>1.0 % RPD</b>					
349	TOX-ICR	TOX	143	µg Cl-/L	SM 5320 B	1	25	10/9/98		10/19/98 12-0-228
350	TOX-ICR	TOX (Dupl)	143	µg Cl-/L	SM 5320 B	1	25	10/9/98		10/19/98 12-0-228
			<b>143</b>	<b>µg Cl-/L</b>	<b>0.0 % RPD</b>					
351	THM-ICR	1,2,3-Trichloropropane (Surrogate)	105.2	%	EPA 551.1	1	1.0	10/9/98	10/16/98	10/16/98 0-238-0
352	THM-ICR	Bromodichloromethane	10.2	µg/L	EPA 551.1	1	1.0	10/9/98	10/16/98	10/16/98 0-238-0
353	THM-ICR	Bromoform	ND	µg/L	EPA 551.1	1	1.0	10/9/98	10/16/98	10/16/98 0-238-0
354	THM-ICR	Chloroform	21.8	µg/L	EPA 551.1	1	1.0	10/9/98	10/16/98	10/16/98 0-238-0
355	THM-ICR	Dibromochloromethane	2.9	µg/L	EPA 551.1	1	1.0	10/9/98	10/16/98	10/16/98 0-238-0
356	UV-ICR	UV	0.029	1/cm	SM 5910 B	1	0.009	10/4/98		10/5/98 8-0-317
357	UV-ICR	UV (Dupl)	0.029	1/cm	SM 5910 B	1	0.009	10/4/98		10/5/98 8-0-317

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 150  
Study Title: ICR RSSCT #2

0.029 1/cm

0.0 % RPD

Sample ID: 150.10.Eff-18

S&amp;H ID: 9809-701

Date Sampled: 10/6/98 2:46:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
358	Cl2Dose	Chlorine Dose	3.67	mg/L as Cl2	SM 4500-Cl B	1	n/a	10/8/98		10/8/98	n/a
359	Cl2Res	Chlorine Residual	0.81	mg/L as Cl2	SM 4500-Cl F	1	0.10	10/8/98		10/9/98	n/a
360	HAA-ICR	1,2,3-Trichloropropane (IS) (Internal Standard)	96.8	%	EPA 552.2	1	1.0	10/9/98	10/15/98	10/15/98	0-237-0
361	HAA-ICR	2-Bromopropionic acid (Surrogate)	101.2	%	EPA 552.2	1	1.0	10/9/98	10/15/98	10/15/98	0-237-0
362	HAA-ICR	Bromochloroacetic acid	3.6	µg/L	EPA 552.2	1	1.0	10/9/98	10/15/98	10/15/98	0-237-0
363	HAA-ICR	Bromodichloroacetic acid	3.9	µg/L	EPA 552.2	1	1.0	10/9/98	10/15/98	10/15/98	0-237-0
364	HAA-ICR	Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	10/9/98	10/15/98	10/15/98	0-237-0
365	HAA-ICR	Dibromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	10/9/98	10/15/98	10/15/98	0-237-0
366	HAA-ICR	Dichloroacetic acid	11.7	µg/L	EPA 552.2	1	1.0	10/9/98	10/15/98	10/15/98	0-237-0
367	HAA-ICR	Monobromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	10/9/98	10/15/98	10/15/98	0-237-0
368	HAA-ICR	Monochloroacetic acid	ND	µg/L	EPA 552.2	1	2.0	10/9/98	10/15/98	10/15/98	0-237-0
369	HAA-ICR	Tribromoacetic acid	ND	µg/L	EPA 552.2	1	4.0	10/9/98	10/15/98	10/15/98	0-237-0
370	HAA-ICR	Trichloroacetic acid	13.1	µg/L	EPA 552.2	1	1.0	10/9/98	10/15/98	10/15/98	0-237-0
371	pH	Cl2 pH - Final	7.5	Unit	SM 4500-H+ B	1	n/a	10/8/98		10/9/98	n/a
372	pH	Cl2 pH - Initial	7.4	Unit	SM 4500-H+ B	1	n/a	10/8/98		10/8/98	n/a
373	pH	pH	7.9	Unit	SM 4500-H+ B	1	n/a	10/6/98		10/6/98	n/a
374	TEMP	Cl2 Temperature	20.0	°C	SM 2550 B	1	n/a	10/8/98		10/9/98	n/a
375	TEMP	Temperature	21.5	°C	SM 2550 B	1	n/a	10/6/98		10/6/98	n/a
376	TIME	Cl2 Incubation Time	24.0	hrs	n/a	1	n/a	10/8/98		10/9/98	n/a
377	TOC-ICR	TOC	2.15	mg/L	SM 5310 C	1	0.50	10/6/98		10/6/98	7-0-423
378	TOC-ICR	TOC (Dupl)	2.17	mg/L	SM 5310 C	1	0.50	10/6/98		10/6/98	7-0-423
			<b>2.16</b>	<b>mg/L</b>	<b>0.9 % RPD</b>						
379	TOX-ICR	TOX	162	µg Cl-/L	SM 5320 B	1	25	10/9/98		10/19/98	12-0-228
380	TOX-ICR	TOX (Dupl)	164	µg Cl-/L	SM 5320 B	1	25	10/9/98		10/19/98	12-0-228
			<b>163</b>	<b>µg Cl-/L</b>	<b>1.2 % RPD</b>						
381	THM-ICR	1,2,3-Trichloropropane (Surrogate)	100.0	%	EPA 551.1	1	1.0	10/9/98	10/16/98	10/16/98	0-238-0
382	THM-ICR	Bromodichloromethane	11.7	µg/L	EPA 551.1	1	1.0	10/9/98	10/16/98	10/16/98	0-238-0
383	THM-ICR	Bromoform	ND	µg/L	EPA 551.1	1	1.0	10/9/98	10/16/98	10/16/98	0-238-0
384	THM-ICR	Chloroform	27.6	µg/L	EPA 551.1	1	1.0	10/9/98	10/16/98	10/16/98	0-238-0
385	THM-ICR	Dibromochloromethane	2.9	µg/L	EPA 551.1	1	1.0	10/9/98	10/16/98	10/16/98	0-238-0
386	UV-ICR	UV	0.034	1/cm	SM 5910 B	1	0.009	10/6/98		10/6/98	8-0-318
387	UV-ICR	UV (Dupl)	0.034	1/cm	SM 5910 B	1	0.009	10/6/98		10/6/98	8-0-318
			<b>0.034</b>	<b>1/cm</b>	<b>0.0 % RPD</b>						

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 150  
Study Title: ICR RSSCT #2

Sample ID: 150.10.Eff-19

S&amp;H ID: 9809-702

Date Sampled: 10/7/98 6:08:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
388	pH	pH	7.8	Unit	SM 4500-H+ B	1	n/a	10/7/98		10/7/98	n/a
389	TEMP	Temperature	21.2	°C	SM 2550 B	1	n/a	10/7/98		10/7/98	n/a
390	TOC-ICR	TOC	2.34	mg/L	SM 5310 C	1	0.50	10/7/98		10/7/98	7-0-424
391	TOC-ICR	TOC (Dupl)	2.37	mg/L	SM 5310 C	1	0.50	10/7/98		10/7/98	7-0-424
			<b>2.36</b>	<b>mg/L</b>	<b>1.3 % RPD</b>						
392	UV-ICR	UV	0.041	1/cm	SM 5910 B	1	0.009	10/7/98		10/7/98	8-0-319
393	UV-ICR	UV (Dupl)	0.041	1/cm	SM 5910 B	1	0.009	10/7/98		10/7/98	8-0-319
			<b>0.041</b>	<b>1/cm</b>	<b>0.0 % RPD</b>						

Sample ID: 150.10.Eff-5d

S&amp;H ID: 9809-714

Date Sampled: 10/2/98 2:19:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
394	Cl2Dose	Chlorine Dose	2.98	mg/L as Cl2	SM 4500-Cl B	1	n/a	10/7/98		10/7/98	n/a
395	Cl2Res	Chlorine Residual	0.90	mg/L as Cl2	SM 4500-Cl F	1	0.10	10/7/98		10/8/98	n/a
396	HAA-ICR	1,2,3-Trichloropropane (IS) (Internal Standard)	96.4	%	EPA 552.2	1	1.0	10/8/98	10/15/98	10/15/98	0-237-0
397	HAA-ICR	2-Bromopropionic acid (Surrogate)	104.4	%	EPA 552.2	1	1.0	10/8/98	10/15/98	10/15/98	0-237-0
398	HAA-ICR	Bromochloroacetic acid	1.9	µg/L	EPA 552.2	1	1.0	10/8/98	10/15/98	10/15/98	0-237-0
399	HAA-ICR	Bromodichloroacetic acid	1.9	µg/L	EPA 552.2	1	1.0	10/8/98	10/15/98	10/15/98	0-237-0
400	HAA-ICR	Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	10/8/98	10/15/98	10/15/98	0-237-0
401	HAA-ICR	Dibromoacetic acid	1.0	µg/L	EPA 552.2	1	1.0	10/8/98	10/15/98	10/15/98	0-237-0
402	HAA-ICR	Dichloroacetic acid	3.1	µg/L	EPA 552.2	1	1.0	10/8/98	10/15/98	10/15/98	0-237-0
403	HAA-ICR	Monobromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	10/8/98	10/15/98	10/15/98	0-237-0
404	HAA-ICR	Monochloroacetic acid	ND	µg/L	EPA 552.2	1	2.0	10/8/98	10/15/98	10/15/98	0-237-0
405	HAA-ICR	Tribromoacetic acid	ND	µg/L	EPA 552.2	1	4.0	10/8/98	10/15/98	10/15/98	0-237-0
406	HAA-ICR	Trichloroacetic acid	2.5	µg/L	EPA 552.2	1	1.0	10/8/98	10/15/98	10/15/98	0-237-0
407	pH	Cl2 pH - Final	7.5	Unit	SM 4500-H+ B	1	n/a	10/7/98		10/8/98	n/a
408	pH	Cl2 pH - Initial	7.4	Unit	SM 4500-H+ B	1	n/a	10/7/98		10/7/98	n/a
409	pH	pH	7.8	Unit	SM 4500-H+ B	1	n/a	10/2/98		10/2/98	n/a
410	TEMP	Cl2 Temperature	19.9	°C	SM 2550 B	1	n/a	10/7/98		10/8/98	n/a
411	TEMP	Temperature	22.0	°C	SM 2550 B	1	n/a	10/2/98		10/2/98	n/a
412	TIME	Cl2 Incubation Time	23.9	hrs	n/a	1	n/a	10/7/98		10/8/98	n/a
413	TOC-ICR	TOC	0.86	mg/L	SM 5310 C	1	0.50	10/2/98		10/2/98	7-0-419
414	TOC-ICR	TOC (Dupl)	0.86	mg/L	SM 5310 C	1	0.50	10/2/98		10/2/98	7-0-419
			<b>0.86</b>	<b>mg/L</b>	<b>0.0 % RPD</b>						
415	TOX-ICR	TOX	42	µg Cl-/L	SM 5320 B	1	25	10/8/98		10/14/98	12-0-225
416	TOX-ICR	TOX (Dupl)	43	µg Cl-/L	SM 5320 B	1	25	10/8/98		10/14/98	12-0-225

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 150  
Study Title: ICR RSSCT #2

		43 µg Cl-/L	2.3 % RPD						
417	THM-ICR 1,2,3-Trichloropropane (Surrogate)	100.0 %	EPA 551.1	1	1.0	10/8/98	10/16/98	10/16/98	0-238-0
418	THM-ICR Bromodichloromethane	3.9 µg/L	EPA 551.1	1	1.0	10/8/98	10/16/98	10/16/98	0-238-0
419	THM-ICR Bromoform	ND µg/L	EPA 551.1	1	1.0	10/8/98	10/16/98	10/16/98	0-238-0
420	THM-ICR Chloroform	4.8 µg/L	EPA 551.1	1	1.0	10/8/98	10/16/98	10/16/98	0-238-0
421	THM-ICR Dibromochloromethane	2.4 µg/L	EPA 551.1	1	1.0	10/8/98	10/16/98	10/16/98	0-238-0
422	UV-ICR UV	0.009 1/cm	SM 5910 B	1	0.009	10/2/98		10/3/98	8-0-314
423	UV-ICR UV (Dupl)	0.009 1/cm	SM 5910 B	1	0.009	10/2/98		10/3/98	8-0-314
		<b>0.009 1/cm</b>	<b>0.0 % RPD</b>						

Sample ID: 150.10.Eff-12d

S&amp;H ID: 9809-716

Date Sampled: 10/3/98 8:28:00 PM

#	Analysis Type	Result Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
424	Cl2Dose Chlorine Dose	3.59 mg/L as Cl2	SM 4500-Cl B	1	n/a	10/7/98		10/7/98	n/a
425	Cl2Res Chlorine Residual	1.01 mg/L as Cl2	SM 4500-Cl F	1	0.10	10/7/98		10/8/98	n/a
426	HAA-ICR 1,2,3-Trichloropropane (IS) (Internal Standard)	95.2 %	EPA 552.2	1	1.0	10/8/98	10/15/98	10/15/98	0-237-0
427	HAA-ICR 2-Bromopropionic acid (Surrogate)	102.4 %	EPA 552.2	1	1.0	10/8/98	10/15/98	10/15/98	0-237-0
428	HAA-ICR Bromochloroacetic acid	3.1 µg/L	EPA 552.2	1	1.0	10/8/98	10/15/98	10/15/98	0-237-0
429	HAA-ICR Bromodichloroacetic acid	3.4 µg/L	EPA 552.2	1	1.0	10/8/98	10/15/98	10/15/98	0-237-0
430	HAA-ICR Chlorodibromoacetic acid	ND µg/L	EPA 552.2	1	2.0	10/8/98	10/15/98	10/15/98	0-237-0
431	HAA-ICR Dibromoacetic acid	1.0 µg/L	EPA 552.2	1	1.0	10/8/98	10/15/98	10/15/98	0-237-0
432	HAA-ICR Dichloroacetic acid	8.0 µg/L	EPA 552.2	1	1.0	10/8/98	10/15/98	10/15/98	0-237-0
433	HAA-ICR Monobromoacetic acid	ND µg/L	EPA 552.2	1	1.0	10/8/98	10/15/98	10/15/98	0-237-0
434	HAA-ICR Monochloroacetic acid	ND µg/L	EPA 552.2	1	2.0	10/8/98	10/15/98	10/15/98	0-237-0
435	HAA-ICR Tribromoacetic acid	ND µg/L	EPA 552.2	1	4.0	10/8/98	10/15/98	10/15/98	0-237-0
436	HAA-ICR Trichloroacetic acid	7.4 µg/L	EPA 552.2	1	1.0	10/8/98	10/15/98	10/15/98	0-237-0
437	pH Cl2 pH - Final	7.5 Unit	SM 4500-H+ B	1	n/a	10/7/98		10/8/98	n/a
438	pH Cl2 pH - Initial	7.4 Unit	SM 4500-H+ B	1	n/a	10/7/98		10/7/98	n/a
439	pH pH	7.9 Unit	SM 4500-H+ B	1	n/a	10/3/98		10/3/98	n/a
440	TEMP Cl2 Temperature	19.9 °C	SM 2550 B	1	n/a	10/7/98		10/8/98	n/a
441	TEMP Temperature	22.1 °C	SM 2550 B	1	n/a	10/3/98		10/3/98	n/a
442	TIME Cl2 Incubation Time	24.0 hrs	n/a	1	n/a	10/7/98		10/8/98	n/a
443	TOC-ICR TOC	1.62 mg/L	SM 5310 C	1	0.50	10/3/98		10/4/98	7-0-421
444	TOC-ICR TOC (Dupl)	1.63 mg/L	SM 5310 C	1	0.50	10/3/98		10/4/98	7-0-421
		<b>1.63 mg/L</b>	<b>0.6 % RPD</b>						
445	TOX-ICR TOX	112 µg Cl-/L	SM 5320 B	1	25	10/8/98		10/15/98	12-0-226
446	TOX-ICR TOX (Dupl)	110 µg Cl-/L	SM 5320 B	1	25	10/8/98		10/15/98	12-0-226
		<b>111 µg Cl-/L</b>	<b>1.8 % RPD</b>						

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 150  
Study Title: ICR RSSCT #2

447	THM-ICR 1,2,3-Trichloropropane (Surrogate)	94.8 %	EPA 551.1	1	1.0	10/8/98	10/16/98	10/16/98	0-238-0
448	THM-ICR Bromodichloromethane	9.1 µg/L	EPA 551.1	1	1.0	10/8/98	10/16/98	10/16/98	0-238-0
449	THM-ICR Bromoform	ND µg/L	EPA 551.1	1	1.0	10/8/98	10/16/98	10/16/98	0-238-0
450	THM-ICR Chloroform	16.0 µg/L	EPA 551.1	1	1.0	10/8/98	10/16/98	10/16/98	0-238-0
451	THM-ICR Dibromochloromethane	3.2 µg/L	EPA 551.1	1	1.0	10/8/98	10/16/98	10/16/98	0-238-0
452	UV-ICR UV	0.022 1/cm	SM 5910 B	1	0.009	10/3/98		10/4/98	8-0-315
453	UV-ICR UV (Dupl)	0.022 1/cm	SM 5910 B	1	0.009	10/3/98		10/4/98	8-0-315
		<b>0.022 1/cm</b>	<b>0.0 % RPD</b>						

Sample ID: 150.10.Eff-15d

S&amp;H ID: 9809-717

Date Sampled: 10/4/98 11:39:00 PM

#	Analysis Type	Result Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
454	Cl2Dose Chlorine Dose	3.56 mg/L as Cl2	SM 4500-Cl B	1	n/a	10/8/98		10/8/98	n/a
455	Cl2Res Chlorine Residual	0.77 mg/L as Cl2	SM 4500-Cl F	1	0.10	10/8/98		10/9/98	n/a
456	HAA-ICR 1,2,3-Trichloropropane (IS) (Internal Standard)	96.8 %	EPA 552.2	1	1.0	10/9/98	10/15/98	10/15/98	0-237-0
457	HAA-ICR 2-Bromopropionic acid (Surrogate)	97.6 %	EPA 552.2	1	1.0	10/9/98	10/15/98	10/15/98	0-237-0
458	HAA-ICR Bromochloroacetic acid	2.7 µg/L	EPA 552.2	1	1.0	10/9/98	10/15/98	10/15/98	0-237-0
459	HAA-ICR Bromodichloroacetic acid	3.1 µg/L	EPA 552.2	1	1.0	10/9/98	10/15/98	10/15/98	0-237-0
460	HAA-ICR Chlorodibromoacetic acid	ND µg/L	EPA 552.2	1	2.0	10/9/98	10/15/98	10/15/98	0-237-0
461	HAA-ICR Dibromoacetic acid	ND µg/L	EPA 552.2	1	1.0	10/9/98	10/15/98	10/15/98	0-237-0
462	HAA-ICR Dichloroacetic acid	8.7 µg/L	EPA 552.2	1	1.0	10/9/98	10/15/98	10/15/98	0-237-0
463	HAA-ICR Monobromoacetic acid	ND µg/L	EPA 552.2	1	1.0	10/9/98	10/15/98	10/15/98	0-237-0
464	HAA-ICR Monochloroacetic acid	ND µg/L	EPA 552.2	1	2.0	10/9/98	10/15/98	10/15/98	0-237-0
465	HAA-ICR Tribromoacetic acid	ND µg/L	EPA 552.2	1	4.0	10/9/98	10/15/98	10/15/98	0-237-0
466	HAA-ICR Trichloroacetic acid	8.9 µg/L	EPA 552.2	1	1.0	10/9/98	10/15/98	10/15/98	0-237-0
467	pH Cl2 pH - Final	7.5 Unit	SM 4500-H+ B	1	n/a	10/8/98		10/9/98	n/a
468	pH Cl2 pH - Initial	7.4 Unit	SM 4500-H+ B	1	n/a	10/8/98		10/8/98	n/a
469	pH pH	7.9 Unit	SM 4500-H+ B	1	n/a	10/4/98		10/4/98	n/a
470	TEMP Cl2 Temperature	20.0 °C	SM 2550 B	1	n/a	10/8/98		10/9/98	n/a
471	TEMP Temperature	22.1 °C	SM 2550 B	1	n/a	10/4/98		10/4/98	n/a
472	TIME Cl2 Incubation Time	24.0 hrs	n/a	1	n/a	10/8/98		10/9/98	n/a
473	TOC-ICR TOC	1.97 mg/L	SM 5310 C	1	0.50	10/4/98		10/5/98	7-0-422
474	TOC-ICR TOC (Dupl)	1.96 mg/L	SM 5310 C	1	0.50	10/4/98		10/5/98	7-0-422
		<b>1.96 mg/L</b>	<b>0.5 % RPD</b>						
475	TOX-ICR TOX	148 µg Cl-/L	SM 5320 B	1	25	10/9/98		10/19/98	12-0-228
476	TOX-ICR TOX (Dupl)	142 µg Cl-/L	SM 5320 B	1	25	10/9/98		10/19/98	12-0-228
		<b>145 µg Cl-/L</b>	<b>4.1 % RPD</b>						
477	THM-ICR 1,2,3-Trichloropropane (Surrogate)	103.6 %	EPA 551.1	1	1.0	10/9/98	10/16/98	10/16/98	0-238-0

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 150  
Study Title: ICR RSSCT #2

478	THM-ICR Bromodichloromethane	10.6 µg/L	EPA 551.1	1	1.0	10/9/98	10/16/98	10/16/98	0-238-0
479	THM-ICR Bromoform	ND µg/L	EPA 551.1	1	1.0	10/9/98	10/16/98	10/16/98	0-238-0
480	THM-ICR Chloroform	22.9 µg/L	EPA 551.1	1	1.0	10/9/98	10/16/98	10/16/98	0-238-0
481	THM-ICR Dibromochloromethane	3.0 µg/L	EPA 551.1	1	1.0	10/9/98	10/16/98	10/16/98	0-238-0
482	UV-ICR UV	0.029 1/cm	SM 5910 B	1	0.009	10/4/98		10/5/98	8-0-317
483	UV-ICR UV (Dupl)	0.029 1/cm	SM 5910 B	1	0.009	10/4/98		10/5/98	8-0-317
		<b>0.029 1/cm</b>	<b>0.0 % RPD</b>						

Sample ID: 150.20.Eff-1

S&amp;H ID: 9809-724

Date Sampled: 9/30/98 6:57:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
484	Cl2Dose	Chlorine Dose	2.50	mg/L as Cl2	SM 4500-Cl B	1	n/a	10/4/98		10/4/98	n/a
485	Cl2Res	Chlorine Residual	0.89	mg/L as Cl2	SM 4500-Cl F	1	0.10	10/4/98		10/5/98	n/a
486	HAA-ICR	1,2,3-Trichloropropane (IS) (Internal Standard)	81.6	%	EPA 552.2	1	1.0	10/5/98	10/13/98	10/14/98	0-236-0
487	HAA-ICR	2-Bromopropionic acid (Surrogate)	100.4	%	EPA 552.2	1	1.0	10/5/98	10/13/98	10/14/98	0-236-0
488	HAA-ICR	Bromochloroacetic acid	ND	µg/L	EPA 552.2	1	1.0	10/5/98	10/13/98	10/14/98	0-236-0
489	HAA-ICR	Bromodichloroacetic acid	ND	µg/L	EPA 552.2	1	1.0	10/5/98	10/13/98	10/14/98	0-236-0
490	HAA-ICR	Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	10/5/98	10/13/98	10/14/98	0-236-0
491	HAA-ICR	Dibromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	10/5/98	10/13/98	10/14/98	0-236-0
492	HAA-ICR	Dichloroacetic acid	ND	µg/L	EPA 552.2	1	1.0	10/5/98	10/13/98	10/14/98	0-236-0
493	HAA-ICR	Monobromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	10/5/98	10/13/98	10/14/98	0-236-0
494	HAA-ICR	Monochloroacetic acid	ND	µg/L	EPA 552.2	1	2.0	10/5/98	10/13/98	10/14/98	0-236-0
495	HAA-ICR	Tribromoacetic acid	ND	µg/L	EPA 552.2	1	4.0	10/5/98	10/13/98	10/14/98	0-236-0
496	HAA-ICR	Trichloroacetic acid	ND	µg/L	EPA 552.2	1	1.0	10/5/98	10/13/98	10/14/98	0-236-0
497	pH	Cl2 pH - Final	7.5	Unit	SM 4500-H+ B	1	n/a	10/4/98		10/5/98	n/a
498	pH	Cl2 pH - Initial	7.4	Unit	SM 4500-H+ B	1	n/a	10/4/98		10/4/98	n/a
499	pH	pH	8.0	Unit	SM 4500-H+ B	1	n/a	9/30/98		9/30/98	n/a
500	TEMP	Cl2 Temperature	19.8	°C	SM 2550 B	1	n/a	10/4/98		10/5/98	n/a
501	TEMP	Temperature	21.8	°C	SM 2550 B	1	n/a	9/30/98		9/30/98	n/a
502	TIME	Cl2 Incubation Time	24.0	hrs	n/a	1	n/a	10/4/98		10/5/98	n/a
503	TOC-ICR	TOC	ND	mg/L	SM 5310 C	1	0.50	9/30/98		10/1/98	7-0-418
504	TOC-ICR	TOC (Dupl)	ND	mg/L	SM 5310 C	1	0.50	9/30/98		10/1/98	7-0-418
			<b>ND mg/L</b>								
505	TOX-ICR	TOX	ND	µg Cl-/L	SM 5320 B	1	25	10/5/98		10/12/98	12-0-223
506	TOX-ICR	TOX (Dupl)	ND	µg Cl-/L	SM 5320 B	1	25	10/5/98		10/12/98	12-0-223
			<b>ND µg Cl-/L</b>								
507	THM-ICR	1,2,3-Trichloropropane (Surrogate)	92.0	%	EPA 551.1	1	1.0	10/5/98	10/16/98	10/16/98	0-238-0
508	THM-ICR	Bromodichloromethane	ND	µg/L	EPA 551.1	1	1.0	10/5/98	10/16/98	10/16/98	0-238-0
509	THM-ICR	Bromoform	ND	µg/L	EPA 551.1	1	1.0	10/5/98	10/16/98	10/16/98	0-238-0

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 150  
Study Title: ICR RSSCT #2

510	THM-ICR Chloroform	ND µg/L	EPA 551.1	1	1.0	10/5/98	10/16/98	10/16/98	0-238-0
511	THM-ICR Dibromochloromethane	ND µg/L	EPA 551.1	1	1.0	10/5/98	10/16/98	10/16/98	0-238-0
512	UV-ICR UV	ND 1/cm	SM 5910 B	1	0.009	9/30/98		10/1/98	8-0-312
513	UV-ICR UV (Dupl)	ND 1/cm	SM 5910 B	1	0.009	9/30/98		10/1/98	8-0-312
		<b>ND 1/cm</b>							

Sample ID: 150.20.Eff-2

S&amp;H ID: 9809-725

Date Sampled: 10/4/98 3:23:00 AM

#	Analysis Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
514	Cl2Dose Chlorine Dose	2.52	mg/L as Cl2	SM 4500-Cl B	1	n/a	10/8/98		10/8/98	n/a
515	Cl2Res Chlorine Residual	0.69	mg/L as Cl2	SM 4500-Cl F	1	0.10	10/8/98		10/9/98	n/a
516	HAA-ICR 1,2,3-Trichloropropane (IS) (Internal Standard)	95.6	%	EPA 552.2	1	1.0	10/9/98	10/15/98	10/15/98	0-237-0
517	HAA-ICR 1,2,3-Trichloropropane (IS) (Internal Standard) (Lab Dupl)	93.6	%	EPA 552.2	1	1.0	10/9/98	10/15/98	10/15/98	0-237-0
		<b>94.6</b>	<b>%</b>	<b>2.1 % RPD</b>						
518	HAA-ICR 2-Bromopropionic acid (Surrogate)	100.0	%	EPA 552.2	1	1.0	10/9/98	10/15/98	10/15/98	0-237-0
519	HAA-ICR 2-Bromopropionic acid (Surrogate) (Lab Dupl)	100.4	%	EPA 552.2	1	1.0	10/9/98	10/15/98	10/15/98	0-237-0
		<b>100.2</b>	<b>%</b>	<b>0.4 % RPD</b>						
520	HAA-ICR Bromochloroacetic acid	ND	µg/L	EPA 552.2	1	1.0	10/9/98	10/15/98	10/15/98	0-237-0
521	HAA-ICR Bromochloroacetic acid (Lab Dupl)	ND	µg/L	EPA 552.2	1	1.0	10/9/98	10/15/98	10/15/98	0-237-0
		<b>ND</b>	<b>µg/L</b>							
522	HAA-ICR Bromodichloroacetic acid	1.2	µg/L	EPA 552.2	1	1.0	10/9/98	10/15/98	10/15/98	0-237-0
523	HAA-ICR Bromodichloroacetic acid (Lab Dupl)	1.2	µg/L	EPA 552.2	1	1.0	10/9/98	10/15/98	10/15/98	0-237-0
		<b>1.2</b>	<b>µg/L</b>	<b>0.0 % RPD</b>						
524	HAA-ICR Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	10/9/98	10/15/98	10/15/98	0-237-0
525	HAA-ICR Chlorodibromoacetic acid (Lab Dupl)	ND	µg/L	EPA 552.2	1	2.0	10/9/98	10/15/98	10/15/98	0-237-0
		<b>ND</b>	<b>µg/L</b>							
526	HAA-ICR Dibromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	10/9/98	10/15/98	10/15/98	0-237-0
527	HAA-ICR Dibromoacetic acid (Lab Dupl)	ND	µg/L	EPA 552.2	1	1.0	10/9/98	10/15/98	10/15/98	0-237-0
		<b>ND</b>	<b>µg/L</b>							
528	HAA-ICR Dichloroacetic acid	ND	µg/L	EPA 552.2	1	1.0	10/9/98	10/15/98	10/15/98	0-237-0
529	HAA-ICR Dichloroacetic acid (Lab Dupl)	ND	µg/L	EPA 552.2	1	1.0	10/9/98	10/15/98	10/15/98	0-237-0
		<b>ND</b>	<b>µg/L</b>							
530	HAA-ICR Monobromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	10/9/98	10/15/98	10/15/98	0-237-0
531	HAA-ICR Monobromoacetic acid (Lab Dupl)	ND	µg/L	EPA 552.2	1	1.0	10/9/98	10/15/98	10/15/98	0-237-0
		<b>ND</b>	<b>µg/L</b>							
532	HAA-ICR Monochloroacetic acid	ND	µg/L	EPA 552.2	1	2.0	10/9/98	10/15/98	10/15/98	0-237-0
533	HAA-ICR Monochloroacetic acid (Lab Dupl)	ND	µg/L	EPA 552.2	1	2.0	10/9/98	10/15/98	10/15/98	0-237-0

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.



**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 150  
Study Title: ICR RSSCT #2

			<b>ND µg/L</b>							
534	HAA-ICR	Tribromoacetic acid	ND µg/L	EPA 552.2	1	4.0	10/9/98	10/15/98	10/15/98	0-237-0
535	HAA-ICR	Tribromoacetic acid (Lab Dupl)	ND µg/L	EPA 552.2	1	4.0	10/9/98	10/15/98	10/15/98	0-237-0
			<b>ND µg/L</b>							
536	HAA-ICR	Trichloroacetic acid	ND µg/L	EPA 552.2	1	1.0	10/9/98	10/15/98	10/15/98	0-237-0
537	HAA-ICR	Trichloroacetic acid (Lab Dupl)	ND µg/L	EPA 552.2	1	1.0	10/9/98	10/15/98	10/15/98	0-237-0
			<b>ND µg/L</b>							
538	pH	Cl2 pH - Final	7.5 Unit	SM 4500-H+ B	1	n/a	10/8/98		10/9/98	n/a
539	pH	Cl2 pH - Initial	7.4 Unit	SM 4500-H+ B	1	n/a	10/8/98		10/8/98	n/a
540	pH	pH	7.9 Unit	SM 4500-H+ B	1	n/a	10/4/98		10/4/98	n/a
541	TEMP	Cl2 Temperature	20.0 °C	SM 2550 B	1	n/a	10/8/98		10/9/98	n/a
542	TEMP	Temperature	21.3 °C	SM 2550 B	1	n/a	10/4/98		10/4/98	n/a
543	TIME	Cl2 Incubation Time	24.0 hrs	n/a	1	n/a	10/8/98		10/9/98	n/a
544	TOC-ICR	TOC	ND mg/L	SM 5310 C	1	0.50	10/4/98		10/4/98	7-0-421
545	TOC-ICR	TOC (Dupl)	ND mg/L	SM 5310 C	1	0.50	10/4/98		10/4/98	7-0-421
			<b>ND mg/L</b>							
546	TOX-ICR	TOX	ND µg Cl-/L	SM 5320 B	1	25	10/9/98		10/19/98	12-0-228
547	TOX-ICR	TOX (Dupl)	ND µg Cl-/L	SM 5320 B	1	25	10/9/98		10/19/98	12-0-228
			<b>ND µg Cl-/L</b>							
548	THM-ICR	1,2,3-Trichloropropane (Surrogate)	100.8 %	EPA 551.1	1	1.0	10/9/98	10/16/98	10/16/98	0-238-0
549	THM-ICR	Bromodichloromethane	1.2 µg/L	EPA 551.1	1	1.0	10/9/98	10/16/98	10/16/98	0-238-0
550	THM-ICR	Bromoform	ND µg/L	EPA 551.1	1	1.0	10/9/98	10/16/98	10/16/98	0-238-0
551	THM-ICR	Chloroform	1.5 µg/L	EPA 551.1	1	1.0	10/9/98	10/16/98	10/16/98	0-238-0
552	THM-ICR	Dibromochloromethane	ND µg/L	EPA 551.1	1	1.0	10/9/98	10/16/98	10/16/98	0-238-0
553	UV-ICR	UV	ND 1/cm	SM 5910 B	1	0.009	10/4/98		10/4/98	8-0-316
554	UV-ICR	UV (Dupl)	ND 1/cm	SM 5910 B	1	0.009	10/4/98		10/4/98	8-0-316
			<b>ND 1/cm</b>							

Sample ID: 150.20.Eff-4

S&amp;H ID: 9809-727

Date Sampled: 10/4/98 2:18:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
555	Cl2Dose	Chlorine Dose	2.61	mg/L as Cl2	SM 4500-Cl B	1	n/a	10/8/98		10/8/98	n/a
556	Cl2Res	Chlorine Residual	0.75	mg/L as Cl2	SM 4500-Cl F	1	0.10	10/8/98		10/9/98	n/a
557	HAA-ICR	1,2,3-Trichloropropane (IS) (Internal Standard)	94.4	%	EPA 552.2	1	1.0	10/9/98	10/15/98	10/16/98	0-237-0
558	HAA-ICR	2-Bromopropionic acid (Surrogate)	100.0	%	EPA 552.2	1	1.0	10/9/98	10/15/98	10/16/98	0-237-0
559	HAA-ICR	Bromochloroacetic acid	1.0	µg/L	EPA 552.2	1	1.0	10/9/98	10/15/98	10/16/98	0-237-0
560	HAA-ICR	Bromodichloroacetic acid	1.4	µg/L	EPA 552.2	1	1.0	10/9/98	10/15/98	10/16/98	0-237-0
561	HAA-ICR	Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	10/9/98	10/15/98	10/16/98	0-237-0

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water Company**Study#:** 150  
**Study Title:** ICR RSSCT #2

562	HAA-ICR	Dibromoacetic acid	ND µg/L	EPA 552.2	1	1.0	10/9/98	10/15/98	10/16/98	0-237-0
563	HAA-ICR	Dichloroacetic acid	1.2 µg/L	EPA 552.2	1	1.0	10/9/98	10/15/98	10/16/98	0-237-0
564	HAA-ICR	Monobromoacetic acid	ND µg/L	EPA 552.2	1	1.0	10/9/98	10/15/98	10/16/98	0-237-0
565	HAA-ICR	Monochloroacetic acid	ND µg/L	EPA 552.2	1	2.0	10/9/98	10/15/98	10/16/98	0-237-0
566	HAA-ICR	Tribromoacetic acid	ND µg/L	EPA 552.2	1	4.0	10/9/98	10/15/98	10/16/98	0-237-0
567	HAA-ICR	Trichloroacetic acid	1.2 µg/L	EPA 552.2	1	1.0	10/9/98	10/15/98	10/16/98	0-237-0
568	pH	Cl2 pH - Final	7.5 Unit	SM 4500-H+ B	1	n/a	10/8/98		10/9/98	n/a
569	pH	Cl2 pH - Initial	7.4 Unit	SM 4500-H+ B	1	n/a	10/8/98		10/8/98	n/a
570	pH	pH	7.8 Unit	SM 4500-H+ B	1	n/a	10/4/98		10/4/98	n/a
571	TEMP	Cl2 Temperature	20.0 °C	SM 2550 B	1	n/a	10/8/98		10/9/98	n/a
572	TEMP	Temperature	21.9 °C	SM 2550 B	1	n/a	10/4/98		10/4/98	n/a
573	TIME	Cl2 Incubation Time	24.0 hrs	n/a	1	n/a	10/8/98		10/9/98	n/a
574	TOC-ICR	TOC	ND mg/L	SM 5310 C	1	0.50	10/4/98		10/4/98	7-0-421
575	TOC-ICR	TOC (Dupl)	ND mg/L	SM 5310 C	1	0.50	10/4/98		10/4/98	7-0-421
			<b>ND mg/L</b>							
576	TOX-ICR	TOX	ND µg Cl-/L	SM 5320 B	1	25	10/9/98		10/16/98	12-0-227
577	TOX-ICR	TOX (Dupl)	ND µg Cl-/L	SM 5320 B	1	25	10/9/98		10/16/98	12-0-227
			<b>ND µg Cl-/L</b>							
578	THM-ICR	1,2,3-Trichloropropane (Surrogate)	98.8 %	EPA 551.1	1	1.0	10/9/98	10/19/98	10/19/98	0-243-0
579	THM-ICR	Bromodichloromethane	1.8 µg/L	EPA 551.1	1	1.0	10/9/98	10/19/98	10/19/98	0-243-0
580	THM-ICR	Bromoform	ND µg/L	EPA 551.1	1	1.0	10/9/98	10/19/98	10/19/98	0-243-0
581	THM-ICR	Chloroform	2.1 µg/L	EPA 551.1	1	1.0	10/9/98	10/19/98	10/19/98	0-243-0
582	THM-ICR	Dibromochloromethane	1.4 µg/L	EPA 551.1	1	1.0	10/9/98	10/19/98	10/19/98	0-243-0
583	UV-ICR	UV	ND 1/cm	SM 5910 B	1	0.009	10/4/98		10/4/98	8-0-316
584	UV-ICR	UV (Dupl)	ND 1/cm	SM 5910 B	1	0.009	10/4/98		10/4/98	8-0-316
			<b>ND 1/cm</b>							

**Sample ID:** 150.20.Eff-5**S&H ID:** 9809-728**Date Sampled:** 10/5/98 1:13:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
585	Cl2Dose	Chlorine Dose	2.78	mg/L as Cl2	SM 4500-Cl B	1	n/a	10/8/98		10/8/98	n/a
586	Cl2Res	Chlorine Residual	0.82	mg/L as Cl2	SM 4500-Cl F	1	0.10	10/8/98		10/9/98	n/a
587	HAA-ICR	1,2,3-Trichloropropane (IS) (Internal Standard)	92.8	%	EPA 552.2	1	1.0	10/9/98	10/15/98	10/16/98	0-237-0
588	HAA-ICR	2-Bromopropionic acid (Surrogate)	98.4	%	EPA 552.2	1	1.0	10/9/98	10/15/98	10/16/98	0-237-0
589	HAA-ICR	Bromochloroacetic acid	1.4	µg/L	EPA 552.2	1	1.0	10/9/98	10/15/98	10/16/98	0-237-0
590	HAA-ICR	Bromodichloroacetic acid	1.6	µg/L	EPA 552.2	1	1.0	10/9/98	10/15/98	10/16/98	0-237-0
591	HAA-ICR	Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	10/9/98	10/15/98	10/16/98	0-237-0
592	HAA-ICR	Dibromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	10/9/98	10/15/98	10/16/98	0-237-0
593	HAA-ICR	Dichloroacetic acid	2.1	µg/L	EPA 552.2	1	1.0	10/9/98	10/15/98	10/16/98	0-237-0

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 150  
Study Title: ICR RSSCT #2

594	HAA-ICR	Monobromoacetic acid	ND µg/L	EPA 552.2	1	1.0	10/9/98	10/15/98	10/16/98	0-237-0
595	HAA-ICR	Monochloroacetic acid	ND µg/L	EPA 552.2	1	2.0	10/9/98	10/15/98	10/16/98	0-237-0
596	HAA-ICR	Tribromoacetic acid	ND µg/L	EPA 552.2	1	4.0	10/9/98	10/15/98	10/16/98	0-237-0
597	HAA-ICR	Trichloroacetic acid	1.7 µg/L	EPA 552.2	1	1.0	10/9/98	10/15/98	10/16/98	0-237-0
598	pH	Cl2 pH - Final	7.5 Unit	SM 4500-H+ B	1	n/a	10/8/98		10/9/98	n/a
599	pH	Cl2 pH - Initial	7.4 Unit	SM 4500-H+ B	1	n/a	10/8/98		10/8/98	n/a
600	pH	pH	8.0 Unit	SM 4500-H+ B	1	n/a	10/5/98		10/5/98	n/a
601	TEMP	Cl2 Temperature	20.0 °C	SM 2550 B	1	n/a	10/8/98		10/9/98	n/a
602	TEMP	Temperature	21.7 °C	SM 2550 B	1	n/a	10/5/98		10/5/98	n/a
603	TIME	Cl2 Incubation Time	24.0 hrs	n/a	1	n/a	10/8/98		10/9/98	n/a
604	TOC-ICR	TOC	0.70 mg/L	SM 5310 C	1	0.50	10/5/98		10/5/98	7-0-422
605	TOC-ICR	TOC (Dupl)	0.72 mg/L	SM 5310 C	1	0.50	10/5/98		10/5/98	7-0-422
			<b>0.71 mg/L</b>	<b>2.8 % RPD</b>						
606	TOX-ICR	TOX	29 µg Cl-/L	SM 5320 B	1	25	10/9/98		10/16/98	12-0-227
607	TOX-ICR	TOX (Dupl)	29 µg Cl-/L	SM 5320 B	1	25	10/9/98		10/16/98	12-0-227
			<b>29 µg Cl-/L</b>	<b>0.0 % RPD</b>						
608	THM-ICR	1,2,3-Trichloropropane (Surrogate)	100.4 %	EPA 551.1	1	1.0	10/9/98	10/19/98	10/19/98	0-243-0
609	THM-ICR	Bromodichloromethane	2.9 µg/L	EPA 551.1	1	1.0	10/9/98	10/19/98	10/19/98	0-243-0
610	THM-ICR	Bromoform	ND µg/L	EPA 551.1	1	1.0	10/9/98	10/19/98	10/19/98	0-243-0
611	THM-ICR	Chloroform	3.7 µg/L	EPA 551.1	1	1.0	10/9/98	10/19/98	10/19/98	0-243-0
612	THM-ICR	Dibromochloromethane	2.1 µg/L	EPA 551.1	1	1.0	10/9/98	10/19/98	10/19/98	0-243-0
613	UV-ICR	UV	ND 1/cm	SM 5910 B	1	0.009	10/5/98		10/5/98	8-0-317
614	UV-ICR	UV (Dupl)	ND 1/cm	SM 5910 B	1	0.009	10/5/98		10/5/98	8-0-317
			<b>ND 1/cm</b>							

Sample ID: 150.20.Eff-7

S&amp;H ID: 9809-730

Date Sampled: 10/5/98 12:21:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
615	Cl2Dose	Chlorine Dose	2.90	mg/L as Cl2	SM 4500-Cl B	1	n/a	10/8/98		10/8/98	n/a
616	Cl2Res	Chlorine Residual	0.81	mg/L as Cl2	SM 4500-Cl F	1	0.10	10/8/98		10/9/98	n/a
617	HAA-ICR	1,2,3-Trichloropropane (IS) (Internal Standard)	92.4	%	EPA 552.2	1	1.0	10/9/98	10/15/98	10/16/98	0-237-0
618	HAA-ICR	2-Bromopropionic acid (Surrogate)	100.8	%	EPA 552.2	1	1.0	10/9/98	10/15/98	10/16/98	0-237-0
619	HAA-ICR	Bromochloroacetic acid	1.7	µg/L	EPA 552.2	1	1.0	10/9/98	10/15/98	10/16/98	0-237-0
620	HAA-ICR	Bromodichloroacetic acid	1.9	µg/L	EPA 552.2	1	1.0	10/9/98	10/15/98	10/16/98	0-237-0
621	HAA-ICR	Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	10/9/98	10/15/98	10/16/98	0-237-0
622	HAA-ICR	Dibromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	10/9/98	10/15/98	10/16/98	0-237-0
623	HAA-ICR	Dichloroacetic acid	2.9	µg/L	EPA 552.2	1	1.0	10/9/98	10/15/98	10/16/98	0-237-0
624	HAA-ICR	Monobromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	10/9/98	10/15/98	10/16/98	0-237-0
625	HAA-ICR	Monochloroacetic acid	ND	µg/L	EPA 552.2	1	2.0	10/9/98	10/15/98	10/16/98	0-237-0

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 150  
Study Title: ICR RSSCT #2

626	HAA-ICR	Tribromoacetic acid	ND µg/L	EPA 552.2	1	4.0	10/9/98	10/15/98	10/16/98	0-237-0
627	HAA-ICR	Trichloroacetic acid	2.7 µg/L	EPA 552.2	1	1.0	10/9/98	10/15/98	10/16/98	0-237-0
628	pH	Cl2 pH - Final	7.4 Unit	SM 4500-H+ B	1	n/a	10/8/98		10/9/98	n/a
629	pH	Cl2 pH - Initial	7.4 Unit	SM 4500-H+ B	1	n/a	10/8/98		10/8/98	n/a
630	pH	pH	7.8 Unit	SM 4500-H+ B	1	n/a	10/5/98		10/5/98	n/a
631	TEMP	Cl2 Temperature	20.0 °C	SM 2550 B	1	n/a	10/8/98		10/9/98	n/a
632	TEMP	Temperature	21.4 °C	SM 2550 B	1	n/a	10/5/98		10/5/98	n/a
633	TIME	Cl2 Incubation Time	24.1 hrs	n/a	1	n/a	10/8/98		10/9/98	n/a
634	TOC-ICR	TOC	0.93 mg/L	SM 5310 C	1	0.50	10/5/98		10/5/98	7-0-422
635	TOC-ICR	TOC (Dupl)	0.91 mg/L	SM 5310 C	1	0.50	10/5/98		10/5/98	7-0-422
			<b>0.92 mg/L</b>	<b>2.2 % RPD</b>						
636	TOX-ICR	TOX	43 µg Cl-/L	SM 5320 B	1	25	10/9/98		10/16/98	12-0-227
637	TOX-ICR	TOX (Dupl)	40 µg Cl-/L	SM 5320 B	1	25	10/9/98		10/16/98	12-0-227
			<b>42 µg Cl-/L</b>	<b>7.1 % RPD</b>						
638	THM-ICR	1,2,3-Trichloropropane (Surrogate)	90.4 %	EPA 551.1	1	1.0	10/9/98	10/19/98	10/19/98	0-243-0
639	THM-ICR	Bromodichloromethane	4.4 µg/L	EPA 551.1	1	1.0	10/9/98	10/19/98	10/19/98	0-243-0
640	THM-ICR	Bromoform	ND µg/L	EPA 551.1	1	1.0	10/9/98	10/19/98	10/19/98	0-243-0
641	THM-ICR	Chloroform	6.0 µg/L	EPA 551.1	1	1.0	10/9/98	10/19/98	10/19/98	0-243-0
642	THM-ICR	Dibromochloromethane	2.8 µg/L	EPA 551.1	1	1.0	10/9/98	10/19/98	10/19/98	0-243-0
643	UV-ICR	UV	0.009 1/cm	SM 5910 B	1	0.009	10/5/98		10/6/98	8-0-318
644	UV-ICR	UV (Dupl)	0.009 1/cm	SM 5910 B	1	0.009	10/5/98		10/6/98	8-0-318
			<b>0.009 1/cm</b>	<b>0.0 % RPD</b>						

Sample ID: 150.20.Eff-9

S&amp;H ID: 9809-732

Date Sampled: 10/5/98 11:24:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
645	Cl2Dose	Chlorine Dose	2.98	mg/L as Cl2	SM 4500-Cl B	1	n/a	10/8/98		10/8/98	n/a
646	Cl2Res	Chlorine Residual	0.80	mg/L as Cl2	SM 4500-Cl F	1	0.10	10/8/98		10/9/98	n/a
647	HAA-ICR	1,2,3-Trichloropropane (IS) (Internal Standard)	93.6	%	EPA 552.2	1	1.0	10/9/98	10/15/98	10/16/98	0-237-0
648	HAA-ICR	2-Bromopropionic acid (Surrogate)	101.6	%	EPA 552.2	1	1.0	10/9/98	10/15/98	10/16/98	0-237-0
649	HAA-ICR	Bromochloroacetic acid	2.2	µg/L	EPA 552.2	1	1.0	10/9/98	10/15/98	10/16/98	0-237-0
650	HAA-ICR	Bromodichloroacetic acid	2.2	µg/L	EPA 552.2	1	1.0	10/9/98	10/15/98	10/16/98	0-237-0
651	HAA-ICR	Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	10/9/98	10/15/98	10/16/98	0-237-0
652	HAA-ICR	Dibromoacetic acid	1.1	µg/L	EPA 552.2	1	1.0	10/9/98	10/15/98	10/16/98	0-237-0
653	HAA-ICR	Dichloroacetic acid	4.0	µg/L	EPA 552.2	1	1.0	10/9/98	10/15/98	10/16/98	0-237-0
654	HAA-ICR	Monobromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	10/9/98	10/15/98	10/16/98	0-237-0
655	HAA-ICR	Monochloroacetic acid	ND	µg/L	EPA 552.2	1	2.0	10/9/98	10/15/98	10/16/98	0-237-0
656	HAA-ICR	Tribromoacetic acid	ND	µg/L	EPA 552.2	1	4.0	10/9/98	10/15/98	10/16/98	0-237-0
657	HAA-ICR	Trichloroacetic acid	4.0	µg/L	EPA 552.2	1	1.0	10/9/98	10/15/98	10/16/98	0-237-0

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 150  
Study Title: ICR RSSCT #2

658	pH	Cl2 pH - Final	7.4 Unit	SM 4500-H+ B	1	n/a	10/8/98	10/9/98	n/a
659	pH	Cl2 pH - Initial	7.4 Unit	SM 4500-H+ B	1	n/a	10/8/98	10/8/98	n/a
660	pH	pH	7.9 Unit	SM 4500-H+ B	1	n/a	10/5/98	10/5/98	n/a
661	TEMP	Cl2 Temperature	20.0 °C	SM 2550 B	1	n/a	10/8/98	10/9/98	n/a
662	TEMP	Temperature	21.4 °C	SM 2550 B	1	n/a	10/5/98	10/5/98	n/a
663	TIME	Cl2 Incubation Time	24.1 hrs	n/a	1	n/a	10/8/98	10/9/98	n/a
664	TOC-ICR	TOC	1.05 mg/L	SM 5310 C	1	0.50	10/5/98	10/6/98	7-0-423
665	TOC-ICR	TOC (Dupl)	1.04 mg/L	SM 5310 C	1	0.50	10/5/98	10/6/98	7-0-423
			<b>1.04 mg/L</b>	<b>1.0 % RPD</b>					
666	TOX-ICR	TOX	53 µg Cl-/L	SM 5320 B	1	25	10/9/98	10/16/98	12-0-227
667	TOX-ICR	TOX (Dupl)	49 µg Cl-/L	SM 5320 B	1	25	10/9/98	10/16/98	12-0-227
			<b>51 µg Cl-/L</b>	<b>7.8 % RPD</b>					
668	THM-ICR	1,2,3-Trichloropropane (Surrogate)	94.0 %	EPA 551.1	1	1.0	10/9/98	10/19/98	0-243-0
669	THM-ICR	Bromodichloromethane	4.8 µg/L	EPA 551.1	1	1.0	10/9/98	10/19/98	0-243-0
670	THM-ICR	Bromoform	ND µg/L	EPA 551.1	1	1.0	10/9/98	10/19/98	0-243-0
671	THM-ICR	Chloroform	7.1 µg/L	EPA 551.1	1	1.0	10/9/98	10/19/98	0-243-0
672	THM-ICR	Dibromochloromethane	2.8 µg/L	EPA 551.1	1	1.0	10/9/98	10/19/98	0-243-0
673	UV-ICR	UV	0.011 1/cm	SM 5910 B	1	0.009	10/5/98	10/6/98	8-0-318
674	UV-ICR	UV (Dupl)	0.011 1/cm	SM 5910 B	1	0.009	10/5/98	10/6/98	8-0-318
			<b>0.011 1/cm</b>	<b>0.0 % RPD</b>					

Sample ID: 150.20.Eff-11

S&amp;H ID: 9809-734

Date Sampled: 10/6/98 10:33:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
675	Cl2Dose	Chlorine Dose	3.07	mg/L as Cl2	SM 4500-Cl B	1	n/a	10/8/98		10/8/98	n/a
676	Cl2Res	Chlorine Residual	0.88	mg/L as Cl2	SM 4500-Cl F	1	0.10	10/8/98		10/9/98	n/a
677	HAA-ICR	1,2,3-Trichloropropane (IS) (Internal Standard)	91.6	%	EPA 552.2	1	1.0	10/9/98	10/15/98	10/16/98	0-237-0
678	HAA-ICR	2-Bromopropionic acid (Surrogate)	102.4	%	EPA 552.2	1	1.0	10/9/98	10/15/98	10/16/98	0-237-0
679	HAA-ICR	Bromochloroacetic acid	2.2	µg/L	EPA 552.2	1	1.0	10/9/98	10/15/98	10/16/98	0-237-0
680	HAA-ICR	Bromodichloroacetic acid	2.3	µg/L	EPA 552.2	1	1.0	10/9/98	10/15/98	10/16/98	0-237-0
681	HAA-ICR	Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	10/9/98	10/15/98	10/16/98	0-237-0
682	HAA-ICR	Dibromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	10/9/98	10/15/98	10/16/98	0-237-0
683	HAA-ICR	Dichloroacetic acid	4.4	µg/L	EPA 552.2	1	1.0	10/9/98	10/15/98	10/16/98	0-237-0
684	HAA-ICR	Monobromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	10/9/98	10/15/98	10/16/98	0-237-0
685	HAA-ICR	Monochloroacetic acid	ND	µg/L	EPA 552.2	1	2.0	10/9/98	10/15/98	10/16/98	0-237-0
686	HAA-ICR	Tribromoacetic acid	ND	µg/L	EPA 552.2	1	4.0	10/9/98	10/15/98	10/16/98	0-237-0
687	HAA-ICR	Trichloroacetic acid	4.2	µg/L	EPA 552.2	1	1.0	10/9/98	10/15/98	10/16/98	0-237-0
688	pH	Cl2 pH - Final	7.4	Unit	SM 4500-H+ B	1	n/a	10/8/98		10/9/98	n/a
689	pH	Cl2 pH - Initial	7.4	Unit	SM 4500-H+ B	1	n/a	10/8/98		10/8/98	n/a

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 150  
Study Title: ICR RSSCT #2

690	pH	pH	7.9	Unit	SM 4500-H+ B	1	n/a	10/6/98	10/6/98	n/a
691	TEMP	Cl2 Temperature	20.0	°C	SM 2550 B	1	n/a	10/8/98	10/9/98	n/a
692	TEMP	Temperature	21.4	°C	SM 2550 B	1	n/a	10/6/98	10/6/98	n/a
693	TIME	Cl2 Incubation Time	24.2	hrs	n/a	1	n/a	10/8/98	10/9/98	n/a
694	TOC-ICR	TOC	1.19	mg/L	SM 5310 C	1	0.50	10/6/98	10/6/98	7-0-423
695	TOC-ICR	TOC (Dupl)	1.18	mg/L	SM 5310 C	1	0.50	10/6/98	10/6/98	7-0-423
			<b>1.19</b>	<b>mg/L</b>	<b>0.8 % RPD</b>					
696	TOX-ICR	TOX	61	µg Cl-/L	SM 5320 B	1	25	10/9/98	10/16/98	12-0-227
697	TOX-ICR	TOX (Dupl)	63	µg Cl-/L	SM 5320 B	1	25	10/9/98	10/16/98	12-0-227
			<b>62</b>	<b>µg Cl-/L</b>	<b>3.2 % RPD</b>					
698	THM-ICR	1,2,3-Trichloropropane (Surrogate)	95.2	%	EPA 551.1	1	1.0	10/9/98	10/19/98	10/19/98 0-243-0
699	THM-ICR	Bromodichloromethane	5.6	µg/L	EPA 551.1	1	1.0	10/9/98	10/19/98	10/19/98 0-243-0
700	THM-ICR	Bromoform	ND	µg/L	EPA 551.1	1	1.0	10/9/98	10/19/98	10/19/98 0-243-0
701	THM-ICR	Chloroform	8.5	µg/L	EPA 551.1	1	1.0	10/9/98	10/19/98	10/19/98 0-243-0
702	THM-ICR	Dibromochloromethane	2.8	µg/L	EPA 551.1	1	1.0	10/9/98	10/19/98	10/19/98 0-243-0
703	UV-ICR	UV	0.013	1/cm	SM 5910 B	1	0.009	10/6/98	10/7/98	8-0-319
704	UV-ICR	UV (Dupl)	0.013	1/cm	SM 5910 B	1	0.009	10/6/98	10/7/98	8-0-319
			<b>0.013</b>	<b>1/cm</b>	<b>0.0 % RPD</b>					

Sample ID: 150.20.Eff-13

S&amp;H ID: 9809-736

Date Sampled: 10/7/98 8:32:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
705	Cl2Dose	Chlorine Dose	3.18	mg/L as Cl2	SM 4500-Cl B	1	n/a	10/8/98		10/8/98	n/a
706	Cl2Res	Chlorine Residual	0.84	mg/L as Cl2	SM 4500-Cl F	1	0.10	10/8/98		10/9/98	n/a
707	HAA-ICR	1,2,3-Trichloropropane (IS) (Internal Standard)	92.4	%	EPA 552.2	1	1.0	10/9/98	10/15/98	10/16/98	0-237-0
708	HAA-ICR	2-Bromopropionic acid (Surrogate)	101.6	%	EPA 552.2	1	1.0	10/9/98	10/15/98	10/16/98	0-237-0
709	HAA-ICR	Bromochloroacetic acid	2.6	µg/L	EPA 552.2	1	1.0	10/9/98	10/15/98	10/16/98	0-237-0
710	HAA-ICR	Bromodichloroacetic acid	2.7	µg/L	EPA 552.2	1	1.0	10/9/98	10/15/98	10/16/98	0-237-0
711	HAA-ICR	Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	10/9/98	10/15/98	10/16/98	0-237-0
712	HAA-ICR	Dibromoacetic acid	1.0	µg/L	EPA 552.2	1	1.0	10/9/98	10/15/98	10/16/98	0-237-0
713	HAA-ICR	Dichloroacetic acid	5.5	µg/L	EPA 552.2	1	1.0	10/9/98	10/15/98	10/16/98	0-237-0
714	HAA-ICR	Monobromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	10/9/98	10/15/98	10/16/98	0-237-0
715	HAA-ICR	Monochloroacetic acid	ND	µg/L	EPA 552.2	1	2.0	10/9/98	10/15/98	10/16/98	0-237-0
716	HAA-ICR	Tribromoacetic acid	ND	µg/L	EPA 552.2	1	4.0	10/9/98	10/15/98	10/16/98	0-237-0
717	HAA-ICR	Trichloroacetic acid	5.1	µg/L	EPA 552.2	1	1.0	10/9/98	10/15/98	10/16/98	0-237-0
718	pH	Cl2 pH - Final	7.4	Unit	SM 4500-H+ B	1	n/a	10/8/98		10/9/98	n/a
719	pH	Cl2 pH - Initial	7.3	Unit	SM 4500-H+ B	1	n/a	10/8/98		10/8/98	n/a
720	pH	pH	7.8	Unit	SM 4500-H+ B	1	n/a	10/7/98		10/7/98	n/a

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 150  
Study Title: ICR RSSCT #2

721	TEMP	Cl2 Temperature	20.0 °C	SM 2550 B	1	n/a	10/8/98	10/9/98	n/a
722	TEMP	Temperature	21.0 °C	SM 2550 B	1	n/a	10/7/98	10/7/98	n/a
723	TIME	Cl2 Incubation Time	24.3 hrs	n/a	1	n/a	10/8/98	10/9/98	n/a
724	TOC-ICR	TOC	1.36 mg/L	SM 5310 C	1	0.50	10/7/98	10/7/98	7-0-424
725	TOC-ICR	TOC (Dupl)	1.38 mg/L	SM 5310 C	1	0.50	10/7/98	10/7/98	7-0-424
			<b>1.37 mg/L</b>	<b>1.5 % RPD</b>					
726	TOX-ICR	TOX	88 µg Cl-/L	SM 5320 B	1	25	10/9/98	10/15/98	12-0-226
727	TOX-ICR	TOX (Dupl)	78 µg Cl-/L	SM 5320 B	1	25	10/9/98	10/15/98	12-0-226
			<b>83 µg Cl-/L</b>	<b>12.0 % RPD</b>					
728	THM-ICR	1,2,3-Trichloropropane (Surrogate)	108.0 %	EPA 551.1	1	1.0	10/9/98	10/19/98	10/19/98 0-243-0
729	THM-ICR	Bromodichloromethane	6.9 µg/L	EPA 551.1	1	1.0	10/9/98	10/19/98	10/19/98 0-243-0
730	THM-ICR	Bromoform	ND µg/L	EPA 551.1	1	1.0	10/9/98	10/19/98	10/19/98 0-243-0
731	THM-ICR	Chloroform	10.8 µg/L	EPA 551.1	1	1.0	10/9/98	10/19/98	10/19/98 0-243-0
732	THM-ICR	Dibromochloromethane	3.2 µg/L	EPA 551.1	1	1.0	10/9/98	10/19/98	10/19/98 0-243-0
733	UV-ICR	UV	0.016 1/cm	SM 5910 B	1	0.009	10/7/98	10/7/98	8-0-319
734	UV-ICR	UV (Dupl)	0.016 1/cm	SM 5910 B	1	0.009	10/7/98	10/7/98	8-0-319
			<b>0.016 1/cm</b>	<b>0.0 % RPD</b>					

Sample ID: 150.20.Eff-15

S&amp;H ID: 9809-738

Date Sampled: 10/8/98 12:03:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
735	Cl2Dose	Chlorine Dose	3.27	mg/L as Cl2	SM 4500-Cl B	1	n/a	10/12/98		10/12/98	n/a
736	Cl2Res	Chlorine Residual	0.84	mg/L as Cl2	SM 4500-Cl F	1	0.10	10/12/98		10/13/98	n/a
737	HAA-ICR	1,2,3-Trichloropropane (IS) (Internal Standard)	101.2	%	EPA 552.2	1	1.0	10/13/98	10/15/98	10/16/98	0-237-0
738	HAA-ICR	2-Bromopropionic acid (Surrogate)	97.6	%	EPA 552.2	1	1.0	10/13/98	10/15/98	10/16/98	0-237-0
739	HAA-ICR	Bromochloroacetic acid	2.7	µg/L	EPA 552.2	1	1.0	10/13/98	10/15/98	10/16/98	0-237-0
740	HAA-ICR	Bromodichloroacetic acid	2.9	µg/L	EPA 552.2	1	1.0	10/13/98	10/15/98	10/16/98	0-237-0
741	HAA-ICR	Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	10/13/98	10/15/98	10/16/98	0-237-0
742	HAA-ICR	Dibromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	10/13/98	10/15/98	10/16/98	0-237-0
743	HAA-ICR	Dichloroacetic acid	6.5	µg/L	EPA 552.2	1	1.0	10/13/98	10/15/98	10/16/98	0-237-0
744	HAA-ICR	Monobromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	10/13/98	10/15/98	10/16/98	0-237-0
745	HAA-ICR	Monochloroacetic acid	ND	µg/L	EPA 552.2	1	2.0	10/13/98	10/15/98	10/16/98	0-237-0
746	HAA-ICR	Tribromoacetic acid	ND	µg/L	EPA 552.2	1	4.0	10/13/98	10/15/98	10/16/98	0-237-0
747	HAA-ICR	Trichloroacetic acid	6.7	µg/L	EPA 552.2	1	1.0	10/13/98	10/15/98	10/16/98	0-237-0
748	pH	Cl2 pH - Final	7.4	Unit	SM 4500-H+ B	1	n/a	10/12/98		10/13/98	n/a
749	pH	Cl2 pH - Initial	7.4	Unit	SM 4500-H+ B	1	n/a	10/12/98		10/12/98	n/a
750	pH	pH	7.8	Unit	SM 4500-H+ B	1	n/a	10/8/98		10/8/98	n/a
751	TEMP	Cl2 Temperature	20.0	°C	SM 2550 B	1	n/a	10/12/98		10/13/98	n/a
752	TEMP	Temperature	21.1	°C	SM 2550 B	1	n/a	10/8/98		10/8/98	n/a

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 150  
Study Title: ICR RSSCT #2

753	TIME	Cl2 Incubation Time	23.5 hrs	n/a	1	n/a	10/12/98	10/13/98	n/a
754	TOC-ICR	TOC	1.54 mg/L	SM 5310 C	1	0.50	10/8/98	10/8/98	7-0-425
755	TOC-ICR	TOC (Dupl)	1.60 mg/L	SM 5310 C	1	0.50	10/8/98	10/8/98	7-0-425
			<b>1.57 mg/L</b>	<b>3.8 % RPD</b>					
756	TOX-ICR	TOX	111 µg Cl-/L	SM 5320 B	1	25	10/13/98	10/20/98	12-0-229
757	TOX-ICR	TOX (Dupl)	102 µg Cl-/L	SM 5320 B	1	25	10/13/98	10/20/98	12-0-229
			<b>107 µg Cl-/L</b>	<b>8.4 % RPD</b>					
758	THM-ICR	1,2,3-Trichloropropane (Surrogate)	98.0 %	EPA 551.1	1	1.0	10/13/98	10/19/98	10/19/98 0-243-0
759	THM-ICR	Bromodichloromethane	8.2 µg/L	EPA 551.1	1	1.0	10/13/98	10/19/98	10/19/98 0-243-0
760	THM-ICR	Bromoform	ND µg/L	EPA 551.1	1	1.0	10/13/98	10/19/98	10/19/98 0-243-0
761	THM-ICR	Chloroform	15.2 µg/L	EPA 551.1	1	1.0	10/13/98	10/19/98	10/19/98 0-243-0
762	THM-ICR	Dibromochloromethane	3.1 µg/L	EPA 551.1	1	1.0	10/13/98	10/19/98	10/19/98 0-243-0
763	UV-ICR	UV	0.020 1/cm	SM 5910 B	1	0.009	10/8/98	10/9/98	8-0-320
764	UV-ICR	UV (Dupl)	0.020 1/cm	SM 5910 B	1	0.009	10/8/98	10/9/98	8-0-320
			<b>0.020 1/cm</b>	<b>0.0 % RPD</b>					

Sample ID: 150.20.Eff-16

S&amp;H ID: 9809-739

Date Sampled: 10/9/98 3:30:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
765	Cl2Dose	Chlorine Dose	3.39	mg/L as Cl2	SM 4500-Cl B	1	n/a	10/14/98		10/14/98	n/a
766	Cl2Res	Chlorine Residual	0.88	mg/L as Cl2	SM 4500-Cl F	1	0.10	10/14/98		10/15/98	n/a
767	HAA-ICR	1,2,3-Trichloropropane (IS) (Internal Standard)	99.6	%	EPA 552.2	1	1.0	10/15/98	10/20/98	10/21/98	0-247-0
768	HAA-ICR	2-Bromopropionic acid (Surrogate)	95.6	%	EPA 552.2	1	1.0	10/15/98	10/20/98	10/21/98	0-247-0
769	HAA-ICR	Bromochloroacetic acid	3.5	µg/L	EPA 552.2	1	1.0	10/15/98	10/20/98	10/21/98	0-247-0
770	HAA-ICR	Bromodichloroacetic acid	4.7	µg/L	EPA 552.2	1	1.0	10/15/98	10/20/98	10/21/98	0-247-0
771	HAA-ICR	Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	10/15/98	10/20/98	10/21/98	0-247-0
772	HAA-ICR	Dibromoacetic acid	1.0	µg/L	EPA 552.2	1	1.0	10/15/98	10/20/98	10/21/98	0-247-0
773	HAA-ICR	Dichloroacetic acid	9.3	µg/L	EPA 552.2	1	1.0	10/15/98	10/20/98	10/21/98	0-247-0
774	HAA-ICR	Monobromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	10/15/98	10/20/98	10/21/98	0-247-0
775	HAA-ICR	Monochloroacetic acid	ND	µg/L	EPA 552.2	1	2.0	10/15/98	10/20/98	10/21/98	0-247-0
776	HAA-ICR	Tribromoacetic acid	ND	µg/L	EPA 552.2	1	4.0	10/15/98	10/20/98	10/21/98	0-247-0
777	HAA-ICR	Trichloroacetic acid	14.3	µg/L	EPA 552.2	1	1.0	10/15/98	10/20/98	10/21/98	0-247-0
778	pH	Cl2 pH - Final	7.4	Unit	SM 4500-H+ B	1	n/a	10/14/98		10/15/98	n/a
779	pH	Cl2 pH - Initial	7.4	Unit	SM 4500-H+ B	1	n/a	10/14/98		10/14/98	n/a
780	pH	pH	7.9	Unit	SM 4500-H+ B	1	n/a	10/9/98		10/9/98	n/a
781	TEMP	Cl2 Temperature	20.0	°C	SM 2550 B	1	n/a	10/14/98		10/15/98	n/a
782	TEMP	Temperature	21.2	°C	SM 2550 B	1	n/a	10/9/98		10/9/98	n/a
783	TIME	Cl2 Incubation Time	24.0	hrs	n/a	1	n/a	10/14/98		10/15/98	n/a

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.



**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 150  
Study Title: ICR RSSCT #2

784	TOC-ICR TOC	1.77 mg/L	SM 5310 C	1	0.50	10/9/98	10/10/98	7-0-427
785	TOC-ICR TOC (Dupl)	1.80 mg/L	SM 5310 C	1	0.50	10/9/98	10/10/98	7-0-427
		<b>1.79 mg/L</b>	<b>1.7 % RPD</b>					
786	TOX-ICR TOX	120 µg Cl-/L	SM 5320 B	1	25	10/15/98	10/20/98	12-0-229
787	TOX-ICR TOX (Dupl)	122 µg Cl-/L	SM 5320 B	1	25	10/15/98	10/20/98	12-0-229
		<b>121 µg Cl-/L</b>	<b>1.7 % RPD</b>					
788	THM-ICR 1,2,3-Trichloropropane (Surrogate)	99.2 %	EPA 551.1	1	1.0	10/15/98	10/21/98	0-246-0
789	THM-ICR Bromodichloromethane	8.7 µg/L	EPA 551.1	1	1.0	10/15/98	10/21/98	0-246-0
790	THM-ICR Bromoform	ND µg/L	EPA 551.1	1	1.0	10/15/98	10/21/98	0-246-0
791	THM-ICR Chloroform	17.9 µg/L	EPA 551.1	1	1.0	10/15/98	10/21/98	0-246-0
792	THM-ICR Dibromochloromethane	2.8 µg/L	EPA 551.1	1	1.0	10/15/98	10/21/98	0-246-0
793	UV-ICR UV	0.024 1/cm	SM 5910 B	1	0.009	10/9/98	10/10/98	8-0-322
794	UV-ICR UV (Dupl)	0.024 1/cm	SM 5910 B	1	0.009	10/9/98	10/10/98	8-0-322
		<b>0.024 1/cm</b>	<b>0.0 % RPD</b>					

Sample ID: 150.20.Eff-19

S&amp;H ID: 9809-742

Date Sampled: 10/11/98 5:09:00 AM

#	Analysis Type	Result Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
795	Cl2Dose Chlorine Dose	3.46 mg/L as Cl2	SM 4500-Cl B	1	n/a	10/14/98		10/14/98	n/a
796	Cl2Res Chlorine Residual	0.90 mg/L as Cl2	SM 4500-Cl F	1	0.10	10/14/98		10/15/98	n/a
797	HAA-ICR 1,2,3-Trichloropropane (IS) (Internal Standard)	98.4 %	EPA 552.2	1	1.0	10/15/98	10/20/98	10/21/98	0-247-0
798	HAA-ICR 2-Bromopropionic acid (Surrogate)	98.4 %	EPA 552.2	1	1.0	10/15/98	10/20/98	10/21/98	0-247-0
799	HAA-ICR Bromochloroacetic acid	3.4 µg/L	EPA 552.2	1	1.0	10/15/98	10/20/98	10/21/98	0-247-0
800	HAA-ICR Bromodichloroacetic acid	4.2 µg/L	EPA 552.2	1	1.0	10/15/98	10/20/98	10/21/98	0-247-0
801	HAA-ICR Chlorodibromoacetic acid	ND µg/L	EPA 552.2	1	2.0	10/15/98	10/20/98	10/21/98	0-247-0
802	HAA-ICR Dibromoacetic acid	ND µg/L	EPA 552.2	1	1.0	10/15/98	10/20/98	10/21/98	0-247-0
803	HAA-ICR Dichloroacetic acid	10.1 µg/L	EPA 552.2	1	1.0	10/15/98	10/20/98	10/21/98	0-247-0
804	HAA-ICR Monobromoacetic acid	ND µg/L	EPA 552.2	1	1.0	10/15/98	10/20/98	10/21/98	0-247-0
805	HAA-ICR Monochloroacetic acid	ND µg/L	EPA 552.2	1	2.0	10/15/98	10/20/98	10/21/98	0-247-0
806	HAA-ICR Tribromoacetic acid	ND µg/L	EPA 552.2	1	4.0	10/15/98	10/20/98	10/21/98	0-247-0
807	HAA-ICR Trichloroacetic acid	13.8 µg/L	EPA 552.2	1	1.0	10/15/98	10/20/98	10/21/98	0-247-0
808	pH Cl2 pH - Final	7.4 Unit	SM 4500-H+ B	1	n/a	10/14/98		10/15/98	n/a
809	pH Cl2 pH - Initial	7.4 Unit	SM 4500-H+ B	1	n/a	10/14/98		10/14/98	n/a
810	pH pH	7.8 Unit	SM 4500-H+ B	1	n/a	10/11/98		10/11/98	n/a
811	TEMP Cl2 Temperature	20.0 °C	SM 2550 B	1	n/a	10/14/98		10/15/98	n/a
812	TEMP Temperature	21.2 °C	SM 2550 B	1	n/a	10/11/98		10/11/98	n/a
813	TIME Cl2 Incubation Time	23.2 hrs	n/a	1	n/a	10/14/98		10/15/98	n/a
814	TOC-ICR TOC	1.93 mg/L	SM 5310 C	1	0.50	10/11/98		10/11/98	7-0-428
815	TOC-ICR TOC (Dupl)	1.89 mg/L	SM 5310 C	1	0.50	10/11/98		10/11/98	7-0-428

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 150  
Study Title: ICR RSSCT #2

		1.91 mg/L	2.1 % RPD					
816	TOX-ICR TOX	137 µg Cl-/L	SM 5320 B	1	25	10/15/98	10/20/98	12-0-229
817	TOX-ICR TOX (Dupl)	142 µg Cl-/L	SM 5320 B	1	25	10/15/98	10/20/98	12-0-229
		140 µg Cl-/L	3.6 % RPD					
818	THM-ICR 1,2,3-Trichloropropane (Surrogate)	97.6 %	EPA 551.1	1	1.0	10/15/98	10/21/98	10/21/98 0-246-0
819	THM-ICR Bromodichloromethane	9.7 µg/L	EPA 551.1	1	1.0	10/15/98	10/21/98	10/21/98 0-246-0
820	THM-ICR Bromoform	ND µg/L	EPA 551.1	1	1.0	10/15/98	10/21/98	10/21/98 0-246-0
821	THM-ICR Chloroform	21.8 µg/L	EPA 551.1	1	1.0	10/15/98	10/21/98	10/21/98 0-246-0
822	THM-ICR Dibromochloromethane	2.7 µg/L	EPA 551.1	1	1.0	10/15/98	10/21/98	10/21/98 0-246-0
823	UV-ICR UV	0.028 1/cm	SM 5910 B	1	0.009	10/11/98	10/11/98	8-0-323
824	UV-ICR UV (Dupl)	0.028 1/cm	SM 5910 B	1	0.009	10/11/98	10/11/98	8-0-323
		0.028 1/cm	0.0 % RPD					

Sample ID: 150.20.Eff-20

S&amp;H ID: 9809-743

Date Sampled: 10/13/98 10:41:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
825	pH	pH	7.8	Unit	SM 4500-H+ B	1	n/a	10/13/98		10/13/98	n/a
826	TEMP	Temperature	21.2	°C	SM 2550 B	1	n/a	10/13/98		10/13/98	n/a
827	TOC-ICR TOC		2.12	mg/L	SM 5310 C	1	0.50	10/13/98		10/13/98	7-0-430
828	TOC-ICR TOC (Dupl)		2.15	mg/L	SM 5310 C	1	0.50	10/13/98		10/13/98	7-0-430
			2.13	mg/L	1.4 % RPD						
829	UV-ICR UV		0.032	1/cm	SM 5910 B	1	0.009	10/13/98		10/13/98	8-0-325
830	UV-ICR UV (Dupl)		0.032	1/cm	SM 5910 B	1	0.009	10/13/98		10/13/98	8-0-325
			0.032	1/cm	0.0 % RPD						

Sample ID: 150.20.Eff-21

S&amp;H ID: 9809-744

Date Sampled: 10/14/98 1:38:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
831	Cl2Dose	Chlorine Dose	3.60	mg/L as Cl2	SM 4500-Cl B	1	n/a	10/15/98		10/15/98	n/a
832	Cl2Res	Chlorine Residual	1.18	mg/L as Cl2	SM 4500-Cl F	1	0.10	10/15/98		10/16/98	n/a
833	HAA-ICR 1,2,3-Trichloropropane (IS) (Internal Standard)		96.0	%	EPA 552.2	1	1.0	10/16/98	10/20/98	10/21/98	0-247-0
834	HAA-ICR 2-Bromopropionic acid (Surrogate)		100.4	%	EPA 552.2	1	1.0	10/16/98	10/20/98	10/21/98	0-247-0
835	HAA-ICR Bromochloroacetic acid		4.1	µg/L	EPA 552.2	1	1.0	10/16/98	10/20/98	10/21/98	0-247-0
836	HAA-ICR Bromodichloroacetic acid		5.7	µg/L	EPA 552.2	1	1.0	10/16/98	10/20/98	10/21/98	0-247-0
837	HAA-ICR Chlorodibromoacetic acid		ND	µg/L	EPA 552.2	1	2.0	10/16/98	10/20/98	10/21/98	0-247-0
838	HAA-ICR Dibromoacetic acid		ND	µg/L	EPA 552.2	1	1.0	10/16/98	10/20/98	10/21/98	0-247-0
839	HAA-ICR Dichloroacetic acid		13.5	µg/L	EPA 552.2	1	1.0	10/16/98	10/20/98	10/21/98	0-247-0
840	HAA-ICR Monobromoacetic acid		ND	µg/L	EPA 552.2	1	1.0	10/16/98	10/20/98	10/21/98	0-247-0
841	HAA-ICR Monochloroacetic acid		ND	µg/L	EPA 552.2	1	2.0	10/16/98	10/20/98	10/21/98	0-247-0
842	HAA-ICR Tribromoacetic acid		ND	µg/L	EPA 552.2	1	4.0	10/16/98	10/20/98	10/21/98	0-247-0

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 150  
Study Title: ICR RSSCT #2

843	HAA-ICR	Trichloroacetic acid	21.2 µg/L	EPA 552.2	1	1.0	10/16/98	10/20/98	10/21/98	0-247-0
844	pH	Cl2 pH - Final	7.4 Unit	SM 4500-H+ B	1	n/a	10/15/98		10/16/98	n/a
845	pH	Cl2 pH - Initial	7.4 Unit	SM 4500-H+ B	1	n/a	10/15/98		10/15/98	n/a
846	pH	pH	7.8 Unit	SM 4500-H+ B	1	n/a	10/14/98		10/14/98	n/a
847	TEMP	Cl2 Temperature	20.0 °C	SM 2550 B	1	n/a	10/15/98		10/16/98	n/a
848	TEMP	Temperature	20.4 °C	SM 2550 B	1	n/a	10/14/98		10/14/98	n/a
849	TIME	Cl2 Incubation Time	24.0 hrs	n/a	1	n/a	10/15/98		10/16/98	n/a
850	TOC-ICR	TOC	2.15 mg/L	SM 5310 C	1	0.50	10/14/98		10/14/98	7-0-431
851	TOC-ICR	TOC (Dupl)	2.14 mg/L	SM 5310 C	1	0.50	10/14/98		10/14/98	7-0-431
			<b>2.15 mg/L</b>	<b>0.5 % RPD</b>						
852	TOX-ICR	TOX	164 µg Cl-/L	SM 5320 B	1	25	10/16/98		10/21/98	12-0-230
853	TOX-ICR	TOX (Dupl)	164 µg Cl-/L	SM 5320 B	1	25	10/16/98		10/21/98	12-0-230
			<b>164 µg Cl-/L</b>	<b>0.0 % RPD</b>						
854	THM-ICR	1,2,3-Trichloropropane (Surrogate)	96.4 %	EPA 551.1	1	1.0	10/16/98	10/21/98	10/21/98	0-246-0
855	THM-ICR	Bromodichloromethane	11.2 µg/L	EPA 551.1	1	1.0	10/16/98	10/21/98	10/21/98	0-246-0
856	THM-ICR	Bromoform	ND µg/L	EPA 551.1	1	1.0	10/16/98	10/21/98	10/21/98	0-246-0
857	THM-ICR	Chloroform	27.6 µg/L	EPA 551.1	1	1.0	10/16/98	10/21/98	10/21/98	0-246-0
858	THM-ICR	Dibromochloromethane	2.5 µg/L	EPA 551.1	1	1.0	10/16/98	10/21/98	10/21/98	0-246-0
859	UV-ICR	UV	0.033 1/cm	SM 5910 B	1	0.009	10/14/98		10/14/98	8-0-326
860	UV-ICR	UV (Dupl)	0.033 1/cm	SM 5910 B	1	0.009	10/14/98		10/14/98	8-0-326
			<b>0.033 1/cm</b>	<b>0.0 % RPD</b>						

Sample ID: 150.20.Eff-5d

S&amp;H ID: 9809-754

Date Sampled: 10/5/98 1:13:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
861	Cl2Dose	Chlorine Dose	2.78	mg/L as Cl2	SM 4500-Cl B	1	n/a	10/8/98		10/8/98	n/a
862	Cl2Res	Chlorine Residual	0.80	mg/L as Cl2	SM 4500-Cl F	1	0.10	10/8/98		10/9/98	n/a
863	HAA-ICR	1,2,3-Trichloropropane (IS) (Internal Standard)	94.4	%	EPA 552.2	1	1.0	10/9/98	10/15/98	10/16/98	0-237-0
864	HAA-ICR	2-Bromopropionic acid (Surrogate)	98.4	%	EPA 552.2	1	1.0	10/9/98	10/15/98	10/16/98	0-237-0
865	HAA-ICR	Bromochloroacetic acid	1.4	µg/L	EPA 552.2	1	1.0	10/9/98	10/15/98	10/16/98	0-237-0
866	HAA-ICR	Bromodichloroacetic acid	1.7	µg/L	EPA 552.2	1	1.0	10/9/98	10/15/98	10/16/98	0-237-0
867	HAA-ICR	Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	10/9/98	10/15/98	10/16/98	0-237-0
868	HAA-ICR	Dibromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	10/9/98	10/15/98	10/16/98	0-237-0
869	HAA-ICR	Dichloroacetic acid	2.0	µg/L	EPA 552.2	1	1.0	10/9/98	10/15/98	10/16/98	0-237-0
870	HAA-ICR	Monobromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	10/9/98	10/15/98	10/16/98	0-237-0
871	HAA-ICR	Monochloroacetic acid	ND	µg/L	EPA 552.2	1	2.0	10/9/98	10/15/98	10/16/98	0-237-0
872	HAA-ICR	Tribromoacetic acid	ND	µg/L	EPA 552.2	1	4.0	10/9/98	10/15/98	10/16/98	0-237-0
873	HAA-ICR	Trichloroacetic acid	1.9	µg/L	EPA 552.2	1	1.0	10/9/98	10/15/98	10/16/98	0-237-0
874	pH	Cl2 pH - Final	7.4	Unit	SM 4500-H+ B	1	n/a	10/8/98		10/9/98	n/a

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 150  
Study Title: ICR RSSCT #2

875	pH	Cl2 pH - Initial	7.4 Unit	SM 4500-H+ B	1	n/a	10/8/98	10/8/98	n/a
876	pH	pH	7.9 Unit	SM 4500-H+ B	1	n/a	10/5/98	10/5/98	n/a
877	TEMP	Cl2 Temperature	20.0 °C	SM 2550 B	1	n/a	10/8/98	10/9/98	n/a
878	TEMP	Temperature	21.7 °C	SM 2550 B	1	n/a	10/5/98	10/5/98	n/a
879	TIME	Cl2 Incubation Time	24.1 hrs	n/a	1	n/a	10/8/98	10/9/98	n/a
880	TOC-ICR	TOC	0.70 mg/L	SM 5310 C	1	0.50	10/5/98	10/5/98	7-0-422
881	TOC-ICR	TOC (Dupl)	0.73 mg/L	SM 5310 C	1	0.50	10/5/98	10/5/98	7-0-422
			<b>0.71 mg/L</b>	<b>4.2 % RPD</b>					
882	TOX-ICR	TOX	28 µg Cl-/L	SM 5320 B	1	25	10/9/98	10/16/98	12-0-227
883	TOX-ICR	TOX (Dupl)	30 µg Cl-/L	SM 5320 B	1	25	10/9/98	10/16/98	12-0-227
			<b>29 µg Cl-/L</b>	<b>6.9 % RPD</b>					
884	THM-ICR	1,2,3-Trichloropropane (Surrogate)	106.4 %	EPA 551.1	1	1.0	10/9/98 10/19/98	10/19/98	0-243-0
885	THM-ICR	Bromodichloromethane	2.8 µg/L	EPA 551.1	1	1.0	10/9/98 10/19/98	10/19/98	0-243-0
886	THM-ICR	Bromoform	ND µg/L	EPA 551.1	1	1.0	10/9/98 10/19/98	10/19/98	0-243-0
887	THM-ICR	Chloroform	3.6 µg/L	EPA 551.1	1	1.0	10/9/98 10/19/98	10/19/98	0-243-0
888	THM-ICR	Dibromochloromethane	2.0 µg/L	EPA 551.1	1	1.0	10/9/98 10/19/98	10/19/98	0-243-0
889	UV-ICR	UV	ND 1/cm	SM 5910 B	1	0.009	10/5/98	10/5/98	8-0-317
890	UV-ICR	UV (Dupl)	ND 1/cm	SM 5910 B	1	0.009	10/5/98	10/5/98	8-0-317
			<b>ND 1/cm</b>						

Sample ID: 150.20.Eff-11d

S&amp;H ID: 9809-757

Date Sampled: 10/6/98 10:33:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
891	Cl2Dose	Chlorine Dose	3.07	mg/L as Cl2	SM 4500-Cl B	1	n/a	10/8/98		10/8/98	n/a
892	Cl2Res	Chlorine Residual	0.89	mg/L as Cl2	SM 4500-Cl F	1	0.10	10/8/98		10/9/98	n/a
893	HAA-ICR	1,2,3-Trichloropropane (IS) (Internal Standard)	94.0	%	EPA 552.2	1	1.0	10/9/98 10/15/98		10/16/98	0-237-0
894	HAA-ICR	2-Bromopropionic acid (Surrogate)	102.4	%	EPA 552.2	1	1.0	10/9/98 10/15/98		10/16/98	0-237-0
895	HAA-ICR	Bromochloroacetic acid	2.3	µg/L	EPA 552.2	1	1.0	10/9/98 10/15/98		10/16/98	0-237-0
896	HAA-ICR	Bromodichloroacetic acid	2.4	µg/L	EPA 552.2	1	1.0	10/9/98 10/15/98		10/16/98	0-237-0
897	HAA-ICR	Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	10/9/98 10/15/98		10/16/98	0-237-0
898	HAA-ICR	Dibromoacetic acid	1.0	µg/L	EPA 552.2	1	1.0	10/9/98 10/15/98		10/16/98	0-237-0
899	HAA-ICR	Dichloroacetic acid	4.4	µg/L	EPA 552.2	1	1.0	10/9/98 10/15/98		10/16/98	0-237-0
900	HAA-ICR	Monobromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	10/9/98 10/15/98		10/16/98	0-237-0
901	HAA-ICR	Monochloroacetic acid	ND	µg/L	EPA 552.2	1	2.0	10/9/98 10/15/98		10/16/98	0-237-0
902	HAA-ICR	Tribromoacetic acid	ND	µg/L	EPA 552.2	1	4.0	10/9/98 10/15/98		10/16/98	0-237-0
903	HAA-ICR	Trichloroacetic acid	4.7	µg/L	EPA 552.2	1	1.0	10/9/98 10/15/98		10/16/98	0-237-0
904	pH	Cl2 pH - Final	7.4	Unit	SM 4500-H+ B	1	n/a	10/8/98		10/9/98	n/a
905	pH	Cl2 pH - Initial	7.4	Unit	SM 4500-H+ B	1	n/a	10/8/98		10/8/98	n/a
906	pH	pH	7.8	Unit	SM 4500-H+ B	1	n/a	10/6/98		10/6/98	n/a

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 150  
Study Title: ICR RSSCT #2

907	TEMP	Cl2 Temperature	20.0 °C	SM 2550 B	1	n/a	10/8/98	10/9/98	n/a
908	TEMP	Temperature	21.4 °C	SM 2550 B	1	n/a	10/6/98	10/6/98	n/a
909	TIME	Cl2 Incubation Time	24.2 hrs	n/a	1	n/a	10/8/98	10/9/98	n/a
910	TOC-ICR	TOC	1.18 mg/L	SM 5310 C	1	0.50	10/6/98	10/6/98	7-0-423
911	TOC-ICR	TOC (Dupl)	1.20 mg/L	SM 5310 C	1	0.50	10/6/98	10/6/98	7-0-423
			<b>1.19 mg/L</b>	<b>1.7 % RPD</b>					
912	TOX-ICR	TOX	62 µg Cl-/L	SM 5320 B	1	25	10/9/98	10/16/98	12-0-227
913	TOX-ICR	TOX (Dupl)	62 µg Cl-/L	SM 5320 B	1	25	10/9/98	10/16/98	12-0-227
			<b>62 µg Cl-/L</b>	<b>0.0 % RPD</b>					
914	THM-ICR	1,2,3-Trichloropropane (Surrogate)	99.2 %	EPA 551.1	1	1.0	10/9/98 10/19/98	10/19/98	0-243-0
915	THM-ICR	Bromodichloromethane	5.3 µg/L	EPA 551.1	1	1.0	10/9/98 10/19/98	10/19/98	0-243-0
916	THM-ICR	Bromoform	ND µg/L	EPA 551.1	1	1.0	10/9/98 10/19/98	10/19/98	0-243-0
917	THM-ICR	Chloroform	8.1 µg/L	EPA 551.1	1	1.0	10/9/98 10/19/98	10/19/98	0-243-0
918	THM-ICR	Dibromochloromethane	2.7 µg/L	EPA 551.1	1	1.0	10/9/98 10/19/98	10/19/98	0-243-0
919	UV-ICR	UV	0.012 1/cm	SM 5910 B	1	0.009	10/6/98	10/7/98	8-0-319
920	UV-ICR	UV (Dupl)	0.013 1/cm	SM 5910 B	1	0.009	10/6/98	10/7/98	8-0-319
			<b>0.013 1/cm</b>	<b>7.7 % RPD</b>					

Sample ID: 150.20.Eff-16d

S&amp;H ID: 9809-758

Date Sampled: 10/9/98 3:30:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
921	Cl2Dose	Chlorine Dose	3.39	mg/L as Cl2	SM 4500-Cl B	1	n/a	10/14/98		10/14/98	n/a
922	Cl2Res	Chlorine Residual	0.88	mg/L as Cl2	SM 4500-Cl F	1	0.10	10/14/98		10/15/98	n/a
923	HAA-ICR	1,2,3-Trichloropropane (IS) (Internal Standard)	94.8	%	EPA 552.2	1	1.0	10/15/98 10/20/98		10/21/98	0-247-0
924	HAA-ICR	2-Bromopropionic acid (Surrogate)	98.8	%	EPA 552.2	1	1.0	10/15/98 10/20/98		10/21/98	0-247-0
925	HAA-ICR	Bromochloroacetic acid	3.2	µg/L	EPA 552.2	1	1.0	10/15/98 10/20/98		10/21/98	0-247-0
926	HAA-ICR	Bromodichloroacetic acid	3.7	µg/L	EPA 552.2	1	1.0	10/15/98 10/20/98		10/21/98	0-247-0
927	HAA-ICR	Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	10/15/98 10/20/98		10/21/98	0-247-0
928	HAA-ICR	Dibromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	10/15/98 10/20/98		10/21/98	0-247-0
929	HAA-ICR	Dichloroacetic acid	8.6	µg/L	EPA 552.2	1	1.0	10/15/98 10/20/98		10/21/98	0-247-0
930	HAA-ICR	Monobromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	10/15/98 10/20/98		10/21/98	0-247-0
931	HAA-ICR	Monochloroacetic acid	ND	µg/L	EPA 552.2	1	2.0	10/15/98 10/20/98		10/21/98	0-247-0
932	HAA-ICR	Tribromoacetic acid	ND	µg/L	EPA 552.2	1	4.0	10/15/98 10/20/98		10/21/98	0-247-0
933	HAA-ICR	Trichloroacetic acid	11.8	µg/L	EPA 552.2	1	1.0	10/15/98 10/20/98		10/21/98	0-247-0
934	pH	Cl2 pH - Final	7.4	Unit	SM 4500-H+ B	1	n/a	10/14/98		10/15/98	n/a
935	pH	Cl2 pH - Initial	7.4	Unit	SM 4500-H+ B	1	n/a	10/14/98		10/14/98	n/a
936	pH	pH	7.9	Unit	SM 4500-H+ B	1	n/a	10/9/98		10/9/98	n/a
937	TEMP	Cl2 Temperature	20.0	°C	SM 2550 B	1	n/a	10/14/98		10/15/98	n/a

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 150  
Study Title: ICR RSSCT #2

938	TEMP	Temperature	21.2 °C	SM 2550 B	1	n/a	10/9/98	10/9/98	n/a
939	TIME	Cl2 Incubation Time	24.1 hrs	n/a	1	n/a	10/14/98	10/15/98	n/a
940	TOC-ICR	TOC	1.82 mg/L	SM 5310 C	1	0.50	10/9/98	10/10/98	7-0-427
941	TOC-ICR	TOC (Dupl)	1.79 mg/L	SM 5310 C	1	0.50	10/9/98	10/10/98	7-0-427
			<b>1.81 mg/L</b>	<b>1.7 % RPD</b>					
942	TOX-ICR	TOX	123 µg Cl-/L	SM 5320 B	1	25	10/15/98	10/20/98	12-0-229
943	TOX-ICR	TOX (Dupl)	120 µg Cl-/L	SM 5320 B	1	25	10/15/98	10/20/98	12-0-229
			<b>122 µg Cl-/L</b>	<b>2.5 % RPD</b>					
944	THM-ICR	1,2,3-Trichloropropane (Surrogate)	103.2 %	EPA 551.1	1	1.0	10/15/98	10/21/98	10/21/98 0-246-0
945	THM-ICR	Bromodichloromethane	9.0 µg/L	EPA 551.1	1	1.0	10/15/98	10/21/98	10/21/98 0-246-0
946	THM-ICR	Bromoform	ND µg/L	EPA 551.1	1	1.0	10/15/98	10/21/98	10/21/98 0-246-0
947	THM-ICR	Chloroform	18.5 µg/L	EPA 551.1	1	1.0	10/15/98	10/21/98	10/21/98 0-246-0
948	THM-ICR	Dibromochloromethane	2.9 µg/L	EPA 551.1	1	1.0	10/15/98	10/21/98	10/21/98 0-246-0
949	UV-ICR	UV	0.024 1/cm	SM 5910 B	1	0.009	10/9/98	10/10/98	8-0-322
950	UV-ICR	UV (Dupl)	0.024 1/cm	SM 5910 B	1	0.009	10/9/98	10/10/98	8-0-322
			<b>0.024 1/cm</b>	<b>0.0 % RPD</b>					

Sample ID: 150.Inf.A-1

S&amp;H ID: 9809-764

Date Sampled: 9/30/98 3:05:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
951	ALK	Alkalinity	133	mg/L	SM 2320 B	1	5	9/30/98		10/1/98	1-0-34
952	ALK	Alkalinity (Dupl)	134	mg/L	SM 2320 B	1	5	9/30/98		10/1/98	1-0-34
			<b>134</b>	<b>mg/L</b>	<b>0.7 % RPD</b>						
953	NH3	Ammonia Nitrogen	0.17	mg/L	EPA 350.1	1	0.05	9/30/98		10/16/98	MW85827
954	BR	Bromide	0.029	mg/L	EPA 300.0 A	1	0.020	9/30/98		10/13/98	MW85806
955	CaHardM	Calcium Hardness	122	mg/L CaCO3	EPA 200.7	1	5	9/30/98		10/7/98	MW n/a
956	CaMW	Calcium, Total, ICAP	49	mg/L	EPA 200.7	1	1	9/30/98	10/7/98	10/7/98	MW85263
957	MgMW	Magnesium, Total, ICAP	23	mg/L	EPA 200.7	1	0	9/30/98	10/7/98	10/7/98	MW85264
958	TotHard	Total Hardness as CaCO3 by ICP	217	mg/L CaCO3	SM 2340B	1	7	9/30/98		10/7/98	MW n/a

Sample ID: 150.Inf.A-2

S&amp;H ID: 9809-765

Date Sampled: 10/6/98 3:00:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
959	ALK	Alkalinity	120	mg/L	SM 2320 B	1	5	10/6/98		10/7/98	1-0-34
960	ALK	Alkalinity (Dupl)	120	mg/L	SM 2320 B	1	5	10/6/98		10/7/98	1-0-34
			<b>120</b>	<b>mg/L</b>	<b>0.0 % RPD</b>						
961	NH3	Ammonia Nitrogen	0.14	mg/L	EPA 350.1	1	0.05	10/6/98		10/26/98	MW86398
962	BR	Bromide	0.028	mg/L	EPA 300.0 A	1	0.020	10/6/98		10/22/98	MW86228
963	CaHardM	Calcium Hardness	117	mg/L CaCO3	EPA 200.7	1	5	10/6/98		10/15/98	MW n/a

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 150  
Study Title: ICR RSSCT #2

964	CaMW	Calcium, Total, ICAP	47 mg/L	EPA 200.7	1	1	10/6/98	10/15/98	10/15/98	MW85823
965	MgMW	Magnesium, Total, ICAP	21 mg/L	EPA 200.7	1	0	10/6/98	10/15/98	10/15/98	MW85872
966	TotHard	Total Hardness as CaCO3 by ICP	204 mg/L CaCO3	SM 2340B	1	7	10/6/98		10/15/98	MW n/a

Sample ID: 150.Inf.B-1

S&amp;H ID: 9809-766

Date Sampled: 9/30/98 2:05:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
967	Cl2Dose	Chlorine Dose	4.75	mg/L as Cl2	SM 4500-Cl B	1	n/a	10/4/98		10/4/98	n/a
968	Cl2Res	Chlorine Residual	0.89	mg/L as Cl2	SM 4500-Cl F	1	0.10	10/4/98		10/5/98	n/a
969	HAA-ICR	1,2,3-Trichloropropane (IS) (Internal Standard)	84.4	%	EPA 552.2	1	1.0	10/5/98	10/13/98	10/14/98	0-236-0
970	HAA-ICR	2-Bromopropionic acid (Surrogate)	96.8	%	EPA 552.2	1	1.0	10/5/98	10/13/98	10/14/98	0-236-0
971	HAA-ICR	Bromochloroacetic acid	4.0	µg/L	EPA 552.2	1	1.0	10/5/98	10/13/98	10/14/98	0-236-0
972	HAA-ICR	Bromodichloroacetic acid	4.6	µg/L	EPA 552.2	1	1.0	10/5/98	10/13/98	10/14/98	0-236-0
973	HAA-ICR	Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	10/5/98	10/13/98	10/14/98	0-236-0
974	HAA-ICR	Dibromoacetic acid	1.1	µg/L	EPA 552.2	1	1.0	10/5/98	10/13/98	10/14/98	0-236-0
975	HAA-ICR	Dichloroacetic acid	18.8	µg/L	EPA 552.2	1	1.0	10/5/98	10/13/98	10/14/98	0-236-0
976	HAA-ICR	Monobromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	10/5/98	10/13/98	10/14/98	0-236-0
977	HAA-ICR	Monochloroacetic acid	ND	µg/L	EPA 552.2	1	2.0	10/5/98	10/13/98	10/14/98	0-236-0
978	HAA-ICR	Tribromoacetic acid	ND	µg/L	EPA 552.2	1	4.0	10/5/98	10/13/98	10/14/98	0-236-0
979	HAA-ICR	Trichloroacetic acid	25.8	µg/L	EPA 552.2	1	1.0	10/5/98	10/13/98	10/14/98	0-236-0
980	pH	Cl2 pH - Final	7.4	Unit	SM 4500-H+ B	1	n/a	10/4/98		10/5/98	n/a
981	pH	Cl2 pH - Initial	7.3	Unit	SM 4500-H+ B	1	n/a	10/4/98		10/4/98	n/a
982	pH	pH	7.2	Unit	SM 4500-H+ B	1	n/a	9/30/98		9/30/98	n/a
983	TEMP	Cl2 Temperature	19.8	°C	SM 2550 B	1	n/a	10/4/98		10/5/98	n/a
984	TEMP	Temperature	19.3	°C	SM 2550 B	1	n/a	9/30/98		9/30/98	n/a
985	TIME	Cl2 Incubation Time	24.0	hrs	n/a	1	n/a	10/4/98		10/5/98	n/a
986	TOC-ICR	TOC	2.97	mg/L	SM 5310 C	1	0.50	9/30/98		10/3/98	7-0-419
987	TOC-ICR	TOC (Dupl)	2.99	mg/L	SM 5310 C	1	0.50	9/30/98		10/3/98	7-0-419
			<b>2.98</b>	<b>mg/L</b>	<b>0.7 % RPD</b>						
988	TOX-ICR	TOX	290	µg Cl-/L	SM 5320 B	1	25	10/5/98		10/12/98	12-0-223
989	TOX-ICR	TOX (Dupl)	283	µg Cl-/L	SM 5320 B	1	25	10/5/98		10/12/98	12-0-223
			<b>287</b>	<b>µg Cl-/L</b>	<b>2.4 % RPD</b>						
990	THM-ICR	1,2,3-Trichloropropane (Surrogate)	96.0	%	EPA 551.1	1	1.0	10/5/98	10/16/98	10/16/98	0-238-0
991	THM-ICR	Bromodichloromethane	15.3	µg/L	EPA 551.1	1	1.0	10/5/98	10/16/98	10/16/98	0-238-0
992	THM-ICR	Bromoform	ND	µg/L	EPA 551.1	1	1.0	10/5/98	10/16/98	10/16/98	0-238-0
993	THM-ICR	Chloroform	53.5	µg/L	EPA 551.1	1	1.0	10/5/98	10/16/98	10/16/98	0-238-0
994	THM-ICR	Dibromochloromethane	2.1	µg/L	EPA 551.1	1	1.0	10/5/98	10/16/98	10/16/98	0-238-0

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 150  
Study Title: ICR RSSCT #2

995	TURB	Turbidity	0.10	ntu	SM 2130 B	1	0.05	9/30/98	9/30/98	9-0-18
996	UV-ICR	UV	0.065	1/cm	SM 5910 B	1	0.009	9/30/98	9/30/98	8-0-310
997	UV-ICR	UV (Dupl)	0.066	1/cm	SM 5910 B	1	0.009	9/30/98	9/30/98	8-0-310
			<b>0.066</b>	<b>1/cm</b>	<b>1.5 % RPD</b>					

Sample ID: 150.Inf.B-2

S&amp;H ID: 9809-767

Date Sampled: 10/3/98 1:40:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
998	pH	pH	7.2	Unit	SM 4500-H+ B	1	n/a	10/3/98		10/3/98	n/a
999	TEMP	Temperature	17.2	°C	SM 2550 B	1	n/a	10/3/98		10/3/98	n/a
1000	TOC-ICR	TOC	2.92	mg/L	SM 5310 C	1	0.50	10/3/98		10/3/98	7-0-420
1001	TOC-ICR	TOC (Dupl)	2.99	mg/L	SM 5310 C	1	0.50	10/3/98		10/3/98	7-0-420
			<b>2.96</b>	<b>mg/L</b>	<b>2.4 % RPD</b>						

Sample ID: 150.Inf.B-3

S&amp;H ID: 9809-768

Date Sampled: 10/4/98 7:40:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
1002	pH	pH	7.2	Unit	SM 4500-H+ B	1	n/a	10/4/98		10/4/98	n/a
1003	TEMP	Temperature	18.2	°C	SM 2550 B	1	n/a	10/4/98		10/4/98	n/a
1004	TOC-ICR	TOC	2.98	mg/L	SM 5310 C	1	0.50	10/4/98		10/5/98	7-0-422
1005	TOC-ICR	TOC (Dupl)	2.99	mg/L	SM 5310 C	1	0.50	10/4/98		10/5/98	7-0-422
			<b>2.99</b>	<b>mg/L</b>	<b>0.3 % RPD</b>						

Sample ID: 150.Inf.B-4

S&amp;H ID: 9809-769

Date Sampled: 10/6/98 3:00:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
1006	Cl2Dose	Chlorine Dose	4.65	mg/L as Cl2	SM 4500-Cl B	1	n/a	10/8/98		10/8/98	n/a
1007	Cl2Res	Chlorine Residual	0.79	mg/L as Cl2	SM 4500-Cl F	1	0.10	10/8/98		10/9/98	n/a
1008	HAA-ICR	1,2,3-Trichloropropane (IS) (Internal Standard)	95.6	%	EPA 552.2	1	1.0	10/9/98	10/15/98	10/16/98	0-237-0
1009	HAA-ICR	2-Bromopropionic acid (Surrogate)	101.6	%	EPA 552.2	1	1.0	10/9/98	10/15/98	10/16/98	0-237-0
1010	HAA-ICR	Bromochloroacetic acid	4.6	µg/L	EPA 552.2	1	1.0	10/9/98	10/15/98	10/16/98	0-237-0
1011	HAA-ICR	Bromodichloroacetic acid	6.5	µg/L	EPA 552.2	1	1.0	10/9/98	10/15/98	10/16/98	0-237-0
1012	HAA-ICR	Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	10/9/98	10/15/98	10/16/98	0-237-0
1013	HAA-ICR	Dibromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	10/9/98	10/15/98	10/16/98	0-237-0
1014	HAA-ICR	Dichloroacetic acid	22.0	µg/L	EPA 552.2	1	1.0	10/9/98	10/15/98	10/16/98	0-237-0
1015	HAA-ICR	Monobromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	10/9/98	10/15/98	10/16/98	0-237-0
1016	HAA-ICR	Monochloroacetic acid	ND	µg/L	EPA 552.2	1	2.0	10/9/98	10/15/98	10/16/98	0-237-0
1017	HAA-ICR	Tribromoacetic acid	ND	µg/L	EPA 552.2	1	4.0	10/9/98	10/15/98	10/16/98	0-237-0
1018	HAA-ICR	Trichloroacetic acid	34.6	µg/L	EPA 552.2	1	1.0	10/9/98	10/15/98	10/16/98	0-237-0
1019	pH	Cl2 pH - Final	7.3	Unit	SM 4500-H+ B	1	n/a	10/8/98		10/9/98	n/a

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.



**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 150  
Study Title: ICR RSSCT #2

1020	pH	Cl2 pH - Initial	7.3 Unit	SM 4500-H+ B	1	n/a	10/8/98	10/8/98	n/a
1021	pH	pH	7.2 Unit	SM 4500-H+ B	1	n/a	10/6/98	10/6/98	n/a
1022	TEMP	Cl2 Temperature	20.0 °C	SM 2550 B	1	n/a	10/8/98	10/9/98	n/a
1023	TEMP	Temperature	17.3 °C	SM 2550 B	1	n/a	10/6/98	10/6/98	n/a
1024	TIME	Cl2 Incubation Time	24.3 hrs	n/a	1	n/a	10/8/98	10/9/98	n/a
1025	TOC-ICR	TOC	2.98 mg/L	SM 5310 C	1	0.50	10/6/98	10/6/98	7-0-423
1026	TOC-ICR	TOC (Dupl)	3.02 mg/L	SM 5310 C	1	0.50	10/6/98	10/6/98	7-0-423
			<b>3.00 mg/L</b>	<b>1.3 % RPD</b>					
1027	TOX-ICR	TOX	291 µg Cl-/L	SM 5320 B	1	25	10/9/98	10/15/98	12-0-226
1028	TOX-ICR	TOX (Dupl)	287 µg Cl-/L	SM 5320 B	1	25	10/9/98	10/15/98	12-0-226
			<b>289 µg Cl-/L</b>	<b>1.4 % RPD</b>					
1029	THM-ICR	1,2,3-Trichloropropane (Surrogate)	98.0 %	EPA 551.1	1	1.0	10/9/98	10/19/98	10/19/98 0-243-0
1030	THM-ICR	1,2,3-Trichloropropane (Surrogate) (Lab Dupl)	96.8 %	EPA 551.1	1	1.0	10/9/98	10/19/98	10/19/98 0-243-0
			<b>97.4 %</b>	<b>1.2 % RPD</b>					
1031	THM-ICR	Bromodichloromethane	15.4 µg/L	EPA 551.1	1	1.0	10/9/98	10/19/98	10/19/98 0-243-0
1032	THM-ICR	Bromodichloromethane (Lab Dupl)	14.6 µg/L	EPA 551.1	1	1.0	10/9/98	10/19/98	10/19/98 0-243-0
			<b>15.0 µg/L</b>	<b>5.3 % RPD</b>					
1033	THM-ICR	Bromoform	ND µg/L	EPA 551.1	1	1.0	10/9/98	10/19/98	10/19/98 0-243-0
1034	THM-ICR	Bromoform (Lab Dupl)	ND µg/L	EPA 551.1	1	1.0	10/9/98	10/19/98	10/19/98 0-243-0
			<b>ND µg/L</b>						
1035	THM-ICR	Chloroform	50.5 µg/L	EPA 551.1	1	1.0	10/9/98	10/19/98	10/19/98 0-243-0
1036	THM-ICR	Chloroform (Lab Dupl)	47.5 µg/L	EPA 551.1	1	1.0	10/9/98	10/19/98	10/19/98 0-243-0
			<b>49.0 µg/L</b>	<b>6.1 % RPD</b>					
1037	THM-ICR	Dibromochloromethane	2.1 µg/L	EPA 551.1	1	1.0	10/9/98	10/19/98	10/19/98 0-243-0
1038	THM-ICR	Dibromochloromethane (Lab Dupl)	2.1 µg/L	EPA 551.1	1	1.0	10/9/98	10/19/98	10/19/98 0-243-0
			<b>2.1 µg/L</b>	<b>0.0 % RPD</b>					
1039	TURB	Turbidity	0.15 ntu	SM 2130 B	1	0.05	10/6/98	10/6/98	9-0-18
1040	UV-ICR	UV	0.065 1/cm	SM 5910 B	1	0.009	10/6/98	10/7/98	8-0-319
1041	UV-ICR	UV (Dupl)	0.065 1/cm	SM 5910 B	1	0.009	10/6/98	10/7/98	8-0-319
			<b>0.065 1/cm</b>	<b>0.0 % RPD</b>					

Sample ID: 150.Inf.B-5

S&amp;H ID: 9809-770

Date Sampled: 10/11/98 11:00:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
1042	pH	pH	7.2	Unit	SM 4500-H+ B	1	n/a	10/11/98		10/11/98	n/a
1043	TEMP	Temperature	18.8	°C	SM 2550 B	1	n/a	10/11/98		10/11/98	n/a
1044	TOC-ICR	TOC	3.01	mg/L	SM 5310 C	1	0.50	10/11/98		10/11/98	7-0-428
1045	TOC-ICR	TOC (Dupl)	2.92	mg/L	SM 5310 C	1	0.50	10/11/98		10/11/98	7-0-428
			<b>2.96 mg/L</b>		<b>3.0 % RPD</b>						

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 150  
Study Title: ICR RSSCT #2

Sample ID: 150.Inf.B-6		S&H ID: 9809-771		Date Sampled: 10/14/98 8:30:00 AM						
#	Analysis Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
1046	Cl2Dose Chlorine Dose	4.60	mg/L as Cl2	SM 4500-Cl B	1	n/a	10/15/98		10/15/98	n/a
1047	Cl2Res Chlorine Residual	0.74	mg/L as Cl2	SM 4500-Cl F	1	0.10	10/15/98		10/16/98	n/a
1048	HAA-ICR 1,2,3-Trichloropropane (IS) (Internal Standard)	95.6	%	EPA 552.2	1	1.0	10/16/98	10/20/98	10/21/98	0-247-0
1049	HAA-ICR 2-Bromopropionic acid (Surrogate)	98.0	%	EPA 552.2	1	1.0	10/16/98	10/20/98	10/21/98	0-247-0
1050	HAA-ICR Bromochloroacetic acid	4.1	µg/L	EPA 552.2	1	1.0	10/16/98	10/20/98	10/21/98	0-247-0
1051	HAA-ICR Bromodichloroacetic acid	5.9	µg/L	EPA 552.2	1	1.0	10/16/98	10/20/98	10/21/98	0-247-0
1052	HAA-ICR Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	10/16/98	10/20/98	10/21/98	0-247-0
1053	HAA-ICR Dibromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	10/16/98	10/20/98	10/21/98	0-247-0
1054	HAA-ICR Dichloroacetic acid	20.1	µg/L	EPA 552.2	1	1.0	10/16/98	10/20/98	10/21/98	0-247-0
1055	HAA-ICR Monobromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	10/16/98	10/20/98	10/21/98	0-247-0
1056	HAA-ICR Monochloroacetic acid	ND	µg/L	EPA 552.2	1	2.0	10/16/98	10/20/98	10/21/98	0-247-0
1057	HAA-ICR Tribromoacetic acid	ND	µg/L	EPA 552.2	1	4.0	10/16/98	10/20/98	10/21/98	0-247-0
1058	HAA-ICR Trichloroacetic acid	31.0	µg/L	EPA 552.2	1	1.0	10/16/98	10/20/98	10/21/98	0-247-0
1059	pH Cl2 pH - Final	7.4	Unit	SM 4500-H+ B	1	n/a	10/15/98		10/16/98	n/a
1060	pH Cl2 pH - Initial	7.3	Unit	SM 4500-H+ B	1	n/a	10/15/98		10/15/98	n/a
1061	pH pH	7.2	Unit	SM 4500-H+ B	1	n/a	10/14/98		10/14/98	n/a
1062	TEMP Cl2 Temperature	20.0	°C	SM 2550 B	1	n/a	10/15/98		10/16/98	n/a
1063	TEMP Temperature	18.1	°C	SM 2550 B	1	n/a	10/14/98		10/14/98	n/a
1064	TIME Cl2 Incubation Time	24.0	hrs	n/a	1	n/a	10/15/98		10/16/98	n/a
1065	TOC-ICR TOC	2.97	mg/L	SM 5310 C	1	0.50	10/14/98		10/14/98	7-0-431
1066	TOC-ICR TOC (Dupl)	2.98	mg/L	SM 5310 C	1	0.50	10/14/98		10/14/98	7-0-431
		<b>2.98</b>	<b>mg/L</b>	<b>0.3 % RPD</b>						
1067	TOX-ICR TOX	290	µg Cl-/L	SM 5320 B	1	25	10/16/98		10/21/98	12-0-230
1068	TOX-ICR TOX (Dupl)	285	µg Cl-/L	SM 5320 B	1	25	10/16/98		10/21/98	12-0-230
		<b>288</b>	<b>µg Cl-/L</b>	<b>1.7 % RPD</b>						
1069	THM-ICR 1,2,3-Trichloropropane (Surrogate)	98.8	%	EPA 551.1	1	1.0	10/16/98	10/21/98	10/21/98	0-246-0
1070	THM-ICR Bromodichloromethane	14.7	µg/L	EPA 551.1	1	1.0	10/16/98	10/21/98	10/21/98	0-246-0
1071	THM-ICR Bromoform	ND	µg/L	EPA 551.1	1	1.0	10/16/98	10/21/98	10/21/98	0-246-0
1072	THM-ICR Chloroform	48.1	µg/L	EPA 551.1	1	1.0	10/16/98	10/21/98	10/21/98	0-246-0
1073	THM-ICR Dibromochloromethane	2.3	µg/L	EPA 551.1	1	1.0	10/16/98	10/21/98	10/21/98	0-246-0
1074	TURB Turbidity	0.10	ntu	SM 2130 B	1	0.05	10/14/98		10/14/98	9-0-18
1075	UV-ICR UV	0.064	1/cm	SM 5910 B	1	0.009	10/14/98		10/14/98	8-0-326
1076	UV-ICR UV (Dupl)	0.064	1/cm	SM 5910 B	1	0.009	10/14/98		10/14/98	8-0-326
		<b>0.064</b>	<b>1/cm</b>	<b>0.0 % RPD</b>						

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

***Laboratory Test Results***

Mr. Joel Mohr  
Iowa-American Water Company

**Study#:** 150  
**Study Title:** ICR RSSCT #2

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***End of laboratory test results***

**Quality Control Report**

Mr. Joel Mohr  
Iowa-American Water Company  
230 East 2nd Street  
P.O. Box 979  
Davenport, IA 52805

Phone: 319-322-0161 Fax: 319-322-2190

**Study#:** 150  
**Study Title:** ICR RSSCT #2

**Analysis:** ALK (Alkalinity)**Method:** SM 2320 B**QC Batch ID:** 1-0-34

												Acceptance Criteria	
<u>QC Type</u>		<u>Spike</u>	<u>Recovery</u>	<u>Unit</u>	<u>Yield</u>	<u>RPD</u>	<u>Date Run</u>	<u>S&amp;H ID</u>	<u>MRL</u>	<u>Range</u>	<u>RPD</u>		
Matrix Spike	Matrix Spike	100	97	mg/L	97%		10/01/98	9809-549	5				
Matrix Spike (Dupl)	Matrix Spike	100	96	mg/L	96%		10/01/98	9809-549	5				
		<b>100</b>	<b>96</b>	<b>mg/L</b>	<b>96%</b>	<b>1.0 %</b>							
Method Blank	Method Blank		ND*	mg/L			10/01/98	9810-2	5				
Standard	Standard	100	98	mg/L	98%		10/01/98	9810-3	5				
Standard (Dupl)	Standard	100	100	mg/L	100%		10/01/98	9810-3	5				
		<b>100</b>	<b>99</b>	<b>mg/L</b>	<b>99%</b>	<b>2.0 %</b>							
Matrix Spike	Matrix Spike	100	94	mg/L	94%		10/07/98	9809-765	5				
Matrix Spike (Dupl)	Matrix Spike	100	97	mg/L	97%		10/07/98	9809-765	5				
		<b>100</b>	<b>96</b>	<b>mg/L</b>	<b>96%</b>	<b>4.2 %</b>							
Method Blank	Method Blank		ND*	mg/L			10/07/98	9810-107	5				
Standard	Standard	100	98	mg/L	98%		10/07/98	9810-108	5				
Standard (Dupl)	Standard	100	97	mg/L	97%		10/07/98	9810-108	5				
		<b>100</b>	<b>98</b>	<b>mg/L</b>	<b>98%</b>	<b>1.0 %</b>							

**Analysis:** TOC-ICR (Total Organic Carbon)**Method:** SM 5310 C**QC Batch ID:** 7-0-411

C Batch ID: 7-0-411										Acceptance Criteria	
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range	RPD	
Matrix Spike	Matrix Spike	4.00	3.81	mg/L	95%		9809-108	0.5			
Matrix Spike (Dupl)	Matrix Spike	4.00	3.86	mg/L	96%		9809-108	0.5			
		4.00	3.83	mg/L	96%	1.3 %					
Method Blank	Method Blank		ND*	mg/L			9809-422	0.5			
Method Blank (Dupl)	Method Blank		ND*	mg/L			9809-422	0.5			
			ND*	mg/L							
Standard	Standard	0.50	0.49	mg/L	98%		9809-375	0.5	50-150%		
Standard (Dupl)	Standard	0.50	0.51	mg/L	102%		9809-375	0.5	50-150%		
		0.50	0.50	mg/L	100%	4.0 %			50-150%	20%	
Standard	Standard	4.00	3.92	mg/L	98%		9809-163	0.5	90-110%		
Standard (Dupl)	Standard	4.00	3.95	mg/L	99%		9809-163	0.5	90-110%		
		4.00	3.93	mg/L	98%	0.8 %			90-110%	10%	

**Quality Control Report**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 150  
Study Title: ICR RSSCT #2

Analysis: TOC-ICR (Total Organic Carbon)

Method: SM 5310 C

QC Batch ID: 7-0-418

C Batch ID: 7-0-418

										Acceptance Criteria	
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range	RPD	
Matrix Spike	Matrix Spike	4.00	3.96	mg/L	99%		9809-575	0.5			
Matrix Spike (Dupl)	Matrix Spike	4.00	3.93	mg/L	98%		9809-575	0.5			
		4.00	3.94	mg/L	98%	0.5 %					
Method Blank	Method Blank		ND*	mg/L			9810-9	0.5			
Method Blank (Dupl)	Method Blank		ND*	mg/L			9810-9	0.5			
			ND*	mg/L							
Standard	Standard	0.50	0.50	mg/L	100%		9809-375	0.5	50-150%		
Standard (Dupl)	Standard	0.50	0.50	mg/L	100%		9809-375	0.5	50-150%		
		0.50	0.50	mg/L	100%	0.0 %			50-150%	20%	
Standard	Standard	4.00	3.90	mg/L	97%		9809-163	0.5	90-110%		
Standard (Dupl)	Standard	4.00	3.94	mg/L	98%		9809-163	0.5	90-110%		
		4.00	3.92	mg/L	98%	1.0 %			90-110%	10%	
Standard	Standard	10.00	9.82	mg/L	98%		9809-169	0.5	90-110%		
Standard (Dupl)	Standard	10.00	9.97	mg/L	100%		9809-169	0.5	90-110%		
		10.00	9.89	mg/L	99%	1.5 %			90-110%	10%	

Analysis: TOC-ICR (Total Organic Carbon)

Method: SM 5310 C

QC Batch ID: 7-0-419

C Batch ID: 7-0-419

										Acceptance Criteria	
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range	RPD	
Matrix Spike	Matrix Spike	4.00	4.29	mg/L	107%		9809-619	0.5			
Matrix Spike (Dupl)	Matrix Spike	4.00	4.08	mg/L	102%		9809-619	0.5			
		4.00	4.19	mg/L	105%	5.0 %					
Matrix Spike	Matrix Spike	4.00	3.95	mg/L	99%		9809-714	0.5			
Matrix Spike (Dupl)	Matrix Spike	4.00	3.96	mg/L	99%		9809-714	0.5			
		4.00	3.96	mg/L	99%	0.3 %					
Method Blank	Method Blank		ND*	mg/L			9810-57	0.5			
Method Blank (Dupl)	Method Blank		ND*	mg/L			9810-57	0.5			
			ND*	mg/L							
Standard	Standard	0.50	0.53	mg/L	106%		9809-375	0.5	50-150%		
Standard (Dupl)	Standard	0.50	0.59	mg/L	118%		9809-375	0.5	50-150%		
		0.50	0.56	mg/L	112%	10.7 %			50-150%	20%	
Standard	Standard	4.00	3.94	mg/L	98%		9809-163	0.5	90-110%		
Standard (Dupl)	Standard	4.00	3.95	mg/L	99%		9809-163	0.5	90-110%		
		4.00	3.95	mg/L	99%	0.3 %			90-110%	10%	
Standard	Standard	4.00	3.89	mg/L	97%		9809-163	0.5	90-110%		
Standard (Dupl)	Standard	4.00	3.93	mg/L	98%		9809-163	0.5	90-110%		
		4.00	3.91	mg/L	98%	1.0 %			90-110%	10%	
Standard	Standard	10.00	9.91	mg/L	99%		9809-169	0.5	90-110%		
Standard (Dupl)	Standard	10.00	10.08	mg/L	101%		9809-169	0.5	90-110%		

ND: non-detect. \*Recovery is below 1/2 minimum reporting level (MRL). NA (not applicable): RPD calculation is not applicable.

**Quality Control Report**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 150  
Study Title: ICR RSSCT #2

10.00	9.99 mg/L	100%	1.7 %	90-110%	10%
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Analysis: TOC-ICR (Total Organic Carbon)

Method: SM 5310 C

QC Batch ID: 7-0-420

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria	
									Range	RPD
Matrix Spike	Matrix Spike	4.00	3.82	mg/L	95%		9809-692	0.5		
Matrix Spike (Dupl)	Matrix Spike	4.00	3.92	mg/L	98%		9809-692	0.5		
		4.00	3.87	mg/L	97%	2.6 %				
Method Blank	Method Blank		ND*	mg/L			9810-68	0.5		
Method Blank (Dupl)	Method Blank		ND*	mg/L			9810-68	0.5		
			ND*	mg/L						
Standard	Standard	0.50	0.51	mg/L	102%		9809-375	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.52	mg/L	104%		9809-375	0.5	50-150%	
		0.50	0.51	mg/L	102%	2.0 %			50-150%	20%
Standard	Standard	4.00	3.93	mg/L	98%		9810-67	0.5	90-110%	
Standard (Dupl)	Standard	4.00	3.96	mg/L	99%		9810-67	0.5	90-110%	
		4.00	3.95	mg/L	99%	0.8 %			90-110%	10%

Analysis: TOC-ICR (Total Organic Carbon)

Method: SM 5310 C

QC Batch ID: 7-0-421

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria	
									Range	RPD
Matrix Spike	Matrix Spike	4.00	3.81	mg/L	95%		9809-527	0.5		
Matrix Spike (Dupl)	Matrix Spike	4.00	3.88	mg/L	97%		9809-527	0.5		
		4.00	3.85	mg/L	96%	1.6 %				
Method Blank	Method Blank		ND*	mg/L			9810-74	0.5		
Method Blank (Dupl)	Method Blank		ND*	mg/L			9810-74	0.5		
			ND*	mg/L						
Standard	Standard	0.50	0.51	mg/L	102%		9809-375	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.52	mg/L	104%		9809-375	0.5	50-150%	
		0.50	0.51	mg/L	102%	2.0 %			50-150%	20%
Standard	Standard	4.00	3.93	mg/L	98%		9810-67	0.5	90-110%	
Standard (Dupl)	Standard	4.00	3.95	mg/L	99%		9810-67	0.5	90-110%	
		4.00	3.94	mg/L	98%	0.5 %			90-110%	10%
Standard	Standard	10.00	9.84	mg/L	98%		9809-169	0.5	90-110%	
Standard (Dupl)	Standard	10.00	9.90	mg/L	99%		9809-169	0.5	90-110%	
		10.00	9.87	mg/L	99%	0.6 %			90-110%	10%

Analysis: TOC-ICR (Total Organic Carbon)

Method: SM 5310 C

QC Batch ID: 7-0-422

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria	
									Range	RPD
Matrix Spike	Matrix Spike	4.00	3.96	mg/L	99%		9809-698	0.5		

ND: non-detect. \*Recovery is below 1/2 minimum reporting level (MRL). NA (not applicable): RPD calculation is not applicable.

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Matrix Spike (Dupl)	Matrix Spike	4.00	3.98 mg/L	100%		9809-698	0.5		
		<b>4.00</b>	<b>3.97 mg/L</b>	<b>99%</b>	<b>0.5 %</b>				
Method Blank	Method Blank		ND* mg/L			9810-77	0.5		
Method Blank (Dupl)	Method Blank		ND* mg/L			9810-77	0.5		
			<b>ND* mg/L</b>						
Standard	Standard	0.50	0.51 mg/L	102%		9809-375	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.50 mg/L	100%		9809-375	0.5	50-150%	
		<b>0.50</b>	<b>0.51 mg/L</b>	<b>102%</b>	<b>2.0 %</b>			50-150%	20%
Standard	Standard	4.00	3.94 mg/L	98%		9810-67	0.5	90-110%	
Standard (Dupl)	Standard	4.00	4.00 mg/L	100%		9810-67	0.5	90-110%	
		<b>4.00</b>	<b>3.97 mg/L</b>	<b>99%</b>	<b>1.5 %</b>			90-110%	10%
Standard	Standard	10.00	9.77 mg/L	98%		9809-169	0.5	90-110%	
Standard (Dupl)	Standard	10.00	9.90 mg/L	99%		9809-169	0.5	90-110%	
		<b>10.00</b>	<b>9.84 mg/L</b>	<b>98%</b>	<b>1.3 %</b>			90-110%	10%

Analysis: TOC-ICR (Total Organic Carbon)

Method: SM 5310 C

QC Batch ID: 7-0-423

										Acceptance Criteria
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range	RPD
Matrix Spike	Matrix Spike	4.00	3.99 mg/L		100%		9809-701	0.5		
Matrix Spike (Dupl)	Matrix Spike	4.00	4.02 mg/L		100%		9809-701	0.5		
		<b>4.00</b>	<b>4.01 mg/L</b>		<b>100%</b>	<b>0.5 %</b>				
Method Blank	Method Blank		ND* mg/L				9810-106	0.5		
Method Blank (Dupl)	Method Blank		ND* mg/L				9810-106	0.5		
			<b>ND* mg/L</b>							
Standard	Standard	0.50	0.52 mg/L		104%		9809-375	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.52 mg/L		104%		9809-375	0.5	50-150%	
		<b>0.50</b>	<b>0.52 mg/L</b>		<b>104%</b>	<b>0.0 %</b>			50-150%	20%
Standard	Standard	4.00	3.95 mg/L		99%		9810-67	0.5	90-110%	
Standard (Dupl)	Standard	4.00	4.02 mg/L		100%		9810-67	0.5	90-110%	
		<b>4.00</b>	<b>3.99 mg/L</b>		<b>100%</b>	<b>1.8 %</b>			90-110%	10%
Standard	Standard	4.00	3.81 mg/L		95%		9810-67	0.5	90-110%	
Standard (Dupl)	Standard	4.00	3.88 mg/L		97%		9810-67	0.5	90-110%	
		<b>4.00</b>	<b>3.84 mg/L</b>		<b>96%</b>	<b>1.8 %</b>			90-110%	10%
Standard	Standard	10.00	9.70 mg/L		97%		9809-169	0.5	90-110%	
Standard (Dupl)	Standard	10.00	9.82 mg/L		98%		9809-169	0.5	90-110%	
		<b>10.00</b>	<b>9.76 mg/L</b>		<b>98%</b>	<b>1.2 %</b>			90-110%	10%

Analysis: TOC-ICR (Total Organic Carbon)

Method: SM 5310 C

QC Batch ID: 7-0-424

										Acceptance Criteria
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range	RPD
Matrix Spike	Matrix Spike	4.00	3.92 mg/L		98%		9809-702	0.5		
Matrix Spike (Dupl)	Matrix Spike	4.00	3.93 mg/L		98%		9809-702	0.5		

ND: non-detect. \*Recovery is below 1/2 minimum reporting level (MRL). NA (not applicable): RPD calculation is not applicable.

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		4.00	3.93 mg/L	98%	0.5 %			
Method Blank	Method Blank		ND* mg/L			9810-109	0.5	
Method Blank (Dupl)	Method Blank		ND* mg/L			9810-109	0.5	
			ND* mg/L					
Standard	Standard	0.50	0.48 mg/L	96%		9809-375	0.5	50-150%
Standard (Dupl)	Standard	0.50	0.51 mg/L	102%		9809-375	0.5	50-150%
		0.50	0.49 mg/L	98%	6.1 %			50-150% 20%
Standard	Standard	4.00	3.95 mg/L	99%		9810-67	0.5	90-110%
Standard (Dupl)	Standard	4.00	4.02 mg/L	100%		9810-67	0.5	90-110%
		4.00	3.98 mg/L	100%	1.8 %			90-110% 10%

Analysis: TOC-ICR (Total Organic Carbon)

Method: SM 5310 C

QC Batch ID: 7-0-425

										Acceptance Criteria
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range	RPD
Matrix Spike	Matrix Spike	4.00	3.94	mg/L	98%		9809-737	0.5		
Matrix Spike (Dupl)	Matrix Spike	4.00	3.96	mg/L	99%		9809-737	0.5		
		4.00	3.95	mg/L	99%	0.8 %				
Method Blank	Method Blank		ND*	mg/L			9810-122	0.5		
Method Blank (Dupl)	Method Blank		ND*	mg/L			9810-122	0.5		
			ND*	mg/L						
Standard	Standard	0.50	0.52	mg/L	104%		9809-375	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.50	mg/L	100%		9809-375	0.5	50-150%	
		0.50	0.51	mg/L	102%	3.9 %			50-150%	20%
Standard	Standard	4.00	3.92	mg/L	98%		9810-67	0.5	90-110%	
Standard (Dupl)	Standard	4.00	4.00	mg/L	100%		9810-67	0.5	90-110%	
		4.00	3.96	mg/L	99%	2.0 %			90-110%	10%
Standard	Standard	10.00	9.65	mg/L	97%		9810-133	0.5	90-110%	
Standard (Dupl)	Standard	10.00	9.76	mg/L	98%		9810-133	0.5	90-110%	
		10.00	9.71	mg/L	97%	1.1 %			90-110%	10%

Analysis: TOC-ICR (Total Organic Carbon)

Method: SM 5310 C

QC Batch ID: 7-0-427

										Acceptance Criteria
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range	RPD
Matrix Spike	Matrix Spike	4.00	4.02	mg/L	100%		9809-759	0.5		
Matrix Spike (Dupl)	Matrix Spike	4.00	4.03	mg/L	101%		9809-759	0.5		
		4.00	4.02	mg/L	100%	0.2 %				
Method Blank	Method Blank		ND*	mg/L			9810-240	0.5		
Method Blank (Dupl)	Method Blank		ND*	mg/L			9810-240	0.5		
			ND*	mg/L						
Standard	Standard	0.50	0.52	mg/L	104%		9809-375	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.52	mg/L	104%		9809-375	0.5	50-150%	
		0.50	0.52	mg/L	104%	0.0 %			50-150%	20%

ND: non-detect. \*Recovery is below 1/2 minimum reporting level (MRL). NA (not applicable): RPD calculation is not applicable.



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Standard	Standard	4.00	4.00 mg/L	100%		9810-67	0.5	90-110%	
Standard (Dupl)	Standard	4.00	3.98 mg/L	100%		9810-67	0.5	90-110%	
		<b>4.00</b>	<b>3.99 mg/L</b>	<b>100%</b>	<b>0.5 %</b>			90-110%	10%
Standard	Standard	10.00	10.04 mg/L	100%		9810-133	0.5	90-110%	
Standard (Dupl)	Standard	10.00	10.14 mg/L	101%		9810-133	0.5	90-110%	
		<b>10.00</b>	<b>10.09 mg/L</b>	<b>101%</b>	<b>1.0 %</b>			90-110%	10%

Analysis: TOC-ICR (Total Organic Carbon)

Method: SM 5310 C

QC Batch ID: 7-0-428

										Acceptance Criteria
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range	RPD
Matrix Spike	Matrix Spike	4.00	3.84	mg/L	96%		9810-136	0.5		
Matrix Spike (Dupl)	Matrix Spike	4.00	3.95	mg/L	99%		9810-136	0.5		
		<b>4.00</b>	<b>3.89</b>	<b>mg/L</b>	<b>97%</b>	<b>2.6 %</b>				
Method Blank	Method Blank		ND*	mg/L			9810-242	0.5		
Method Blank (Dupl)	Method Blank		ND*	mg/L			9810-242	0.5		
			<b>ND*</b>	<b>mg/L</b>						
Standard	Standard	0.50	0.52	mg/L	104%		9809-375	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.53	mg/L	106%		9809-375	0.5	50-150%	
		<b>0.50</b>	<b>0.52</b>	<b>mg/L</b>	<b>104%</b>	<b>1.9 %</b>			50-150%	20%
Standard	Standard	4.00	3.95	mg/L	99%		9810-67	0.5	90-110%	
Standard (Dupl)	Standard	4.00	3.98	mg/L	100%		9810-67	0.5	90-110%	
		<b>4.00</b>	<b>3.97</b>	<b>mg/L</b>	<b>99%</b>	<b>0.8 %</b>			90-110%	10%
Standard	Standard	10.00	9.90	mg/L	99%		9810-133	0.5	90-110%	
Standard (Dupl)	Standard	10.00	9.97	mg/L	100%		9810-133	0.5	90-110%	
		<b>10.00</b>	<b>9.94</b>	<b>mg/L</b>	<b>99%</b>	<b>0.7 %</b>			90-110%	10%

Analysis: TOC-ICR (Total Organic Carbon)

Method: SM 5310 C

QC Batch ID: 7-0-430

										Acceptance Criteria
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range	RPD
Matrix Spike	Matrix Spike	4.00	3.98	mg/L	100%		9810-144	0.5		
Matrix Spike (Dupl)	Matrix Spike	4.00	4.00	mg/L	100%		9810-144	0.5		
		<b>4.00</b>	<b>3.99</b>	<b>mg/L</b>	<b>100%</b>	<b>0.5 %</b>				
Method Blank	Method Blank		ND*	mg/L			9810-270	0.5		
Method Blank (Dupl)	Method Blank		ND*	mg/L			9810-270	0.5		
			<b>ND*</b>	<b>mg/L</b>						
Standard	Standard	0.50	0.52	mg/L	104%		9809-375	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.52	mg/L	104%		9809-375	0.5	50-150%	
		<b>0.50</b>	<b>0.52</b>	<b>mg/L</b>	<b>104%</b>	<b>0.0 %</b>			50-150%	20%
Standard	Standard	4.00	3.97	mg/L	99%		9810-67	0.5	90-110%	
Standard (Dupl)	Standard	4.00	3.95	mg/L	99%		9810-67	0.5	90-110%	
		<b>4.00</b>	<b>3.96</b>	<b>mg/L</b>	<b>99%</b>	<b>0.5 %</b>			90-110%	10%

ND: non-detect. \*Recovery is below 1/2 minimum reporting level (MRL). NA (not applicable): RPD calculation is not applicable.

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Iowa-American Water CompanyStudy#: 150  
Study Title: ICR RSSCT #2**Analysis:** TOC-ICR (Total Organic Carbon)**Method:** SM 5310 C**QC Batch ID:** 7-0-431

										Acceptance Criteria	
<u>QC Type</u>		<u>Spike</u>	<u>Recovery</u>	<u>Unit</u>	<u>Yield</u>	<u>RPD</u>	<u>S&amp;H ID</u>	<u>MRL</u>	<u>Range</u>	<u>RPD</u>	
Matrix Spike	Matrix Spike	4.00	3.95	mg/L	99%		9810-176	0.5			
Matrix Spike (Dupl)	Matrix Spike	4.00	3.99	mg/L	100%		9810-176	0.5			
		<b>4.00</b>	<b>3.97</b>	<b>mg/L</b>	<b>99%</b>	<b>0.8 %</b>					
Method Blank	Method Blank		ND*	mg/L			9810-275	0.5			
Method Blank (Dupl)	Method Blank		ND*	mg/L			9810-275	0.5			
			<b>ND*</b>	<b>mg/L</b>							
Standard	Standard	0.50	0.52	mg/L	104%		9809-375	0.5	50-150%		
Standard (Dupl)	Standard	0.50	0.52	mg/L	104%		9809-375	0.5	50-150%		
		<b>0.50</b>	<b>0.52</b>	<b>mg/L</b>	<b>104%</b>	<b>0.0 %</b>			50-150%	20%	
Standard	Standard	4.00	3.99	mg/L	100%		9810-67	0.5	90-110%		
Standard (Dupl)	Standard	4.00	3.96	mg/L	99%		9810-67	0.5	90-110%		
		<b>4.00</b>	<b>3.97</b>	<b>mg/L</b>	<b>99%</b>	<b>0.8 %</b>			90-110%	10%	

**Analysis:** UV-ICR (UV-254)**Method:** SM 5910 B**QC Batch ID:** 8-0-310

										Acceptance Criteria	
<u>QC Type</u>		<u>Spike</u>	<u>Recovery</u>	<u>Unit</u>	<u>Yield</u>	<u>RPD</u>	<u>S&amp;H ID</u>	<u>MRL</u>	<u>Range</u>	<u>RPD</u>	
Method Blank	Method Blank		ND*	1/cm			9809-683	0.009			
Method Blank (Dupl)	Method Blank		ND*	1/cm			9809-683	0.009			
			<b>ND*</b>	<b>1/cm</b>							
Method Blank	Method Blank		ND*	1/cm			9809-683	0.009			
Method Blank (Dupl)	Method Blank		ND*	1/cm			9809-683	0.009			
			<b>ND*</b>	<b>1/cm</b>							
Standard	Standard	0.009	0.008	1/cm	89%		9809-681	0.009	75-125%		
Standard (Dupl)	Standard	0.009	0.008	1/cm	89%		9809-681	0.009	75-125%		
		<b>0.009</b>	<b>0.008</b>	<b>1/cm</b>	<b>89%</b>	<b>0.0 %</b>			75-125%	20%	
Standard	Standard	0.088	0.091	1/cm	103%		9809-650	0.009	85-115%		
Standard (Dupl)	Standard	0.088	0.091	1/cm	103%		9809-650	0.009	85-115%		
		<b>0.088</b>	<b>0.091</b>	<b>1/cm</b>	<b>103%</b>	<b>0.0 %</b>			85-115%	10%	

**Analysis:** UV-ICR (UV-254)**Method:** SM 5910 B**QC Batch ID:** 8-0-312

										Acceptance Criteria	
<u>QC Type</u>		<u>Spike</u>	<u>Recovery</u>	<u>Unit</u>	<u>Yield</u>	<u>RPD</u>	<u>S&amp;H ID</u>	<u>MRL</u>	<u>Range</u>	<u>RPD</u>	
Method Blank	Method Blank		ND*	1/cm			9810-10	0.009			
Method Blank (Dupl)	Method Blank		ND*	1/cm			9810-10	0.009			
			<b>ND*</b>	<b>1/cm</b>							
Method Blank	Method Blank		ND*	1/cm			9810-10	0.009			
Method Blank (Dupl)	Method Blank		ND*	1/cm			9810-10	0.009			
			<b>ND*</b>	<b>1/cm</b>							

ND: non-detect. \*Recovery is below 1/2 minimum reporting level (MRL). NA (not applicable): RPD calculation is not applicable.

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**Study Title:** ICR RSSCT #2

Standard	Standard	0.009	0.008	1/cm	89%	9809-681	0.009	75-125%	
Standard (Dupl)	Standard	0.009	0.008	1/cm	89%	9809-681	0.009	75-125%	
		<b>0.009</b>	<b>0.008</b>	<b>1/cm</b>	<b>89%</b>			75-125%	20%
Standard	Standard	0.088	0.089	1/cm	101%	9809-650	0.009	85-115%	
Standard (Dupl)	Standard	0.088	0.089	1/cm	101%	9809-650	0.009	85-115%	
		<b>0.088</b>	<b>0.089</b>	<b>1/cm</b>	<b>101%</b>			85-115%	10%

**Analysis:** UV-ICR (UV-254)**Method:** SM 5910 B**QC Batch ID:** 8-0-313

										Acceptance Criteria
<u>QC Type</u>		<u>Spike</u>	<u>Recovery</u>	<u>Unit</u>	<u>Yield</u>	<u>RPD</u>	<u>S&amp;H ID</u>	<u>MRL</u>	<u>Range</u>	<u>RPD</u>
Method Blank	Method Blank		ND*	1/cm			9810-58	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9810-58	0.009		
			<b>ND*</b>	<b>1/cm</b>						
Method Blank	Method Blank		ND*	1/cm			9810-58	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9810-58	0.009		
			<b>ND*</b>	<b>1/cm</b>						
Standard	Standard	0.009	0.008	1/cm	89%		9809-681	0.009	75-125%	
Standard (Dupl)	Standard	0.009	0.008	1/cm	89%		9809-681	0.009	75-125%	
		<b>0.009</b>	<b>0.008</b>	<b>1/cm</b>	<b>89%</b>	<b>0.0 %</b>			75-125%	20%
Standard	Standard	0.088	0.089	1/cm	101%		9809-650	0.009	85-115%	
Standard (Dupl)	Standard	0.088	0.090	1/cm	102%		9809-650	0.009	85-115%	
		<b>0.088</b>	<b>0.090</b>	<b>1/cm</b>	<b>102%</b>	<b>1.1 %</b>			85-115%	10%

**Analysis:** UV-ICR (UV-254)**Method:** SM 5910 B**QC Batch ID:** 8-0-314

										Acceptance Criteria
<u>QC Type</u>		<u>Spike</u>	<u>Recovery</u>	<u>Unit</u>	<u>Yield</u>	<u>RPD</u>	<u>S&amp;H ID</u>	<u>MRL</u>	<u>Range</u>	<u>RPD</u>
Method Blank	Method Blank		ND*	1/cm			9810-69	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9810-69	0.009		
			<b>ND*</b>	<b>1/cm</b>						
Method Blank	Method Blank		ND*	1/cm			9810-69	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9810-69	0.009		
			<b>ND*</b>	<b>1/cm</b>						
Standard	Standard	0.009	0.008	1/cm	89%		9809-681	0.009	75-125%	
Standard (Dupl)	Standard	0.009	0.009	1/cm	100%		9809-681	0.009	75-125%	
		<b>0.009</b>	<b>0.008</b>	<b>1/cm</b>	<b>89%</b>	<b>12.5 %</b>			75-125%	20%
Standard	Standard	0.088	0.089	1/cm	101%		9809-650	0.009	85-115%	
Standard (Dupl)	Standard	0.088	0.089	1/cm	101%		9809-650	0.009	85-115%	
		<b>0.088</b>	<b>0.089</b>	<b>1/cm</b>	<b>101%</b>	<b>0.0 %</b>			85-115%	10%

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Iowa-American Water CompanyStudy#: 150  
Study Title: ICR RSSCT #2

Analysis: UV-ICR (UV-254)

Method: SM 5910 B

QC Batch ID: 8-0-315

C Batch ID: 8-0-315										Acceptance Criteria	
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range	RPD	
Method Blank	Method Blank		ND*	1/cm			9810-75	0.009			
Method Blank (Dupl)	Method Blank		ND*	1/cm			9810-75	0.009			
			ND*	1/cm							
Method Blank	Method Blank		ND*	1/cm			9810-75	0.009			
Method Blank (Dupl)	Method Blank		ND*	1/cm			9810-75	0.009			
			ND*	1/cm							
Standard	Standard	0.009	0.008	1/cm	89%		9809-681	0.009	75-125%		
Standard (Dupl)	Standard	0.009	0.008	1/cm	89%		9809-681	0.009	75-125%		
		0.009	0.008	1/cm	89%	0.0 %			75-125%	20%	
Standard	Standard	0.088	0.089	1/cm	101%		9809-650	0.009	85-115%		
Standard (Dupl)	Standard	0.088	0.089	1/cm	101%		9809-650	0.009	85-115%		
		0.088	0.089	1/cm	101%	0.0 %			85-115%	10%	

Analysis: UV-ICR (UV-254)

Method: SM 5910 B

QC Batch ID: 8-0-316

C Batch ID: 8-0-316										Acceptance Criteria	
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range	RPD	
Method Blank	Method Blank		ND*	1/cm			9810-75	0.009			
Method Blank (Dupl)	Method Blank		ND*	1/cm			9810-75	0.009			
			ND*	1/cm							
Method Blank	Method Blank		ND*	1/cm			9810-75	0.009			
Method Blank (Dupl)	Method Blank		ND*	1/cm			9810-75	0.009			
			ND*	1/cm							
Standard	Standard	0.009	0.008	1/cm	89%		9809-681	0.009	75-125%		
Standard (Dupl)	Standard	0.009	0.008	1/cm	89%		9809-681	0.009	75-125%		
		0.009	0.008	1/cm	89%	0.0 %			75-125%	20%	
Standard	Standard	0.088	0.088	1/cm	100%		9810-76	0.009	85-115%		
Standard (Dupl)	Standard	0.088	0.088	1/cm	100%		9810-76	0.009	85-115%		
		0.088	0.088	1/cm	100%	0.0 %			85-115%	10%	

Analysis: UV-ICR (UV-254)

Method: SM 5910 B

QC Batch ID: 8-0-317

C Batch ID: 8-0-317									Acceptance Criteria	
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range	RPD
Method Blank	Method Blank		ND*	1/cm			9810-86	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9810-86	0.009		
			ND*	1/cm						
Method Blank	Method Blank		ND*	1/cm			9810-86	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9810-86	0.009		
			ND*	1/cm						

ND: non-detect. \*Recovery is below 1/2 minimum reporting level (MRL). NA (not applicable): RPD calculation is not applicable.

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Standard	Standard	0.009	0.007	1/cm	78%	9809-681	0.009	75-125%	
Standard (Dupl)	Standard	0.009	0.008	1/cm	89%	9809-681	0.009	75-125%	
		<b>0.009</b>	<b>0.008</b>	<b>1/cm</b>	<b>89%</b>			75-125%	20%
Standard	Standard	0.088	0.084	1/cm	95%	9810-76	0.009	85-115%	
Standard (Dupl)	Standard	0.088	0.084	1/cm	95%	9810-76	0.009	85-115%	
		<b>0.088</b>	<b>0.084</b>	<b>1/cm</b>	<b>95%</b>			85-115%	10%

Analysis: UV-ICR (UV-254)

Method: SM 5910 B

QC Batch ID: 8-0-318

										Acceptance Criteria
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range	RPD
Method Blank	Method Blank		ND*	1/cm			9810-87	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9810-87	0.009		
			<b>ND*</b>	<b>1/cm</b>						
Method Blank	Method Blank		ND*	1/cm			9810-87	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9810-87	0.009		
			<b>ND*</b>	<b>1/cm</b>						
Standard	Standard	0.009	0.008	1/cm	89%		9809-681	0.009	75-125%	
Standard (Dupl)	Standard	0.009	0.008	1/cm	89%		9809-681	0.009	75-125%	
		<b>0.009</b>	<b>0.008</b>	<b>1/cm</b>	<b>89%</b>	<b>0.0 %</b>			75-125%	20%
Standard	Standard	0.088	0.084	1/cm	95%		9810-76	0.009	85-115%	
Standard (Dupl)	Standard	0.088	0.084	1/cm	95%		9810-76	0.009	85-115%	
		<b>0.088</b>	<b>0.084</b>	<b>1/cm</b>	<b>95%</b>	<b>0.0 %</b>			85-115%	10%

Analysis: UV-ICR (UV-254)

Method: SM 5910 B

QC Batch ID: 8-0-319

										Acceptance Criteria
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range	RPD
Method Blank	Method Blank		ND*	1/cm			9810-114	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9810-114	0.009		
			<b>ND*</b>	<b>1/cm</b>						
Method Blank	Method Blank		ND*	1/cm			9810-114	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9810-114	0.009		
			<b>ND*</b>	<b>1/cm</b>						
Standard	Standard	0.009	0.007	1/cm	78%		9809-681	0.009	75-125%	
Standard (Dupl)	Standard	0.009	0.008	1/cm	89%		9809-681	0.009	75-125%	
		<b>0.009</b>	<b>0.008</b>	<b>1/cm</b>	<b>89%</b>	<b>12.5 %</b>			75-125%	20%
Standard	Standard	0.088	0.084	1/cm	95%		9810-76	0.009	85-115%	
Standard (Dupl)	Standard	0.088	0.084	1/cm	95%		9810-76	0.009	85-115%	
		<b>0.088</b>	<b>0.084</b>	<b>1/cm</b>	<b>95%</b>	<b>0.0 %</b>			85-115%	10%

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Analysis: UV-ICR (UV-254)

Method: SM 5910 B

QC Batch ID: 8-0-320

C Batch ID: 8-0-320

										Acceptance Criteria	
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range	RPD	
Method Blank	Method Blank		ND*	1/cm			9810-233	0.009			
Method Blank (Dupl)	Method Blank		ND*	1/cm			9810-233	0.009			
			ND*	1/cm							
Method Blank	Method Blank		ND*	1/cm			9810-233	0.009			
Method Blank (Dupl)	Method Blank		ND*	1/cm			9810-233	0.009			
			ND*	1/cm							
Standard	Standard	0.009	0.007	1/cm	78%		9809-681	0.009	75-125%		
Standard (Dupl)	Standard	0.009	0.007	1/cm	78%		9809-681	0.009	75-125%		
		0.009	0.007	1/cm	78%	0.0 %			75-125%	20%	
Standard	Standard	0.088	0.083	1/cm	94%		9810-76	0.009	85-115%		
Standard (Dupl)	Standard	0.088	0.083	1/cm	94%		9810-76	0.009	85-115%		
		0.088	0.083	1/cm	94%	0.0 %			85-115%	10%	

Analysis: UV-ICR (UV-254)

Method: SM 5910 B

QC Batch ID: 8-0-322

C Batch ID: 8-0-322

									Acceptance Criteria	
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range	RPD
Method Blank	Method Blank		ND*	1/cm			9810-236	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9810-236	0.009		
			ND*	1/cm						
Method Blank	Method Blank		ND*	1/cm			9810-236	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9810-236	0.009		
			ND*	1/cm						
Standard	Standard	0.009	0.007	1/cm	78%		9809-681	0.009	75-125%	
Standard (Dupl)	Standard	0.009	0.007	1/cm	78%		9809-681	0.009	75-125%	
		0.009	0.007	1/cm	78%	0.0 %			75-125%	20%
Standard	Standard	0.088	0.083	1/cm	94%		9810-76	0.009	85-115%	
Standard (Dupl)	Standard	0.088	0.083	1/cm	94%		9810-76	0.009	85-115%	
		0.088	0.083	1/cm	94%	0.0 %			85-115%	10%

Analysis: UV-ICR (UV-254)

Method: SM 5910 B

QC Batch ID: 8-0-323

C Batch ID: 8-0-323									Acceptance Criteria	
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range	RPD
Method Blank	Method Blank		ND*	1/cm			9810-251	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9810-251	0.009		
			ND*	1/cm						
Method Blank	Method Blank		ND*	1/cm			9810-251	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9810-251	0.009		
			ND*	1/cm						

ND: non-detect. \*Recovery is below 1/2 minimum reporting level (MRL). NA (not applicable): RPD calculation is not applicable.

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Standard	Standard	0.009	0.007	1/cm	78%	9810-239	0.009	75-125%	
Standard (Dupl)	Standard	0.009	0.007	1/cm	78%	9810-239	0.009	75-125%	
		<b>0.009</b>	<b>0.007</b>	<b>1/cm</b>	<b>78%</b>			75-125%	20%
Standard	Standard	0.088	0.083	1/cm	94%	9810-76	0.009	85-115%	
Standard (Dupl)	Standard	0.088	0.083	1/cm	94%	9810-76	0.009	85-115%	
		<b>0.088</b>	<b>0.083</b>	<b>1/cm</b>	<b>94%</b>			85-115%	10%

Analysis: UV-ICR (UV-254)

Method: SM 5910 B

QC Batch ID: 8-0-325

										Acceptance Criteria
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range	RPD
Method Blank	Method Blank		ND*	1/cm			9810-265	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9810-265	0.009		
			<b>ND*</b>	<b>1/cm</b>						
Method Blank	Method Blank		ND*	1/cm			9810-265	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9810-265	0.009		
			<b>ND*</b>	<b>1/cm</b>						
Standard	Standard	0.009	0.008	1/cm	89%		9810-239	0.009	75-125%	
Standard (Dupl)	Standard	0.009	0.007	1/cm	78%		9810-239	0.009	75-125%	
		<b>0.009</b>	<b>0.007</b>	<b>1/cm</b>	<b>78%</b>	<b>14.3 %</b>			75-125%	20%
Standard	Standard	0.088	0.083	1/cm	94%		9810-76	0.009	85-115%	
Standard (Dupl)	Standard	0.088	0.084	1/cm	95%		9810-76	0.009	85-115%	
		<b>0.088</b>	<b>0.084</b>	<b>1/cm</b>	<b>95%</b>	<b>1.2 %</b>			85-115%	10%

Analysis: UV-ICR (UV-254)

Method: SM 5910 B

QC Batch ID: 8-0-326

										Acceptance Criteria
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range	RPD
Method Blank	Method Blank		ND*	1/cm			9810-280	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9810-280	0.009		
			<b>ND*</b>	<b>1/cm</b>						
Method Blank	Method Blank		ND*	1/cm			9810-280	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9810-280	0.009		
			<b>ND*</b>	<b>1/cm</b>						
Standard	Standard	0.009	0.007	1/cm	78%		9810-239	0.009	75-125%	
Standard (Dupl)	Standard	0.009	0.007	1/cm	78%		9810-239	0.009	75-125%	
		<b>0.009</b>	<b>0.007</b>	<b>1/cm</b>	<b>78%</b>	<b>0.0 %</b>			75-125%	20%
Standard	Standard	0.088	0.084	1/cm	95%		9810-76	0.009	85-115%	
Standard (Dupl)	Standard	0.088	0.084	1/cm	95%		9810-76	0.009	85-115%	
		<b>0.088</b>	<b>0.084</b>	<b>1/cm</b>	<b>95%</b>	<b>0.0 %</b>			85-115%	10%

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Analysis: TURB (Turbidity)

Method: SM 2130 B

QC Batch ID: 9-0-18

									Acceptance Criteria		
QC Type		Spike	Recovery	Unit	Yield	RPD	Date Run	S&H ID	MRL	Range	RPD
Standard	Standard	5.41	5.48	ntu	101%		09/28/98	9807-108	0.05		
Standard	Standard	5.41	5.59	ntu	103%		09/28/98	9807-108	0.05		
Standard	Standard	5.41	5.48	ntu	101%		09/30/98	9807-108	0.05		
Standard	Standard	5.41	5.50	ntu	102%		10/01/98	9807-108	0.05		
Standard	Standard	5.41	5.52	ntu	102%		10/04/98	9807-108	0.05		
Standard	Standard	5.41	5.53	ntu	102%		10/06/98	9807-108	0.05		
Standard	Standard	5.41	5.48	ntu	101%		10/08/98	9807-108	0.05		
Standard	Standard	5.41	5.48	ntu	101%		10/14/98	9807-108	0.05		
Standard	Standard	5.41	5.51	ntu	102%		10/16/98	9807-108	0.05		
Standard	Standard	5.41	5.54	ntu	102%		10/16/98	9807-108	0.05		

Analysis: TOX-ICR (Total Organic Halide)

Method: SM 5320 B

QC Batch ID: 12-0-223

									Acceptance Criteria		
QC Type		Spike	Recovery	Unit	Yield	RPD		S&H ID	MRL	Range	RPD
Matrix Spike	Matrix Spike	200	192	µg Cl-/L	96%			9809-114	25		
Matrix Spike (Dupl)	Matrix Spike	200	183	µg Cl-/L	92%			9809-114	25		
		<b>200</b>	<b>188</b>	<b>µg Cl-/L</b>	<b>94%</b>	<b>4.3 %</b>					
Standard - TCP Aqueous (Dupl)	Standard	25	23	µg Cl-/L	92%			9810-260	25	75-125%	
Standard - TCP Aqueous	Standard	200	208	µg Cl-/L	104%			9810-259	25	85-115%	
System Blank	Blank		ND*	µg Cl-/L				9810-261	25		

Analysis: TOX-ICR (Total Organic Halide)

Method: SM 5320 B

QC Batch ID: 12-0-225

									Acceptance Criteria		
QC Type		Spike	Recovery	Unit	Yield	RPD		S&H ID	MRL	Range	RPD
Matrix Spike	Matrix Spike	200	201	µg Cl-/L	100%			9809-687	25		
Matrix Spike (Dupl)	Matrix Spike	200	200	µg Cl-/L	100%			9809-687	25		
		<b>200</b>	<b>200</b>	<b>µg Cl-/L</b>	<b>100%</b>	<b>0.5 %</b>					
Standard - TCP Aqueous	Standard	25	24	µg Cl-/L	96%			9810-278	25	75-125%	
Standard - TCP Aqueous	Standard	200	199	µg Cl-/L	100%			9810-277	25	85-115%	
System Blank	Blank		ND*	µg Cl-/L				9810-279	25		



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Analysis: TOX-ICR (Total Organic Halide)

Method: SM 5320 B

QC Batch ID: 12-0-226

								Acceptance Criteria	
<u>QC Type</u>		<u>Spike</u>	<u>Recovery</u>	<u>Unit</u>	<u>Yield</u>	<u>RPD</u>	<u>S&amp;H ID</u>	<u>MRL</u>	<u>Range</u>
Standard - TCP Aqueous	Standard	25	23	µg Cl-/L	92%		9810-288	25	75-125%
Standard - TCP Aqueous	Standard	200	198	µg Cl-/L	99%		9810-287	25	85-115%
System Blank	Blank		ND*	µg Cl-/L			9810-289	25	

Analysis: TOX-ICR (Total Organic Halide)

Method: SM 5320 B

QC Batch ID: 12-0-227

								Acceptance Criteria	
<u>QC Type</u>		<u>Spike</u>	<u>Recovery</u>	<u>Unit</u>	<u>Yield</u>	<u>RPD</u>	<u>S&amp;H ID</u>	<u>MRL</u>	<u>Range</u>
Matrix Spike	Matrix Spike	200	202	µg Cl-/L	101%		9809-727	25	
Matrix Spike (Dupl)	Matrix Spike	200	202	µg Cl-/L	101%		9809-727	25	
		<b>200</b>	<b>202</b>	<b>µg Cl-/L</b>	<b>101%</b>	<b>0.5 %</b>			
Standard - TCP Aqueous	Standard	25	26	µg Cl-/L	104%		9810-307	25	75-125%
Standard - TCP Aqueous	Standard	200	197	µg Cl-/L	98%		9810-306	25	85-115%
System Blank	Blank		ND*	µg Cl-/L			9810-308	25	

Analysis: TOX-ICR (Total Organic Halide)

Method: SM 5320 B

QC Batch ID: 12-0-228

								Acceptance Criteria	
<u>QC Type</u>		<u>Spike</u>	<u>Recovery</u>	<u>Unit</u>	<u>Yield</u>	<u>RPD</u>	<u>S&amp;H ID</u>	<u>MRL</u>	<u>Range</u>
Standard - TCP Aqueous	Standard	25	21	µg Cl-/L	84%		9810-415	25	75-125%
Standard - TCP Aqueous	Standard	200	197	µg Cl-/L	98%		9810-414	25	85-115%
System Blank	Blank		ND*	µg Cl-/L			9810-416	25	

Analysis: TOX-ICR (Total Organic Halide)

Method: SM 5320 B

QC Batch ID: 12-0-229

								Acceptance Criteria	
<u>QC Type</u>		<u>Spike</u>	<u>Recovery</u>	<u>Unit</u>	<u>Yield</u>	<u>RPD</u>	<u>S&amp;H ID</u>	<u>MRL</u>	<u>Range</u>
Matrix Spike	Matrix Spike	200	194	µg Cl-/L	97%		9809-535	25	
Matrix Spike (Dupl)	Matrix Spike	200	194	µg Cl-/L	97%		9809-535	25	
		<b>200</b>	<b>194</b>	<b>µg Cl-/L</b>	<b>97%</b>	<b>0.0 %</b>			
Standard - TCP Aqueous	Standard	25	25	µg Cl-/L	100%		9810-426	25	75-125%
Standard - TCP Aqueous	Standard	200	190	µg Cl-/L	95%		9810-425	25	85-115%
System Blank	Blank		ND*	µg Cl-/L			9810-427	25	

Analysis: TOX-ICR (Total Organic Halide)

Method: SM 5320 B

QC Batch ID: 12-0-230

								Acceptance Criteria	
<u>QC Type</u>		<u>Spike</u>	<u>Recovery</u>	<u>Unit</u>	<u>Yield</u>	<u>RPD</u>	<u>S&amp;H ID</u>	<u>MRL</u>	<u>Range</u>

ND: non-detect. \*Recovery is below 1/2 minimum reporting level (MRL). NA (not applicable): RPD calculation is not applicable.

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Standard - TCP Aqueous	Standard	25	25	µg Cl-/L	100%	9810-438	25	75-125%
Standard - TCP Aqueous	Standard	200	202	µg Cl-/L	101%	9810-437	25	85-115%
System Blank	Blank		ND*	µg Cl-/L		9810-439	25	

**Analysis:** THM-ICR (Trihalomethanes (ICR))**Method:** EPA 551.1**QC Batch ID:** 0-223-0

										Acceptance Criteria	
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range	RPD	
Bromodichloromethane	Duplicate	4.7	4.4	µg/L		6.6%	9809-186	1			
Bromodichloromethane	Matrix Spike	40.0	36.8	µg/L	92%		9809-498	1			
Bromodichloromethane	Method Blank		ND*	µg/L			9810-63	1			
Bromodichloromethane	Secondary Source Std	20.0	21.6	µg/L	108%		9810-64	1	70-130%		
Bromodichloromethane	Standard	20.0	18.3	µg/L	92%		9810-65	1	80-120%		
Bromodichloromethane	Standard	20.0	19.3	µg/L	97%		9810-65	1	80-120%		
Bromodichloromethane	Standard	40.0	39.4	µg/L	98%		9810-66	1	80-120%		
Bromoform	Duplicate	26.7	26.2	µg/L		1.9%	9809-186	1			
Bromoform	Matrix Spike	40.0	38.8	µg/L	97%		9809-498	1			
Bromoform	Method Blank		ND*	µg/L			9810-63	1			
Bromoform	Secondary Source Std	20.0	19.1	µg/L	96%		9810-64	1	70-130%		
Bromoform	Standard	20.0	18.0	µg/L	90%		9810-65	1	80-120%		
Bromoform	Standard	20.0	19.9	µg/L	99%		9810-65	1	80-120%		
Bromoform	Standard	40.0	42.0	µg/L	105%		9810-66	1	80-120%		
Chloroform	Duplicate	1.4	1.2	µg/L		15.4%	9809-186	1			
Chloroform	Matrix Spike	40.0	36.8	µg/L	92%		9809-498	1			
Chloroform	Method Blank		ND*	µg/L			9810-63	1			
Chloroform	Secondary Source Std	20.0	22.1	µg/L	111%		9810-64	1	70-130%		
Chloroform	Standard	20.0	17.8	µg/L	89%		9810-65	1	80-120%		
Chloroform	Standard	20.0	18.6	µg/L	93%		9810-65	1	80-120%		
Chloroform	Standard	40.0	38.3	µg/L	96%		9810-66	1	80-120%		
Dibromochloromethane	Duplicate	16.2	15.3	µg/L		5.7%	9809-186	1			
Dibromochloromethane	Matrix Spike	40.0	37.1	µg/L	93%		9809-498	1			
Dibromochloromethane	Method Blank		ND*	µg/L			9810-63	1			
Dibromochloromethane	Secondary Source Std	20.0	20.9	µg/L	104%		9810-64	1	70-130%		
Dibromochloromethane	Standard	20.0	18.5	µg/L	93%		9810-65	1	80-120%		

ND: non-detect. \*Recovery is below 1/2 minimum reporting level (MRL). NA (not applicable): RPD calculation is not applicable.

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Dibromochloromethane	Standard	20.0	18.7 µg/L	93%	9810-65	1	80-120%
Dibromochloromethane	Standard	40.0	40.3 µg/L	101%	9810-66	1	80-120%

**Analysis:** THM-ICR (Trihalomethanes (ICR))**Method:** EPA 551.1**QC Batch ID:** 0-238-0

C Batch ID: 0-238-0									Acceptance Criteria	
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range	RPD
Bromodichloromethane	Duplicate	24.9	24.9	µg/L		0.0%	9809-580	1		
Bromodichloromethane	Matrix Spike	40.0	41.1	µg/L	103%		9809-716	1		
Bromodichloromethane	Method Blank		ND*	µg/L			9810-301	1		
Bromodichloromethane	Secondary Source Std	20.0	20.5	µg/L	102%		9810-302	1	70-130%	
Bromodichloromethane	Standard	20.0	18.7	µg/L	93%		9810-303	1	80-120%	
Bromodichloromethane	Standard	20.0	19.2	µg/L	96%		9810-303	1	80-120%	
Bromodichloromethane	Standard	40.0	41.5	µg/L	104%		9810-304	1	80-120%	
Bromoform	Duplicate	6.3	6.1	µg/L		3.2%	9809-580	1		
Bromoform	Matrix Spike	40.0	43.8	µg/L	110%		9809-716	1		
Bromoform	Method Blank		ND*	µg/L			9810-301	1		
Bromoform	Secondary Source Std	20.0	17.6	µg/L	88%		9810-302	1	70-130%	
Bromoform	Standard	20.0	18.0	µg/L	90%		9810-303	1	80-120%	
Bromoform	Standard	20.0	19.1	µg/L	96%		9810-303	1	80-120%	
Bromoform	Standard	40.0	43.1	µg/L	108%		9810-304	1	80-120%	
Chloroform	Duplicate	21.7	21.6	µg/L		0.5%	9809-580	1		
Chloroform	Matrix Spike	40.0	43.4	µg/L	109%		9809-716	1		
Chloroform	Method Blank		ND*	µg/L			9810-301	1		
Chloroform	Secondary Source Std	20.0	21.1	µg/L	106%		9810-302	1	70-130%	
Chloroform	Standard	20.0	17.2	µg/L	86%		9810-303	1	80-120%	
Chloroform	Standard	20.0	18.6	µg/L	93%		9810-303	1	80-120%	
Chloroform	Standard	40.0	40.8	µg/L	102%		9810-304	1	80-120%	
Dibromochloromethane	Duplicate	22.5	22.7	µg/L		0.9%	9809-580	1		
Dibromochloromethane	Matrix Spike	40.0	40.6	µg/L	102%		9809-716	1		
Dibromochloromethane	Method Blank		ND*	µg/L			9810-301	1		
Dibromochloromethane	Secondary Source Std	20.0	19.4	µg/L	97%		9810-302	1	70-130%	
Dibromochloromethane	Standard	20.0	18.7	µg/L	93%		9810-303	1	80-120%	
Dibromochloromethane	Standard	20.0	19.1	µg/L	96%		9810-303	1	80-120%	

ND: non-detect. \*Recovery is below 1/2 minimum reporting level (MRL). NA (not applicable): RPD calculation is not applicable.

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Dibromochloromethane	Standard	40.0	42.1	µg/L	105%	9810-304	1	80-120%
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**Analysis:** THM-ICR (Trihalomethanes (ICR))**Method:** EPA 551.1**QC Batch ID:** 0-243-0

									Acceptance Criteria	
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range	RPD
Bromodichloromethane	Duplicate	15.4	14.6	µg/L		5.3%	9809-769	1		
Bromodichloromethane	Matrix Spike	40.0	41.4	µg/L	103%		9810-99	1		
Bromodichloromethane	Method Blank		ND*	µg/L			9810-409	1		
Bromodichloromethane	Secondary Source Std	20.0	22.2	µg/L	111%		9810-410	1	70-130%	
Bromodichloromethane	Standard	20.0	19.2	µg/L	96%		9810-411	1	80-120%	
Bromodichloromethane	Standard	20.0	19.9	µg/L	99%		9810-411	1	80-120%	
Bromodichloromethane	Standard	40.0	40.2	µg/L	101%		9810-412	1	80-120%	
Bromoform	Duplicate	ND	ND	µg/L		NA	9809-769	1		
Bromoform	Matrix Spike	40.0	43.4	µg/L	109%		9810-99	1		
Bromoform	Method Blank		ND*	µg/L			9810-409	1		
Bromoform	Secondary Source Std	20.0	20.2	µg/L	101%		9810-410	1	70-130%	
Bromoform	Standard	20.0	19.6	µg/L	98%		9810-411	1	80-120%	
Bromoform	Standard	20.0	19.7	µg/L	98%		9810-411	1	80-120%	
Bromoform	Standard	40.0	42.4	µg/L	106%		9810-412	1	80-120%	
Chloroform	Duplicate	50.5	47.5	µg/L		6.1%	9809-769	1		
Chloroform	Matrix Spike	40.0	42.5	µg/L	106%		9810-99	1		
Chloroform	Method Blank		ND*	µg/L			9810-409	1		
Chloroform	Secondary Source Std	20.0	22.4	µg/L	112%		9810-410	1	70-130%	
Chloroform	Standard	20.0	18.6	µg/L	93%		9810-411	1	80-120%	
Chloroform	Standard	20.0	19.8	µg/L	99%		9810-411	1	80-120%	
Chloroform	Standard	40.0	40.5	µg/L	101%		9810-412	1	80-120%	
Dibromochloromethane	Duplicate	2.1	2.1	µg/L		0.0%	9809-769	1		
Dibromochloromethane	Matrix Spike	40.0	42.6	µg/L	106%		9810-99	1		
Dibromochloromethane	Method Blank		ND*	µg/L			9810-409	1		
Dibromochloromethane	Secondary Source Std	20.0	21.2	µg/L	106%		9810-410	1	70-130%	
Dibromochloromethane	Standard	20.0	19.8	µg/L	99%		9810-411	1	80-120%	
Dibromochloromethane	Standard	20.0	20.1	µg/L	101%		9810-411	1	80-120%	
Dibromochloromethane	Standard	40.0	41.4	µg/L	103%		9810-412	1	80-120%	

ND: non-detect. \*Recovery is below 1/2 minimum reporting level (MRL). NA (not applicable): RPD calculation is not applicable.

**Quality Control Report**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 150  
Study Title: ICR RSSCT #2

Analysis: THM-ICR (Trihalomethanes (ICR))

Method: EPA 551.1

QC Batch ID: 0-246-0

C Batch ID: 0-246-0									Acceptance Criteria	
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range	RPD
Bromodichloromethane	Duplicate	22.1	19.6	µg/L		12.0%	9810-17	1		
Bromodichloromethane	Matrix Spike	40.0	41.1	µg/L	103%		9810-166	1		
Bromodichloromethane	Method Blank		ND*	µg/L			9810-432	1		
Bromodichloromethane	Secondary Source Std	20.0	20.6	µg/L	103%		9810-433	1	70-130%	
Bromodichloromethane	Standard	20.0	20.6	µg/L	103%		9810-434	1	80-120%	
Bromodichloromethane	Standard	20.0	20.8	µg/L	104%		9810-434	1	80-120%	
Bromodichloromethane	Standard	40.0	40.2	µg/L	101%		9810-435	1	80-120%	
Bromoform	Duplicate	9.3	8.6	µg/L		7.8%	9810-17	1		
Bromoform	Matrix Spike	40.0	41.7	µg/L	104%		9810-166	1		
Bromoform	Method Blank		ND*	µg/L			9810-432	1		
Bromoform	Secondary Source Std	20.0	18.2	µg/L	91%		9810-433	1	70-130%	
Bromoform	Standard	20.0	20.6	µg/L	103%		9810-434	1	80-120%	
Bromoform	Standard	20.0	20.5	µg/L	102%		9810-434	1	80-120%	
Bromoform	Standard	40.0	37.6	µg/L	94%		9810-435	1	80-120%	
Chloroform	Duplicate	12.9	11.6	µg/L		10.6%	9810-17	1		
Chloroform	Matrix Spike	40.0	43.1	µg/L	108%		9810-166	1		
Chloroform	Method Blank		ND*	µg/L			9810-432	1		
Chloroform	Secondary Source Std	20.0	21.0	µg/L	105%		9810-433	1	70-130%	
Chloroform	Standard	20.0	19.8	µg/L	99%		9810-434	1	80-120%	
Chloroform	Standard	20.0	20.2	µg/L	101%		9810-434	1	80-120%	
Chloroform	Standard	40.0	41.2	µg/L	103%		9810-435	1	80-120%	
Dibromochloromethane	Duplicate	25.7	22.4	µg/L		13.7%	9810-17	1		
Dibromochloromethane	Matrix Spike	40.0	43.2	µg/L	108%		9810-166	1		
Dibromochloromethane	Method Blank		ND*	µg/L			9810-432	1		
Dibromochloromethane	Secondary Source Std	20.0	19.8	µg/L	99%		9810-433	1	70-130%	
Dibromochloromethane	Standard	20.0	20.6	µg/L	103%		9810-434	1	80-120%	
Dibromochloromethane	Standard	20.0	21.2	µg/L	106%		9810-434	1	80-120%	
Dibromochloromethane	Standard	40.0	40.3	µg/L	101%		9810-435	1	80-120%	

ND: non-detect. \*Recovery is below 1/2 minimum reporting level (MRL). NA (not applicable): RPD calculation is not applicable.

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Iowa-American Water CompanyStudy#: 150  
Study Title: ICR RSSCT #2

Analysis: HAA-ICR (Haloacetic Acids)

Method: EPA 552.2

QC Batch ID: 0-222-0

C Batch ID: 0-222-0									Acceptance Criteria	
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range	RPD
Bromochloroacetic acid	Duplicate	3.5	3.4	µg/L		2.9%	9809-100	1		
Bromochloroacetic acid	Matrix Spike	40.0	42.5	µg/L	106%		9809-185	1		
Bromochloroacetic acid	Method Blank		ND*	µg/L			9809-677	1		
Bromochloroacetic acid	Secondary Source Std	20.0	17.4	µg/L	87%		9809-678	1	70-130%	
Bromochloroacetic acid	Standard	20.0	18.7	µg/L	93%		9809-679	1	80-120%	
Bromochloroacetic acid	Standard	20.0	19.0	µg/L	95%		9809-679	1	80-120%	
Bromochloroacetic acid	Standard	40.0	41.1	µg/L	103%		9809-680	1	80-120%	
Bromodichloroacetic acid	Duplicate	ND	ND	µg/L		NA	9809-100	1		
Bromodichloroacetic acid	Matrix Spike	40.0	42.2	µg/L	106%		9809-185	1		
Bromodichloroacetic acid	Method Blank		ND*	µg/L			9809-677	1		
Bromodichloroacetic acid	Secondary Source Std		ND	µg/L			9809-678	1	70-130%	
Bromodichloroacetic acid	Standard	20.0	22.9	µg/L	115%		9809-679	1	80-120%	
Bromodichloroacetic acid	Standard	20.0	20.3	µg/L	102%		9809-679	1	80-120%	
Bromodichloroacetic acid	Standard	40.0	43.7	µg/L	109%		9809-680	1	80-120%	
Chlorodibromoacetic acid	Duplicate	ND	ND	µg/L		NA	9809-100	2		
Chlorodibromoacetic acid	Matrix Spike	40.0	42.3	µg/L	106%		9809-185	2		
Chlorodibromoacetic acid	Method Blank		ND*	µg/L			9809-677	2		
Chlorodibromoacetic acid	Secondary Source Std		ND	µg/L			9809-678	2	70-130%	
Chlorodibromoacetic acid	Standard	20.0	23.0	µg/L	115%		9809-679	2	80-120%	
Chlorodibromoacetic acid	Standard	20.0	22.0	µg/L	110%		9809-679	2	80-120%	
Chlorodibromoacetic acid	Standard	40.0	44.0	µg/L	110%		9809-680	2	80-120%	
Dibromoacetic acid	Duplicate	8.1	7.5	µg/L		7.7%	9809-100	1		
Dibromoacetic acid	Matrix Spike	40.0	44.2	µg/L	111%		9809-185	1		
Dibromoacetic acid	Method Blank		ND*	µg/L			9809-677	1		
Dibromoacetic acid	Secondary Source Std	20.0	18.4	µg/L	92%		9809-678	1	70-130%	
Dibromoacetic acid	Standard	20.0	19.2	µg/L	96%		9809-679	1	80-120%	
Dibromoacetic acid	Standard	20.0	20.3	µg/L	102%		9809-679	1	80-120%	
Dibromoacetic acid	Standard	40.0	41.1	µg/L	103%		9809-680	1	80-120%	
Dichloroacetic acid	Duplicate	1.5	1.7	µg/L		12.5%	9809-100	1		
Dichloroacetic acid	Matrix Spike	40.0	43.2	µg/L	108%		9809-185	1		

ND: non-detect. \*Recovery is below 1/2 minimum reporting level (MRL). NA (not applicable): RPD calculation is not applicable.

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Dichloroacetic acid	Method Blank		ND*	µg/L		9809-677	1
Dichloroacetic acid	Secondary Source Std	20.0	19.1	µg/L	96%	9809-678	1 70-130%
Dichloroacetic acid	Standard	20.0	18.7	µg/L	93%	9809-679	1 80-120%
Dichloroacetic acid	Standard	20.0	18.4	µg/L	92%	9809-679	1 80-120%
Dichloroacetic acid	Standard	40.0	37.0	µg/L	93%	9809-680	1 80-120%
Monobromoacetic acid	Duplicate	ND	ND	µg/L	NA	9809-100	1
Monobromoacetic acid	Matrix Spike	40.0	41.7	µg/L	104%	9809-185	1
Monobromoacetic acid	Method Blank		ND*	µg/L		9809-677	1
Monobromoacetic acid	Secondary Source Std	20.0	20.8	µg/L	104%	9809-678	1 70-130%
Monobromoacetic acid	Standard	20.0	17.9	µg/L	89%	9809-679	1 80-120%
Monobromoacetic acid	Standard	20.0	18.1	µg/L	91%	9809-679	1 80-120%
Monobromoacetic acid	Standard	40.0	39.8	µg/L	99%	9809-680	1 80-120%
Monochloroacetic acid	Duplicate	ND	ND	µg/L	NA	9809-100	2
Monochloroacetic acid	Matrix Spike	40.0	38.6	µg/L	97%	9809-185	2
Monochloroacetic acid	Method Blank		ND*	µg/L		9809-677	2
Monochloroacetic acid	Secondary Source Std	20.0	19.1	µg/L	96%	9809-678	2 70-130%
Monochloroacetic acid	Standard	20.0	19.3	µg/L	97%	9809-679	2 80-120%
Monochloroacetic acid	Standard	20.0	17.8	µg/L	89%	9809-679	2 80-120%
Monochloroacetic acid	Standard	40.0	40.1	µg/L	100%	9809-680	2 80-120%
Tribromoacetic acid	Duplicate	ND	ND	µg/L	NA	9809-100	4
Tribromoacetic acid	Matrix Spike	40.0	39.9	µg/L	100%	9809-185	4
Tribromoacetic acid	Method Blank		ND*	µg/L		9809-677	4
Tribromoacetic acid	Secondary Source Std		ND	µg/L		9809-678	4 70-130%
Tribromoacetic acid	Standard	20.0	20.8	µg/L	104%	9809-679	4 80-120%
Tribromoacetic acid	Standard	20.0	22.2	µg/L	111%	9809-679	4 80-120%
Tribromoacetic acid	Standard	40.0	42.3	µg/L	106%	9809-680	4 80-120%
Trichloroacetic acid	Duplicate	ND	ND	µg/L	NA	9809-100	1
Trichloroacetic acid	Matrix Spike	40.0	42.2	µg/L	106%	9809-185	1
Trichloroacetic acid	Method Blank		ND*	µg/L		9809-677	1
Trichloroacetic acid	Secondary Source Std	20.0	17.3	µg/L	86%	9809-678	1 70-130%
Trichloroacetic acid	Standard	20.0	19.5	µg/L	97%	9809-679	1 80-120%
Trichloroacetic acid	Standard	20.0	19.8	µg/L	99%	9809-679	1 80-120%

ND: non-detect. \*Recovery is below 1/2 minimum reporting level (MRL). NA (not applicable): RPD calculation is not applicable.

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Trichloroacetic acid	Standard	40.0	41.1	µg/L	103%	9809-680	1	80-120%
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**Analysis:** HAA-ICR (Haloacetic Acids)**Method:** EPA 552.2**QC Batch ID:** 0-236-0

C Batch ID: 0-236-0									Acceptance Criteria	
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range	RPD
Bromochloroacetic acid	Duplicate	7.3	6.8	µg/L		7.1%	9809-574	1		
Bromochloroacetic acid	Matrix Spike	40.0	34.7	µg/L	87%		9810-11	1		
Bromochloroacetic acid	Method Blank		ND*	µg/L			9810-271	1		
Bromochloroacetic acid	Standard	20.0	17.3	µg/L	86%		9810-273	1	80-120%	
Bromochloroacetic acid	Standard	20.0	16.7	µg/L	83%		9810-273	1	80-120%	
Bromochloroacetic acid	Standard	40.0	38.8	µg/L	97%		9810-274	1	80-120%	
Bromochloroacetic acid	Standard	40.0	37.0	µg/L	93%		9810-274	1	80-120%	
Bromodichloroacetic acid	Duplicate	2.3	2.0	µg/L		14.0%	9809-574	1		
Bromodichloroacetic acid	Matrix Spike	40.0	33.0	µg/L	82%		9810-11	1		
Bromodichloroacetic acid	Method Blank		ND*	µg/L			9810-271	1		
Bromodichloroacetic acid	Standard	20.0	18.0	µg/L	90%		9810-273	1	80-120%	
Bromodichloroacetic acid	Standard	20.0	19.3	µg/L	97%		9810-273	1	80-120%	
Bromodichloroacetic acid	Standard	40.0	36.1	µg/L	90%		9810-274	1	80-120%	
Bromodichloroacetic acid	Standard	40.0	35.2	µg/L	88%		9810-274	1	80-120%	
Chlorodibromoacetic acid	Duplicate	ND	ND	µg/L		NA	9809-574	2		
Chlorodibromoacetic acid	Matrix Spike	40.0	40.2	µg/L	101%		9810-11	2		
Chlorodibromoacetic acid	Method Blank		ND*	µg/L			9810-271	2		
Chlorodibromoacetic acid	Standard	20.0	16.9	µg/L	84%		9810-273	2	80-120%	
Chlorodibromoacetic acid	Standard	20.0	21.5	µg/L	108%		9810-273	2	80-120%	
Chlorodibromoacetic acid	Standard	40.0	35.6	µg/L	89%		9810-274	2	80-120%	
Chlorodibromoacetic acid	Standard	40.0	39.6	µg/L	99%		9810-274	2	80-120%	
Dibromoacetic acid	Duplicate	7.3	6.8	µg/L		7.1%	9809-574	1		
Dibromoacetic acid	Matrix Spike	40.0	37.7	µg/L	94%		9810-11	1		
Dibromoacetic acid	Method Blank		ND*	µg/L			9810-271	1		
Dibromoacetic acid	Standard	20.0	17.9	µg/L	89%		9810-273	1	80-120%	
Dibromoacetic acid	Standard	20.0	21.8	µg/L	109%		9810-273	1	80-120%	
Dibromoacetic acid	Standard	40.0	34.1	µg/L	85%		9810-274	1	80-120%	
Dibromoacetic acid	Standard	40.0	33.7	µg/L	84%		9810-274	1	80-120%	
Dichloroacetic acid	Duplicate	6.2	6.1	µg/L		1.6%	9809-574	1		
Dichloroacetic acid	Matrix Spike	40.0	36.6	µg/L	92%		9810-11	1		

ND: non-detect. \*Recovery is below 1/2 minimum reporting level (MRL). NA (not applicable): RPD calculation is not applicable.



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Dichloroacetic acid	Method Blank		ND*	µg/L		9810-271	1
Dichloroacetic acid	Standard	20.0	19.6	µg/L	98%	9810-273	1 80-120%
Dichloroacetic acid	Standard	20.0	21.2	µg/L	106%	9810-273	1 80-120%
Dichloroacetic acid	Standard	40.0	40.0	µg/L	100%	9810-274	1 80-120%
Dichloroacetic acid	Standard	40.0	41.2	µg/L	103%	9810-274	1 80-120%
Monobromoacetic acid	Duplicate	ND	ND	µg/L	NA	9809-574	1
Monobromoacetic acid	Matrix Spike	40.0	41.9	µg/L	105%	9810-11	1
Monobromoacetic acid	Method Blank		ND*	µg/L		9810-271	1
Monobromoacetic acid	Standard	20.0	22.9	µg/L	115%	9810-273	1 80-120%
Monobromoacetic acid	Standard	20.0	20.4	µg/L	102%	9810-273	1 80-120%
Monobromoacetic acid	Standard	40.0	41.0	µg/L	102%	9810-274	1 80-120%
Monobromoacetic acid	Standard	40.0	41.8	µg/L	104%	9810-274	1 80-120%
Monochloroacetic acid	Duplicate	ND	ND	µg/L	NA	9809-574	2
Monochloroacetic acid	Matrix Spike	40.0	43.1	µg/L	108%	9810-11	2
Monochloroacetic acid	Method Blank		ND*	µg/L		9810-271	2
Monochloroacetic acid	Standard	20.0	23.2	µg/L	116%	9810-273	2 80-120%
Monochloroacetic acid	Standard	20.0	18.4	µg/L	92%	9810-273	2 80-120%
Monochloroacetic acid	Standard	40.0	37.9	µg/L	95%	9810-274	2 80-120%
Monochloroacetic acid	Standard	40.0	37.2	µg/L	93%	9810-274	2 80-120%
Tribromoacetic acid	Duplicate	ND	ND	µg/L	NA	9809-574	4
Tribromoacetic acid	Matrix Spike	40.0	38.5	µg/L	96%	9810-11	4
Tribromoacetic acid	Method Blank		ND*	µg/L		9810-271	4
Tribromoacetic acid	Standard	20.0	18.1	µg/L	91%	9810-273	4 80-120%
Tribromoacetic acid	Standard	20.0	20.1	µg/L	101%	9810-273	4 80-120%
Tribromoacetic acid	Standard	40.0	39.5	µg/L	99%	9810-274	4 80-120%
Tribromoacetic acid	Standard	40.0	39.2	µg/L	98%	9810-274	4 80-120%
Trichloroacetic acid	Duplicate	2.5	2.3	µg/L	8.3%	9809-574	1
Trichloroacetic acid	Matrix Spike	40.0	33.6	µg/L	84%	9810-11	1
Trichloroacetic acid	Method Blank		ND*	µg/L		9810-271	1
Trichloroacetic acid	Standard	20.0	17.2	µg/L	86%	9810-273	1 80-120%
Trichloroacetic acid	Standard	20.0	16.7	µg/L	83%	9810-273	1 80-120%
Trichloroacetic acid	Standard	40.0	34.5	µg/L	86%	9810-274	1 80-120%
Trichloroacetic acid	Standard	40.0	33.9	µg/L	85%	9810-274	1 80-120%

**Quality Control Report**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 150  
Study Title: ICR RSSCT #2

Analysis: HAA-ICR (Haloacetic Acids)

Method: EPA 552.2

QC Batch ID: 0-237-0

								Acceptance Criteria	
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range
Bromochloroacetic acid	Duplicate	ND	ND	µg/L		NA	9809-725	1	
Bromochloroacetic acid	Matrix Spike	40.0	42.0	µg/L	105%		9809-757	1	
Bromochloroacetic acid	Method Blank		ND*	µg/L			9810-282	1	
Bromochloroacetic acid	Secondary Source Std	20.0	20.3	µg/L	102%		9810-283	1	70-130%
Bromochloroacetic acid	Standard	20.0	19.0	µg/L	95%		9810-284	1	80-120%
Bromochloroacetic acid	Standard	20.0	18.9	µg/L	94%		9810-284	1	80-120%
Bromochloroacetic acid	Standard	40.0	41.3	µg/L	103%		9810-285	1	80-120%
Bromodichloroacetic acid	Duplicate	1.2	1.2	µg/L		0.0%	9809-725	1	
Bromodichloroacetic acid	Matrix Spike	40.0	46.2	µg/L	116%		9809-757	1	
Bromodichloroacetic acid	Method Blank		ND*	µg/L			9810-282	1	
Bromodichloroacetic acid	Secondary Source Std		ND	µg/L			9810-283	1	70-130%
Bromodichloroacetic acid	Standard	20.0	16.8	µg/L	84%		9810-284	1	80-120%
Bromodichloroacetic acid	Standard	20.0	17.7	µg/L	89%		9810-284	1	80-120%
Bromodichloroacetic acid	Standard	40.0	44.3	µg/L	111%		9810-285	1	80-120%
Chlorodibromoacetic acid	Duplicate	ND	ND	µg/L		NA	9809-725	2	
Chlorodibromoacetic acid	Matrix Spike	40.0	44.3	µg/L	111%		9809-757	2	
Chlorodibromoacetic acid	Method Blank		ND*	µg/L			9810-282	2	
Chlorodibromoacetic acid	Secondary Source Std		ND	µg/L			9810-283	2	70-130%
Chlorodibromoacetic acid	Standard	20.0	16.4	µg/L	82%		9810-284	2	80-120%
Chlorodibromoacetic acid	Standard	20.0	17.6	µg/L	88%		9810-284	2	80-120%
Chlorodibromoacetic acid	Standard	40.0	44.6	µg/L	112%		9810-285	2	80-120%
Dibromoacetic acid	Duplicate	ND	ND	µg/L		NA	9809-725	1	
Dibromoacetic acid	Matrix Spike	40.0	43.1	µg/L	108%		9809-757	1	
Dibromoacetic acid	Method Blank		ND*	µg/L			9810-282	1	
Dibromoacetic acid	Secondary Source Std	20.0	21.3	µg/L	106%		9810-283	1	70-130%
Dibromoacetic acid	Standard	20.0	18.5	µg/L	93%		9810-284	1	80-120%
Dibromoacetic acid	Standard	20.0	18.4	µg/L	92%		9810-284	1	80-120%
Dibromoacetic acid	Standard	40.0	41.1	µg/L	103%		9810-285	1	80-120%
Dichloroacetic acid	Duplicate	ND	ND	µg/L		NA	9809-725	1	
Dichloroacetic acid	Matrix Spike	40.0	40.1	µg/L	100%		9809-757	1	

ND: non-detect. \*Recovery is below 1/2 minimum reporting level (MRL). NA (not applicable): RPD calculation is not applicable.

**Quality Control Report**Mr. Joel Mohr  
Iowa-American Water Company**Study#:** 150  
**Study Title:** ICR RSSCT #2

Dichloroacetic acid	Method Blank		ND*	µg/L		9810-282	1
Dichloroacetic acid	Secondary Source Std	20.0	21.1	µg/L	106%	9810-283	1 70-130%
Dichloroacetic acid	Standard	20.0	19.8	µg/L	99%	9810-284	1 80-120%
Dichloroacetic acid	Standard	20.0	19.5	µg/L	97%	9810-284	1 80-120%
Dichloroacetic acid	Standard	40.0	40.3	µg/L	101%	9810-285	1 80-120%
Monobromoacetic acid	Duplicate	ND	ND	µg/L	NA	9809-725	1
Monobromoacetic acid	Matrix Spike	40.0	37.0	µg/L	93%	9809-757	1
Monobromoacetic acid	Method Blank		ND*	µg/L		9810-282	1
Monobromoacetic acid	Secondary Source Std	20.0	20.5	µg/L	102%	9810-283	1 70-130%
Monobromoacetic acid	Standard	20.0	19.3	µg/L	97%	9810-284	1 80-120%
Monobromoacetic acid	Standard	20.0	18.8	µg/L	94%	9810-284	1 80-120%
Monobromoacetic acid	Standard	40.0	40.7	µg/L	102%	9810-285	1 80-120%
Monochloroacetic acid	Duplicate	ND	ND	µg/L	NA	9809-725	2
Monochloroacetic acid	Matrix Spike	40.0	36.0	µg/L	90%	9809-757	2
Monochloroacetic acid	Method Blank		ND*	µg/L		9810-282	2
Monochloroacetic acid	Secondary Source Std	20.0	19.6	µg/L	98%	9810-283	2 70-130%
Monochloroacetic acid	Standard	20.0	19.4	µg/L	97%	9810-284	2 80-120%
Monochloroacetic acid	Standard	20.0	20.4	µg/L	102%	9810-284	2 80-120%
Monochloroacetic acid	Standard	40.0	40.6	µg/L	102%	9810-285	2 80-120%
Tribromoacetic acid	Duplicate	ND	ND	µg/L	NA	9809-725	4
Tribromoacetic acid	Matrix Spike	40.0	41.5	µg/L	104%	9809-757	4
Tribromoacetic acid	Method Blank		ND*	µg/L		9810-282	4
Tribromoacetic acid	Secondary Source Std		ND	µg/L		9810-283	4 70-130%
Tribromoacetic acid	Standard	20.0	16.4	µg/L	82%	9810-284	4 80-120%
Tribromoacetic acid	Standard	20.0	18.2	µg/L	91%	9810-284	4 80-120%
Tribromoacetic acid	Standard	40.0	43.2	µg/L	108%	9810-285	4 80-120%
Trichloroacetic acid	Duplicate	ND	ND	µg/L	NA	9809-725	1
Trichloroacetic acid	Matrix Spike	40.0	47.6	µg/L	119%	9809-757	1
Trichloroacetic acid	Method Blank		ND*	µg/L		9810-282	1
Trichloroacetic acid	Secondary Source Std	20.0	21.6	µg/L	108%	9810-283	1 70-130%
Trichloroacetic acid	Standard	20.0	17.8	µg/L	89%	9810-284	1 80-120%
Trichloroacetic acid	Standard	20.0	17.9	µg/L	89%	9810-284	1 80-120%

ND: non-detect. \*Recovery is below 1/2 minimum reporting level (MRL). NA (not applicable): RPD calculation is not applicable.

**Quality Control Report**Mr. Joel Mohr  
Iowa-American Water Company**Study#:** 150  
**Study Title:** ICR RSSCT #2

Trichloroacetic acid	Standard	40.0	42.3	µg/L	106%	9810-285	1	80-120%
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**Analysis:** HAA-ICR (Haloacetic Acids)**Method:** EPA 552.2**QC Batch ID:** 0-247-0

										Acceptance Criteria	
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range	RPD	
Bromochloroacetic acid	Duplicate	3.1	3.0	µg/L		3.3%	9810-216	1			
Bromochloroacetic acid	Matrix Spike	40.0	39.9	µg/L	100%		9810-17	1			
Bromochloroacetic acid	Method Blank		ND*	µg/L			9810-420	1			
Bromochloroacetic acid	Secondary Source Std	20.0	21.4	µg/L	107%		9810-421	1	70-130%		
Bromochloroacetic acid	Standard	20.0	19.6	µg/L	98%		9810-422	1	80-120%		
Bromochloroacetic acid	Standard	20.0	19.6	µg/L	98%		9810-422	1	80-120%		
Bromochloroacetic acid	Standard	40.0	40.4	µg/L	101%		9810-423	1	80-120%		
Bromodichloroacetic acid	Duplicate	3.3	2.9	µg/L		12.9%	9810-216	1			
Bromodichloroacetic acid	Matrix Spike	40.0	45.7	µg/L	114%		9810-17	1			
Bromodichloroacetic acid	Method Blank		ND*	µg/L			9810-420	1			
Bromodichloroacetic acid	Secondary Source Std		ND	µg/L			9810-421	1	70-130%		
Bromodichloroacetic acid	Standard	20.0	18.1	µg/L	91%		9810-422	1	80-120%		
Bromodichloroacetic acid	Standard	20.0	17.2	µg/L	86%		9810-422	1	80-120%		
Bromodichloroacetic acid	Standard	40.0	41.1	µg/L	103%		9810-423	1	80-120%		
Chlorodibromoacetic acid	Duplicate	ND	ND	µg/L		NA	9810-216	2			
Chlorodibromoacetic acid	Matrix Spike	40.0	43.7	µg/L	109%		9810-17	2			
Chlorodibromoacetic acid	Method Blank		ND*	µg/L			9810-420	2			
Chlorodibromoacetic acid	Secondary Source Std		ND	µg/L			9810-421	2	70-130%		
Chlorodibromoacetic acid	Standard	20.0	17.2	µg/L	86%		9810-422	2	80-120%		
Chlorodibromoacetic acid	Standard	20.0	16.0	µg/L	80%		9810-422	2	80-120%		
Chlorodibromoacetic acid	Standard	40.0	41.1	µg/L	103%		9810-423	2	80-120%		
Dibromoacetic acid	Duplicate	ND	ND	µg/L		NA	9810-216	1			
Dibromoacetic acid	Matrix Spike	40.0	40.3	µg/L	101%		9810-17	1			
Dibromoacetic acid	Method Blank		ND*	µg/L			9810-420	1			
Dibromoacetic acid	Secondary Source Std	20.0	22.2	µg/L	111%		9810-421	1	70-130%		
Dibromoacetic acid	Standard	20.0	19.4	µg/L	97%		9810-422	1	80-120%		
Dibromoacetic acid	Standard	20.0	19.2	µg/L	96%		9810-422	1	80-120%		
Dibromoacetic acid	Standard	40.0	40.4	µg/L	101%		9810-423	1	80-120%		

ND: non-detect. \*Recovery is below 1/2 minimum reporting level (MRL). NA (not applicable): RPD calculation is not applicable.

**Quality Control Report**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 150  
Study Title: ICR RSSCT #2

Dichloroacetic acid	Duplicate	11.5	11.3	µg/L	1.8%	9810-216	1
Dichloroacetic acid	Matrix Spike	40.0	39.0	µg/L	97%	9810-17	1
Dichloroacetic acid	Method Blank		ND*	µg/L		9810-420	1
Dichloroacetic acid	Secondary Source Std	20.0	22.2	µg/L	111%	9810-421	1 70-130%
Dichloroacetic acid	Standard	20.0	19.4	µg/L	97%	9810-422	1 80-120%
Dichloroacetic acid	Standard	20.0	19.8	µg/L	99%	9810-422	1 80-120%
Dichloroacetic acid	Standard	40.0	38.9	µg/L	97%	9810-423	1 80-120%
Monobromoacetic acid	Duplicate	ND	ND	µg/L	NA	9810-216	1
Monobromoacetic acid	Matrix Spike	40.0	39.8	µg/L	99%	9810-17	1
Monobromoacetic acid	Method Blank		ND*	µg/L		9810-420	1
Monobromoacetic acid	Secondary Source Std	20.0	22.8	µg/L	114%	9810-421	1 70-130%
Monobromoacetic acid	Standard	20.0	20.4	µg/L	102%	9810-422	1 80-120%
Monobromoacetic acid	Standard	20.0	20.5	µg/L	102%	9810-422	1 80-120%
Monobromoacetic acid	Standard	40.0	39.5	µg/L	99%	9810-423	1 80-120%
Monochloroacetic acid	Duplicate	ND	ND	µg/L	NA	9810-216	2
Monochloroacetic acid	Matrix Spike	40.0	38.5	µg/L	96%	9810-17	2
Monochloroacetic acid	Method Blank		ND*	µg/L		9810-420	2
Monochloroacetic acid	Secondary Source Std	20.0	22.9	µg/L	115%	9810-421	2 70-130%
Monochloroacetic acid	Standard	20.0	21.6	µg/L	108%	9810-422	2 80-120%
Monochloroacetic acid	Standard	20.0	19.9	µg/L	99%	9810-422	2 80-120%
Monochloroacetic acid	Standard	40.0	39.5	µg/L	99%	9810-423	2 80-120%
Tribromoacetic acid	Duplicate	ND	ND	µg/L	NA	9810-216	4
Tribromoacetic acid	Matrix Spike	40.0	44.0	µg/L	110%	9810-17	4
Tribromoacetic acid	Method Blank		ND*	µg/L		9810-420	4
Tribromoacetic acid	Secondary Source Std		ND	µg/L		9810-421	4 70-130%
Tribromoacetic acid	Standard	20.0	17.7	µg/L	89%	9810-422	4 80-120%
Tribromoacetic acid	Standard	20.0	16.0	µg/L	80%	9810-422	4 80-120%
Tribromoacetic acid	Standard	40.0	40.5	µg/L	101%	9810-423	4 80-120%
Trichloroacetic acid	Duplicate	12.8	11.5	µg/L	10.7%	9810-216	1
Trichloroacetic acid	Matrix Spike	40.0	44.0	µg/L	110%	9810-17	1
Trichloroacetic acid	Method Blank		ND*	µg/L		9810-420	1
Trichloroacetic acid	Secondary Source Std	20.0	22.8	µg/L	114%	9810-421	1 70-130%

ND: non-detect. \*Recovery is below 1/2 minimum reporting level (MRL). NA (not applicable): RPD calculation is not applicable.

Quality Control Report

Mr. Joel Mohr  
Iowa-American Water Company

Study#: 150  
Study Title: ICR RSSCT #2

Trichloroacetic acid	Standard	20.0	19.1 µg/L	96%	9810-422	1	80-120%
Trichloroacetic acid	Standard	20.0	19.0 µg/L	95%	9810-422	1	80-120%
Trichloroacetic acid	Standard	40.0	40.6 µg/L	102%	9810-423	1	80-120%

End of quality control report

**QC Results from Montgomery Watson Laboratories**

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Mr. Joel Mohr  
Iowa-American Water Company  
230 East 2nd Street  
P.O. Box 979  
Davenport, IA 52805

**Study#:** 150  
**Study Title:** ICR RSSCT #2

Phone: 319-322-0161 Fax: 319-322-2190

**QC Batch ID:** 85263      **Report #:** 47835  
47836

**Analysis:** CA      **Method:** EPA/ML 200.7

<u>QC</u>	<u>Analyte</u>	<u>Spike</u>	<u>Recovery</u>	<u>Yield</u>	<u>RPD</u>	<u>Acceptance Criteria Range</u>
LCS1	Calcium, Total, ICAP	50	50.3	101.0%		(85 - 115)
LCS2	Calcium, Total, ICAP	50	50.2	100.0%		(85 - 115)
MS	Calcium, Total, ICAP	50	52	104.0%		(70 - 130)

**QC Batch ID:** 85264      **Report #:** 47835  
47836

**Analysis:** MG      **Method:** ML/EPA 200.7

<u>QC</u>	<u>Analyte</u>	<u>Spike</u>	<u>Recovery</u>	<u>Yield</u>	<u>RPD</u>	<u>Acceptance Criteria Range</u>
LCS1	Magnesium, Total, ICAP	20	19.8	99.0%		(85 - 115)
LCS2	Magnesium, Total, ICAP	20	19.8	99.0%		(85 - 115)
MS	Magnesium, Total, ICAP	20	20.6	103.0%		(70 - 130)

**QC Batch ID:** 85806      **Report #:** 47835  
47836

**Analysis:** BR      **Method:** ML/EPA 300

<u>QC</u>	<u>Analyte</u>	<u>Spike</u>	<u>Recovery</u>	<u>Yield</u>	<u>RPD</u>	<u>Acceptance Criteria Range</u>
LCS1	Bromide	0.02	0.023	115.0%		(50 - 150)
LCS2	Bromide	0.1	0.092	92.0%		(90 - 110)
MS	Bromide	0.1	0.109	109.0%		(80 - 120)
MSD	Bromide	0.1	0.108	108.0%		(80 - 120)

**QC Batch ID:** 85823      **Report #:** 48195  
48197

**Analysis:** CA      **Method:** EPA/ML 200.7

<u>QC</u>	<u>Analyte</u>	<u>Spike</u>	<u>Recovery</u>	<u>Yield</u>	<u>RPD</u>	<u>Acceptance Criteria Range</u>
LCS1	Calcium, Total, ICAP	50	52.6	105.0%		(85 - 115)
LCS2	Calcium, Total, ICAP	50	52.9	106.0%		(85 - 115)
MS	Calcium, Total, ICAP	50	48.4	97.0%		(70 - 130)

**QC Results from Montgomery Watson Laboratories**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 150  
Study Title: ICR RSSCT #2QC Batch ID: 85827      Report #: 47835  
47836

Analysis: NH3		Method: ML/EPA 350.1					Acceptance Criteria
QC	Analyte	Spike	Recovery	Yield	RPD	Range	
LCS1	Ammonia Nitrogen	1	1.11	111.0%		(80 - 120)	
LCS2	Ammonia Nitrogen	1	1.09	109.0%		(80 - 120)	
MS	Ammonia Nitrogen	1	1.15	115.0%		(80 - 120)	
MSD	Ammonia Nitrogen	1	1.15	115.0%		(80 - 120)	

QC Batch ID: 85872      Report #: 48195  
48197

Analysis: MG		Method: ML/EPA 200.7					Acceptance Criteria
QC	Analyte	Spike	Recovery	Yield	RPD	Range	
LCS1	Magnesium, Total, ICAP	20	20.4	102.0%		(85 - 115)	
LCS2	Magnesium, Total, ICAP	20	20.3	102.0%		(85 - 115)	
MS	Magnesium, Total, ICAP	20	18.9	94.0%		(70 - 130)	

QC Batch ID: 86228      Report #: 48197

Analysis: BR		Method: ML/EPA 300					Acceptance Criteria
QC	Analyte	Spike	Recovery	Yield	RPD	Range	
LCS1	Bromide	0.02	0.022	110.0%		(50 - 150)	
LCS2	Bromide	0.1	0.1	100.0%		(90 - 110)	
MS	Bromide	0.1	0.095	95.0%		(80 - 120)	
MSD	Bromide	0.1	0.095	95.0%		(80 - 120)	

QC Batch ID: 86398      Report #: 48195  
48197

Analysis: NH3		Method: ML/EPA 350.1					Acceptance Criteria
QC	Analyte	Spike	Recovery	Yield	RPD	Range	
LCS1	Ammonia Nitrogen	1	1.02	102.0%		(80 - 120)	
LCS2	Ammonia Nitrogen	1	1	100.0%		(80 - 120)	
MS	Ammonia Nitrogen	1	0.97	97.0%		(80 - 120)	
MSD	Ammonia Nitrogen	1	0.96	96.0%		(80 - 120)	

**End of MW QC report**



**Comments**Page 1 of 1  
Printed on 6/23/99

Mr. Joel Mohr  
Iowa-American Water Company  
230 East 2nd Street  
P.O. Box 979  
Davenport, IA 52805

Phone: 319-322-0161 Fax: 319-322-2190

**Study#:** 150  
**Study Title:** ICR RSSCT #2

**Analysis comments****Analysis:** Turbidity**Method:** SM 2130 B

Reported turbidity data has been rounded following the requirements of SM 2130 B, reproduced in the table below (Standard Methods, 1995). Note that the reported digits are not necessarily significant.

<b>Turbidity Range</b>	<b>Report to Nearest</b>
0-1.0	0.05
1-10	0.1
10-40	1
40-100	5
100-400	10
400-1000	50
> 1000	100

**End of comments**

## ***Laboratory Report***

**Client:**

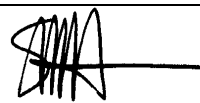
Mr. Joel Mohr  
Iowa-American Water Company  
230 E. 2<sup>nd</sup> Street  
P.O. Box 979  
Davenport, IA 52805

Phone: 319-322-0161 Fax: 319-322-2190

**Study Title:** ICR RSSCT #3,4

**Study #:** 185

**Reviewed By:** \_\_\_\_\_



Stuart M. Hooper

**Date Reviewed:** 6/23/99

**Laboratory Test Results**Page 1 of 76  
Printed on 6/23/99Mr. Joel Mohr  
Iowa-American Water Company  
230 East 2nd Street  
P.O. Box 979  
Davenport, IA 52805

Phone: 319-322-0161 Fax: 319-322-2190

**Study#:** 185  
**Study Title:** ICR RSSCT #3,4

Sample ID: Iowa.Settled			S&H ID: 9811-321		Date Sampled: 11/16/98 11:30:00 AM						
#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
1	TOC-ICR	TOC	2.84	mg/L	SM 5310 C	1	0.50	11/16/98		11/17/98	7-0-465
2	TOC-ICR	TOC (Dupl)	2.88	mg/L	SM 5310 C	1	0.50	11/16/98		11/17/98	7-0-465
			2.86	mg/L	1.4 % RPD						

Sample ID: Iowa.Raw		S&H ID: 9811-339		Date Sampled: 11/17/98 9:40:00 AM						
#	Analysis Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
3	TOC-ICR TOC	3.48	mg/L	SM 5310 C	1	0.50	11/17/98		11/19/98	7-0-467
4	TOC-ICR TOC (Dupl)	3.57	mg/L	SM 5310 C	1	0.50	11/17/98		11/19/98	7-0-467
		3.52	mg/L	2.6 % RPD						

Sample ID: Iowa.Settled.Drum			S&H ID: 9811-340		Date Sampled: 11/17/98 10:45:00 AM						
#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
5	TOC-ICR	TOC	2.86	mg/L	SM 5310 C	1	0.50	11/17/98		11/19/98	7-0-467
6	TOC-ICR	TOC (Dupl)	2.91	mg/L	SM 5310 C	1	0.50	11/17/98		11/19/98	7-0-467
			2.88	mg/L	1.7 % RPD						

Sample ID: Iowa.Filtered			S&H ID: 9811-341		Date Sampled: 11/17/98						
#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
7	TOC-ICR	TOC	2.28	mg/L	SM 5310 C	1	0.50	11/17/98		11/19/98	7-0-467
8	TOC-ICR	TOC (Dupl)	2.26	mg/L	SM 5310 C	1	0.50	11/17/98		11/19/98	7-0-467
			2.27	mg/L	0.9 % RPD						

Sample ID: 185.10.Eff-1			S&H ID: 9811-461		Date Sampled: 11/20/98 7:52:00 PM						
#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
9	Cl2Dose	Chlorine Dose	1.61	mg/L as Cl2	SM 4500-Cl B	1	n/a	11/25/98		11/25/98	n/a
10	Cl2Res	Chlorine Residual	0.68	mg/L as Cl2	SM 4500-Cl F	1	0.10	11/25/98		11/26/98	n/a
11	HAA-ICR	1,2,3-Trichloropropane (IS) (Internal Standard)	110.4	%	EPA 552.2	1	1.0	11/20/98	12/7/98	12/8/98	0-280-0
12	HAA-ICR	2-Bromopropionic acid (Surrogate)	96.4	%	EPA 552.2	1	1.0	11/20/98	12/7/98	12/8/98	0-280-0
13	HAA-ICR	Bromochloroacetic acid	ND	µg/L	EPA 552.2	1	1.0	11/20/98	12/7/98	12/8/98	0-280-0
14	HAA-ICR	Bromodichloroacetic acid	ND	µg/L	EPA 552.2	1	1.0	11/20/98	12/7/98	12/8/98	0-280-0
15	HAA-ICR	Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	11/20/98	12/7/98	12/8/98	0-280-0

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

16	HAA-ICR	Dibromoacetic acid	ND µg/L	EPA 552.2	1	1.0	11/20/98	12/7/98	12/8/98	0-280-0
17	HAA-ICR	Dichloroacetic acid	ND µg/L	EPA 552.2	1	1.0	11/20/98	12/7/98	12/8/98	0-280-0
18	HAA-ICR	Monobromoacetic acid	ND µg/L	EPA 552.2	1	1.0	11/20/98	12/7/98	12/8/98	0-280-0
19	HAA-ICR	Monochloroacetic acid	ND µg/L	EPA 552.2	1	2.0	11/20/98	12/7/98	12/8/98	0-280-0
20	HAA-ICR	Tribromoacetic acid	ND µg/L	EPA 552.2	1	4.0	11/20/98	12/7/98	12/8/98	0-280-0
21	HAA-ICR	Trichloroacetic acid	ND µg/L	EPA 552.2	1	1.0	11/20/98	12/7/98	12/8/98	0-280-0
22	pH	Cl2 pH - Final	7.5 Unit	SM 4500-H+ B	1	n/a	11/25/98		11/26/98	n/a
23	pH	Cl2 pH - Initial	7.4 Unit	SM 4500-H+ B	1	n/a	11/25/98		11/25/98	n/a
24	pH	pH	8.0 Unit	SM 4500-H+ B	1	n/a	11/20/98		11/20/98	n/a
25	TEMP	Cl2 Temperature	7.7 °C	SM 2550 B	1	n/a	11/25/98		11/26/98	n/a
26	TEMP	Temperature	24.6 °C	SM 2550 B	1	n/a	11/20/98		11/20/98	n/a
27	TIME	Cl2 Incubation Time	24.3 hrs	n/a	1	n/a	11/25/98		11/26/98	n/a
28	TOC-ICR	TOC	ND mg/L	SM 5310 C	1	0.50	11/20/98		11/21/98	7-0-469
29	TOC-ICR	TOC (Dupl)	ND mg/L	SM 5310 C	1	0.50	11/20/98		11/21/98	7-0-469
			<b>ND mg/L</b>							
30	TOX-ICR	TOX	ND µg Cl-/L	SM 5320 B	1	25	11/20/98		12/3/98	12-0-255
31	TOX-ICR	TOX (Dupl)	ND µg Cl-/L	SM 5320 B	1	25	11/20/98		12/3/98	12-0-255
			<b>ND µg Cl-/L</b>							
32	THM-ICR	1,2,3-Trichloropropane (Surrogate)	93.6 %	EPA 551.1	1	1.0	11/20/98	12/4/98	12/4/98	0-279-0
33	THM-ICR	Bromodichloromethane	ND µg/L	EPA 551.1	1	1.0	11/20/98	12/4/98	12/4/98	0-279-0
34	THM-ICR	Bromoform	ND µg/L	EPA 551.1	1	1.0	11/20/98	12/4/98	12/4/98	0-279-0
35	THM-ICR	Chloroform	ND µg/L	EPA 551.1	1	1.0	11/20/98	12/4/98	12/4/98	0-279-0
36	THM-ICR	Dibromochloromethane	ND µg/L	EPA 551.1	1	1.0	11/20/98	12/4/98	12/4/98	0-279-0
37	UV-ICR	UV	ND 1/cm	SM 5910 B	1	0.009	11/20/98		11/21/98	8-0-367
38	UV-ICR	UV (Dupl)	ND 1/cm	SM 5910 B	1	0.009	11/20/98		11/21/98	8-0-367
			<b>ND 1/cm</b>							

Sample ID: 185.10.Eff-4

S&amp;H ID: 9811-464

Date Sampled: 11/22/98 8:49:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
39	Cl2Dose	Chlorine Dose	1.76	mg/L as Cl2	SM 4500-Cl B	1	n/a	11/25/98		11/25/98	n/a
40	Cl2Res	Chlorine Residual	0.85	mg/L as Cl2	SM 4500-Cl F	1	0.10	11/25/98		11/26/98	n/a
41	HAA-ICR	1,2,3-Trichloropropane (IS) (Internal Standard)	106.4	%	EPA 552.2	1	1.0	11/22/98	12/7/98	12/8/98	0-280-0
42	HAA-ICR	2-Bromopropionic acid (Surrogate)	96.4	%	EPA 552.2	1	1.0	11/22/98	12/7/98	12/8/98	0-280-0
43	HAA-ICR	Bromochloroacetic acid	ND	µg/L	EPA 552.2	1	1.0	11/22/98	12/7/98	12/8/98	0-280-0
44	HAA-ICR	Bromodichloroacetic acid	ND	µg/L	EPA 552.2	1	1.0	11/22/98	12/7/98	12/8/98	0-280-0
45	HAA-ICR	Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	11/22/98	12/7/98	12/8/98	0-280-0
46	HAA-ICR	Dibromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	11/22/98	12/7/98	12/8/98	0-280-0
47	HAA-ICR	Dichloroacetic acid	ND	µg/L	EPA 552.2	1	1.0	11/22/98	12/7/98	12/8/98	0-280-0

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

48	HAA-ICR	Monobromoacetic acid	ND µg/L	EPA 552.2	1	1.0	11/22/98	12/7/98	12/8/98	0-280-0
49	HAA-ICR	Monochloroacetic acid	ND µg/L	EPA 552.2	1	2.0	11/22/98	12/7/98	12/8/98	0-280-0
50	HAA-ICR	Tribromoacetic acid	ND µg/L	EPA 552.2	1	4.0	11/22/98	12/7/98	12/8/98	0-280-0
51	HAA-ICR	Trichloroacetic acid	ND µg/L	EPA 552.2	1	1.0	11/22/98	12/7/98	12/8/98	0-280-0
52	pH	Cl2 pH - Final	7.4 Unit	SM 4500-H+ B	1	n/a	11/25/98		11/26/98	n/a
53	pH	Cl2 pH - Initial	7.3 Unit	SM 4500-H+ B	1	n/a	11/25/98		11/25/98	n/a
54	pH	pH	7.7 Unit	SM 4500-H+ B	1	n/a	11/22/98		11/22/98	n/a
55	TEMP	Cl2 Temperature	7.7 °C	SM 2550 B	1	n/a	11/25/98		11/26/98	n/a
56	TEMP	Temperature	23.0 °C	SM 2550 B	1	n/a	11/22/98		11/22/98	n/a
57	TIME	Cl2 Incubation Time	24.4 hrs	n/a	1	n/a	11/25/98		11/26/98	n/a
58	TOC-ICR	TOC	ND mg/L	SM 5310 C	1	0.50	11/22/98		11/22/98	7-0-470
59	TOC-ICR	TOC (Dupl)	ND mg/L	SM 5310 C	1	0.50	11/22/98		11/22/98	7-0-470
			<b>ND mg/L</b>							
60	TOX-ICR	TOX	ND µg Cl-/L	SM 5320 B	1	25	11/22/98		12/3/98	12-0-255
61	TOX-ICR	TOX (Dupl)	ND µg Cl-/L	SM 5320 B	1	25	11/22/98		12/3/98	12-0-255
			<b>ND µg Cl-/L</b>							
62	THM-ICR	1,2,3-Trichloropropane (Surrogate)	103.2 %	EPA 551.1	1	1.0	11/22/98	12/4/98	12/4/98	0-279-0
63	THM-ICR	Bromodichloromethane	ND µg/L	EPA 551.1	1	1.0	11/22/98	12/4/98	12/4/98	0-279-0
64	THM-ICR	Bromoform	ND µg/L	EPA 551.1	1	1.0	11/22/98	12/4/98	12/4/98	0-279-0
65	THM-ICR	Chloroform	ND µg/L	EPA 551.1	1	1.0	11/22/98	12/4/98	12/4/98	0-279-0
66	THM-ICR	Dibromochloromethane	ND µg/L	EPA 551.1	1	1.0	11/22/98	12/4/98	12/4/98	0-279-0
67	UV-ICR	UV	ND 1/cm	SM 5910 B	1	0.009	11/22/98		11/22/98	8-0-368
68	UV-ICR	UV (Dupl)	ND 1/cm	SM 5910 B	1	0.009	11/22/98		11/22/98	8-0-368
			<b>ND 1/cm</b>							

Sample ID: 185.10.Eff-5

S&amp;H ID: 9811-465

Date Sampled: 11/22/98 3:00:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
69	Cl2Dose	Chlorine Dose	1.86	mg/L as Cl2	SM 4500-Cl B	1	n/a	11/25/98		11/25/98	n/a
70	Cl2Res	Chlorine Residual	0.80	mg/L as Cl2	SM 4500-Cl F	1	0.10	11/25/98		11/26/98	n/a
71	HAA-ICR	1,2,3-Trichloropropane (IS) (Internal Standard)	108.8	%	EPA 552.2	1	1.0	11/22/98	12/7/98	12/8/98	0-280-0
72	HAA-ICR	2-Bromopropionic acid (Surrogate)	96.4	%	EPA 552.2	1	1.0	11/22/98	12/7/98	12/8/98	0-280-0
73	HAA-ICR	Bromochloroacetic acid	ND	µg/L	EPA 552.2	1	1.0	11/22/98	12/7/98	12/8/98	0-280-0
74	HAA-ICR	Bromodichloroacetic acid	ND	µg/L	EPA 552.2	1	1.0	11/22/98	12/7/98	12/8/98	0-280-0
75	HAA-ICR	Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	11/22/98	12/7/98	12/8/98	0-280-0
76	HAA-ICR	Dibromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	11/22/98	12/7/98	12/8/98	0-280-0
77	HAA-ICR	Dichloroacetic acid	ND	µg/L	EPA 552.2	1	1.0	11/22/98	12/7/98	12/8/98	0-280-0
78	HAA-ICR	Monobromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	11/22/98	12/7/98	12/8/98	0-280-0
79	HAA-ICR	Monochloroacetic acid	ND	µg/L	EPA 552.2	1	2.0	11/22/98	12/7/98	12/8/98	0-280-0

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

80	HAA-ICR	Tribromoacetic acid	ND µg/L	EPA 552.2	1	4.0	11/22/98	12/7/98	12/8/98	0-280-0
81	HAA-ICR	Trichloroacetic acid	ND µg/L	EPA 552.2	1	1.0	11/22/98	12/7/98	12/8/98	0-280-0
82	pH	Cl2 pH - Final	7.4 Unit	SM 4500-H+ B	1	n/a	11/25/98		11/26/98	n/a
83	pH	Cl2 pH - Initial	7.3 Unit	SM 4500-H+ B	1	n/a	11/25/98		11/25/98	n/a
84	pH	pH	7.7 Unit	SM 4500-H+ B	1	n/a	11/22/98		11/22/98	n/a
85	TEMP	Cl2 Temperature	7.7 °C	SM 2550 B	1	n/a	11/25/98		11/26/98	n/a
86	TEMP	Temperature	23.6 °C	SM 2550 B	1	n/a	11/22/98		11/22/98	n/a
87	TIME	Cl2 Incubation Time	24.4 hrs	n/a	1	n/a	11/25/98		11/26/98	n/a
88	TOC-ICR	TOC	0.53 mg/L	SM 5310 C	1	0.50	11/22/98		11/22/98	7-0-470
89	TOC-ICR	TOC (Dupl)	0.50 mg/L	SM 5310 C	1	0.50	11/22/98		11/22/98	7-0-470
			<b>0.52 mg/L</b>	<b>5.8 % RPD</b>						
90	TOX-ICR	TOX	ND µg Cl-/L	SM 5320 B	1	25	11/22/98		12/3/98	12-0-255
91	TOX-ICR	TOX (Dupl)	ND µg Cl-/L	SM 5320 B	1	25	11/22/98		12/3/98	12-0-255
			<b>ND µg Cl-/L</b>							
92	THM-ICR	1,2,3-Trichloropropane (Surrogate)	100.4 %	EPA 551.1	1	1.0	11/22/98	12/4/98	12/4/98	0-279-0
93	THM-ICR	Bromodichloromethane	ND µg/L	EPA 551.1	1	1.0	11/22/98	12/4/98	12/4/98	0-279-0
94	THM-ICR	Bromoform	ND µg/L	EPA 551.1	1	1.0	11/22/98	12/4/98	12/4/98	0-279-0
95	THM-ICR	Chloroform	ND µg/L	EPA 551.1	1	1.0	11/22/98	12/4/98	12/4/98	0-279-0
96	THM-ICR	Dibromochloromethane	ND µg/L	EPA 551.1	1	1.0	11/22/98	12/4/98	12/4/98	0-279-0
97	UV-ICR	UV	ND 1/cm	SM 5910 B	1	0.009	11/22/98		11/23/98	8-0-369
98	UV-ICR	UV (Dupl)	ND 1/cm	SM 5910 B	1	0.009	11/22/98		11/23/98	8-0-369
			<b>ND 1/cm</b>							

Sample ID: 185.10.Eff-6

S&amp;H ID: 9811-466

Date Sampled: 11/22/98 9:07:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
99	Cl2Dose	Chlorine Dose	2.00	mg/L as Cl2	SM 4500-Cl B	1	n/a	11/25/98		11/25/98	n/a
100	Cl2Res	Chlorine Residual	0.90	mg/L as Cl2	SM 4500-Cl F	1	0.10	11/25/98		11/26/98	n/a
101	HAA-ICR	1,2,3-Trichloropropane (IS) (Internal Standard)	106.8	%	EPA 552.2	1	1.0	11/22/98	12/7/98	12/8/98	0-280-0
102	HAA-ICR	1,2,3-Trichloropropane (IS) (Internal Standard) (Lab Dupl)	108.0	%	EPA 552.2	1	1.0	11/22/98	12/7/98	12/8/98	0-280-0
			<b>107.4</b>	<b>%</b>	<b>1.1 % RPD</b>						
103	HAA-ICR	2-Bromopropionic acid (Surrogate)	97.6	%	EPA 552.2	1	1.0	11/22/98	12/7/98	12/8/98	0-280-0
104	HAA-ICR	2-Bromopropionic acid (Surrogate) (Lab Dupl)	99.6	%	EPA 552.2	1	1.0	11/22/98	12/7/98	12/8/98	0-280-0
			<b>98.6</b>	<b>%</b>	<b>2.0 % RPD</b>						
105	HAA-ICR	Bromochloroacetic acid	ND	µg/L	EPA 552.2	1	1.0	11/22/98	12/7/98	12/8/98	0-280-0
106	HAA-ICR	Bromochloroacetic acid (Lab Dupl)	ND	µg/L	EPA 552.2	1	1.0	11/22/98	12/7/98	12/8/98	0-280-0
			<b>ND</b>	<b>µg/L</b>							

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

107	HAA-ICR	Bromodichloroacetic acid	ND µg/L	EPA 552.2	1	1.0	11/22/98	12/7/98	12/8/98	0-280-0
108	HAA-ICR	Bromodichloroacetic acid (Lab Dupl)	ND µg/L	EPA 552.2	1	1.0	11/22/98	12/7/98	12/8/98	0-280-0
			<b>ND µg/L</b>							
109	HAA-ICR	Chlorodibromoacetic acid	ND µg/L	EPA 552.2	1	2.0	11/22/98	12/7/98	12/8/98	0-280-0
110	HAA-ICR	Chlorodibromoacetic acid (Lab Dupl)	ND µg/L	EPA 552.2	1	2.0	11/22/98	12/7/98	12/8/98	0-280-0
			<b>ND µg/L</b>							
111	HAA-ICR	Dibromoacetic acid	ND µg/L	EPA 552.2	1	1.0	11/22/98	12/7/98	12/8/98	0-280-0
112	HAA-ICR	Dibromoacetic acid (Lab Dupl)	ND µg/L	EPA 552.2	1	1.0	11/22/98	12/7/98	12/8/98	0-280-0
			<b>ND µg/L</b>							
113	HAA-ICR	Dichloroacetic acid	ND µg/L	EPA 552.2	1	1.0	11/22/98	12/7/98	12/8/98	0-280-0
114	HAA-ICR	Dichloroacetic acid (Lab Dupl)	ND µg/L	EPA 552.2	1	1.0	11/22/98	12/7/98	12/8/98	0-280-0
			<b>ND µg/L</b>							
115	HAA-ICR	Monobromoacetic acid	ND µg/L	EPA 552.2	1	1.0	11/22/98	12/7/98	12/8/98	0-280-0
116	HAA-ICR	Monobromoacetic acid (Lab Dupl)	ND µg/L	EPA 552.2	1	1.0	11/22/98	12/7/98	12/8/98	0-280-0
			<b>ND µg/L</b>							
117	HAA-ICR	Monochloroacetic acid	ND µg/L	EPA 552.2	1	2.0	11/22/98	12/7/98	12/8/98	0-280-0
118	HAA-ICR	Monochloroacetic acid (Lab Dupl)	ND µg/L	EPA 552.2	1	2.0	11/22/98	12/7/98	12/8/98	0-280-0
			<b>ND µg/L</b>							
119	HAA-ICR	Tribromoacetic acid	ND µg/L	EPA 552.2	1	4.0	11/22/98	12/7/98	12/8/98	0-280-0
120	HAA-ICR	Tribromoacetic acid (Lab Dupl)	ND µg/L	EPA 552.2	1	4.0	11/22/98	12/7/98	12/8/98	0-280-0
			<b>ND µg/L</b>							
121	HAA-ICR	Trichloroacetic acid	ND µg/L	EPA 552.2	1	1.0	11/22/98	12/7/98	12/8/98	0-280-0
122	HAA-ICR	Trichloroacetic acid (Lab Dupl)	ND µg/L	EPA 552.2	1	1.0	11/22/98	12/7/98	12/8/98	0-280-0
			<b>ND µg/L</b>							
123	pH	Cl2 pH - Final	7.4 Unit	SM 4500-H+ B	1	n/a	11/25/98		11/26/98	n/a
124	pH	Cl2 pH - Initial	7.3 Unit	SM 4500-H+ B	1	n/a	11/25/98		11/25/98	n/a
125	pH	pH	7.7 Unit	SM 4500-H+ B	1	n/a	11/22/98		11/22/98	n/a
126	TEMP	Cl2 Temperature	7.7 °C	SM 2550 B	1	n/a	11/25/98		11/26/98	n/a
127	TEMP	Temperature	23.3 °C	SM 2550 B	1	n/a	11/22/98		11/22/98	n/a
128	TIME	Cl2 Incubation Time	24.5 hrs	n/a	1	n/a	11/25/98		11/26/98	n/a
129	TOC-ICR	TOC	0.73 mg/L	SM 5310 C	1	0.50	11/22/98		11/23/98	7-0-471
130	TOC-ICR	TOC (Dupl)	0.72 mg/L	SM 5310 C	1	0.50	11/22/98		11/23/98	7-0-471
			<b>0.72 mg/L</b>	<b>1.4 % RPD</b>						
131	TOX-ICR	TOX	25 µg Cl-/L	SM 5320 B	1	25	11/22/98		12/3/98	12-0-255
132	TOX-ICR	TOX (Dupl)	25 µg Cl-/L	SM 5320 B	1	25	11/22/98		12/3/98	12-0-255
			<b>25 µg Cl-/L</b>	<b>0.0 % RPD</b>						
133	THM-ICR	1,2,3-Trichloropropane (Surrogate)	91.6 %	EPA 551.1	1	1.0	11/22/98	12/4/98	12/4/98	0-279-0
134	THM-ICR	Bromodichloromethane	1.1 µg/L	EPA 551.1	1	1.0	11/22/98	12/4/98	12/4/98	0-279-0

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

135	THM-ICR Bromoform	ND µg/L	EPA 551.1	1	1.0	11/22/98	12/4/98	12/4/98	0-279-0
136	THM-ICR Chloroform	ND µg/L	EPA 551.1	1	1.0	11/22/98	12/4/98	12/4/98	0-279-0
137	THM-ICR Dibromochloromethane	1.2 µg/L	EPA 551.1	1	1.0	11/22/98	12/4/98	12/4/98	0-279-0
138	UV-ICR UV	ND 1/cm	SM 5910 B	1	0.009	11/22/98		11/23/98	8-0-369
139	UV-ICR UV (Dupl)	ND 1/cm	SM 5910 B	1	0.009	11/22/98		11/23/98	8-0-369
		<b>ND 1/cm</b>							
<hr/>									
Sample ID: 185.10.Eff-7      S&H ID: 9811-467      Date Sampled: 11/23/98 3:05:00 AM									
#	Analysis Type	Result Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
140	Cl2Dose Chlorine Dose	2.04 mg/L as Cl2	SM 4500-Cl B	1	n/a	11/27/98		11/27/98	n/a
141	Cl2Res Chlorine Residual	0.84 mg/L as Cl2	SM 4500-Cl F	1	0.10	11/27/98		11/28/98	n/a
142	HAA-ICR 1,2,3-Trichloropropane (IS) (Internal Standard)	107.6 %	EPA 552.2	1	1.0	11/23/98	12/7/98	12/8/98	0-280-0
143	HAA-ICR 2-Bromopropionic acid (Surrogate)	98.4 %	EPA 552.2	1	1.0	11/23/98	12/7/98	12/8/98	0-280-0
144	HAA-ICR Bromochloroacetic acid	1.5 µg/L	EPA 552.2	1	1.0	11/23/98	12/7/98	12/8/98	0-280-0
145	HAA-ICR Bromodichloroacetic acid	1.5 µg/L	EPA 552.2	1	1.0	11/23/98	12/7/98	12/8/98	0-280-0
146	HAA-ICR Chlorodibromoacetic acid	ND µg/L	EPA 552.2	1	2.0	11/23/98	12/7/98	12/8/98	0-280-0
147	HAA-ICR Dibromoacetic acid	ND µg/L	EPA 552.2	1	1.0	11/23/98	12/7/98	12/8/98	0-280-0
148	HAA-ICR Dichloroacetic acid	1.8 µg/L	EPA 552.2	1	1.0	11/23/98	12/7/98	12/8/98	0-280-0
149	HAA-ICR Monobromoacetic acid	ND µg/L	EPA 552.2	1	1.0	11/23/98	12/7/98	12/8/98	0-280-0
150	HAA-ICR Monochloroacetic acid	ND µg/L	EPA 552.2	1	2.0	11/23/98	12/7/98	12/8/98	0-280-0
151	HAA-ICR Tribromoacetic acid	ND µg/L	EPA 552.2	1	4.0	11/23/98	12/7/98	12/8/98	0-280-0
152	HAA-ICR Trichloroacetic acid	1.4 µg/L	EPA 552.2	1	1.0	11/23/98	12/7/98	12/8/98	0-280-0
153	pH Cl2 pH - Final	7.5 Unit	SM 4500-H+ B	1	n/a	11/27/98		11/28/98	n/a
154	pH Cl2 pH - Initial	7.3 Unit	SM 4500-H+ B	1	n/a	11/27/98		11/27/98	n/a
155	pH pH	7.7 Unit	SM 4500-H+ B	1	n/a	11/23/98		11/23/98	n/a
156	TEMP Cl2 Temperature	7.2 °C	SM 2550 B	1	n/a	11/27/98		11/28/98	n/a
157	TEMP Temperature	23.2 °C	SM 2550 B	1	n/a	11/23/98		11/23/98	n/a
158	TIME Cl2 Incubation Time	24.0 hrs	n/a	1	n/a	11/27/98		11/28/98	n/a
159	TOC-ICR TOC	0.94 mg/L	SM 5310 C	1	0.50	11/23/98		11/23/98	7-0-471
160	TOC-ICR TOC (Dupl)	0.98 mg/L	SM 5310 C	1	0.50	11/23/98		11/23/98	7-0-471
		<b>0.96 mg/L</b>	<b>4.2 % RPD</b>						
161	TOX-ICR TOX	30 µg Cl-/L	SM 5320 B	1	25	11/23/98		12/4/98	12-0-256
162	TOX-ICR TOX (Dupl)	34 µg Cl-/L	SM 5320 B	1	25	11/23/98		12/4/98	12-0-256
		<b>32 µg Cl-/L</b>	<b>12.5 % RPD</b>						
163	THM-ICR 1,2,3-Trichloropropane (Surrogate)	102.8 %	EPA 551.1	1	1.0	11/23/98	12/4/98	12/4/98	0-279-0
164	THM-ICR Bromodichloromethane	3.8 µg/L	EPA 551.1	1	1.0	11/23/98	12/4/98	12/4/98	0-279-0
165	THM-ICR Bromoform	ND µg/L	EPA 551.1	1	1.0	11/23/98	12/4/98	12/4/98	0-279-0
166	THM-ICR Chloroform	3.3 µg/L	EPA 551.1	1	1.0	11/23/98	12/4/98	12/4/98	0-279-0

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.



**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

167	THM-ICR	Dibromochloromethane	3.2 µg/L	EPA 551.1	1	1.0	11/23/98	12/4/98	12/4/98	0-279-0
168	UV-ICR	UV	0.012 1/cm	SM 5910 B	1	0.009	11/23/98		11/23/98	8-0-369
169	UV-ICR	UV (Dupl)	0.012 1/cm	SM 5910 B	1	0.009	11/23/98		11/23/98	8-0-369
			<b>0.012 1/cm</b>	<b>0.0 % RPD</b>						

Sample ID: 185.10.Eff-8

S&amp;H ID: 9811-468

Date Sampled: 11/23/98 9:09:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
170	Cl2Dose	Chlorine Dose	2.16	mg/L as Cl2	SM 4500-Cl B	1	n/a	11/27/98		11/27/98	n/a
171	Cl2Res	Chlorine Residual	1.13	mg/L as Cl2	SM 4500-Cl F	1	0.10	11/27/98		11/28/98	n/a
172	HAA-ICR	1,2,3-Trichloropropane (IS) (Internal Standard)	110.0	%	EPA 552.2	1	1.0	11/23/98	12/7/98	12/8/98	0-280-0
173	HAA-ICR	2-Bromopropionic acid (Surrogate)	97.6	%	EPA 552.2	1	1.0	11/23/98	12/7/98	12/8/98	0-280-0
174	HAA-ICR	Bromochloroacetic acid	1.9	µg/L	EPA 552.2	1	1.0	11/23/98	12/7/98	12/8/98	0-280-0
175	HAA-ICR	Bromodichloroacetic acid	2.1	µg/L	EPA 552.2	1	1.0	11/23/98	12/7/98	12/8/98	0-280-0
176	HAA-ICR	Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	11/23/98	12/7/98	12/8/98	0-280-0
177	HAA-ICR	Dibromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	11/23/98	12/7/98	12/8/98	0-280-0
178	HAA-ICR	Dichloroacetic acid	2.3	µg/L	EPA 552.2	1	1.0	11/23/98	12/7/98	12/8/98	0-280-0
179	HAA-ICR	Monobromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	11/23/98	12/7/98	12/8/98	0-280-0
180	HAA-ICR	Monochloroacetic acid	ND	µg/L	EPA 552.2	1	2.0	11/23/98	12/7/98	12/8/98	0-280-0
181	HAA-ICR	Tribromoacetic acid	ND	µg/L	EPA 552.2	1	4.0	11/23/98	12/7/98	12/8/98	0-280-0
182	HAA-ICR	Trichloroacetic acid	2.3	µg/L	EPA 552.2	1	1.0	11/23/98	12/7/98	12/8/98	0-280-0
183	pH	Cl2 pH - Final	7.4	Unit	SM 4500-H+ B	1	n/a	11/27/98		11/28/98	n/a
184	pH	Cl2 pH - Initial	7.3	Unit	SM 4500-H+ B	1	n/a	11/27/98		11/27/98	n/a
185	pH	pH	7.6	Unit	SM 4500-H+ B	1	n/a	11/23/98		11/23/98	n/a
186	TEMP	Cl2 Temperature	7.2	°C	SM 2550 B	1	n/a	11/27/98		11/28/98	n/a
187	TEMP	Temperature	23.2	°C	SM 2550 B	1	n/a	11/23/98		11/23/98	n/a
188	TIME	Cl2 Incubation Time	24.1	hrs	n/a	1	n/a	11/27/98		11/28/98	n/a
189	TOC-ICR	TOC	1.15	mg/L	SM 5310 C	1	0.50	11/23/98		11/23/98	7-0-471
190	TOC-ICR	TOC (Dupl)	1.15	mg/L	SM 5310 C	1	0.50	11/23/98		11/23/98	7-0-471
			<b>1.15 mg/L</b>		<b>0.0 % RPD</b>						
191	TOX-ICR	TOX	44	µg Cl-/L	SM 5320 B	1	25	11/23/98		12/4/98	12-0-256
192	TOX-ICR	TOX (Dupl)	43	µg Cl-/L	SM 5320 B	1	25	11/23/98		12/4/98	12-0-256
			<b>44 µg Cl-/L</b>		<b>2.3 % RPD</b>						
193	THM-ICR	1,2,3-Trichloropropane (Surrogate)	97.2	%	EPA 551.1	1	1.0	11/23/98	12/4/98	12/4/98	0-279-0
194	THM-ICR	Bromodichloromethane	4.1	µg/L	EPA 551.1	1	1.0	11/23/98	12/4/98	12/4/98	0-279-0
195	THM-ICR	Bromoform	ND	µg/L	EPA 551.1	1	1.0	11/23/98	12/4/98	12/4/98	0-279-0
196	THM-ICR	Chloroform	3.8	µg/L	EPA 551.1	1	1.0	11/23/98	12/4/98	12/4/98	0-279-0
197	THM-ICR	Dibromochloromethane	2.9	µg/L	EPA 551.1	1	1.0	11/23/98	12/4/98	12/4/98	0-279-0
198	UV-ICR	UV	0.015	1/cm	SM 5910 B	1	0.009	11/23/98		11/23/98	8-0-370

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

199	UV-ICR	UV (Dupl)	0.015	1/cm	SM 5910 B	1	0.009	11/23/98		11/23/98	8-0-370
			0.015	1/cm	0.0 % RPD						
<hr/>											
Sample ID: 185.10.Eff-9			S&H ID: 9811-469		Date Sampled: 11/23/98 3:16:00 PM						
#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
200	Cl2Dose	Chlorine Dose	2.29	mg/L as Cl2	SM 4500-Cl B	1	n/a	11/27/98		11/27/98	n/a
201	Cl2Res	Chlorine Residual	0.97	mg/L as Cl2	SM 4500-Cl F	1	0.10	11/27/98		11/28/98	n/a
202	HAA-ICR	1,2,3-Trichloropropane (IS) (Internal Standard)	106.0	%	EPA 552.2	1	1.0	11/23/98	12/7/98	12/8/98	0-280-0
203	HAA-ICR	2-Bromopropionic acid (Surrogate)	96.0	%	EPA 552.2	1	1.0	11/23/98	12/7/98	12/8/98	0-280-0
204	HAA-ICR	Bromochloroacetic acid	2.1	µg/L	EPA 552.2	1	1.0	11/23/98	12/7/98	12/8/98	0-280-0
205	HAA-ICR	Bromodichloroacetic acid	2.6	µg/L	EPA 552.2	1	1.0	11/23/98	12/7/98	12/8/98	0-280-0
206	HAA-ICR	Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	11/23/98	12/7/98	12/8/98	0-280-0
207	HAA-ICR	Dibromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	11/23/98	12/7/98	12/8/98	0-280-0
208	HAA-ICR	Dichloroacetic acid	2.9	µg/L	EPA 552.2	1	1.0	11/23/98	12/7/98	12/8/98	0-280-0
209	HAA-ICR	Monobromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	11/23/98	12/7/98	12/8/98	0-280-0
210	HAA-ICR	Monochloroacetic acid	ND	µg/L	EPA 552.2	1	2.0	11/23/98	12/7/98	12/8/98	0-280-0
211	HAA-ICR	Tribromoacetic acid	ND	µg/L	EPA 552.2	1	4.0	11/23/98	12/7/98	12/8/98	0-280-0
212	HAA-ICR	Trichloroacetic acid	3.2	µg/L	EPA 552.2	1	1.0	11/23/98	12/7/98	12/8/98	0-280-0
213	pH	Cl2 pH - Final	7.4	Unit	SM 4500-H+ B	1	n/a	11/27/98		11/28/98	n/a
214	pH	Cl2 pH - Initial	7.3	Unit	SM 4500-H+ B	1	n/a	11/27/98		11/27/98	n/a
215	pH	pH	7.6	Unit	SM 4500-H+ B	1	n/a	11/23/98		11/23/98	n/a
216	TEMP	Cl2 Temperature	7.2	°C	SM 2550 B	1	n/a	11/27/98		11/28/98	n/a
217	TEMP	Temperature	23.8	°C	SM 2550 B	1	n/a	11/23/98		11/23/98	n/a
218	TIME	Cl2 Incubation Time	24.1	hrs	n/a	1	n/a	11/27/98		11/28/98	n/a
219	TOC-ICR	TOC	1.33	mg/L	SM 5310 C	1	0.50	11/23/98		11/23/98	7-0-471
220	TOC-ICR	TOC (Dupl)	1.37	mg/L	SM 5310 C	1	0.50	11/23/98		11/23/98	7-0-471
			1.35	mg/L	3.0 % RPD						
221	TOX-ICR	TOX	58	µg Cl-/L	SM 5320 B	1	25	11/23/98		12/4/98	12-0-256
222	TOX-ICR	TOX (Dupl)	54	µg Cl-/L	SM 5320 B	1	25	11/23/98		12/4/98	12-0-256
			56	µg Cl-/L	7.1 % RPD						
223	THM-ICR	1,2,3-Trichloropropane (Surrogate)	96.8	%	EPA 551.1	1	1.0	11/23/98	12/4/98	12/4/98	0-279-0
224	THM-ICR	Bromodichloromethane	4.9	µg/L	EPA 551.1	1	1.0	11/23/98	12/4/98	12/4/98	0-279-0
225	THM-ICR	Bromoform	ND	µg/L	EPA 551.1	1	1.0	11/23/98	12/4/98	12/4/98	0-279-0
226	THM-ICR	Chloroform	4.8	µg/L	EPA 551.1	1	1.0	11/23/98	12/4/98	12/4/98	0-279-0
227	THM-ICR	Dibromochloromethane	3.1	µg/L	EPA 551.1	1	1.0	11/23/98	12/4/98	12/4/98	0-279-0
228	UV-ICR	UV	0.018	1/cm	SM 5910 B	1	0.009	11/23/98		11/24/98	8-0-371
229	UV-ICR	UV (Dupl)	0.018	1/cm	SM 5910 B	1	0.009	11/23/98		11/24/98	8-0-371
			0.018	1/cm	0.0 % RPD						

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

Sample ID: 185.10.Eff-11

S&amp;H ID: 9811-471

Date Sampled: 11/24/98 3:36:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
230	Cl2Dose	Chlorine Dose	2.39	mg/L as Cl2	SM 4500-Cl B	1	n/a	11/27/98		11/27/98	n/a
231	Cl2Res	Chlorine Residual	1.01	mg/L as Cl2	SM 4500-Cl F	1	0.10	11/27/98		11/28/98	n/a
232	HAA-ICR	1,2,3-Trichloropropane (IS) (Internal Standard)	104.4	%	EPA 552.2	1	1.0	11/24/98	12/7/98	12/8/98	0-280-0
233	HAA-ICR	2-Bromopropionic acid (Surrogate)	96.0	%	EPA 552.2	1	1.0	11/24/98	12/7/98	12/8/98	0-280-0
234	HAA-ICR	Bromochloroacetic acid	2.5	µg/L	EPA 552.2	1	1.0	11/24/98	12/7/98	12/8/98	0-280-0
235	HAA-ICR	Bromodichloroacetic acid	3.3	µg/L	EPA 552.2	1	1.0	11/24/98	12/7/98	12/8/98	0-280-0
236	HAA-ICR	Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	11/24/98	12/7/98	12/8/98	0-280-0
237	HAA-ICR	Dibromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	11/24/98	12/7/98	12/8/98	0-280-0
238	HAA-ICR	Dichloroacetic acid	4.0	µg/L	EPA 552.2	1	1.0	11/24/98	12/7/98	12/8/98	0-280-0
239	HAA-ICR	Monobromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	11/24/98	12/7/98	12/8/98	0-280-0
240	HAA-ICR	Monochloroacetic acid	ND	µg/L	EPA 552.2	1	2.0	11/24/98	12/7/98	12/8/98	0-280-0
241	HAA-ICR	Tribromoacetic acid	ND	µg/L	EPA 552.2	1	4.0	11/24/98	12/7/98	12/8/98	0-280-0
242	HAA-ICR	Trichloroacetic acid	5.0	µg/L	EPA 552.2	1	1.0	11/24/98	12/7/98	12/8/98	0-280-0
243	pH	Cl2 pH - Final	7.4	Unit	SM 4500-H+ B	1	n/a	11/27/98		11/28/98	n/a
244	pH	Cl2 pH - Initial	7.3	Unit	SM 4500-H+ B	1	n/a	11/27/98		11/27/98	n/a
245	pH	pH	7.8	Unit	SM 4500-H+ B	1	n/a	11/24/98		11/24/98	n/a
246	TEMP	Cl2 Temperature	7.2	°C	SM 2550 B	1	n/a	11/27/98		11/28/98	n/a
247	TEMP	Temperature	22.9	°C	SM 2550 B	1	n/a	11/24/98		11/24/98	n/a
248	TIME	Cl2 Incubation Time	24.1	hrs	n/a	1	n/a	11/27/98		11/28/98	n/a
249	TOC-ICR	TOC	1.49	mg/L	SM 5310 C	1	0.50	11/24/98		11/24/98	7-0-472
250	TOC-ICR	TOC (Dupl)	1.52	mg/L	SM 5310 C	1	0.50	11/24/98		11/24/98	7-0-472
			<b>1.50</b>	<b>mg/L</b>	<b>2.0 % RPD</b>						
251	TOX-ICR	TOX	71	µg Cl-/L	SM 5320 B	1	25	11/24/98		12/4/98	12-0-256
252	TOX-ICR	TOX (Dupl)	72	µg Cl-/L	SM 5320 B	1	25	11/24/98		12/4/98	12-0-256
			<b>72</b>	<b>µg Cl-/L</b>	<b>1.4 % RPD</b>						
253	THM-ICR	1,2,3-Trichloropropane (Surrogate)	104.0	%	EPA 551.1	1	1.0	11/24/98	12/4/98	12/4/98	0-279-0
254	THM-ICR	Bromodichloromethane	6.3	µg/L	EPA 551.1	1	1.0	11/24/98	12/4/98	12/4/98	0-279-0
255	THM-ICR	Bromoform	ND	µg/L	EPA 551.1	1	1.0	11/24/98	12/4/98	12/4/98	0-279-0
256	THM-ICR	Chloroform	6.9	µg/L	EPA 551.1	1	1.0	11/24/98	12/4/98	12/4/98	0-279-0
257	THM-ICR	Dibromochloromethane	3.4	µg/L	EPA 551.1	1	1.0	11/24/98	12/4/98	12/4/98	0-279-0
258	UV-ICR	UV	0.021	1/cm	SM 5910 B	1	0.009	11/24/98		11/24/98	8-0-371
259	UV-ICR	UV (Dupl)	0.021	1/cm	SM 5910 B	1	0.009	11/24/98		11/24/98	8-0-371
			<b>0.021</b>	<b>1/cm</b>	<b>0.0 % RPD</b>						

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

Sample ID: 185.10.Eff-13			S&H ID: 9811-473		Date Sampled: 11/24/98 3:56:00 PM						
#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
260	Cl2Dose	Chlorine Dose	2.47	mg/L as Cl2	SM 4500-Cl B	1	n/a	11/27/98		11/27/98	n/a
261	Cl2Res	Chlorine Residual	1.11	mg/L as Cl2	SM 4500-Cl F	1	0.10	11/27/98		11/28/98	n/a
262	HAA-ICR	1,2,3-Trichloropropane (IS) (Internal Standard)	106.4	%	EPA 552.2	1	1.0	11/24/98	12/7/98	12/8/98	0-280-0
263	HAA-ICR	2-Bromopropionic acid (Surrogate)	95.6	%	EPA 552.2	1	1.0	11/24/98	12/7/98	12/8/98	0-280-0
264	HAA-ICR	Bromochloroacetic acid	2.5	µg/L	EPA 552.2	1	1.0	11/24/98	12/7/98	12/8/98	0-280-0
265	HAA-ICR	Bromodichloroacetic acid	3.4	µg/L	EPA 552.2	1	1.0	11/24/98	12/7/98	12/8/98	0-280-0
266	HAA-ICR	Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	11/24/98	12/7/98	12/8/98	0-280-0
267	HAA-ICR	Dibromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	11/24/98	12/7/98	12/8/98	0-280-0
268	HAA-ICR	Dichloroacetic acid	4.6	µg/L	EPA 552.2	1	1.0	11/24/98	12/7/98	12/8/98	0-280-0
269	HAA-ICR	Monobromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	11/24/98	12/7/98	12/8/98	0-280-0
270	HAA-ICR	Monochloroacetic acid	ND	µg/L	EPA 552.2	1	2.0	11/24/98	12/7/98	12/8/98	0-280-0
271	HAA-ICR	Tribromoacetic acid	ND	µg/L	EPA 552.2	1	4.0	11/24/98	12/7/98	12/8/98	0-280-0
272	HAA-ICR	Trichloroacetic acid	6.0	µg/L	EPA 552.2	1	1.0	11/24/98	12/7/98	12/8/98	0-280-0
273	pH	Cl2 pH - Final	7.4	Unit	SM 4500-H+ B	1	n/a	11/27/98		11/28/98	n/a
274	pH	Cl2 pH - Initial	7.3	Unit	SM 4500-H+ B	1	n/a	11/27/98		11/27/98	n/a
275	pH	pH	7.7	Unit	SM 4500-H+ B	1	n/a	11/24/98		11/24/98	n/a
276	TEMP	Cl2 Temperature	7.2	°C	SM 2550 B	1	n/a	11/27/98		11/28/98	n/a
277	TEMP	Temperature	24.4	°C	SM 2550 B	1	n/a	11/24/98		11/24/98	n/a
278	TIME	Cl2 Incubation Time	24.1	hrs	n/a	1	n/a	11/27/98		11/28/98	n/a
279	TOC-ICR	TOC	1.63	mg/L	SM 5310 C	1	0.50	11/24/98		11/24/98	7-0-472
280	TOC-ICR	TOC (Dupl)	1.67	mg/L	SM 5310 C	1	0.50	11/24/98		11/24/98	7-0-472
			1.65	mg/L	2.4 % RPD						
281	TOX-ICR	TOX	85	µg Cl-/L	SM 5320 B	1	25	11/24/98		12/7/98	12-0-257
282	TOX-ICR	TOX (Dupl)	84	µg Cl-/L	SM 5320 B	1	25	11/24/98		12/7/98	12-0-257
			85	µg Cl-/L	1.2 % RPD						
283	THM-ICR	1,2,3-Trichloropropane (Surrogate)	102.4	%	EPA 551.1	1	1.0	11/24/98	12/4/98	12/4/98	0-279-0
284	THM-ICR	Bromodichloromethane	7.3	µg/L	EPA 551.1	1	1.0	11/24/98	12/4/98	12/4/98	0-279-0
285	THM-ICR	Bromoform	ND	µg/L	EPA 551.1	1	1.0	11/24/98	12/4/98	12/4/98	0-279-0
286	THM-ICR	Chloroform	8.6	µg/L	EPA 551.1	1	1.0	11/24/98	12/4/98	12/4/98	0-279-0
287	THM-ICR	Dibromochloromethane	3.3	µg/L	EPA 551.1	1	1.0	11/24/98	12/4/98	12/4/98	0-279-0
288	UV-ICR	UV	0.025	1/cm	SM 5910 B	1	0.009	11/24/98		11/25/98	8-0-374
289	UV-ICR	UV (Dupl)	0.025	1/cm	SM 5910 B	1	0.009	11/24/98		11/25/98	8-0-374
			0.025	1/cm	0.0 % RPD						

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

Sample ID: 185.10.Eff-16

S&amp;H ID: 9811-476

Date Sampled: 11/25/98 4:54:00 PM

#	Analysis Type	Result Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
290	Cl2Dose Chlorine Dose	2.59 mg/L as Cl2	SM 4500-Cl B	1	n/a	11/27/98		11/27/98	n/a
291	Cl2Res Chlorine Residual	1.06 mg/L as Cl2	SM 4500-Cl F	1	0.10	11/27/98		11/28/98	n/a
292	HAA-ICR 1,2,3-Trichloropropane (IS) (Internal Standard)	106.0 %	EPA 552.2	1	1.0	11/25/98	12/7/98	12/8/98	0-280-0
293	HAA-ICR 2-Bromopropionic acid (Surrogate)	98.4 %	EPA 552.2	1	1.0	11/25/98	12/7/98	12/8/98	0-280-0
294	HAA-ICR Bromochloroacetic acid	3.0 µg/L	EPA 552.2	1	1.0	11/25/98	12/7/98	12/8/98	0-280-0
295	HAA-ICR Bromodichloroacetic acid	4.5 µg/L	EPA 552.2	1	1.0	11/25/98	12/7/98	12/8/98	0-280-0
296	HAA-ICR Chlorodibromoacetic acid	ND µg/L	EPA 552.2	1	2.0	11/25/98	12/7/98	12/8/98	0-280-0
297	HAA-ICR Dibromoacetic acid	ND µg/L	EPA 552.2	1	1.0	11/25/98	12/7/98	12/8/98	0-280-0
298	HAA-ICR Dichloroacetic acid	6.0 µg/L	EPA 552.2	1	1.0	11/25/98	12/7/98	12/8/98	0-280-0
299	HAA-ICR Monobromoacetic acid	ND µg/L	EPA 552.2	1	1.0	11/25/98	12/7/98	12/8/98	0-280-0
300	HAA-ICR Monochloroacetic acid	ND µg/L	EPA 552.2	1	2.0	11/25/98	12/7/98	12/8/98	0-280-0
301	HAA-ICR Tribromoacetic acid	ND µg/L	EPA 552.2	1	4.0	11/25/98	12/7/98	12/8/98	0-280-0
302	HAA-ICR Trichloroacetic acid	8.2 µg/L	EPA 552.2	1	1.0	11/25/98	12/7/98	12/8/98	0-280-0
303	pH Cl2 pH - Final	7.4 Unit	SM 4500-H+ B	1	n/a	11/27/98		11/28/98	n/a
304	pH Cl2 pH - Initial	7.3 Unit	SM 4500-H+ B	1	n/a	11/27/98		11/27/98	n/a
305	pH pH	8.0 Unit	SM 4500-H+ B	1	n/a	11/25/98		11/25/98	n/a
306	TEMP Cl2 Temperature	7.2 °C	SM 2550 B	1	n/a	11/27/98		11/28/98	n/a
307	TEMP Temperature	23.7 °C	SM 2550 B	1	n/a	11/25/98		11/25/98	n/a
308	TIME Cl2 Incubation Time	24.1 hrs	n/a	1	n/a	11/27/98		11/28/98	n/a
309	TOC-ICR TOC	1.83 mg/L	SM 5310 C	1	0.50	11/25/98		11/26/98	7-0-474
310	TOC-ICR TOC (Dupl)	1.81 mg/L	SM 5310 C	1	0.50	11/25/98		11/26/98	7-0-474
		<b>1.82 mg/L</b>	<b>1.1 % RPD</b>						
311	TOX-ICR TOX	106 µg Cl-/L	SM 5320 B	1	25	11/25/98		12/4/98	12-0-256
312	TOX-ICR TOX (Dupl)	103 µg Cl-/L	SM 5320 B	1	25	11/25/98		12/4/98	12-0-256
		<b>105 µg Cl-/L</b>	<b>2.9 % RPD</b>						
313	THM-ICR 1,2,3-Trichloropropane (Surrogate)	99.6 %	EPA 551.1	1	1.0	11/25/98	12/4/98	12/4/98	0-279-0
314	THM-ICR Bromodichloromethane	8.6 µg/L	EPA 551.1	1	1.0	11/25/98	12/4/98	12/4/98	0-279-0
315	THM-ICR Bromoform	ND µg/L	EPA 551.1	1	1.0	11/25/98	12/4/98	12/4/98	0-279-0
316	THM-ICR Chloroform	11.7 µg/L	EPA 551.1	1	1.0	11/25/98	12/4/98	12/4/98	0-279-0
317	THM-ICR Dibromochloromethane	3.2 µg/L	EPA 551.1	1	1.0	11/25/98	12/4/98	12/4/98	0-279-0
318	UV-ICR UV	0.030 1/cm	SM 5910 B	1	0.009	11/25/98		11/26/98	8-0-375
319	UV-ICR UV (Dupl)	0.030 1/cm	SM 5910 B	1	0.009	11/25/98		11/26/98	8-0-375
		<b>0.030 1/cm</b>	<b>0.0 % RPD</b>						

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

Sample ID: 185.10.Eff-18			S&H ID: 9811-478		Date Sampled: 11/26/98 11:42:00 AM						
#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
320	Cl2Dose	Chlorine Dose	2.27	mg/L as Cl2	SM 4500-Cl B	1	n/a	11/30/98		11/30/98	n/a
321	Cl2Res	Chlorine Residual	0.57	mg/L as Cl2	SM 4500-Cl F	1	0.10	11/30/98		12/1/98	n/a
322	HAA-ICR	1,2,3-Trichloropropane (IS) (Internal Standard)	99.2	%	EPA 552.2	1	1.0	12/1/98	12/10/98	12/10/98	0-286-0
323	HAA-ICR	2-Bromopropionic acid (Surrogate)	102.8	%	EPA 552.2	1	1.0	12/1/98	12/10/98	12/10/98	0-286-0
324	HAA-ICR	Bromochloroacetic acid	3.1	µg/L	EPA 552.2	1	1.0	12/1/98	12/10/98	12/10/98	0-286-0
325	HAA-ICR	Bromodichloroacetic acid	3.5	µg/L	EPA 552.2	1	1.0	12/1/98	12/10/98	12/10/98	0-286-0
326	HAA-ICR	Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	12/1/98	12/10/98	12/10/98	0-286-0
327	HAA-ICR	Dibromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	12/1/98	12/10/98	12/10/98	0-286-0
328	HAA-ICR	Dichloroacetic acid	6.7	µg/L	EPA 552.2	1	1.0	12/1/98	12/10/98	12/10/98	0-286-0
329	HAA-ICR	Monobromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	12/1/98	12/10/98	12/10/98	0-286-0
330	HAA-ICR	Monochloroacetic acid	ND	µg/L	EPA 552.2	1	2.0	12/1/98	12/10/98	12/10/98	0-286-0
331	HAA-ICR	Tribromoacetic acid	ND	µg/L	EPA 552.2	1	4.0	12/1/98	12/10/98	12/10/98	0-286-0
332	HAA-ICR	Trichloroacetic acid	8.3	µg/L	EPA 552.2	1	1.0	12/1/98	12/10/98	12/10/98	0-286-0
333	pH	Cl2 pH - Final	7.4	Unit	SM 4500-H+ B	1	n/a	11/30/98		12/1/98	n/a
334	pH	Cl2 pH - Initial	7.3	Unit	SM 4500-H+ B	1	n/a	11/30/98		11/30/98	n/a
335	pH	pH	7.7	Unit	SM 4500-H+ B	1	n/a	11/26/98		11/26/98	n/a
336	TEMP	Cl2 Temperature	8.0	°C	SM 2550 B	1	n/a	11/30/98		12/1/98	n/a
337	TEMP	Temperature	22.7	°C	SM 2550 B	1	n/a	11/26/98		11/26/98	n/a
338	TIME	Cl2 Incubation Time	24.2	hrs	n/a	1	n/a	11/30/98		12/1/98	n/a
339	TOC-ICR	TOC	1.94	mg/L	SM 5310 C	1	0.50	11/26/98		11/26/98	7-0-474
340	TOC-ICR	TOC (Dupl)	1.93	mg/L	SM 5310 C	1	0.50	11/26/98		11/26/98	7-0-474
			1.94	mg/L	0.5 % RPD						
341	TOX-ICR	TOX	108	µg Cl-/L	SM 5320 B	1	25	11/26/98		12/9/98	12-0-259
342	TOX-ICR	TOX (Dupl)	102	µg Cl-/L	SM 5320 B	1	25	11/26/98		12/9/98	12-0-259
			105	µg Cl-/L	5.7 % RPD						
343	THM-ICR	1,2,3-Trichloropropane (Surrogate)	100.8	%	EPA 551.1	1	1.0	12/1/98	12/9/98	12/9/98	0-284-0
344	THM-ICR	Bromodichloromethane	9.0	µg/L	EPA 551.1	1	1.0	12/1/98	12/9/98	12/9/98	0-284-0
345	THM-ICR	Bromoform	ND	µg/L	EPA 551.1	1	1.0	12/1/98	12/9/98	12/9/98	0-284-0
346	THM-ICR	Chloroform	12.0	µg/L	EPA 551.1	1	1.0	12/1/98	12/9/98	12/9/98	0-284-0
347	THM-ICR	Dibromochloromethane	3.3	µg/L	EPA 551.1	1	1.0	12/1/98	12/9/98	12/9/98	0-284-0
348	UV-ICR	UV	0.033	1/cm	SM 5910 B	1	0.009	11/26/98		11/26/98	8-0-376
349	UV-ICR	UV (Dupl)	0.033	1/cm	SM 5910 B	1	0.009	11/26/98		11/26/98	8-0-376
			0.033	1/cm	0.0 % RPD						

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

Sample ID: 185.10.Eff-20		S&H ID: 9811-480		Date Sampled: 11/27/98 6:02:00 PM						
#	Analysis Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
350	Cl2Dose Chlorine Dose	2.34	mg/L as Cl2	SM 4500-Cl B	1	n/a	11/30/98		11/30/98	n/a
351	Cl2Res Chlorine Residual	0.62	mg/L as Cl2	SM 4500-Cl F	1	0.10	11/30/98		12/1/98	n/a
352	HAA-ICR 1,2,3-Trichloropropane (IS) (Internal Standard)	95.6	%	EPA 552.2	1	1.0	12/1/98	12/10/98	12/10/98	0-286-0
353	HAA-ICR 2-Bromopropionic acid (Surrogate)	100.0	%	EPA 552.2	1	1.0	12/1/98	12/10/98	12/10/98	0-286-0
354	HAA-ICR Bromochloroacetic acid	3.5	µg/L	EPA 552.2	1	1.0	12/1/98	12/10/98	12/10/98	0-286-0
355	HAA-ICR Bromodichloroacetic acid	4.3	µg/L	EPA 552.2	1	1.0	12/1/98	12/10/98	12/10/98	0-286-0
356	HAA-ICR Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	12/1/98	12/10/98	12/10/98	0-286-0
357	HAA-ICR Dibromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	12/1/98	12/10/98	12/10/98	0-286-0
358	HAA-ICR Dichloroacetic acid	7.8	µg/L	EPA 552.2	1	1.0	12/1/98	12/10/98	12/10/98	0-286-0
359	HAA-ICR Monobromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	12/1/98	12/10/98	12/10/98	0-286-0
360	HAA-ICR Monochloroacetic acid	ND	µg/L	EPA 552.2	1	2.0	12/1/98	12/10/98	12/10/98	0-286-0
361	HAA-ICR Tribromoacetic acid	ND	µg/L	EPA 552.2	1	4.0	12/1/98	12/10/98	12/10/98	0-286-0
362	HAA-ICR Trichloroacetic acid	11.7	µg/L	EPA 552.2	1	1.0	12/1/98	12/10/98	12/10/98	0-286-0
363	pH Cl2 pH - Final	7.4	Unit	SM 4500-H+ B	1	n/a	11/30/98		12/1/98	n/a
364	pH Cl2 pH - Initial	7.3	Unit	SM 4500-H+ B	1	n/a	11/30/98		11/30/98	n/a
365	pH pH	7.8	Unit	SM 4500-H+ B	1	n/a	11/27/98		11/27/98	n/a
366	TEMP Cl2 Temperature	8.0	°C	SM 2550 B	1	n/a	11/30/98		12/1/98	n/a
367	TEMP Temperature	24.5	°C	SM 2550 B	1	n/a	11/27/98		11/27/98	n/a
368	TIME Cl2 Incubation Time	24.2	hrs	n/a	1	n/a	11/30/98		12/1/98	n/a
369	TOC-ICR TOC	2.14	mg/L	SM 5310 C	1	0.50	11/27/98		11/28/98	7-0-475
370	TOC-ICR TOC (Dupl)	2.14	mg/L	SM 5310 C	1	0.50	11/27/98		11/28/98	7-0-475
		<b>2.14</b>	<b>mg/L</b>	<b>0.0 % RPD</b>						
371	TOX-ICR TOX	127	µg Cl-/L	SM 5320 B	1	25	11/27/98		12/9/98	12-0-259
372	TOX-ICR TOX (Dupl)	130	µg Cl-/L	SM 5320 B	1	25	11/27/98		12/9/98	12-0-259
		<b>129</b>	<b>µg Cl-/L</b>	<b>2.3 % RPD</b>						
373	THM-ICR 1,2,3-Trichloropropane (Surrogate)	98.0	%	EPA 551.1	1	1.0	12/1/98	12/9/98	12/9/98	0-284-0
374	THM-ICR Bromodichloromethane	9.2	µg/L	EPA 551.1	1	1.0	12/1/98	12/9/98	12/9/98	0-284-0
375	THM-ICR Bromoform	ND	µg/L	EPA 551.1	1	1.0	12/1/98	12/9/98	12/9/98	0-284-0
376	THM-ICR Chloroform	13.4	µg/L	EPA 551.1	1	1.0	12/1/98	12/9/98	12/9/98	0-284-0
377	THM-ICR Dibromochloromethane	2.9	µg/L	EPA 551.1	1	1.0	12/1/98	12/9/98	12/9/98	0-284-0
378	UV-ICR UV	0.037	1/cm	SM 5910 B	1	0.009	11/27/98		11/28/98	8-0-379
379	UV-ICR UV (Dupl)	0.037	1/cm	SM 5910 B	1	0.009	11/27/98		11/28/98	8-0-379
		<b>0.037</b>	<b>1/cm</b>	<b>0.0 % RPD</b>						

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

Sample ID: 185.10.Eff-21			S&H ID: 9811-481		Date Sampled: 11/29/98 12:15:00 AM						
#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
380	pH	pH	7.8	Unit	SM 4500-H+ B	1	n/a	11/29/98		11/29/98	n/a
381	TEMP	Temperature	23.2	°C	SM 2550 B	1	n/a	11/29/98		11/29/98	n/a
382	TOC-ICR	TOC	2.23	mg/L	SM 5310 C	1	0.50	11/29/98		11/29/98	7-0-476
383	TOC-ICR	TOC (Dupl)	2.25	mg/L	SM 5310 C	1	0.50	11/29/98		11/29/98	7-0-476
			2.24	mg/L	0.9 % RPD						
384	UV-ICR	UV	0.039	1/cm	SM 5910 B	1	0.009	11/29/98		11/29/98	8-0-380
385	UV-ICR	UV (Dupl)	0.039	1/cm	SM 5910 B	1	0.009	11/29/98		11/29/98	8-0-380
			0.039	1/cm	0.0 % RPD						

Sample ID: 185.10.Eff-5d			S&H ID: 9811-492		Date Sampled: 11/22/98 3:00:00 PM						
#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
386	Cl2Dose	Chlorine Dose	1.86	mg/L as Cl2	SM 4500-Cl B	1	n/a	11/25/98		11/25/98	n/a
387	Cl2Res	Chlorine Residual	0.82	mg/L as Cl2	SM 4500-Cl F	1	0.10	11/25/98		11/26/98	n/a
388	HAA-ICR	1,2,3-Trichloropropane (IS) (Internal Standard)	103.6	%	EPA 552.2	1	1.0	11/22/98	12/7/98	12/8/98	0-280-0
389	HAA-ICR	2-Bromopropionic acid (Surrogate)	100.4	%	EPA 552.2	1	1.0	11/22/98	12/7/98	12/8/98	0-280-0
390	HAA-ICR	Bromochloroacetic acid	ND	µg/L	EPA 552.2	1	1.0	11/22/98	12/7/98	12/8/98	0-280-0
391	HAA-ICR	Bromodichloroacetic acid	ND	µg/L	EPA 552.2	1	1.0	11/22/98	12/7/98	12/8/98	0-280-0
392	HAA-ICR	Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	11/22/98	12/7/98	12/8/98	0-280-0
393	HAA-ICR	Dibromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	11/22/98	12/7/98	12/8/98	0-280-0
394	HAA-ICR	Dichloroacetic acid	ND	µg/L	EPA 552.2	1	1.0	11/22/98	12/7/98	12/8/98	0-280-0
395	HAA-ICR	Monobromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	11/22/98	12/7/98	12/8/98	0-280-0
396	HAA-ICR	Monochloroacetic acid	ND	µg/L	EPA 552.2	1	2.0	11/22/98	12/7/98	12/8/98	0-280-0
397	HAA-ICR	Tribromoacetic acid	ND	µg/L	EPA 552.2	1	4.0	11/22/98	12/7/98	12/8/98	0-280-0
398	HAA-ICR	Trichloroacetic acid	ND	µg/L	EPA 552.2	1	1.0	11/22/98	12/7/98	12/8/98	0-280-0
399	pH	Cl2 pH - Final	7.4	Unit	SM 4500-H+ B	1	n/a	11/25/98		11/26/98	n/a
400	pH	Cl2 pH - Initial	7.3	Unit	SM 4500-H+ B	1	n/a	11/25/98		11/25/98	n/a
401	pH	pH	7.7	Unit	SM 4500-H+ B	1	n/a	11/22/98		11/22/98	n/a
402	TEMP	Cl2 Temperature	7.7	°C	SM 2550 B	1	n/a	11/25/98		11/26/98	n/a
403	TEMP	Temperature	23.6	°C	SM 2550 B	1	n/a	11/22/98		11/22/98	n/a
404	TIME	Cl2 Incubation Time	24.4	hrs	n/a	1	n/a	11/25/98		11/26/98	n/a
405	TOC-ICR	TOC	0.50	mg/L	SM 5310 C	1	0.50	11/22/98		11/22/98	7-0-470
406	TOC-ICR	TOC (Dupl)	0.52	mg/L	SM 5310 C	1	0.50	11/22/98		11/22/98	7-0-470
			0.51	mg/L	3.9 % RPD						
407	TOX-ICR	TOX	ND	µg Cl-/L	SM 5320 B	1	25	11/22/98		12/3/98	12-0-255
408	TOX-ICR	TOX (Dupl)	ND	µg Cl-/L	SM 5320 B	1	25	11/22/98		12/3/98	12-0-255
			ND	µg Cl-/L							

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.



**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

409	THM-ICR 1,2,3-Trichloropropane (Surrogate)	94.4 %	EPA 551.1	1	1.0	11/22/98	12/4/98	12/4/98	0-279-0
410	THM-ICR 1,2,3-Trichloropropane (Surrogate) (Lab Dupl)	98.0 %	EPA 551.1	1	1.0	11/22/98	12/4/98	12/4/98	0-279-0
		<b>96.2 %</b>	<b>3.7 % RPD</b>						
411	THM-ICR Bromodichloromethane	1.0 µg/L	EPA 551.1	1	1.0	11/22/98	12/4/98	12/4/98	0-279-0
412	THM-ICR Bromodichloromethane (Lab Dupl)	1.2 µg/L	EPA 551.1	1	1.0	11/22/98	12/4/98	12/4/98	0-279-0
		<b>1.1 µg/L</b>	<b>18.2 % RPD</b>						
413	THM-ICR Bromoform	ND µg/L	EPA 551.1	1	1.0	11/22/98	12/4/98	12/4/98	0-279-0
414	THM-ICR Bromoform (Lab Dupl)	ND µg/L	EPA 551.1	1	1.0	11/22/98	12/4/98	12/4/98	0-279-0
		<b>ND µg/L</b>							
415	THM-ICR Chloroform	ND µg/L	EPA 551.1	1	1.0	11/22/98	12/4/98	12/4/98	0-279-0
416	THM-ICR Chloroform (Lab Dupl)	ND µg/L	EPA 551.1	1	1.0	11/22/98	12/4/98	12/4/98	0-279-0
		<b>ND µg/L</b>							
417	THM-ICR Dibromochloromethane	1.2 µg/L	EPA 551.1	1	1.0	11/22/98	12/4/98	12/4/98	0-279-0
418	THM-ICR Dibromochloromethane (Lab Dupl)	1.2 µg/L	EPA 551.1	1	1.0	11/22/98	12/4/98	12/4/98	0-279-0
		<b>1.2 µg/L</b>	<b>0.0 % RPD</b>						
419	UV-ICR UV	ND 1/cm	SM 5910 B	1	0.009	11/22/98		11/23/98	8-0-369
420	UV-ICR UV (Dupl)	ND 1/cm	SM 5910 B	1	0.009	11/22/98		11/23/98	8-0-369
		<b>ND 1/cm</b>							

Sample ID: 185.10.Eff-9d

S&amp;H ID: 9811-493

Date Sampled: 11/23/98 3:16:00 PM

#	Analysis Type	Result Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
421	Cl2Dose Chlorine Dose	2.29 mg/L as Cl2	SM 4500-Cl B	1	n/a	11/27/98		11/27/98	n/a
422	Cl2Res Chlorine Residual	0.97 mg/L as Cl2	SM 4500-Cl F	1	0.10	11/27/98		11/28/98	n/a
423	HAA-ICR 1,2,3-Trichloropropane (IS) (Internal Standard)	117.6 %	EPA 552.2	1	1.0	11/23/98	12/7/98	12/8/98	0-280-0
424	HAA-ICR 2-Bromopropionic acid (Surrogate)	96.8 %	EPA 552.2	1	1.0	11/23/98	12/7/98	12/8/98	0-280-0
425	HAA-ICR Bromochloroacetic acid	2.3 µg/L	EPA 552.2	1	1.0	11/23/98	12/7/98	12/8/98	0-280-0
426	HAA-ICR Bromodichloroacetic acid	3.5 µg/L	EPA 552.2	1	1.0	11/23/98	12/7/98	12/8/98	0-280-0
427	HAA-ICR Chlorodibromoacetic acid	ND µg/L	EPA 552.2	1	2.0	11/23/98	12/7/98	12/8/98	0-280-0
428	HAA-ICR Dibromoacetic acid	ND µg/L	EPA 552.2	1	1.0	11/23/98	12/7/98	12/8/98	0-280-0
429	HAA-ICR Dichloroacetic acid	2.9 µg/L	EPA 552.2	1	1.0	11/23/98	12/7/98	12/8/98	0-280-0
430	HAA-ICR Monobromoacetic acid	ND µg/L	EPA 552.2	1	1.0	11/23/98	12/7/98	12/8/98	0-280-0
431	HAA-ICR Monochloroacetic acid	ND µg/L	EPA 552.2	1	2.0	11/23/98	12/7/98	12/8/98	0-280-0
432	HAA-ICR Tribromoacetic acid	ND µg/L	EPA 552.2	1	4.0	11/23/98	12/7/98	12/8/98	0-280-0
433	HAA-ICR Trichloroacetic acid	3.8 µg/L	EPA 552.2	1	1.0	11/23/98	12/7/98	12/8/98	0-280-0
434	pH Cl2 pH - Final	7.4 Unit	SM 4500-H+ B	1	n/a	11/27/98		11/28/98	n/a
435	pH Cl2 pH - Initial	7.3 Unit	SM 4500-H+ B	1	n/a	11/27/98		11/27/98	n/a
436	pH pH	7.7 Unit	SM 4500-H+ B	1	n/a	11/23/98		11/23/98	n/a
437	TEMP Cl2 Temperature	7.2 °C	SM 2550 B	1	n/a	11/27/98		11/28/98	n/a

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

438	TEMP	Temperature	23.8 °C	SM 2550 B	1	n/a	11/23/98	11/23/98	n/a
439	TIME	Cl2 Incubation Time	24.1 hrs	n/a	1	n/a	11/27/98	11/28/98	n/a
440	TOC-ICR	TOC	1.36 mg/L	SM 5310 C	1	0.50	11/23/98	11/23/98	7-0-471
441	TOC-ICR	TOC (Dupl)	1.38 mg/L	SM 5310 C	1	0.50	11/23/98	11/23/98	7-0-471
			<b>1.37 mg/L</b>	<b>1.5 % RPD</b>					
442	TOX-ICR	TOX	56 µg Cl-/L	SM 5320 B	1	25	11/23/98	12/4/98	12-0-256
443	TOX-ICR	TOX (Dupl)	56 µg Cl-/L	SM 5320 B	1	25	11/23/98	12/4/98	12-0-256
			<b>56 µg Cl-/L</b>	<b>0.0 % RPD</b>					
444	THM-ICR	1,2,3-Trichloropropane (Surrogate)	96.4 %	EPA 551.1	1	1.0	11/23/98	12/4/98	12/4/98 0-279-0
445	THM-ICR	Bromodichloromethane	4.8 µg/L	EPA 551.1	1	1.0	11/23/98	12/4/98	12/4/98 0-279-0
446	THM-ICR	Bromoform	ND µg/L	EPA 551.1	1	1.0	11/23/98	12/4/98	12/4/98 0-279-0
447	THM-ICR	Chloroform	4.6 µg/L	EPA 551.1	1	1.0	11/23/98	12/4/98	12/4/98 0-279-0
448	THM-ICR	Dibromochloromethane	3.0 µg/L	EPA 551.1	1	1.0	11/23/98	12/4/98	12/4/98 0-279-0
449	UV-ICR	UV	0.018 1/cm	SM 5910 B	1	0.009	11/23/98	11/24/98	8-0-371
450	UV-ICR	UV (Dupl)	0.018 1/cm	SM 5910 B	1	0.009	11/23/98	11/24/98	8-0-371
			<b>0.018 1/cm</b>	<b>0.0 % RPD</b>					

Sample ID: 185.10.Eff-16d

S&amp;H ID: 9811-496

Date Sampled: 11/25/98 4:54:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
451	Cl2Dose	Chlorine Dose	2.59	mg/L as Cl2	SM 4500-Cl B	1	n/a	11/27/98		11/27/98	n/a
452	Cl2Res	Chlorine Residual	0.84	mg/L as Cl2	SM 4500-Cl F	1	0.10	11/27/98		11/28/98	n/a
453	HAA-ICR	1,2,3-Trichloropropane (IS) (Internal Standard)	114.0	%	EPA 552.2	1	1.0	11/25/98	12/7/98	12/9/98	0-280-0
454	HAA-ICR	2-Bromopropionic acid (Surrogate)	97.2	%	EPA 552.2	1	1.0	11/25/98	12/7/98	12/9/98	0-280-0
455	HAA-ICR	Bromochloroacetic acid	3.2	µg/L	EPA 552.2	1	1.0	11/25/98	12/7/98	12/9/98	0-280-0
456	HAA-ICR	Bromodichloroacetic acid	6.1	µg/L	EPA 552.2	1	1.0	11/25/98	12/7/98	12/9/98	0-280-0
457	HAA-ICR	Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	11/25/98	12/7/98	12/9/98	0-280-0
458	HAA-ICR	Dibromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	11/25/98	12/7/98	12/9/98	0-280-0
459	HAA-ICR	Dichloroacetic acid	6.2	µg/L	EPA 552.2	1	1.0	11/25/98	12/7/98	12/9/98	0-280-0
460	HAA-ICR	Monobromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	11/25/98	12/7/98	12/9/98	0-280-0
461	HAA-ICR	Monochloroacetic acid	ND	µg/L	EPA 552.2	1	2.0	11/25/98	12/7/98	12/9/98	0-280-0
462	HAA-ICR	Tribromoacetic acid	ND	µg/L	EPA 552.2	1	4.0	11/25/98	12/7/98	12/9/98	0-280-0
463	HAA-ICR	Trichloroacetic acid	10.6	µg/L	EPA 552.2	1	1.0	11/25/98	12/7/98	12/9/98	0-280-0
464	pH	Cl2 pH - Final	7.4	Unit	SM 4500-H+ B	1	n/a	11/27/98		11/28/98	n/a
465	pH	Cl2 pH - Initial	7.3	Unit	SM 4500-H+ B	1	n/a	11/27/98		11/27/98	n/a
466	pH	pH	7.9	Unit	SM 4500-H+ B	1	n/a	11/25/98		11/25/98	n/a
467	TEMP	Cl2 Temperature	7.2	°C	SM 2550 B	1	n/a	11/27/98		11/28/98	n/a
468	TEMP	Temperature	23.7	°C	SM 2550 B	1	n/a	11/25/98		11/25/98	n/a
469	TIME	Cl2 Incubation Time	24.1	hrs	n/a	1	n/a	11/27/98		11/28/98	n/a

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

470	TOC-ICR TOC	1.81 mg/L	SM 5310 C	1	0.50	11/25/98	11/26/98	7-0-474
471	TOC-ICR TOC (Dupl)	1.89 mg/L	SM 5310 C	1	0.50	11/25/98	11/27/98	7-0-474
		<b>1.85 mg/L</b>	<b>4.3 % RPD</b>					
472	TOX-ICR TOX	103 µg Cl-/L	SM 5320 B	1	25	11/25/98	12/4/98	12-0-256
473	TOX-ICR TOX (Dupl)	103 µg Cl-/L	SM 5320 B	1	25	11/25/98	12/4/98	12-0-256
		<b>103 µg Cl-/L</b>	<b>0.0 % RPD</b>					
474	THM-ICR 1,2,3-Trichloropropane (Surrogate)	100.0 %	EPA 551.1	1	1.0	11/25/98	12/4/98	12/4/98 0-279-0
475	THM-ICR Bromodichloromethane	8.1 µg/L	EPA 551.1	1	1.0	11/25/98	12/4/98	12/4/98 0-279-0
476	THM-ICR Bromoform	ND µg/L	EPA 551.1	1	1.0	11/25/98	12/4/98	12/4/98 0-279-0
477	THM-ICR Chloroform	10.9 µg/L	EPA 551.1	1	1.0	11/25/98	12/4/98	12/4/98 0-279-0
478	THM-ICR Dibromochloromethane	3.0 µg/L	EPA 551.1	1	1.0	11/25/98	12/4/98	12/4/98 0-279-0
479	UV-ICR UV	0.030 1/cm	SM 5910 B	1	0.009	11/25/98	11/26/98	8-0-375
480	UV-ICR UV (Dupl)	0.030 1/cm	SM 5910 B	1	0.009	11/25/98	11/26/98	8-0-375
		<b>0.030 1/cm</b>	<b>0.0 % RPD</b>					

Sample ID: 185.20.Eff-1

S&amp;H ID: 9811-502

Date Sampled: 11/20/98 7:30:00 PM

#	Analysis Type	Result Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
481	Cl2Dose Chlorine Dose	1.48 mg/L as Cl2	SM 4500-Cl B	1	n/a	11/25/98		11/25/98	n/a
482	Cl2Res Chlorine Residual	0.90 mg/L as Cl2	SM 4500-Cl F	1	0.10	11/25/98		11/26/98	n/a
483	HAA-ICR 1,2,3-Trichloropropane (IS) (Internal Standard)	106.0 %	EPA 552.2	1	1.0	11/20/98	12/7/98	12/8/98	0-280-0
484	HAA-ICR 2-Bromopropionic acid (Surrogate)	95.6 %	EPA 552.2	1	1.0	11/20/98	12/7/98	12/8/98	0-280-0
485	HAA-ICR Bromochloroacetic acid	ND µg/L	EPA 552.2	1	1.0	11/20/98	12/7/98	12/8/98	0-280-0
486	HAA-ICR Bromodichloroacetic acid	ND µg/L	EPA 552.2	1	1.0	11/20/98	12/7/98	12/8/98	0-280-0
487	HAA-ICR Chlorodibromoacetic acid	ND µg/L	EPA 552.2	1	2.0	11/20/98	12/7/98	12/8/98	0-280-0
488	HAA-ICR Dibromoacetic acid	ND µg/L	EPA 552.2	1	1.0	11/20/98	12/7/98	12/8/98	0-280-0
489	HAA-ICR Dichloroacetic acid	ND µg/L	EPA 552.2	1	1.0	11/20/98	12/7/98	12/8/98	0-280-0
490	HAA-ICR Monobromoacetic acid	ND µg/L	EPA 552.2	1	1.0	11/20/98	12/7/98	12/8/98	0-280-0
491	HAA-ICR Monochloroacetic acid	ND µg/L	EPA 552.2	1	2.0	11/20/98	12/7/98	12/8/98	0-280-0
492	HAA-ICR Tribromoacetic acid	ND µg/L	EPA 552.2	1	4.0	11/20/98	12/7/98	12/8/98	0-280-0
493	HAA-ICR Trichloroacetic acid	ND µg/L	EPA 552.2	1	1.0	11/20/98	12/7/98	12/8/98	0-280-0
494	pH Cl2 pH - Final	7.5 Unit	SM 4500-H+ B	1	n/a	11/25/98		11/26/98	n/a
495	pH Cl2 pH - Initial	7.4 Unit	SM 4500-H+ B	1	n/a	11/25/98		11/25/98	n/a
496	pH pH	8.0 Unit	SM 4500-H+ B	1	n/a	11/20/98		11/20/98	n/a
497	TEMP Cl2 Temperature	7.7 °C	SM 2550 B	1	n/a	11/25/98		11/26/98	n/a
498	TEMP Temperature	23.5 °C	SM 2550 B	1	n/a	11/20/98		11/20/98	n/a
499	TIME Cl2 Incubation Time	24.5 hrs	n/a	1	n/a	11/25/98		11/26/98	n/a
500	TOC-ICR TOC	ND mg/L	SM 5310 C	1	0.50	11/20/98		11/21/98	7-0-469
501	TOC-ICR TOC (Dupl)	ND mg/L	SM 5310 C	1	0.50	11/20/98		11/21/98	7-0-469

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

		ND mg/L							
502	TOX-ICR TOX	ND µg Cl-/L	SM 5320 B	1	25	11/20/98		12/3/98	12-0-255
503	TOX-ICR TOX (Dupl)	ND µg Cl-/L	SM 5320 B	1	25	11/20/98		12/3/98	12-0-255
		ND µg Cl-/L							
504	THM-ICR 1,2,3-Trichloropropane (Surrogate)	98.4 %	EPA 551.1	1	1.0	11/20/98	12/4/98	12/4/98	0-279-0
505	THM-ICR Bromodichloromethane	ND µg/L	EPA 551.1	1	1.0	11/20/98	12/4/98	12/4/98	0-279-0
506	THM-ICR Bromoform	ND µg/L	EPA 551.1	1	1.0	11/20/98	12/4/98	12/4/98	0-279-0
507	THM-ICR Chloroform	ND µg/L	EPA 551.1	1	1.0	11/20/98	12/4/98	12/4/98	0-279-0
508	THM-ICR Dibromochloromethane	ND µg/L	EPA 551.1	1	1.0	11/20/98	12/4/98	12/4/98	0-279-0
509	UV-ICR UV	ND 1/cm	SM 5910 B	1	0.009	11/20/98		11/21/98	8-0-367
510	UV-ICR UV (Dupl)	ND 1/cm	SM 5910 B	1	0.009	11/20/98		11/21/98	8-0-367
		ND 1/cm							

Sample ID: 185.20.Eff-4

S&amp;H ID: 9811-505

Date Sampled: 11/24/98 12:53:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
511	Cl2Dose	Chlorine Dose	1.61	mg/L as Cl2	SM 4500-Cl B	1	n/a	11/27/98		11/27/98	n/a
512	Cl2Res	Chlorine Residual	0.99	mg/L as Cl2	SM 4500-Cl F	1	0.10	11/27/98		11/28/98	n/a
513	HAA-ICR	1,2,3-Trichloropropane (IS) (Internal Standard)	107.2	%	EPA 552.2	1	1.0	11/24/98	12/7/98	12/9/98	0-280-0
514	HAA-ICR	2-Bromopropionic acid (Surrogate)	98.0	%	EPA 552.2	1	1.0	11/24/98	12/7/98	12/9/98	0-280-0
515	HAA-ICR	Bromochloroacetic acid	ND	µg/L	EPA 552.2	1	1.0	11/24/98	12/7/98	12/9/98	0-280-0
516	HAA-ICR	Bromodichloroacetic acid	ND	µg/L	EPA 552.2	1	1.0	11/24/98	12/7/98	12/9/98	0-280-0
517	HAA-ICR	Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	11/24/98	12/7/98	12/9/98	0-280-0
518	HAA-ICR	Dibromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	11/24/98	12/7/98	12/9/98	0-280-0
519	HAA-ICR	Dichloroacetic acid	ND	µg/L	EPA 552.2	1	1.0	11/24/98	12/7/98	12/9/98	0-280-0
520	HAA-ICR	Monobromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	11/24/98	12/7/98	12/9/98	0-280-0
521	HAA-ICR	Monochloroacetic acid	ND	µg/L	EPA 552.2	1	2.0	11/24/98	12/7/98	12/9/98	0-280-0
522	HAA-ICR	Tribromoacetic acid	ND	µg/L	EPA 552.2	1	4.0	11/24/98	12/7/98	12/9/98	0-280-0
523	HAA-ICR	Trichloroacetic acid	ND	µg/L	EPA 552.2	1	1.0	11/24/98	12/7/98	12/9/98	0-280-0
524	pH	Cl2 pH - Final	7.4	Unit	SM 4500-H+ B	1	n/a	11/27/98		11/28/98	n/a
525	pH	Cl2 pH - Initial	7.3	Unit	SM 4500-H+ B	1	n/a	11/27/98		11/27/98	n/a
526	pH	pH	7.8	Unit	SM 4500-H+ B	1	n/a	11/24/98		11/24/98	n/a
527	TEMP	Cl2 Temperature	7.2	°C	SM 2550 B	1	n/a	11/27/98		11/28/98	n/a
528	TEMP	Temperature	22.1	°C	SM 2550 B	1	n/a	11/24/98		11/24/98	n/a
529	TIME	Cl2 Incubation Time	24.1	hrs	n/a	1	n/a	11/27/98		11/28/98	n/a
530	TOC-ICR	TOC	ND	mg/L	SM 5310 C	1	0.50	11/24/98		11/24/98	7-0-472
531	TOC-ICR	TOC (Dupl)	ND	mg/L	SM 5310 C	1	0.50	11/24/98		11/24/98	7-0-472
			ND	mg/L							
532	TOX-ICR	TOX	ND	µg Cl-/L	SM 5320 B	1	25	11/24/98		12/7/98	12-0-257

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

533	TOX-ICR TOX (Dupl)	ND µg Cl-/L ND µg Cl-/L	SM 5320 B	1	25	11/24/98	12/7/98	12-0-257
534	THM-ICR 1,2,3-Trichloropropane (Surrogate)	92.0 %	EPA 551.1	1	1.0	11/24/98	12/4/98	12/4/98 0-279-0
535	THM-ICR Bromodichloromethane	ND µg/L	EPA 551.1	1	1.0	11/24/98	12/4/98	12/4/98 0-279-0
536	THM-ICR Bromoform	ND µg/L	EPA 551.1	1	1.0	11/24/98	12/4/98	12/4/98 0-279-0
537	THM-ICR Chloroform	ND µg/L	EPA 551.1	1	1.0	11/24/98	12/4/98	12/4/98 0-279-0
538	THM-ICR Dibromochloromethane	ND µg/L	EPA 551.1	1	1.0	11/24/98	12/4/98	12/4/98 0-279-0
539	UV-ICR UV	ND 1/cm	SM 5910 B	1	0.009	11/24/98	11/24/98	8-0-371
540	UV-ICR UV (Dupl)	ND 1/cm ND 1/cm	SM 5910 B	1	0.009	11/24/98	11/24/98	8-0-371

Sample ID: 185.20.Eff-8

S&amp;H ID: 9811-509

Date Sampled: 11/25/98 1:22:00 AM

#	Analysis Type	Result Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
541	Cl2Dose Chlorine Dose	1.73 mg/L as Cl2	SM 4500-Cl B	1	n/a	11/27/98		11/27/98	n/a
542	Cl2Res Chlorine Residual	0.99 mg/L as Cl2	SM 4500-Cl F	1	0.10	11/27/98		11/28/98	n/a
543	HAA-ICR 1,2,3-Trichloropropane (IS) (Internal Standard)	109.6 %	EPA 552.2	1	1.0	11/25/98	12/7/98	12/9/98	0-280-0
544	HAA-ICR 2-Bromopropionic acid (Surrogate)	96.4 %	EPA 552.2	1	1.0	11/25/98	12/7/98	12/9/98	0-280-0
545	HAA-ICR Bromochloroacetic acid	ND µg/L	EPA 552.2	1	1.0	11/25/98	12/7/98	12/9/98	0-280-0
546	HAA-ICR Bromodichloroacetic acid	ND µg/L	EPA 552.2	1	1.0	11/25/98	12/7/98	12/9/98	0-280-0
547	HAA-ICR Chlorodibromoacetic acid	ND µg/L	EPA 552.2	1	2.0	11/25/98	12/7/98	12/9/98	0-280-0
548	HAA-ICR Dibromoacetic acid	ND µg/L	EPA 552.2	1	1.0	11/25/98	12/7/98	12/9/98	0-280-0
549	HAA-ICR Dichloroacetic acid	ND µg/L	EPA 552.2	1	1.0	11/25/98	12/7/98	12/9/98	0-280-0
550	HAA-ICR Monobromoacetic acid	ND µg/L	EPA 552.2	1	1.0	11/25/98	12/7/98	12/9/98	0-280-0
551	HAA-ICR Monochloroacetic acid	ND µg/L	EPA 552.2	1	2.0	11/25/98	12/7/98	12/9/98	0-280-0
552	HAA-ICR Tribromoacetic acid	ND µg/L	EPA 552.2	1	4.0	11/25/98	12/7/98	12/9/98	0-280-0
553	HAA-ICR Trichloroacetic acid	ND µg/L	EPA 552.2	1	1.0	11/25/98	12/7/98	12/9/98	0-280-0
554	pH Cl2 pH - Final	7.4 Unit	SM 4500-H+ B	1	n/a	11/27/98		11/28/98	n/a
555	pH Cl2 pH - Initial	7.3 Unit	SM 4500-H+ B	1	n/a	11/27/98		11/27/98	n/a
556	pH pH	7.8 Unit	SM 4500-H+ B	1	n/a	11/25/98		11/25/98	n/a
557	TEMP Cl2 Temperature	7.2 °C	SM 2550 B	1	n/a	11/27/98		11/28/98	n/a
558	TEMP Temperature	22.6 °C	SM 2550 B	1	n/a	11/25/98		11/25/98	n/a
559	TIME Cl2 Incubation Time	24.1 hrs	n/a	1	n/a	11/27/98		11/28/98	n/a
560	TOC-ICR TOC	ND mg/L	SM 5310 C	1	0.50	11/25/98		11/25/98	7-0-473
561	TOC-ICR TOC (Dupl)	ND mg/L ND mg/L	SM 5310 C	1	0.50	11/25/98		11/25/98	7-0-473
562	TOX-ICR TOX	ND µg Cl-/L	SM 5320 B	1	25	11/25/98		12/7/98	12-0-257
563	TOX-ICR TOX (Dupl)	ND µg Cl-/L ND µg Cl-/L	SM 5320 B	1	25	11/25/98		12/7/98	12-0-257

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

564	THM-ICR 1,2,3-Trichloropropane (Surrogate)	95.6 %	EPA 551.1	1	1.0	11/25/98	12/4/98	12/4/98	0-279-0
565	THM-ICR Bromodichloromethane	1.0 µg/L	EPA 551.1	1	1.0	11/25/98	12/4/98	12/4/98	0-279-0
566	THM-ICR Bromoform	ND µg/L	EPA 551.1	1	1.0	11/25/98	12/4/98	12/4/98	0-279-0
567	THM-ICR Chloroform	ND µg/L	EPA 551.1	1	1.0	11/25/98	12/4/98	12/4/98	0-279-0
568	THM-ICR Dibromochloromethane	1.2 µg/L	EPA 551.1	1	1.0	11/25/98	12/4/98	12/4/98	0-279-0
569	UV-ICR UV	ND 1/cm	SM 5910 B	1	0.009	11/25/98		11/25/98	8-0-373
570	UV-ICR UV (Dupl)	ND 1/cm	SM 5910 B	1	0.009	11/25/98		11/25/98	8-0-373
		<b>ND 1/cm</b>							

Sample ID: 185.20.Eff-10

S&amp;H ID: 9811-511

Date Sampled: 11/25/98 1:51:00 PM

#	Analysis Type	Result Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
571	Cl2Dose Chlorine Dose	1.83 mg/L as Cl2	SM 4500-Cl B	1	n/a	11/27/98		11/27/98	n/a
572	Cl2Res Chlorine Residual	1.09 mg/L as Cl2	SM 4500-Cl F	1	0.10	11/27/98		11/28/98	n/a
573	HAA-ICR 1,2,3-Trichloropropane (IS) (Internal Standard)	110.0 %	EPA 552.2	1	1.0	11/25/98	12/7/98	12/9/98	0-280-0
574	HAA-ICR 2-Bromopropionic acid (Surrogate)	80.4 %	EPA 552.2	1	1.0	11/25/98	12/7/98	12/9/98	0-280-0
575	HAA-ICR Bromochloroacetic acid	ND µg/L	EPA 552.2	1	1.0	11/25/98	12/7/98	12/9/98	0-280-0
576	HAA-ICR Bromodichloroacetic acid	ND µg/L	EPA 552.2	1	1.0	11/25/98	12/7/98	12/9/98	0-280-0
577	HAA-ICR Chlorodibromoacetic acid	ND µg/L	EPA 552.2	1	2.0	11/25/98	12/7/98	12/9/98	0-280-0
578	HAA-ICR Dibromoacetic acid	ND µg/L	EPA 552.2	1	1.0	11/25/98	12/7/98	12/9/98	0-280-0
579	HAA-ICR Dichloroacetic acid	ND µg/L	EPA 552.2	1	1.0	11/25/98	12/7/98	12/9/98	0-280-0
580	HAA-ICR Monobromoacetic acid	ND µg/L	EPA 552.2	1	1.0	11/25/98	12/7/98	12/9/98	0-280-0
581	HAA-ICR Monochloroacetic acid	ND µg/L	EPA 552.2	1	2.0	11/25/98	12/7/98	12/9/98	0-280-0
582	HAA-ICR Tribromoacetic acid	ND µg/L	EPA 552.2	1	4.0	11/25/98	12/7/98	12/9/98	0-280-0
583	HAA-ICR Trichloroacetic acid	ND µg/L	EPA 552.2	1	1.0	11/25/98	12/7/98	12/9/98	0-280-0
584	pH Cl2 pH - Final	7.4 Unit	SM 4500-H+ B	1	n/a	11/27/98		11/28/98	n/a
585	pH Cl2 pH - Initial	7.3 Unit	SM 4500-H+ B	1	n/a	11/27/98		11/27/98	n/a
586	pH pH	7.7 Unit	SM 4500-H+ B	1	n/a	11/25/98		11/25/98	n/a
587	TEMP Cl2 Temperature	7.2 °C	SM 2550 B	1	n/a	11/27/98		11/28/98	n/a
588	TEMP Temperature	22.1 °C	SM 2550 B	1	n/a	11/25/98		11/25/98	n/a
589	TIME Cl2 Incubation Time	24.2 hrs	n/a	1	n/a	11/27/98		11/28/98	n/a
590	TOC-ICR TOC	0.61 mg/L	SM 5310 C	1	0.50	11/25/98		11/25/98	7-0-473
591	TOC-ICR TOC (Dupl)	0.64 mg/L	SM 5310 C	1	0.50	11/25/98		11/25/98	7-0-473
		<b>0.63 mg/L</b>	<b>4.8 % RPD</b>						
592	TOX-ICR TOX	ND µg Cl-/L	SM 5320 B	1	25	11/25/98		12/7/98	12-0-257
593	TOX-ICR TOX (Dupl)	ND µg Cl-/L	SM 5320 B	1	25	11/25/98		12/7/98	12-0-257
		<b>ND µg Cl-/L</b>							
594	THM-ICR 1,2,3-Trichloropropane (Surrogate)	96.4 %	EPA 551.1	1	1.0	11/25/98	12/4/98	12/4/98	0-279-0

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

595	THM-ICR Bromodichloromethane	1.5 µg/L	EPA 551.1	1	1.0	11/25/98	12/4/98	12/4/98	0-279-0
596	THM-ICR Bromoform	ND µg/L	EPA 551.1	1	1.0	11/25/98	12/4/98	12/4/98	0-279-0
597	THM-ICR Chloroform	1.0 µg/L	EPA 551.1	1	1.0	11/25/98	12/4/98	12/4/98	0-279-0
598	THM-ICR Dibromochloromethane	1.6 µg/L	EPA 551.1	1	1.0	11/25/98	12/4/98	12/4/98	0-279-0
599	UV-ICR UV	ND 1/cm	SM 5910 B	1	0.009	11/25/98		11/25/98	8-0-374
600	UV-ICR UV (Dupl)	ND 1/cm	SM 5910 B	1	0.009	11/25/98		11/25/98	8-0-374
		<b>ND 1/cm</b>							

Sample ID: 185.20.Eff-11

S&amp;H ID: 9811-512

Date Sampled: 11/25/98 7:55:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
601	Cl2Dose	Chlorine Dose	1.52	mg/L as Cl2	SM 4500-Cl B	1	n/a	11/30/98		11/30/98	n/a
602	Cl2Res	Chlorine Residual	0.89	mg/L as Cl2	SM 4500-Cl F	1	0.10	11/30/98		12/1/98	n/a
603	HAA-ICR	1,2,3-Trichloropropane (IS) (Internal Standard)	104.4	%	EPA 552.2	1	1.0	12/1/98	12/10/98	12/10/98	0-286-0
604	HAA-ICR	1,2,3-Trichloropropane (IS) (Internal Standard) (Lab Dupl)	94.4	%	EPA 552.2	1	1.0	12/1/98	12/10/98	12/11/98	0-286-0
			<b>99.4</b>	<b>%</b>	<b>10.1 % RPD</b>						
605	HAA-ICR	2-Bromopropionic acid (Surrogate)	98.4	%	EPA 552.2	1	1.0	12/1/98	12/10/98	12/10/98	0-286-0
606	HAA-ICR	2-Bromopropionic acid (Surrogate) (Lab Dupl)	99.6	%	EPA 552.2	1	1.0	12/1/98	12/10/98	12/11/98	0-286-0
			<b>99.0</b>	<b>%</b>	<b>1.2 % RPD</b>						
607	HAA-ICR	Bromochloroacetic acid	1.1	µg/L	EPA 552.2	1	1.0	12/1/98	12/10/98	12/10/98	0-286-0
608	HAA-ICR	Bromochloroacetic acid (Lab Dupl)	1.2	µg/L	EPA 552.2	1	1.0	12/1/98	12/10/98	12/11/98	0-286-0
			<b>1.1</b>	<b>µg/L</b>	<b>9.1 % RPD</b>						
609	HAA-ICR	Bromodichloroacetic acid	1.1	µg/L	EPA 552.2	1	1.0	12/1/98	12/10/98	12/10/98	0-286-0
610	HAA-ICR	Bromodichloroacetic acid (Lab Dupl)	1.1	µg/L	EPA 552.2	1	1.0	12/1/98	12/10/98	12/11/98	0-286-0
			<b>1.1</b>	<b>µg/L</b>	<b>0.0 % RPD</b>						
611	HAA-ICR	Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	12/1/98	12/10/98	12/10/98	0-286-0
612	HAA-ICR	Chlorodibromoacetic acid (Lab Dupl)	ND	µg/L	EPA 552.2	1	2.0	12/1/98	12/10/98	12/11/98	0-286-0
			<b>ND</b>	<b>µg/L</b>							
613	HAA-ICR	Dibromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	12/1/98	12/10/98	12/10/98	0-286-0
614	HAA-ICR	Dibromoacetic acid (Lab Dupl)	ND	µg/L	EPA 552.2	1	1.0	12/1/98	12/10/98	12/11/98	0-286-0
			<b>ND</b>	<b>µg/L</b>							
615	HAA-ICR	Dichloroacetic acid	ND	µg/L	EPA 552.2	1	1.0	12/1/98	12/10/98	12/10/98	0-286-0
616	HAA-ICR	Dichloroacetic acid (Lab Dupl)	ND	µg/L	EPA 552.2	1	1.0	12/1/98	12/10/98	12/11/98	0-286-0
			<b>ND</b>	<b>µg/L</b>							
617	HAA-ICR	Monobromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	12/1/98	12/10/98	12/10/98	0-286-0
618	HAA-ICR	Monobromoacetic acid (Lab Dupl)	ND	µg/L	EPA 552.2	1	1.0	12/1/98	12/10/98	12/11/98	0-286-0
			<b>ND</b>	<b>µg/L</b>							

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

619	HAA-ICR	Monochloroacetic acid	ND µg/L	EPA 552.2	1	2.0	12/1/98	12/10/98	12/10/98	0-286-0
620	HAA-ICR	Monochloroacetic acid (Lab Dupl)	ND µg/L	EPA 552.2	1	2.0	12/1/98	12/10/98	12/11/98	0-286-0
			<b>ND µg/L</b>							
621	HAA-ICR	Tribromoacetic acid	ND µg/L	EPA 552.2	1	4.0	12/1/98	12/10/98	12/10/98	0-286-0
622	HAA-ICR	Tribromoacetic acid (Lab Dupl)	ND µg/L	EPA 552.2	1	4.0	12/1/98	12/10/98	12/11/98	0-286-0
			<b>ND µg/L</b>							
623	HAA-ICR	Trichloroacetic acid	ND µg/L	EPA 552.2	1	1.0	12/1/98	12/10/98	12/10/98	0-286-0
624	HAA-ICR	Trichloroacetic acid (Lab Dupl)	ND µg/L	EPA 552.2	1	1.0	12/1/98	12/10/98	12/11/98	0-286-0
			<b>ND µg/L</b>							
625	pH	Cl2 pH - Final	7.4 Unit	SM 4500-H+ B	1	n/a	11/30/98		12/1/98	n/a
626	pH	Cl2 pH - Initial	7.3 Unit	SM 4500-H+ B	1	n/a	11/30/98		11/30/98	n/a
627	pH	pH	7.9 Unit	SM 4500-H+ B	1	n/a	11/25/98		11/25/98	n/a
628	TEMP	Cl2 Temperature	8.0 °C	SM 2550 B	1	n/a	11/30/98		12/1/98	n/a
629	TEMP	Temperature	22.7 °C	SM 2550 B	1	n/a	11/25/98		11/25/98	n/a
630	TIME	Cl2 Incubation Time	24.2 hrs	n/a	1	n/a	11/30/98		12/1/98	n/a
631	TOC-ICR	TOC	0.72 mg/L	SM 5310 C	1	0.50	11/25/98		11/26/98	7-0-474
632	TOC-ICR	TOC (Dupl)	0.74 mg/L	SM 5310 C	1	0.50	11/25/98		11/26/98	7-0-474
			<b>0.73 mg/L</b>	<b>2.7 % RPD</b>						
633	TOX-ICR	TOX	ND µg Cl-/L	SM 5320 B	1	25	11/25/98		12/9/98	12-0-259
634	TOX-ICR	TOX (Dupl)	ND µg Cl-/L	SM 5320 B	1	25	11/25/98		12/9/98	12-0-259
			<b>ND µg Cl-/L</b>							
635	THM-ICR	1,2,3-Trichloropropane (Surrogate)	100.4 %	EPA 551.1	1	1.0	12/1/98	12/9/98	12/9/98	0-284-0
636	THM-ICR	Bromodichloromethane	2.1 µg/L	EPA 551.1	1	1.0	12/1/98	12/9/98	12/9/98	0-284-0
637	THM-ICR	Bromoform	ND µg/L	EPA 551.1	1	1.0	12/1/98	12/9/98	12/9/98	0-284-0
638	THM-ICR	Chloroform	1.5 µg/L	EPA 551.1	1	1.0	12/1/98	12/9/98	12/9/98	0-284-0
639	THM-ICR	Dibromochloromethane	2.4 µg/L	EPA 551.1	1	1.0	12/1/98	12/9/98	12/9/98	0-284-0
640	UV-ICR	UV	0.009 1/cm	SM 5910 B	1	0.009	11/25/98		11/26/98	8-0-375
641	UV-ICR	UV (Dupl)	ND 1/cm	SM 5910 B	1	0.009	11/25/98		11/26/98	8-0-375
			<b>ND 1/cm</b>							

Sample ID: 185.20.Eff-12

S&amp;H ID: 9811-513

Date Sampled: 11/26/98 8:17:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
642	Cl2Dose	Chlorine Dose	1.56	mg/L as Cl2	SM 4500-Cl B	1	n/a	11/30/98		11/30/98	n/a
643	Cl2Res	Chlorine Residual	0.91	mg/L as Cl2	SM 4500-Cl F	1	0.10	11/30/98		12/1/98	n/a
644	HAA-ICR	1,2,3-Trichloropropane (IS) (Internal Standard)	101.6	%	EPA 552.2	1	1.0	12/1/98	12/10/98	12/11/98	0-286-0
645	HAA-ICR	2-Bromopropionic acid (Surrogate)	98.4	%	EPA 552.2	1	1.0	12/1/98	12/10/98	12/11/98	0-286-0
646	HAA-ICR	Bromochloroacetic acid	1.5	µg/L	EPA 552.2	1	1.0	12/1/98	12/10/98	12/11/98	0-286-0

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.



**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

647	HAA-ICR	Bromodichloroacetic acid	1.3 µg/L	EPA 552.2	1	1.0	12/1/98	12/10/98	12/11/98	0-286-0
648	HAA-ICR	Chlorodibromoacetic acid	ND µg/L	EPA 552.2	1	2.0	12/1/98	12/10/98	12/11/98	0-286-0
649	HAA-ICR	Dibromoacetic acid	ND µg/L	EPA 552.2	1	1.0	12/1/98	12/10/98	12/11/98	0-286-0
650	HAA-ICR	Dichloroacetic acid	1.4 µg/L	EPA 552.2	1	1.0	12/1/98	12/10/98	12/11/98	0-286-0
651	HAA-ICR	Monobromoacetic acid	ND µg/L	EPA 552.2	1	1.0	12/1/98	12/10/98	12/11/98	0-286-0
652	HAA-ICR	Monochloroacetic acid	ND µg/L	EPA 552.2	1	2.0	12/1/98	12/10/98	12/11/98	0-286-0
653	HAA-ICR	Tribromoacetic acid	ND µg/L	EPA 552.2	1	4.0	12/1/98	12/10/98	12/11/98	0-286-0
654	HAA-ICR	Trichloroacetic acid	1.1 µg/L	EPA 552.2	1	1.0	12/1/98	12/10/98	12/11/98	0-286-0
655	pH	Cl2 pH - Final	7.4 Unit	SM 4500-H+ B	1	n/a	11/30/98		12/1/98	n/a
656	pH	Cl2 pH - Initial	7.3 Unit	SM 4500-H+ B	1	n/a	11/30/98		11/30/98	n/a
657	pH	pH	7.8 Unit	SM 4500-H+ B	1	n/a	11/26/98		11/26/98	n/a
658	TEMP	Cl2 Temperature	8.0 °C	SM 2550 B	1	n/a	11/30/98		12/1/98	n/a
659	TEMP	Temperature	21.6 °C	SM 2550 B	1	n/a	11/26/98		11/26/98	n/a
660	TIME	Cl2 Incubation Time	24.1 hrs	n/a	1	n/a	11/30/98		12/1/98	n/a
661	TOC-ICR	TOC	0.87 mg/L	SM 5310 C	1	0.50	11/26/98		11/26/98	7-0-474
662	TOC-ICR	TOC (Dupl)	0.89 mg/L	SM 5310 C	1	0.50	11/26/98		11/26/98	7-0-474
			<b>0.88 mg/L</b>	<b>2.3 % RPD</b>						
663	TOX-ICR	TOX	28 µg Cl-/L	SM 5320 B	1	25	11/26/98		12/9/98	12-0-259
664	TOX-ICR	TOX (Dupl)	28 µg Cl-/L	SM 5320 B	1	25	11/26/98		12/9/98	12-0-259
			<b>28 µg Cl-/L</b>	<b>0.0 % RPD</b>						
665	THM-ICR	1,2,3-Trichloropropane (Surrogate)	96.8 %	EPA 551.1	1	1.0	12/1/98	12/9/98	12/9/98	0-284-0
666	THM-ICR	1,2,3-Trichloropropane (Surrogate) (Lab Dupl)	103.6 %	EPA 551.1	1	1.0	12/1/98	12/9/98	12/9/98	0-284-0
			<b>100.2 %</b>	<b>6.8 % RPD</b>						
667	THM-ICR	Bromodichloromethane	2.8 µg/L	EPA 551.1	1	1.0	12/1/98	12/9/98	12/9/98	0-284-0
668	THM-ICR	Bromodichloromethane (Lab Dupl)	2.8 µg/L	EPA 551.1	1	1.0	12/1/98	12/9/98	12/9/98	0-284-0
			<b>2.8 µg/L</b>	<b>0.0 % RPD</b>						
669	THM-ICR	Bromoform	ND µg/L	EPA 551.1	1	1.0	12/1/98	12/9/98	12/9/98	0-284-0
670	THM-ICR	Bromoform (Lab Dupl)	ND µg/L	EPA 551.1	1	1.0	12/1/98	12/9/98	12/9/98	0-284-0
			<b>ND µg/L</b>							
671	THM-ICR	Chloroform	1.8 µg/L	EPA 551.1	1	1.0	12/1/98	12/9/98	12/9/98	0-284-0
672	THM-ICR	Chloroform (Lab Dupl)	1.8 µg/L	EPA 551.1	1	1.0	12/1/98	12/9/98	12/9/98	0-284-0
			<b>1.8 µg/L</b>	<b>0.0 % RPD</b>						
673	THM-ICR	Dibromochloromethane	2.8 µg/L	EPA 551.1	1	1.0	12/1/98	12/9/98	12/9/98	0-284-0
674	THM-ICR	Dibromochloromethane (Lab Dupl)	2.8 µg/L	EPA 551.1	1	1.0	12/1/98	12/9/98	12/9/98	0-284-0
			<b>2.8 µg/L</b>	<b>0.0 % RPD</b>						
675	UV-ICR	UV	0.010 1/cm	SM 5910 B	1	0.009	11/26/98		11/26/98	8-0-376
676	UV-ICR	UV (Dupl)	0.010 1/cm	SM 5910 B	1	0.009	11/26/98		11/26/98	8-0-376
			<b>0.010 1/cm</b>	<b>0.0 % RPD</b>						

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

Sample ID: 185.20.Eff-13			S&H ID: 9811-514		Date Sampled: 11/26/98 8:13:00 PM						
#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
677	Cl2Dose	Chlorine Dose	1.62	mg/L as Cl2	SM 4500-Cl B	1	n/a	11/30/98		11/30/98	n/a
678	Cl2Res	Chlorine Residual	0.75	mg/L as Cl2	SM 4500-Cl F	1	0.10	11/30/98		12/1/98	n/a
679	HAA-ICR	1,2,3-Trichloropropane (IS) (Internal Standard)	101.2	%	EPA 552.2	1	1.0	12/1/98	12/10/98	12/11/98	0-286-0
680	HAA-ICR	2-Bromopropionic acid (Surrogate)	96.0	%	EPA 552.2	1	1.0	12/1/98	12/10/98	12/11/98	0-286-0
681	HAA-ICR	Bromochloroacetic acid	1.8	µg/L	EPA 552.2	1	1.0	12/1/98	12/10/98	12/11/98	0-286-0
682	HAA-ICR	Bromodichloroacetic acid	1.7	µg/L	EPA 552.2	1	1.0	12/1/98	12/10/98	12/11/98	0-286-0
683	HAA-ICR	Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	12/1/98	12/10/98	12/11/98	0-286-0
684	HAA-ICR	Dibromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	12/1/98	12/10/98	12/11/98	0-286-0
685	HAA-ICR	Dichloroacetic acid	1.8	µg/L	EPA 552.2	1	1.0	12/1/98	12/10/98	12/11/98	0-286-0
686	HAA-ICR	Monobromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	12/1/98	12/10/98	12/11/98	0-286-0
687	HAA-ICR	Monochloroacetic acid	ND	µg/L	EPA 552.2	1	2.0	12/1/98	12/10/98	12/11/98	0-286-0
688	HAA-ICR	Tribromoacetic acid	ND	µg/L	EPA 552.2	1	4.0	12/1/98	12/10/98	12/11/98	0-286-0
689	HAA-ICR	Trichloroacetic acid	1.5	µg/L	EPA 552.2	1	1.0	12/1/98	12/10/98	12/11/98	0-286-0
690	pH	Cl2 pH - Final	7.4	Unit	SM 4500-H+ B	1	n/a	11/30/98		12/1/98	n/a
691	pH	Cl2 pH - Initial	7.4	Unit	SM 4500-H+ B	1	n/a	11/30/98		11/30/98	n/a
692	pH	pH	7.9	Unit	SM 4500-H+ B	1	n/a	11/26/98		11/26/98	n/a
693	TEMP	Cl2 Temperature	8.0	°C	SM 2550 B	1	n/a	11/30/98		12/1/98	n/a
694	TEMP	Temperature	22.3	°C	SM 2550 B	1	n/a	11/26/98		11/26/98	n/a
695	TIME	Cl2 Incubation Time	24.1	hrs	n/a	1	n/a	11/30/98		12/1/98	n/a
696	TOC-ICR	TOC	1.03	mg/L	SM 5310 C	1	0.50	11/26/98		11/29/98	7-0-476
697	TOC-ICR	TOC (Dupl)	1.04	mg/L	SM 5310 C	1	0.50	11/26/98		11/29/98	7-0-476
			1.04	mg/L	1.0 % RPD						
698	TOX-ICR	TOX	42	µg Cl-/L	SM 5320 B	1	25	11/26/98		12/10/98	12-0-260
699	TOX-ICR	TOX (Dupl)	38	µg Cl-/L	SM 5320 B	1	25	11/26/98		12/10/98	12-0-260
			40	µg Cl-/L	10.0 % RPD						
700	THM-ICR	1,2,3-Trichloropropane (Surrogate)	100.8	%	EPA 551.1	1	1.0	12/1/98	12/9/98	12/9/98	0-284-0
701	THM-ICR	Bromodichloromethane	3.7	µg/L	EPA 551.1	1	1.0	12/1/98	12/9/98	12/9/98	0-284-0
702	THM-ICR	Bromoform	ND	µg/L	EPA 551.1	1	1.0	12/1/98	12/9/98	12/9/98	0-284-0
703	THM-ICR	Chloroform	3.0	µg/L	EPA 551.1	1	1.0	12/1/98	12/9/98	12/9/98	0-284-0
704	THM-ICR	Dibromochloromethane	3.2	µg/L	EPA 551.1	1	1.0	12/1/98	12/9/98	12/9/98	0-284-0
705	UV-ICR	UV	0.014	1/cm	SM 5910 B	1	0.009	11/26/98		11/27/98	8-0-377
706	UV-ICR	UV (Dupl)	0.014	1/cm	SM 5910 B	1	0.009	11/26/98		11/27/98	8-0-377
			0.014	1/cm	0.0 % RPD						

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

Sample ID: 185.20.Eff-17		S&H ID: 9811-518		Date Sampled: 11/27/98 7:55:00 PM						
#	Analysis Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
707	Cl2Dose Chlorine Dose	1.68	mg/L as Cl2	SM 4500-Cl B	1	n/a	11/30/98		11/30/98	n/a
708	Cl2Res Chlorine Residual	0.81	mg/L as Cl2	SM 4500-Cl F	1	0.10	11/30/98		12/1/98	n/a
709	HAA-ICR 1,2,3-Trichloropropane (IS) (Internal Standard)	101.2	%	EPA 552.2	1	1.0	12/1/98	12/10/98	12/11/98	0-286-0
710	HAA-ICR 2-Bromopropionic acid (Surrogate)	99.2	%	EPA 552.2	1	1.0	12/1/98	12/10/98	12/11/98	0-286-0
711	HAA-ICR Bromochloroacetic acid	2.2	µg/L	EPA 552.2	1	1.0	12/1/98	12/10/98	12/11/98	0-286-0
712	HAA-ICR Bromodichloroacetic acid	2.0	µg/L	EPA 552.2	1	1.0	12/1/98	12/10/98	12/11/98	0-286-0
713	HAA-ICR Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	12/1/98	12/10/98	12/11/98	0-286-0
714	HAA-ICR Dibromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	12/1/98	12/10/98	12/11/98	0-286-0
715	HAA-ICR Dichloroacetic acid	2.4	µg/L	EPA 552.2	1	1.0	12/1/98	12/10/98	12/11/98	0-286-0
716	HAA-ICR Monobromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	12/1/98	12/10/98	12/11/98	0-286-0
717	HAA-ICR Monochloroacetic acid	ND	µg/L	EPA 552.2	1	2.0	12/1/98	12/10/98	12/11/98	0-286-0
718	HAA-ICR Tribromoacetic acid	ND	µg/L	EPA 552.2	1	4.0	12/1/98	12/10/98	12/11/98	0-286-0
719	HAA-ICR Trichloroacetic acid	2.4	µg/L	EPA 552.2	1	1.0	12/1/98	12/10/98	12/11/98	0-286-0
720	pH Cl2 pH - Final	7.4	Unit	SM 4500-H+ B	1	n/a	11/30/98		12/1/98	n/a
721	pH Cl2 pH - Initial	7.4	Unit	SM 4500-H+ B	1	n/a	11/30/98		11/30/98	n/a
722	pH pH	7.9	Unit	SM 4500-H+ B	1	n/a	11/27/98		11/27/98	n/a
723	TEMP Cl2 Temperature	8.0	°C	SM 2550 B	1	n/a	11/30/98		12/1/98	n/a
724	TEMP Temperature	23.3	°C	SM 2550 B	1	n/a	11/27/98		11/27/98	n/a
725	TIME Cl2 Incubation Time	24.1	hrs	n/a	1	n/a	11/30/98		12/1/98	n/a
726	TOC-ICR TOC	1.24	mg/L	SM 5310 C	1	0.50	11/27/98		11/28/98	7-0-475
727	TOC-ICR TOC (Dupl)	1.27	mg/L	SM 5310 C	1	0.50	11/27/98		11/28/98	7-0-475
		<b>1.25</b>	<b>mg/L</b>	<b>2.4 % RPD</b>						
728	TOX-ICR TOX	51	µg Cl-/L	SM 5320 B	1	25	11/27/98		12/9/98	12-0-259
729	TOX-ICR TOX (Dupl)	48	µg Cl-/L	SM 5320 B	1	25	11/27/98		12/9/98	12-0-259
		<b>50</b>	<b>µg Cl-/L</b>	<b>6.0 % RPD</b>						
730	THM-ICR 1,2,3-Trichloropropane (Surrogate)	96.8	%	EPA 551.1	1	1.0	12/1/98	12/9/98	12/9/98	0-284-0
731	THM-ICR Bromodichloromethane	5.0	µg/L	EPA 551.1	1	1.0	12/1/98	12/9/98	12/9/98	0-284-0
732	THM-ICR Bromoform	ND	µg/L	EPA 551.1	1	1.0	12/1/98	12/9/98	12/9/98	0-284-0
733	THM-ICR Chloroform	3.6	µg/L	EPA 551.1	1	1.0	12/1/98	12/9/98	12/9/98	0-284-0
734	THM-ICR Dibromochloromethane	3.6	µg/L	EPA 551.1	1	1.0	12/1/98	12/9/98	12/9/98	0-284-0
735	UV-ICR UV	0.016	1/cm	SM 5910 B	1	0.009	11/27/98		11/28/98	8-0-379
736	UV-ICR UV (Dupl)	0.016	1/cm	SM 5910 B	1	0.009	11/27/98		11/28/98	8-0-379
		<b>0.016</b>	<b>1/cm</b>	<b>0.0 % RPD</b>						

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

Sample ID: 185.20.Eff-24			S&H ID: 9811-525		Date Sampled: 11/29/98 7:48:00 PM						
#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
737	Cl2Dose	Chlorine Dose	1.74	mg/L as Cl2	SM 4500-Cl B	1	n/a	11/30/98		11/30/98	n/a
738	Cl2Res	Chlorine Residual	0.83	mg/L as Cl2	SM 4500-Cl F	1	0.10	11/30/98		12/1/98	n/a
739	HAA-ICR	1,2,3-Trichloropropane (IS) (Internal Standard)	96.4	%	EPA 552.2	1	1.0	12/1/98	12/10/98	12/11/98	0-286-0
740	HAA-ICR	2-Bromopropionic acid (Surrogate)	98.0	%	EPA 552.2	1	1.0	12/1/98	12/10/98	12/11/98	0-286-0
741	HAA-ICR	Bromochloroacetic acid	2.7	µg/L	EPA 552.2	1	1.0	12/1/98	12/10/98	12/11/98	0-286-0
742	HAA-ICR	Bromodichloroacetic acid	2.8	µg/L	EPA 552.2	1	1.0	12/1/98	12/10/98	12/11/98	0-286-0
743	HAA-ICR	Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	12/1/98	12/10/98	12/11/98	0-286-0
744	HAA-ICR	Dibromoacetic acid	1.1	µg/L	EPA 552.2	1	1.0	12/1/98	12/10/98	12/11/98	0-286-0
745	HAA-ICR	Dichloroacetic acid	3.4	µg/L	EPA 552.2	1	1.0	12/1/98	12/10/98	12/11/98	0-286-0
746	HAA-ICR	Monobromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	12/1/98	12/10/98	12/11/98	0-286-0
747	HAA-ICR	Monochloroacetic acid	ND	µg/L	EPA 552.2	1	2.0	12/1/98	12/10/98	12/11/98	0-286-0
748	HAA-ICR	Tribromoacetic acid	ND	µg/L	EPA 552.2	1	4.0	12/1/98	12/10/98	12/11/98	0-286-0
749	HAA-ICR	Trichloroacetic acid	3.9	µg/L	EPA 552.2	1	1.0	12/1/98	12/10/98	12/11/98	0-286-0
750	pH	Cl2 pH - Final	7.4	Unit	SM 4500-H+ B	1	n/a	11/30/98		12/1/98	n/a
751	pH	Cl2 pH - Initial	7.3	Unit	SM 4500-H+ B	1	n/a	11/30/98		11/30/98	n/a
752	pH	pH	7.8	Unit	SM 4500-H+ B	1	n/a	11/29/98		11/29/98	n/a
753	TEMP	Cl2 Temperature	8.0	°C	SM 2550 B	1	n/a	11/30/98		12/1/98	n/a
754	TEMP	Temperature	22.6	°C	SM 2550 B	1	n/a	11/29/98		11/29/98	n/a
755	TIME	Cl2 Incubation Time	24.1	hrs	n/a	1	n/a	11/30/98		12/1/98	n/a
756	TOC-ICR	TOC	1.42	mg/L	SM 5310 C	1	0.50	11/29/98		11/30/98	7-0-477
757	TOC-ICR	TOC (Dupl)	1.48	mg/L	SM 5310 C	1	0.50	11/29/98		11/30/98	7-0-477
			1.45	mg/L	4.1 % RPD						
758	TOX-ICR	TOX	59	µg Cl-/L	SM 5320 B	1	25	11/29/98		12/9/98	12-0-259
759	TOX-ICR	TOX (Dupl)	61	µg Cl-/L	SM 5320 B	1	25	11/29/98		12/9/98	12-0-259
			60	µg Cl-/L	3.3 % RPD						
760	THM-ICR	1,2,3-Trichloropropane (Surrogate)	98.8	%	EPA 551.1	1	1.0	12/1/98	12/9/98	12/9/98	0-284-0
761	THM-ICR	Bromodichloromethane	6.1	µg/L	EPA 551.1	1	1.0	12/1/98	12/9/98	12/9/98	0-284-0
762	THM-ICR	Bromoform	ND	µg/L	EPA 551.1	1	1.0	12/1/98	12/9/98	12/9/98	0-284-0
763	THM-ICR	Chloroform	4.8	µg/L	EPA 551.1	1	1.0	12/1/98	12/9/98	12/9/98	0-284-0
764	THM-ICR	Dibromochloromethane	3.7	µg/L	EPA 551.1	1	1.0	12/1/98	12/9/98	12/9/98	0-284-0
765	UV-ICR	UV	0.020	1/cm	SM 5910 B	1	0.009	11/29/98		11/30/98	8-0-381
766	UV-ICR	UV (Dupl)	0.020	1/cm	SM 5910 B	1	0.009	11/29/98		11/30/98	8-0-381
			0.020	1/cm	0.0 % RPD						

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

Sample ID: 185.20.Eff-28			S&H ID: 9811-529		Date Sampled: 12/2/98 2:26:00 AM						
#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
767	Cl2Dose	Chlorine Dose	1.70	mg/L as Cl2	SM 4500-Cl B	1	n/a	12/3/98		12/3/98	n/a
768	Cl2Res	Chlorine Residual	0.86	mg/L as Cl2	SM 4500-Cl F	1	0.10	12/3/98		12/4/98	n/a
769	HAA-ICR	1,2,3-Trichloropropane (IS) (Internal Standard)	106.4	%	EPA 552.2	1	1.0	12/4/98	12/10/98	12/11/98	0-286-0
770	HAA-ICR	2-Bromopropionic acid (Surrogate)	100.8	%	EPA 552.2	1	1.0	12/4/98	12/10/98	12/11/98	0-286-0
771	HAA-ICR	Bromochloroacetic acid	2.9	µg/L	EPA 552.2	1	1.0	12/4/98	12/10/98	12/11/98	0-286-0
772	HAA-ICR	Bromodichloroacetic acid	3.3	µg/L	EPA 552.2	1	1.0	12/4/98	12/10/98	12/11/98	0-286-0
773	HAA-ICR	Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	12/4/98	12/10/98	12/11/98	0-286-0
774	HAA-ICR	Dibromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	12/4/98	12/10/98	12/11/98	0-286-0
775	HAA-ICR	Dichloroacetic acid	4.2	µg/L	EPA 552.2	1	1.0	12/4/98	12/10/98	12/11/98	0-286-0
776	HAA-ICR	Monobromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	12/4/98	12/10/98	12/11/98	0-286-0
777	HAA-ICR	Monochloroacetic acid	ND	µg/L	EPA 552.2	1	2.0	12/4/98	12/10/98	12/11/98	0-286-0
778	HAA-ICR	Tribromoacetic acid	ND	µg/L	EPA 552.2	1	4.0	12/4/98	12/10/98	12/11/98	0-286-0
779	HAA-ICR	Trichloroacetic acid	5.0	µg/L	EPA 552.2	1	1.0	12/4/98	12/10/98	12/11/98	0-286-0
780	pH	Cl2 pH - Final	7.4	Unit	SM 4500-H+ B	1	n/a	12/3/98		12/4/98	n/a
781	pH	Cl2 pH - Initial	7.3	Unit	SM 4500-H+ B	1	n/a	12/3/98		12/3/98	n/a
782	pH	pH	7.8	Unit	SM 4500-H+ B	1	n/a	12/2/98		12/2/98	n/a
783	TEMP	Cl2 Temperature	7.5	°C	SM 2550 B	1	n/a	12/3/98		12/4/98	n/a
784	TEMP	Temperature	21.6	°C	SM 2550 B	1	n/a	12/2/98		12/2/98	n/a
785	TIME	Cl2 Incubation Time	24.1	hrs	n/a	1	n/a	12/3/98		12/4/98	n/a
786	TOC-ICR	TOC	1.64	mg/L	SM 5310 C	1	0.50	12/2/98		12/2/98	7-0-479
787	TOC-ICR	TOC (Dupl)	1.64	mg/L	SM 5310 C	1	0.50	12/2/98		12/2/98	7-0-479
			1.64	mg/L	0.0 % RPD						
788	TOX-ICR	TOX	74	µg Cl-/L	SM 5320 B	1	25	12/4/98		12/14/98	12-0-262
789	TOX-ICR	TOX (Dupl)	75	µg Cl-/L	SM 5320 B	1	25	12/4/98		12/14/98	12-0-262
			75	µg Cl-/L	1.3 % RPD						
790	THM-ICR	1,2,3-Trichloropropane (Surrogate)	106.8	%	EPA 551.1	1	1.0	12/4/98	12/9/98	12/10/98	0-284-0
791	THM-ICR	Bromodichloromethane	7.6	µg/L	EPA 551.1	1	1.0	12/4/98	12/9/98	12/10/98	0-284-0
792	THM-ICR	Bromoform	ND	µg/L	EPA 551.1	1	1.0	12/4/98	12/9/98	12/10/98	0-284-0
793	THM-ICR	Chloroform	7.2	µg/L	EPA 551.1	1	1.0	12/4/98	12/9/98	12/10/98	0-284-0
794	THM-ICR	Dibromochloromethane	3.7	µg/L	EPA 551.1	1	1.0	12/4/98	12/9/98	12/10/98	0-284-0
795	UV-ICR	UV	0.024	1/cm	SM 5910 B	1	0.009	12/2/98		12/2/98	8-0-383
796	UV-ICR	UV (Dupl)	0.024	1/cm	SM 5910 B	1	0.009	12/2/98		12/2/98	8-0-383
			0.024	1/cm	0.0 % RPD						

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

Sample ID: 185.20.Eff-30			S&H ID: 9811-531		Date Sampled: 12/4/98 9:03:00 AM						
#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
797	Cl2Dose	Chlorine Dose	1.70	mg/L as Cl2	SM 4500-Cl B	1	n/a	12/7/98		12/7/98	n/a
798	Cl2Res	Chlorine Residual	0.68	mg/L as Cl2	SM 4500-Cl F	1	0.10	12/7/98		12/8/98	n/a
799	HAA-ICR	1,2,3-Trichloropropane (IS) (Internal Standard)	102.4	%	EPA 552.2	1	1.0	12/8/98	12/14/98	12/14/98	0-289-0
800	HAA-ICR	2-Bromopropionic acid (Surrogate)	100.0	%	EPA 552.2	1	1.0	12/8/98	12/14/98	12/14/98	0-289-0
801	HAA-ICR	Bromochloroacetic acid	3.2	µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/14/98	0-289-0
802	HAA-ICR	Bromodichloroacetic acid	3.4	µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/14/98	0-289-0
803	HAA-ICR	Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	12/8/98	12/14/98	12/14/98	0-289-0
804	HAA-ICR	Dibromoacetic acid	1.0	µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/14/98	0-289-0
805	HAA-ICR	Dichloroacetic acid	4.9	µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/14/98	0-289-0
806	HAA-ICR	Monobromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/14/98	0-289-0
807	HAA-ICR	Monochloroacetic acid	ND	µg/L	EPA 552.2	1	2.0	12/8/98	12/14/98	12/14/98	0-289-0
808	HAA-ICR	Tribromoacetic acid	ND	µg/L	EPA 552.2	1	4.0	12/8/98	12/14/98	12/14/98	0-289-0
809	HAA-ICR	Trichloroacetic acid	5.2	µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/14/98	0-289-0
810	pH	Cl2 pH - Final	7.4	Unit	SM 4500-H+ B	1	n/a	12/7/98		12/8/98	n/a
811	pH	Cl2 pH - Initial	7.3	Unit	SM 4500-H+ B	1	n/a	12/7/98		12/7/98	n/a
812	pH	pH	7.7	Unit	SM 4500-H+ B	1	n/a	12/4/98		12/4/98	n/a
813	TEMP	Cl2 Temperature	7.4	°C	SM 2550 B	1	n/a	12/7/98		12/8/98	n/a
814	TEMP	Temperature	23.1	°C	SM 2550 B	1	n/a	12/4/98		12/4/98	n/a
815	TIME	Cl2 Incubation Time	23.8	hrs	n/a	1	n/a	12/7/98		12/8/98	n/a
816	TOC-ICR	TOC	1.95	mg/L	SM 5310 C	1	0.50	12/4/98		12/4/98	7-0-481
817	TOC-ICR	TOC (Dupl)	1.91	mg/L	SM 5310 C	1	0.50	12/4/98		12/4/98	7-0-481
			1.93	mg/L	2.1 % RPD						
818	TOX-ICR	TOX	88	µg Cl-/L	SM 5320 B	1	25	12/8/98		12/16/98	12-0-264
819	TOX-ICR	TOX (Dupl)	89	µg Cl-/L	SM 5320 B	1	25	12/8/98		12/16/98	12-0-264
			89	µg Cl-/L	1.1 % RPD						
820	THM-ICR	1,2,3-Trichloropropane (Surrogate)	103.2	%	EPA 551.1	1	1.0	12/8/98	12/11/98	12/11/98	0-288-0
821	THM-ICR	Bromodichloromethane	7.4	µg/L	EPA 551.1	1	1.0	12/8/98	12/11/98	12/11/98	0-288-0
822	THM-ICR	Bromoform	ND	µg/L	EPA 551.1	1	1.0	12/8/98	12/11/98	12/11/98	0-288-0
823	THM-ICR	Chloroform	7.0	µg/L	EPA 551.1	1	1.0	12/8/98	12/11/98	12/11/98	0-288-0
824	THM-ICR	Dibromochloromethane	3.6	µg/L	EPA 551.1	1	1.0	12/8/98	12/11/98	12/11/98	0-288-0
825	UV-ICR	UV	0.030	1/cm	SM 5910 B	1	0.009	12/4/98		12/4/98	8-0-386
826	UV-ICR	UV (Dupl)	0.030	1/cm	SM 5910 B	1	0.009	12/4/98		12/4/98	8-0-386
			0.030	1/cm	0.0 % RPD						

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

Sample ID: 185.20.Eff-8d		S&H ID: 9811-533		Date Sampled: 11/25/98 1:22:00 AM						
#	Analysis Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
827	Cl2Dose Chlorine Dose	1.73	mg/L as Cl2	SM 4500-Cl B	1	n/a	11/27/98		11/27/98	n/a
828	Cl2Res Chlorine Residual	1.05	mg/L as Cl2	SM 4500-Cl F	1	0.10	11/27/98		11/28/98	n/a
829	HAA-ICR 1,2,3-Trichloropropane (IS) (Internal Standard)	113.6	%	EPA 552.2	1	1.0	11/25/98	12/7/98	12/9/98	0-280-0
830	HAA-ICR 2-Bromopropionic acid (Surrogate)	95.2	%	EPA 552.2	1	1.0	11/25/98	12/7/98	12/9/98	0-280-0
831	HAA-ICR Bromochloroacetic acid	ND	µg/L	EPA 552.2	1	1.0	11/25/98	12/7/98	12/9/98	0-280-0
832	HAA-ICR Bromodichloroacetic acid	ND	µg/L	EPA 552.2	1	1.0	11/25/98	12/7/98	12/9/98	0-280-0
833	HAA-ICR Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	11/25/98	12/7/98	12/9/98	0-280-0
834	HAA-ICR Dibromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	11/25/98	12/7/98	12/9/98	0-280-0
835	HAA-ICR Dichloroacetic acid	ND	µg/L	EPA 552.2	1	1.0	11/25/98	12/7/98	12/9/98	0-280-0
836	HAA-ICR Monobromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	11/25/98	12/7/98	12/9/98	0-280-0
837	HAA-ICR Monochloroacetic acid	ND	µg/L	EPA 552.2	1	2.0	11/25/98	12/7/98	12/9/98	0-280-0
838	HAA-ICR Tribromoacetic acid	ND	µg/L	EPA 552.2	1	4.0	11/25/98	12/7/98	12/9/98	0-280-0
839	HAA-ICR Trichloroacetic acid	ND	µg/L	EPA 552.2	1	1.0	11/25/98	12/7/98	12/9/98	0-280-0
840	pH Cl2 pH - Final	7.5	Unit	SM 4500-H+ B	1	n/a	11/27/98		11/28/98	n/a
841	pH Cl2 pH - Initial	7.3	Unit	SM 4500-H+ B	1	n/a	11/27/98		11/27/98	n/a
842	pH pH	7.8	Unit	SM 4500-H+ B	1	n/a	11/25/98		11/25/98	n/a
843	TEMP Cl2 Temperature	7.2	°C	SM 2550 B	1	n/a	11/27/98		11/28/98	n/a
844	TEMP Temperature	22.5	°C	SM 2550 B	1	n/a	11/25/98		11/25/98	n/a
845	TIME Cl2 Incubation Time	24.2	hrs	n/a	1	n/a	11/27/98		11/28/98	n/a
846	TOC-ICR TOC	ND	mg/L	SM 5310 C	1	0.50	11/25/98		11/25/98	7-0-473
847	TOC-ICR TOC (Dupl)	0.51	mg/L	SM 5310 C	1	0.50	11/25/98		11/25/98	7-0-473
		ND	mg/L							
848	TOX-ICR TOX	ND	µg Cl-/L	SM 5320 B	1	25	11/25/98		12/7/98	12-0-257
849	TOX-ICR TOX (Dupl)	ND	µg Cl-/L	SM 5320 B	1	25	11/25/98		12/7/98	12-0-257
		ND	µg Cl-/L							
850	THM-ICR 1,2,3-Trichloropropane (Surrogate)	92.8	%	EPA 551.1	1	1.0	11/25/98	12/4/98	12/4/98	0-279-0
851	THM-ICR Bromodichloromethane	1.0	µg/L	EPA 551.1	1	1.0	11/25/98	12/4/98	12/4/98	0-279-0
852	THM-ICR Bromoform	ND	µg/L	EPA 551.1	1	1.0	11/25/98	12/4/98	12/4/98	0-279-0
853	THM-ICR Chloroform	ND	µg/L	EPA 551.1	1	1.0	11/25/98	12/4/98	12/4/98	0-279-0
854	THM-ICR Dibromochloromethane	1.2	µg/L	EPA 551.1	1	1.0	11/25/98	12/4/98	12/4/98	0-279-0
855	UV-ICR UV	ND	1/cm	SM 5910 B	1	0.009	11/25/98		11/25/98	8-0-373
856	UV-ICR UV (Dupl)	ND	1/cm	SM 5910 B	1	0.009	11/25/98		11/25/98	8-0-373
		ND	1/cm							

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

Sample ID: 185.20.Eff-13d			S&H ID: 9811-534		Date Sampled: 11/26/98 8:13:00 PM				
#	Analysis Type	Result Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
857	Cl2Dose Chlorine Dose	1.62 mg/L as Cl2	SM 4500-Cl B	1	n/a	11/30/98		11/30/98	n/a
858	Cl2Res Chlorine Residual	0.77 mg/L as Cl2	SM 4500-Cl F	1	0.10	11/30/98		12/1/98	n/a
859	HAA-ICR 1,2,3-Trichloropropane (IS) (Internal Standard)	100.8 %	EPA 552.2	1	1.0	12/1/98	12/10/98	12/11/98	0-286-0
860	HAA-ICR 2-Bromopropionic acid (Surrogate)	98.0 %	EPA 552.2	1	1.0	12/1/98	12/10/98	12/11/98	0-286-0
861	HAA-ICR Bromochloroacetic acid	2.0 µg/L	EPA 552.2	1	1.0	12/1/98	12/10/98	12/11/98	0-286-0
862	HAA-ICR Bromodichloroacetic acid	1.9 µg/L	EPA 552.2	1	1.0	12/1/98	12/10/98	12/11/98	0-286-0
863	HAA-ICR Chlorodibromoacetic acid	ND µg/L	EPA 552.2	1	2.0	12/1/98	12/10/98	12/11/98	0-286-0
864	HAA-ICR Dibromoacetic acid	ND µg/L	EPA 552.2	1	1.0	12/1/98	12/10/98	12/11/98	0-286-0
865	HAA-ICR Dichloroacetic acid	2.0 µg/L	EPA 552.2	1	1.0	12/1/98	12/10/98	12/11/98	0-286-0
866	HAA-ICR Monobromoacetic acid	ND µg/L	EPA 552.2	1	1.0	12/1/98	12/10/98	12/11/98	0-286-0
867	HAA-ICR Monochloroacetic acid	ND µg/L	EPA 552.2	1	2.0	12/1/98	12/10/98	12/11/98	0-286-0
868	HAA-ICR Tribromoacetic acid	ND µg/L	EPA 552.2	1	4.0	12/1/98	12/10/98	12/11/98	0-286-0
869	HAA-ICR Trichloroacetic acid	1.7 µg/L	EPA 552.2	1	1.0	12/1/98	12/10/98	12/11/98	0-286-0
870	pH Cl2 pH - Final	7.4 Unit	SM 4500-H+ B	1	n/a	11/30/98		12/1/98	n/a
871	pH Cl2 pH - Initial	7.4 Unit	SM 4500-H+ B	1	n/a	11/30/98		11/30/98	n/a
872	pH pH	7.9 Unit	SM 4500-H+ B	1	n/a	11/26/98		11/26/98	n/a
873	TEMP Cl2 Temperature	8.0 °C	SM 2550 B	1	n/a	11/30/98		12/1/98	n/a
874	TEMP Temperature	22.3 °C	SM 2550 B	1	n/a	11/26/98		11/26/98	n/a
875	TIME Cl2 Incubation Time	24.2 hrs	n/a	1	n/a	11/30/98		12/1/98	n/a
876	TOC-ICR TOC	1.04 mg/L	SM 5310 C	1	0.50	11/26/98		11/29/98	7-0-476
877	TOC-ICR TOC (Dupl)	1.07 mg/L	SM 5310 C	1	0.50	11/26/98		11/29/98	7-0-476
		<b>1.06 mg/L</b>	<b>2.8 % RPD</b>						
878	TOX-ICR TOX	38 µg Cl-/L	SM 5320 B	1	25	11/26/98		12/9/98	12-0-259
879	TOX-ICR TOX (Dupl)	40 µg Cl-/L	SM 5320 B	1	25	11/26/98		12/9/98	12-0-259
		<b>39 µg Cl-/L</b>	<b>5.1 % RPD</b>						
880	THM-ICR 1,2,3-Trichloropropane (Surrogate)	97.6 %	EPA 551.1	1	1.0	12/1/98	12/9/98	12/9/98	0-284-0
881	THM-ICR Bromodichloromethane	3.8 µg/L	EPA 551.1	1	1.0	12/1/98	12/9/98	12/9/98	0-284-0
882	THM-ICR Bromoform	ND µg/L	EPA 551.1	1	1.0	12/1/98	12/9/98	12/9/98	0-284-0
883	THM-ICR Chloroform	2.5 µg/L	EPA 551.1	1	1.0	12/1/98	12/9/98	12/9/98	0-284-0
884	THM-ICR Dibromochloromethane	3.3 µg/L	EPA 551.1	1	1.0	12/1/98	12/9/98	12/9/98	0-284-0
885	UV-ICR UV	0.013 1/cm	SM 5910 B	1	0.009	11/26/98		11/27/98	8-0-377
886	UV-ICR UV (Dupl)	0.013 1/cm	SM 5910 B	1	0.009	11/26/98		11/27/98	8-0-377
		<b>0.013 1/cm</b>	<b>0.0 % RPD</b>						

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.



**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

Sample ID: 185.20.Eff-28d		S&H ID: 9811-539		Date Sampled: 12/2/98 2:26:00 AM						
#	Analysis Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
887	Cl2Dose Chlorine Dose	1.70	mg/L as Cl2	SM 4500-Cl B	1	n/a	12/3/98		12/3/98	n/a
888	Cl2Res Chlorine Residual	0.87	mg/L as Cl2	SM 4500-Cl F	1	0.10	12/3/98		12/4/98	n/a
889	HAA-ICR 1,2,3-Trichloropropane (IS) (Internal Standard)	106.0	%	EPA 552.2	1	1.0	12/4/98	12/10/98	12/11/98	0-286-0
890	HAA-ICR 2-Bromopropionic acid (Surrogate)	98.0	%	EPA 552.2	1	1.0	12/4/98	12/10/98	12/11/98	0-286-0
891	HAA-ICR Bromochloroacetic acid	2.8	µg/L	EPA 552.2	1	1.0	12/4/98	12/10/98	12/11/98	0-286-0
892	HAA-ICR Bromodichloroacetic acid	3.3	µg/L	EPA 552.2	1	1.0	12/4/98	12/10/98	12/11/98	0-286-0
893	HAA-ICR Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	12/4/98	12/10/98	12/11/98	0-286-0
894	HAA-ICR Dibromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	12/4/98	12/10/98	12/11/98	0-286-0
895	HAA-ICR Dichloroacetic acid	3.9	µg/L	EPA 552.2	1	1.0	12/4/98	12/10/98	12/11/98	0-286-0
896	HAA-ICR Monobromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	12/4/98	12/10/98	12/11/98	0-286-0
897	HAA-ICR Monochloroacetic acid	ND	µg/L	EPA 552.2	1	2.0	12/4/98	12/10/98	12/11/98	0-286-0
898	HAA-ICR Tribromoacetic acid	ND	µg/L	EPA 552.2	1	4.0	12/4/98	12/10/98	12/11/98	0-286-0
899	HAA-ICR Trichloroacetic acid	4.7	µg/L	EPA 552.2	1	1.0	12/4/98	12/10/98	12/11/98	0-286-0
900	pH Cl2 pH - Final	7.4	Unit	SM 4500-H+ B	1	n/a	12/3/98		12/4/98	n/a
901	pH Cl2 pH - Initial	7.3	Unit	SM 4500-H+ B	1	n/a	12/3/98		12/3/98	n/a
902	pH pH	7.8	Unit	SM 4500-H+ B	1	n/a	12/2/98		12/2/98	n/a
903	TEMP Cl2 Temperature	7.5	°C	SM 2550 B	1	n/a	12/3/98		12/4/98	n/a
904	TEMP Temperature	21.6	°C	SM 2550 B	1	n/a	12/2/98		12/2/98	n/a
905	TIME Cl2 Incubation Time	24.2	hrs	n/a	1	n/a	12/3/98		12/4/98	n/a
906	TOC-ICR TOC	1.63	mg/L	SM 5310 C	1	0.50	12/2/98		12/2/98	7-0-479
907	TOC-ICR TOC (Dupl)	1.63	mg/L	SM 5310 C	1	0.50	12/2/98		12/2/98	7-0-479
		<b>1.63</b>	<b>mg/L</b>	<b>0.0 % RPD</b>						
908	TOX-ICR TOX	72	µg Cl-/L	SM 5320 B	1	25	12/4/98		12/11/98	12-0-261
909	TOX-ICR TOX (Dupl)	74	µg Cl-/L	SM 5320 B	1	25	12/4/98		12/11/98	12-0-261
		<b>73</b>	<b>µg Cl-/L</b>	<b>2.7 % RPD</b>						
910	THM-ICR 1,2,3-Trichloropropane (Surrogate)	100.0	%	EPA 551.1	1	1.0	12/4/98	12/9/98	12/10/98	0-284-0
911	THM-ICR Bromodichloromethane	7.5	µg/L	EPA 551.1	1	1.0	12/4/98	12/9/98	12/10/98	0-284-0
912	THM-ICR Bromoform	ND	µg/L	EPA 551.1	1	1.0	12/4/98	12/9/98	12/10/98	0-284-0
913	THM-ICR Chloroform	7.2	µg/L	EPA 551.1	1	1.0	12/4/98	12/9/98	12/10/98	0-284-0
914	THM-ICR Dibromochloromethane	3.5	µg/L	EPA 551.1	1	1.0	12/4/98	12/9/98	12/10/98	0-284-0
915	UV-ICR UV	0.024	1/cm	SM 5910 B	1	0.009	12/2/98		12/2/98	8-0-383
916	UV-ICR UV (Dupl)	0.024	1/cm	SM 5910 B	1	0.009	12/2/98		12/2/98	8-0-383
		<b>0.024</b>	<b>1/cm</b>	<b>0.0 % RPD</b>						

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

Sample ID: 185.Inf.A-1			S&H ID: 9811-542		Date Sampled: 11/20/98 2:40:00 PM						
#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
917	ALK	Alkalinity	150	mg/L	SM 2320 B	1	5	11/20/98		11/21/98	1-0-38
918	ALK	Alkalinity (Dupl)	151	mg/L	SM 2320 B	1	5	11/20/98		11/21/98	1-0-38
			151	mg/L	0.7 % RPD						
919	NH3	Ammonia Nitrogen	0.06	mg/L	EPA 350.1	1	0.05	11/20/98		12/2/98	MW88171
920	BR	Bromide	0.034	mg/L	EPA 300.0 A	1	0.020	11/20/98		11/30/98	MW88138
921	CaHardM	Calcium Hardness	130	mg/L CaCO3	EPA 200.7	1	5	11/20/98		12/2/98	MW n/a
922	CaMW	Calcium, Total, ICAP	52	mg/L	EPA 200.7	1	1	11/20/98	12/2/98	12/2/98	MW88148
923	MgMW	Magnesium, Total, ICAP	21	mg/L	EPA 200.7	1	0	11/20/98	12/2/98	12/2/98	MW88153
924	TotHard	Total Hardness as CaCO3 by ICP	216	mg/L CaCO3	SM 2340B	1	7	11/20/98		12/2/98	MW n/a

Sample ID: 185.Inf.A-2			S&H ID: 9811-543		Date Sampled: 11/28/98 4:30:00 PM						
#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
925	ALK	Alkalinity	128	mg/L	SM 2320 B	1	5	11/28/98		11/29/98	1-0-38
926	ALK	Alkalinity (Dupl)	125	mg/L	SM 2320 B	1	5	11/28/98		11/29/98	1-0-38
			127	mg/L	2.4 % RPD						
927	NH3	Ammonia Nitrogen	ND	mg/L	EPA 350.1	1	0.05	11/28/98		12/9/98	MW88718
928	BR	Bromide	0.033	mg/L	EPA 300.0 A	1	0.020	11/28/98		12/3/98	MW88404
929	CaHardM	Calcium Hardness	136	mg/L CaCO3	EPA 200.7	1	5	11/28/98		12/7/98	MW n/a
930	CaMW	Calcium, Total, ICAP	54	mg/L	EPA 200.7	1	1	11/28/98	12/7/98	12/7/98	MW88377
931	MgMW	Magnesium, Total, ICAP	22	mg/L	EPA 200.7	1	0	11/28/98	12/7/98	12/7/98	MW88380
932	TotHard	Total Hardness as CaCO3 by ICP	226	mg/L CaCO3	SM 2340B	1	7	11/28/98		12/7/98	MW n/a

Sample ID: 185.Inf.B-1			S&H ID: 9811-544		Date Sampled: 11/20/98 2:35:00 PM						
#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
933	Cl2Dose	Chlorine Dose	3.40	mg/L as Cl2	SM 4500-Cl B	1	n/a	11/25/98		11/25/98	n/a
934	Cl2Res	Chlorine Residual	1.09	mg/L as Cl2	SM 4500-Cl F	1	0.10	11/25/98		11/26/98	n/a
935	HAA-ICR	1,2,3-Trichloropropane (IS) (Internal Standard)	113.6	%	EPA 552.2	1	1.0	11/20/98	12/7/98	12/8/98	0-280-0
936	HAA-ICR	2-Bromopropionic acid (Surrogate)	95.2	%	EPA 552.2	1	1.0	11/20/98	12/7/98	12/8/98	0-280-0
937	HAA-ICR	Bromochloroacetic acid	3.6	µg/L	EPA 552.2	1	1.0	11/20/98	12/7/98	12/8/98	0-280-0
938	HAA-ICR	Bromodichloroacetic acid	7.9	µg/L	EPA 552.2	1	1.0	11/20/98	12/7/98	12/8/98	0-280-0
939	HAA-ICR	Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	11/20/98	12/7/98	12/8/98	0-280-0
940	HAA-ICR	Dibromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	11/20/98	12/7/98	12/8/98	0-280-0
941	HAA-ICR	Dichloroacetic acid	14.2	µg/L	EPA 552.2	1	1.0	11/20/98	12/7/98	12/8/98	0-280-0

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

942	HAA-ICR	Monobromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	11/20/98	12/7/98	12/8/98	0-280-0
943	HAA-ICR	Monochloroacetic acid	ND	µg/L	EPA 552.2	1	2.0	11/20/98	12/7/98	12/8/98	0-280-0
944	HAA-ICR	Tribromoacetic acid	ND	µg/L	EPA 552.2	1	4.0	11/20/98	12/7/98	12/8/98	0-280-0
945	HAA-ICR	Trichloroacetic acid	26.0	µg/L	EPA 552.2	1	1.0	11/20/98	12/7/98	12/8/98	0-280-0
946	pH	Cl2 pH - Final	7.4	Unit	SM 4500-H+ B	1	n/a	11/25/98		11/26/98	n/a
947	pH	Cl2 pH - Initial	7.3	Unit	SM 4500-H+ B	1	n/a	11/25/98		11/25/98	n/a
948	pH	pH	7.2	Unit	SM 4500-H+ B	1	n/a	11/20/98		11/20/98	n/a
949	TEMP	Cl2 Temperature	7.7	°C	SM 2550 B	1	n/a	11/25/98		11/26/98	n/a
950	TEMP	Temperature	18.4	°C	SM 2550 B	1	n/a	11/20/98		11/20/98	n/a
951	TIME	Cl2 Incubation Time	24.5	hrs	n/a	1	n/a	11/25/98		11/26/98	n/a
952	TOC-ICR	TOC	2.90	mg/L	SM 5310 C	1	0.50	11/20/98		11/20/98	7-0-468
953	TOC-ICR	TOC (Dupl)	2.92	mg/L	SM 5310 C	1	0.50	11/20/98		11/20/98	7-0-468
			<b>2.91</b>	<b>mg/L</b>	<b>0.7 % RPD</b>						
954	TOX-ICR	TOX	216	µg Cl-/L	SM 5320 B	1	25	11/20/98		12/3/98	12-0-255
955	TOX-ICR	TOX (Dupl)	210	µg Cl-/L	SM 5320 B	1	25	11/20/98		12/3/98	12-0-255
			<b>213</b>	<b>µg Cl-/L</b>	<b>2.8 % RPD</b>						
956	THM-ICR	1,2,3-Trichloropropane (Surrogate)	100.0	%	EPA 551.1	1	1.0	11/20/98	12/4/98	12/4/98	0-279-0
957	THM-ICR	Bromodichloromethane	12.0	µg/L	EPA 551.1	1	1.0	11/20/98	12/4/98	12/4/98	0-279-0
958	THM-ICR	Bromoform	ND	µg/L	EPA 551.1	1	1.0	11/20/98	12/4/98	12/4/98	0-279-0
959	THM-ICR	Chloroform	28.7	µg/L	EPA 551.1	1	1.0	11/20/98	12/4/98	12/4/98	0-279-0
960	THM-ICR	Dibromochloromethane	2.0	µg/L	EPA 551.1	1	1.0	11/20/98	12/4/98	12/4/98	0-279-0
961	TURB	Turbidity	0.15	ntu	SM 2130 B	1	0.05	11/20/98		11/20/98	9-0-21
962	UV-ICR	UV	0.060	1/cm	SM 5910 B	1	0.009	11/20/98		11/21/98	8-0-367
963	UV-ICR	UV (Dupl)	0.060	1/cm	SM 5910 B	1	0.009	11/20/98		11/21/98	8-0-367
			<b>0.060</b>	<b>1/cm</b>	<b>0.0 % RPD</b>						

Sample ID: 185.Inf.B-2

S&amp;H ID: 9811-545

Date Sampled: 11/22/98 1:40:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
964	pH	pH	7.0	Unit	SM 4500-H+ B	1	n/a	11/22/98		11/22/98	n/a
965	TEMP	Temperature	18.0	°C	SM 2550 B	1	n/a	11/22/98		11/22/98	n/a
966	TOC-ICR	TOC	2.71	mg/L	SM 5310 C	1	0.50	11/22/98		11/22/98	7-0-470
967	TOC-ICR	TOC (Dupl)	2.73	mg/L	SM 5310 C	1	0.50	11/22/98		11/22/98	7-0-470
			<b>2.72</b>	<b>mg/L</b>	<b>0.7 % RPD</b>						

Sample ID: 185.Inf.B-3

S&amp;H ID: 9811-546

Date Sampled: 11/25/98 1:00:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
968	pH	pH	7.0	Unit	SM 4500-H+ B	1	n/a	11/25/98		11/25/98	n/a
969	TEMP	Temperature	18.2	°C	SM 2550 B	1	n/a	11/25/98		11/25/98	n/a

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

970	TOC-ICR	TOC	2.83	mg/L	SM 5310 C	1	0.50	11/25/98	11/27/98	7-0-474
971	TOC-ICR	TOC (Dupl)	2.77	mg/L	SM 5310 C	1	0.50	11/25/98	11/27/98	7-0-474
			<b>2.80</b>	<b>mg/L</b>	<b>2.1 % RPD</b>					
<hr/>										
Sample ID: 185.Inf.B-4			S&H ID: 9811-547		Date Sampled: 11/28/98 2:30:00 PM					
#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal. QC Batch
972	Cl2Dose	Chlorine Dose	3.00	mg/L as Cl2	SM 4500-Cl B	1	n/a	11/30/98		11/30/98 n/a
973	Cl2Res	Chlorine Residual	0.66	mg/L as Cl2	SM 4500-Cl F	1	0.10	11/30/98		12/1/98 n/a
974	HAA-ICR	1,2,3-Trichloropropane (IS) (Internal Standard)	100.8	%	EPA 552.2	1	1.0	12/1/98	12/10/98	12/11/98 0-286-0
975	HAA-ICR	2-Bromopropionic acid (Surrogate)	98.8	%	EPA 552.2	1	1.0	12/1/98	12/10/98	12/11/98 0-286-0
976	HAA-ICR	Bromochloroacetic acid	3.5	µg/L	EPA 552.2	1	1.0	12/1/98	12/10/98	12/11/98 0-286-0
977	HAA-ICR	Bromodichloroacetic acid	4.9	µg/L	EPA 552.2	1	1.0	12/1/98	12/10/98	12/11/98 0-286-0
978	HAA-ICR	Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	12/1/98	12/10/98	12/11/98 0-286-0
979	HAA-ICR	Dibromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	12/1/98	12/10/98	12/11/98 0-286-0
980	HAA-ICR	Dichloroacetic acid	13.0	µg/L	EPA 552.2	1	1.0	12/1/98	12/10/98	12/11/98 0-286-0
981	HAA-ICR	Monobromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	12/1/98	12/10/98	12/11/98 0-286-0
982	HAA-ICR	Monochloroacetic acid	ND	µg/L	EPA 552.2	1	2.0	12/1/98	12/10/98	12/11/98 0-286-0
983	HAA-ICR	Tribromoacetic acid	ND	µg/L	EPA 552.2	1	4.0	12/1/98	12/10/98	12/11/98 0-286-0
984	HAA-ICR	Trichloroacetic acid	19.6	µg/L	EPA 552.2	1	1.0	12/1/98	12/10/98	12/11/98 0-286-0
985	pH	Cl2 pH - Final	7.3	Unit	SM 4500-H+ B	1	n/a	11/30/98		12/1/98 n/a
986	pH	Cl2 pH - Initial	7.3	Unit	SM 4500-H+ B	1	n/a	11/30/98		11/30/98 n/a
987	pH	pH	7.0	Unit	SM 4500-H+ B	1	n/a	11/28/98		11/28/98 n/a
988	TEMP	Cl2 Temperature	8.0	°C	SM 2550 B	1	n/a	11/30/98		12/1/98 n/a
989	TEMP	Temperature	18.2	°C	SM 2550 B	1	n/a	11/28/98		11/28/98 n/a
990	TIME	Cl2 Incubation Time	24.1	hrs	n/a	1	n/a	11/30/98		12/1/98 n/a
991	TOC-ICR	TOC	2.74	mg/L	SM 5310 C	1	0.50	11/28/98		11/28/98 7-0-475
992	TOC-ICR	TOC (Dupl)	2.83	mg/L	SM 5310 C	1	0.50	11/28/98		11/28/98 7-0-475
			<b>2.79</b>	<b>mg/L</b>	<b>3.2 % RPD</b>					
993	TOX-ICR	TOX	205	µg Cl-/L	SM 5320 B	1	25	11/28/98		12/10/98 12-0-260
994	TOX-ICR	TOX (Dupl)	198	µg Cl-/L	SM 5320 B	1	25	11/28/98		12/10/98 12-0-260
			<b>202</b>	<b>µg Cl-/L</b>	<b>3.5 % RPD</b>					
995	THM-ICR	1,2,3-Trichloropropane (Surrogate)	98.0	%	EPA 551.1	1	1.0	12/1/98	12/9/98	12/9/98 0-284-0
996	THM-ICR	Bromodichloromethane	11.1	µg/L	EPA 551.1	1	1.0	12/1/98	12/9/98	12/9/98 0-284-0
997	THM-ICR	Bromoform	ND	µg/L	EPA 551.1	1	1.0	12/1/98	12/9/98	12/9/98 0-284-0
998	THM-ICR	Chloroform	25.0	µg/L	EPA 551.1	1	1.0	12/1/98	12/9/98	12/9/98 0-284-0
999	THM-ICR	Dibromochloromethane	2.0	µg/L	EPA 551.1	1	1.0	12/1/98	12/9/98	12/9/98 0-284-0
1000	TURB	Turbidity	0.25	ntu	SM 2130 B	1	0.05	11/28/98		11/28/98 9-0-21
1001	UV-ICR	UV	0.060	1/cm	SM 5910 B	1	0.009	11/28/98		11/28/98 8-0-379

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

1002	UV-ICR	UV (Dupl)	0.060 1/cm	SM 5910 B	1	0.009	11/28/98	11/28/98	8-0-379
			<b>0.060 1/cm</b>	<b>0.0 % RPD</b>					

Sample ID: 185.Inf.B-5 S&amp;H ID: 9811-548 Date Sampled: 12/3/98 10:20:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
1003	pH	pH	7.0	Unit	SM 4500-H+ B	1	n/a	12/3/98		12/3/98	n/a
1004	TEMP	Temperature	19.4	°C	SM 2550 B	1	n/a	12/3/98		12/3/98	n/a
1005	TOC-ICR	TOC	2.80	mg/L	SM 5310 C	1	0.50	12/3/98		12/3/98	7-0-480
1006	TOC-ICR	TOC (Dupl)	2.83	mg/L	SM 5310 C	1	0.50	12/3/98		12/3/98	7-0-480
			<b>2.81</b>	<b>mg/L</b>	<b>1.1 % RPD</b>						

Sample ID: 185.Inf.B-6 S&amp;H ID: 9811-549 Date Sampled: 12/8/98 8:45:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
1007	Cl2Dose	Chlorine Dose	3.10	mg/L as Cl2	SM 4500-Cl B	1	n/a	12/8/98		12/8/98	n/a
1008	Cl2Res	Chlorine Residual	0.92	mg/L as Cl2	SM 4500-Cl F	1	0.10	12/8/98		12/9/98	n/a
1009	HAA-ICR	1,2,3-Trichloropropane (IS) (Internal Standard)	96.4	%	EPA 552.2	1	1.0	12/9/98	12/21/98	12/21/98	0-291-0
1010	HAA-ICR	2-Bromopropionic acid (Surrogate)	100.0	%	EPA 552.2	1	1.0	12/9/98	12/21/98	12/21/98	0-291-0
1011	HAA-ICR	Bromochloroacetic acid	3.5	µg/L	EPA 552.2	1	1.0	12/9/98	12/21/98	12/21/98	0-291-0
1012	HAA-ICR	Bromodichloroacetic acid	4.9	µg/L	EPA 552.2	1	1.0	12/9/98	12/21/98	12/21/98	0-291-0
1013	HAA-ICR	Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	12/9/98	12/21/98	12/21/98	0-291-0
1014	HAA-ICR	Dibromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	12/9/98	12/21/98	12/21/98	0-291-0
1015	HAA-ICR	Dichloroacetic acid	13.6	µg/L	EPA 552.2	1	1.0	12/9/98	12/21/98	12/21/98	0-291-0
1016	HAA-ICR	Monobromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	12/9/98	12/21/98	12/21/98	0-291-0
1017	HAA-ICR	Monochloroacetic acid	ND	µg/L	EPA 552.2	1	2.0	12/9/98	12/21/98	12/21/98	0-291-0
1018	HAA-ICR	Tribromoacetic acid	ND	µg/L	EPA 552.2	1	4.0	12/9/98	12/21/98	12/21/98	0-291-0
1019	HAA-ICR	Trichloroacetic acid	19.3	µg/L	EPA 552.2	1	1.0	12/9/98	12/21/98	12/21/98	0-291-0
1020	pH	Cl2 pH - Final	7.3	Unit	SM 4500-H+ B	1	n/a	12/8/98		12/9/98	n/a
1021	pH	Cl2 pH - Initial	7.3	Unit	SM 4500-H+ B	1	n/a	12/8/98		12/8/98	n/a
1022	pH	pH	7.0	Unit	SM 4500-H+ B	1	n/a	12/8/98		12/8/98	n/a
1023	TEMP	Cl2 Temperature	7.5	°C	SM 2550 B	1	n/a	12/8/98		12/9/98	n/a
1024	TEMP	Temperature	18.2	°C	SM 2550 B	1	n/a	12/8/98		12/8/98	n/a
1025	TIME	Cl2 Incubation Time	24.0	hrs	n/a	1	n/a	12/8/98		12/9/98	n/a
1026	TOC-ICR	TOC	2.77	mg/L	SM 5310 C	1	0.50	12/8/98		12/8/98	7-0-485
1027	TOC-ICR	TOC (Dupl)	2.78	mg/L	SM 5310 C	1	0.50	12/8/98		12/8/98	7-0-485
			<b>2.77</b>	<b>mg/L</b>	<b>0.4 % RPD</b>						
1028	TOX-ICR	TOX	204	µg Cl-/L	SM 5320 B	1	25	12/9/98		12/17/98	12-0-265
1029	TOX-ICR	TOX (Dupl)	207	µg Cl-/L	SM 5320 B	1	25	12/9/98		12/17/98	12-0-265
			<b>206</b>	<b>µg Cl-/L</b>	<b>1.5 % RPD</b>						

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

1030	THM-ICR 1,2,3-Trichloropropane (Surrogate)	100.8 %	EPA 551.1	1	1.0	12/9/98	12/15/98	12/15/98	0-290-0
1031	THM-ICR Bromodichloromethane	10.8 µg/L	EPA 551.1	1	1.0	12/9/98	12/15/98	12/15/98	0-290-0
1032	THM-ICR Bromoform	ND µg/L	EPA 551.1	1	1.0	12/9/98	12/15/98	12/15/98	0-290-0
1033	THM-ICR Chloroform	23.7 µg/L	EPA 551.1	1	1.0	12/9/98	12/15/98	12/15/98	0-290-0
1034	THM-ICR Dibromochloromethane	2.0 µg/L	EPA 551.1	1	1.0	12/9/98	12/15/98	12/15/98	0-290-0
1035	TURB Turbidity	0.20 ntu	SM 2130 B	1	0.05	12/8/98		12/8/98	9-0-22
1036	UV-ICR UV	0.060 1/cm	SM 5910 B	1	0.009	12/8/98		12/9/98	8-0-390
1037	UV-ICR UV (Dupl)	0.060 1/cm	SM 5910 B	1	0.009	12/8/98		12/9/98	8-0-390
		<b>0.060 1/cm</b>	<b>0.0 % RPD</b>						

Sample ID: 185.10.pH6.5.Eff-1

S&amp;H ID: 9811-550

Date Sampled: 11/30/98 8:24:00 PM

#	Analysis Type	Result Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
1038	Cl2Dose Chlorine Dose	1.81 mg/L as Cl2	SM 4500-Cl B	1	n/a	12/3/98		12/3/98	n/a
1039	Cl2Res Chlorine Residual	0.78 mg/L as Cl2	SM 4500-Cl F	1	0.10	12/3/98		12/4/98	n/a
1040	HAA-ICR 1,2,3-Trichloropropane (IS) (Internal Standard)	104.4 %	EPA 552.2	1	1.0	12/4/98	12/10/98	12/11/98	0-286-0
1041	HAA-ICR 2-Bromopropionic acid (Surrogate)	98.4 %	EPA 552.2	1	1.0	12/4/98	12/10/98	12/11/98	0-286-0
1042	HAA-ICR Bromochloroacetic acid	ND µg/L	EPA 552.2	1	1.0	12/4/98	12/10/98	12/11/98	0-286-0
1043	HAA-ICR Bromodichloroacetic acid	ND µg/L	EPA 552.2	1	1.0	12/4/98	12/10/98	12/11/98	0-286-0
1044	HAA-ICR Chlorodibromoacetic acid	ND µg/L	EPA 552.2	1	2.0	12/4/98	12/10/98	12/11/98	0-286-0
1045	HAA-ICR Dibromoacetic acid	ND µg/L	EPA 552.2	1	1.0	12/4/98	12/10/98	12/11/98	0-286-0
1046	HAA-ICR Dichloroacetic acid	ND µg/L	EPA 552.2	1	1.0	12/4/98	12/10/98	12/11/98	0-286-0
1047	HAA-ICR Monobromoacetic acid	ND µg/L	EPA 552.2	1	1.0	12/4/98	12/10/98	12/11/98	0-286-0
1048	HAA-ICR Monochloroacetic acid	ND µg/L	EPA 552.2	1	2.0	12/4/98	12/10/98	12/11/98	0-286-0
1049	HAA-ICR Tribromoacetic acid	ND µg/L	EPA 552.2	1	4.0	12/4/98	12/10/98	12/11/98	0-286-0
1050	HAA-ICR Trichloroacetic acid	ND µg/L	EPA 552.2	1	1.0	12/4/98	12/10/98	12/11/98	0-286-0
1051	pH Cl2 pH - Final	7.4 Unit	SM 4500-H+ B	1	n/a	12/3/98		12/4/98	n/a
1052	pH Cl2 pH - Initial	7.3 Unit	SM 4500-H+ B	1	n/a	12/3/98		12/3/98	n/a
1053	pH pH	7.4 Unit	SM 4500-H+ B	1	n/a	11/30/98		11/30/98	n/a
1054	TEMP Cl2 Temperature	7.5 °C	SM 2550 B	1	n/a	12/3/98		12/4/98	n/a
1055	TEMP Temperature	24.2 °C	SM 2550 B	1	n/a	11/30/98		11/30/98	n/a
1056	TIME Cl2 Incubation Time	24.0 hrs	n/a	1	n/a	12/3/98		12/4/98	n/a
1057	TOC-ICR TOC	ND mg/L	SM 5310 C	1	0.50	11/30/98		12/1/98	7-0-478
1058	TOC-ICR TOC (Dupl)	ND mg/L	SM 5310 C	1	0.50	11/30/98		12/1/98	7-0-478
		<b>ND mg/L</b>							
1059	TOX-ICR TOX	ND µg Cl-/L	SM 5320 B	1	25	12/4/98		12/14/98	12-0-262
1060	TOX-ICR TOX (Dupl)	ND µg Cl-/L	SM 5320 B	1	25	12/4/98		12/14/98	12-0-262
		<b>ND µg Cl-/L</b>							

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

1061	THM-ICR 1,2,3-Trichloropropane (Surrogate)	96.0 %	EPA 551.1	1	1.0	12/4/98	12/9/98	12/10/98	0-284-0
1062	THM-ICR Bromodichloromethane	ND µg/L	EPA 551.1	1	1.0	12/4/98	12/9/98	12/10/98	0-284-0
1063	THM-ICR Bromoform	ND µg/L	EPA 551.1	1	1.0	12/4/98	12/9/98	12/10/98	0-284-0
1064	THM-ICR Chloroform	ND µg/L	EPA 551.1	1	1.0	12/4/98	12/9/98	12/10/98	0-284-0
1065	THM-ICR Dibromochloromethane	ND µg/L	EPA 551.1	1	1.0	12/4/98	12/9/98	12/10/98	0-284-0
1066	UV-ICR UV	ND 1/cm	SM 5910 B	1	0.009	11/30/98		12/1/98	8-0-382
1067	UV-ICR UV (Dupl)	ND 1/cm	SM 5910 B	1	0.009	11/30/98		12/1/98	8-0-382
		<b>ND 1/cm</b>							

Sample ID: 185.10.pH6.5.Eff-2

S&amp;H ID: 9811-551

Date Sampled: 12/2/98 8:41:00 AM

#	Analysis Type	Result Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
1068	Cl2Dose Chlorine Dose	1.39 mg/L as Cl2	SM 4500-Cl B	1	n/a	12/7/98		12/7/98	n/a
1069	Cl2Res Chlorine Residual	0.49 mg/L as Cl2	SM 4500-Cl F	1	0.10	12/7/98		12/8/98	n/a
1070	HAA-ICR 1,2,3-Trichloropropane (IS) (Internal Standard)	98.0 %	EPA 552.2	1	1.0	12/8/98	12/14/98	12/14/98	0-289-0
1071	HAA-ICR 1,2,3-Trichloropropane (IS) (Internal Standard) (Lab Dupl)	103.2 %	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
		<b>100.6 %</b>	<b>5.2 % RPD</b>						
1072	HAA-ICR 2-Bromopropionic acid (Surrogate)	100.8 %	EPA 552.2	1	1.0	12/8/98	12/14/98	12/14/98	0-289-0
1073	HAA-ICR 2-Bromopropionic acid (Surrogate) (Lab Dupl)	100.0 %	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
		<b>100.4 %</b>	<b>0.8 % RPD</b>						
1074	HAA-ICR Bromochloroacetic acid	ND µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/14/98	0-289-0
1075	HAA-ICR Bromochloroacetic acid (Lab Dupl)	ND µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
		<b>ND µg/L</b>							
1076	HAA-ICR Bromodichloroacetic acid	ND µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/14/98	0-289-0
1077	HAA-ICR Bromodichloroacetic acid (Lab Dupl)	ND µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
		<b>ND µg/L</b>							
1078	HAA-ICR Chlorodibromoacetic acid	ND µg/L	EPA 552.2	1	2.0	12/8/98	12/14/98	12/14/98	0-289-0
1079	HAA-ICR Chlorodibromoacetic acid (Lab Dupl)	ND µg/L	EPA 552.2	1	2.0	12/8/98	12/14/98	12/15/98	0-289-0
		<b>ND µg/L</b>							
1080	HAA-ICR Dibromoacetic acid	ND µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/14/98	0-289-0
1081	HAA-ICR Dibromoacetic acid (Lab Dupl)	ND µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
		<b>ND µg/L</b>							
1082	HAA-ICR Dichloroacetic acid	ND µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/14/98	0-289-0
1083	HAA-ICR Dichloroacetic acid (Lab Dupl)	ND µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
		<b>ND µg/L</b>							
1084	HAA-ICR Monobromoacetic acid	ND µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/14/98	0-289-0
1085	HAA-ICR Monobromoacetic acid (Lab Dupl)	ND µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

			<b>ND µg/L</b>							
1086	HAA-ICR	Monochloroacetic acid	ND µg/L	EPA 552.2	1	2.0	12/8/98	12/14/98	12/14/98	0-289-0
1087	HAA-ICR	Monochloroacetic acid (Lab Dupl)	ND µg/L	EPA 552.2	1	2.0	12/8/98	12/14/98	12/15/98	0-289-0
			<b>ND µg/L</b>							
1088	HAA-ICR	Tribromoacetic acid	ND µg/L	EPA 552.2	1	4.0	12/8/98	12/14/98	12/14/98	0-289-0
1089	HAA-ICR	Tribromoacetic acid (Lab Dupl)	ND µg/L	EPA 552.2	1	4.0	12/8/98	12/14/98	12/15/98	0-289-0
			<b>ND µg/L</b>							
1090	HAA-ICR	Trichloroacetic acid	ND µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/14/98	0-289-0
1091	HAA-ICR	Trichloroacetic acid (Lab Dupl)	ND µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
			<b>ND µg/L</b>							
1092	pH	Cl <sub>2</sub> pH - Final	7.3 Unit	SM 4500-H+ B	1	n/a	12/7/98		12/8/98	n/a
1093	pH	Cl <sub>2</sub> pH - Initial	7.3 Unit	SM 4500-H+ B	1	n/a	12/7/98		12/7/98	n/a
1094	pH	pH	7.2 Unit	SM 4500-H+ B	1	n/a	12/2/98		12/2/98	n/a
1095	TEMP	Cl <sub>2</sub> Temperature	7.4 °C	SM 2550 B	1	n/a	12/7/98		12/8/98	n/a
1096	TEMP	Temperature	21.0 °C	SM 2550 B	1	n/a	12/2/98		12/2/98	n/a
1097	TIME	Cl <sub>2</sub> Incubation Time	23.6 hrs	n/a	1	n/a	12/7/98		12/8/98	n/a
1098	TOC-ICR	TOC	ND mg/L	SM 5310 C	1	0.50	12/2/98		12/2/98	7-0-479
1099	TOC-ICR	TOC (Dupl)	ND mg/L	SM 5310 C	1	0.50	12/2/98		12/2/98	7-0-479
			<b>ND mg/L</b>							
1100	TOX-ICR	TOX	ND µg Cl-/L	SM 5320 B	1	25	12/8/98		12/14/98	12-0-262
1101	TOX-ICR	TOX (Dupl)	ND µg Cl-/L	SM 5320 B	1	25	12/8/98		12/14/98	12-0-262
			<b>ND µg Cl-/L</b>							
1102	THM-ICR	1,2,3-Trichloropropane (Surrogate)	108.0 %	EPA 551.1	1	1.0	12/8/98	12/11/98	12/11/98	0-288-0
1103	THM-ICR	Bromodichloromethane	ND µg/L	EPA 551.1	1	1.0	12/8/98	12/11/98	12/11/98	0-288-0
1104	THM-ICR	Bromoform	ND µg/L	EPA 551.1	1	1.0	12/8/98	12/11/98	12/11/98	0-288-0
1105	THM-ICR	Chloroform	ND µg/L	EPA 551.1	1	1.0	12/8/98	12/11/98	12/11/98	0-288-0
1106	THM-ICR	Dibromochloromethane	ND µg/L	EPA 551.1	1	1.0	12/8/98	12/11/98	12/11/98	0-288-0
1107	UV-ICR	UV	ND 1/cm	SM 5910 B	1	0.009	12/2/98		12/2/98	8-0-383
1108	UV-ICR	UV (Dupl)	ND 1/cm	SM 5910 B	1	0.009	12/2/98		12/2/98	8-0-383
			<b>ND 1/cm</b>							

Sample ID: 185.10.pH6.5.Eff-3

S&amp;H ID: 9811-552

Date Sampled: 12/2/98 8:23:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
1109	Cl <sub>2</sub> Dose	Chlorine Dose	1.42	mg/L as Cl <sub>2</sub>	SM 4500-Cl B	1	n/a	12/7/98		12/7/98	n/a
1110	Cl <sub>2</sub> Res	Chlorine Residual	0.56	mg/L as Cl <sub>2</sub>	SM 4500-Cl F	1	0.10	12/7/98		12/8/98	n/a
1111	HAA-ICR	1,2,3-Trichloropropane (IS) (Internal Standard)	100.4	%	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1112	HAA-ICR	2-Bromopropionic acid (Surrogate)	100.8	%	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.



**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

1113	HAA-ICR	Bromochloroacetic acid	ND µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1114	HAA-ICR	Bromodichloroacetic acid	ND µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1115	HAA-ICR	Chlorodibromoacetic acid	ND µg/L	EPA 552.2	1	2.0	12/8/98	12/14/98	12/15/98	0-289-0
1116	HAA-ICR	Dibromoacetic acid	ND µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1117	HAA-ICR	Dichloroacetic acid	ND µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1118	HAA-ICR	Monobromoacetic acid	ND µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1119	HAA-ICR	Monochloroacetic acid	ND µg/L	EPA 552.2	1	2.0	12/8/98	12/14/98	12/15/98	0-289-0
1120	HAA-ICR	Tribromoacetic acid	ND µg/L	EPA 552.2	1	4.0	12/8/98	12/14/98	12/15/98	0-289-0
1121	HAA-ICR	Trichloroacetic acid	ND µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1122	pH	Cl2 pH - Final	7.3 Unit	SM 4500-H+ B	1	n/a	12/7/98		12/8/98	n/a
1123	pH	Cl2 pH - Initial	7.3 Unit	SM 4500-H+ B	1	n/a	12/7/98		12/7/98	n/a
1124	pH	pH	7.2 Unit	SM 4500-H+ B	1	n/a	12/2/98		12/2/98	n/a
1125	TEMP	Cl2 Temperature	7.4 °C	SM 2550 B	1	n/a	12/7/98		12/8/98	n/a
1126	TEMP	Temperature	24.1 °C	SM 2550 B	1	n/a	12/2/98		12/2/98	n/a
1127	TIME	Cl2 Incubation Time	23.6 hrs	n/a	1	n/a	12/7/98		12/8/98	n/a
1128	TOC-ICR	TOC	ND mg/L	SM 5310 C	1	0.50	12/2/98		12/3/98	7-0-480
1129	TOC-ICR	TOC (Dupl)	ND mg/L	SM 5310 C	1	0.50	12/2/98		12/3/98	7-0-480
			<b>ND mg/L</b>							
1130	TOX-ICR	TOX	ND µg Cl-/L	SM 5320 B	1	25	12/8/98		12/15/98	12-0-263
1131	TOX-ICR	TOX (Dupl)	ND µg Cl-/L	SM 5320 B	1	25	12/8/98		12/15/98	12-0-263
			<b>ND µg Cl-/L</b>							
1132	THM-ICR	1,2,3-Trichloropropane (Surrogate)	98.4 %	EPA 551.1	1	1.0	12/8/98	12/11/98	12/11/98	0-288-0
1133	THM-ICR	1,2,3-Trichloropropane (Surrogate) (Lab Dupl)	102.8 %	EPA 551.1	1	1.0	12/8/98	12/11/98	12/11/98	0-288-0
			<b>100.6 %</b>	<b>4.4 % RPD</b>						
1134	THM-ICR	Bromodichloromethane	ND µg/L	EPA 551.1	1	1.0	12/8/98	12/11/98	12/11/98	0-288-0
1135	THM-ICR	Bromodichloromethane (Lab Dupl)	ND µg/L	EPA 551.1	1	1.0	12/8/98	12/11/98	12/11/98	0-288-0
			<b>ND µg/L</b>							
1136	THM-ICR	Bromoform	ND µg/L	EPA 551.1	1	1.0	12/8/98	12/11/98	12/11/98	0-288-0
1137	THM-ICR	Bromoform (Lab Dupl)	ND µg/L	EPA 551.1	1	1.0	12/8/98	12/11/98	12/11/98	0-288-0
			<b>ND µg/L</b>							
1138	THM-ICR	Chloroform	ND µg/L	EPA 551.1	1	1.0	12/8/98	12/11/98	12/11/98	0-288-0
1139	THM-ICR	Chloroform (Lab Dupl)	ND µg/L	EPA 551.1	1	1.0	12/8/98	12/11/98	12/11/98	0-288-0
			<b>ND µg/L</b>							
1140	THM-ICR	Dibromochloromethane	ND µg/L	EPA 551.1	1	1.0	12/8/98	12/11/98	12/11/98	0-288-0
1141	THM-ICR	Dibromochloromethane (Lab Dupl)	ND µg/L	EPA 551.1	1	1.0	12/8/98	12/11/98	12/11/98	0-288-0
			<b>ND µg/L</b>							
1142	UV-ICR	UV	ND 1/cm	SM 5910 B	1	0.009	12/2/98		12/3/98	8-0-384
1143	UV-ICR	UV (Dupl)	ND 1/cm	SM 5910 B	1	0.009	12/2/98		12/3/98	8-0-384
			<b>ND 1/cm</b>							

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

Sample ID: 185.10.pH6.5.Eff-4			S&H ID: 9811-553		Date Sampled: 12/3/98 2:16:00 AM						
#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
1144	Cl2Dose	Chlorine Dose	1.44	mg/L as Cl2	SM 4500-Cl B	1	n/a	12/7/98		12/7/98	n/a
1145	Cl2Res	Chlorine Residual	0.52	mg/L as Cl2	SM 4500-Cl F	1	0.10	12/7/98		12/8/98	n/a
1146	HAA-ICR	1,2,3-Trichloropropane (IS) (Internal Standard)	105.6	%	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1147	HAA-ICR	2-Bromopropionic acid (Surrogate)	93.6	%	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1148	HAA-ICR	Bromochloroacetic acid	ND	µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1149	HAA-ICR	Bromodichloroacetic acid	ND	µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1150	HAA-ICR	Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	12/8/98	12/14/98	12/15/98	0-289-0
1151	HAA-ICR	Dibromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1152	HAA-ICR	Dichloroacetic acid	ND	µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1153	HAA-ICR	Monobromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1154	HAA-ICR	Monochloroacetic acid	ND	µg/L	EPA 552.2	1	2.0	12/8/98	12/14/98	12/15/98	0-289-0
1155	HAA-ICR	Tribromoacetic acid	ND	µg/L	EPA 552.2	1	4.0	12/8/98	12/14/98	12/15/98	0-289-0
1156	HAA-ICR	Trichloroacetic acid	ND	µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1157	pH	Cl2 pH - Final	7.3	Unit	SM 4500-H+ B	1	n/a	12/7/98		12/8/98	n/a
1158	pH	Cl2 pH - Initial	7.3	Unit	SM 4500-H+ B	1	n/a	12/7/98		12/7/98	n/a
1159	pH	pH	7.2	Unit	SM 4500-H+ B	1	n/a	12/3/98		12/3/98	n/a
1160	TEMP	Cl2 Temperature	7.4	°C	SM 2550 B	1	n/a	12/7/98		12/8/98	n/a
1161	TEMP	Temperature	22.7	°C	SM 2550 B	1	n/a	12/3/98		12/3/98	n/a
1162	TIME	Cl2 Incubation Time	23.6	hrs	n/a	1	n/a	12/7/98		12/8/98	n/a
1163	TOC-ICR	TOC	0.60	mg/L	SM 5310 C	1	0.50	12/3/98		12/3/98	7-0-480
1164	TOC-ICR	TOC (Dupl)	0.60	mg/L	SM 5310 C	1	0.50	12/3/98		12/3/98	7-0-480
			0.60	mg/L	0.0 % RPD						
1165	TOX-ICR	TOX	ND	µg Cl-/L	SM 5320 B	1	25	12/8/98		12/16/98	12-0-264
1166	TOX-ICR	TOX (Dupl)	ND	µg Cl-/L	SM 5320 B	1	25	12/8/98		12/16/98	12-0-264
			ND	µg Cl-/L							
1167	THM-ICR	1,2,3-Trichloropropane (Surrogate)	98.0	%	EPA 551.1	1	1.0	12/8/98	12/11/98	12/11/98	0-288-0
1168	THM-ICR	Bromodichloromethane	1.3	µg/L	EPA 551.1	1	1.0	12/8/98	12/11/98	12/11/98	0-288-0
1169	THM-ICR	Bromoform	ND	µg/L	EPA 551.1	1	1.0	12/8/98	12/11/98	12/11/98	0-288-0
1170	THM-ICR	Chloroform	1.2	µg/L	EPA 551.1	1	1.0	12/8/98	12/11/98	12/11/98	0-288-0
1171	THM-ICR	Dibromochloromethane	1.6	µg/L	EPA 551.1	1	1.0	12/8/98	12/11/98	12/11/98	0-288-0
1172	UV-ICR	UV	ND	1/cm	SM 5910 B	1	0.009	12/3/98		12/3/98	8-0-384
1173	UV-ICR	UV (Dupl)	ND	1/cm	SM 5910 B	1	0.009	12/3/98		12/3/98	8-0-384
			ND	1/cm							

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

Sample ID: 185.10.pH6.5.Eff-5			S&H ID: 9811-554		Date Sampled: 12/3/98 8:14:00 AM						
#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
1174	Cl2Dose	Chlorine Dose	1.48	mg/L as Cl2	SM 4500-Cl B	1	n/a	12/7/98		12/7/98	n/a
1175	Cl2Res	Chlorine Residual	0.55	mg/L as Cl2	SM 4500-Cl F	1	0.10	12/7/98		12/8/98	n/a
1176	HAA-ICR	1,2,3-Trichloropropane (IS) (Internal Standard)	105.6	%	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1177	HAA-ICR	2-Bromopropionic acid (Surrogate)	98.4	%	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1178	HAA-ICR	Bromochloroacetic acid	1.1	µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1179	HAA-ICR	Bromodichloroacetic acid	1.3	µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1180	HAA-ICR	Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	12/8/98	12/14/98	12/15/98	0-289-0
1181	HAA-ICR	Dibromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1182	HAA-ICR	Dichloroacetic acid	1.1	µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1183	HAA-ICR	Monobromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1184	HAA-ICR	Monochloroacetic acid	ND	µg/L	EPA 552.2	1	2.0	12/8/98	12/14/98	12/15/98	0-289-0
1185	HAA-ICR	Tribromoacetic acid	ND	µg/L	EPA 552.2	1	4.0	12/8/98	12/14/98	12/15/98	0-289-0
1186	HAA-ICR	Trichloroacetic acid	ND	µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1187	pH	Cl2 pH - Final	7.3	Unit	SM 4500-H+ B	1	n/a	12/7/98		12/8/98	n/a
1188	pH	Cl2 pH - Initial	7.3	Unit	SM 4500-H+ B	1	n/a	12/7/98		12/7/98	n/a
1189	pH	pH	7.1	Unit	SM 4500-H+ B	1	n/a	12/3/98		12/3/98	n/a
1190	TEMP	Cl2 Temperature	7.4	°C	SM 2550 B	1	n/a	12/7/98		12/8/98	n/a
1191	TEMP	Temperature	21.8	°C	SM 2550 B	1	n/a	12/3/98		12/3/98	n/a
1192	TIME	Cl2 Incubation Time	23.6	hrs	n/a	1	n/a	12/7/98		12/8/98	n/a
1193	TOC-ICR	TOC	0.77	mg/L	SM 5310 C	1	0.50	12/3/98		12/3/98	7-0-480
1194	TOC-ICR	TOC (Dupl)	0.79	mg/L	SM 5310 C	1	0.50	12/3/98		12/3/98	7-0-480
			0.78	mg/L	2.6 % RPD						
1195	TOX-ICR	TOX	ND	µg Cl-/L	SM 5320 B	1	25	12/8/98		12/15/98	12-0-263
1196	TOX-ICR	TOX (Dupl)	ND	µg Cl-/L	SM 5320 B	1	25	12/8/98		12/15/98	12-0-263
			ND	µg Cl-/L							
1197	THM-ICR	1,2,3-Trichloropropane (Surrogate)	96.4	%	EPA 551.1	1	1.0	12/8/98	12/11/98	12/11/98	0-288-0
1198	THM-ICR	Bromodichloromethane	1.9	µg/L	EPA 551.1	1	1.0	12/8/98	12/11/98	12/11/98	0-288-0
1199	THM-ICR	Bromoform	ND	µg/L	EPA 551.1	1	1.0	12/8/98	12/11/98	12/11/98	0-288-0
1200	THM-ICR	Chloroform	1.7	µg/L	EPA 551.1	1	1.0	12/8/98	12/11/98	12/11/98	0-288-0
1201	THM-ICR	Dibromochloromethane	2.0	µg/L	EPA 551.1	1	1.0	12/8/98	12/11/98	12/11/98	0-288-0
1202	UV-ICR	UV	ND	1/cm	SM 5910 B	1	0.009	12/3/98		12/3/98	8-0-384
1203	UV-ICR	UV (Dupl)	0.009	1/cm	SM 5910 B	1	0.009	12/3/98		12/3/98	8-0-384
			ND	1/cm							

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

Sample ID: 185.10.pH6.5.Eff-6			S&H ID: 9811-555		Date Sampled: 12/3/98 2:02:00 PM						
#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
1204	Cl2Dose	Chlorine Dose	1.52	mg/L as Cl2	SM 4500-Cl B	1	n/a	12/7/98		12/7/98	n/a
1205	Cl2Res	Chlorine Residual	0.41	mg/L as Cl2	SM 4500-Cl F	1	0.10	12/7/98		12/8/98	n/a
1206	HAA-ICR	1,2,3-Trichloropropane (IS) (Internal Standard)	104.0	%	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1207	HAA-ICR	2-Bromopropionic acid (Surrogate)	100.8	%	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1208	HAA-ICR	Bromochloroacetic acid	1.4	µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1209	HAA-ICR	Bromodichloroacetic acid	1.4	µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1210	HAA-ICR	Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	12/8/98	12/14/98	12/15/98	0-289-0
1211	HAA-ICR	Dibromoacetic acid	1.0	µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1212	HAA-ICR	Dichloroacetic acid	1.5	µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1213	HAA-ICR	Monobromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1214	HAA-ICR	Monochloroacetic acid	ND	µg/L	EPA 552.2	1	2.0	12/8/98	12/14/98	12/15/98	0-289-0
1215	HAA-ICR	Tribromoacetic acid	ND	µg/L	EPA 552.2	1	4.0	12/8/98	12/14/98	12/15/98	0-289-0
1216	HAA-ICR	Trichloroacetic acid	1.1	µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1217	pH	Cl2 pH - Final	7.3	Unit	SM 4500-H+ B	1	n/a	12/7/98		12/8/98	n/a
1218	pH	Cl2 pH - Initial	7.3	Unit	SM 4500-H+ B	1	n/a	12/7/98		12/7/98	n/a
1219	pH	pH	7.1	Unit	SM 4500-H+ B	1	n/a	12/3/98		12/3/98	n/a
1220	TEMP	Cl2 Temperature	7.4	°C	SM 2550 B	1	n/a	12/7/98		12/8/98	n/a
1221	TEMP	Temperature	23.0	°C	SM 2550 B	1	n/a	12/3/98		12/3/98	n/a
1222	TIME	Cl2 Incubation Time	23.6	hrs	n/a	1	n/a	12/7/98		12/8/98	n/a
1223	TOC-ICR	TOC	0.99	mg/L	SM 5310 C	1	0.50	12/3/98		12/3/98	7-0-480
1224	TOC-ICR	TOC (Dupl)	1.02	mg/L	SM 5310 C	1	0.50	12/3/98		12/3/98	7-0-480
			1.00	mg/L	3.0 % RPD						
1225	TOX-ICR	TOX	30	µg Cl-/L	SM 5320 B	1	25	12/8/98		12/14/98	12-0-262
1226	TOX-ICR	TOX (Dupl)	34	µg Cl-/L	SM 5320 B	1	25	12/8/98		12/14/98	12-0-262
			32	µg Cl-/L	12.5 % RPD						
1227	THM-ICR	1,2,3-Trichloropropane (Surrogate)	94.0	%	EPA 551.1	1	1.0	12/8/98	12/11/98	12/11/98	0-288-0
1228	THM-ICR	Bromodichloromethane	2.6	µg/L	EPA 551.1	1	1.0	12/8/98	12/11/98	12/11/98	0-288-0
1229	THM-ICR	Bromoform	ND	µg/L	EPA 551.1	1	1.0	12/8/98	12/11/98	12/11/98	0-288-0
1230	THM-ICR	Chloroform	2.1	µg/L	EPA 551.1	1	1.0	12/8/98	12/11/98	12/11/98	0-288-0
1231	THM-ICR	Dibromochloromethane	2.6	µg/L	EPA 551.1	1	1.0	12/8/98	12/11/98	12/11/98	0-288-0
1232	UV-ICR	UV	0.012	1/cm	SM 5910 B	1	0.009	12/3/98		12/4/98	8-0-385
1233	UV-ICR	UV (Dupl)	0.012	1/cm	SM 5910 B	1	0.009	12/3/98		12/4/98	8-0-385
			0.012	1/cm	0.0 % RPD						

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

Sample ID: 185.10.pH6.5.Eff-7			S&H ID: 9811-556		Date Sampled: 12/3/98 7:41:00 PM						
#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
1234	Cl2Dose	Chlorine Dose	1.56	mg/L as Cl2	SM 4500-Cl B	1	n/a	12/7/98		12/7/98	n/a
1235	Cl2Res	Chlorine Residual	0.30	mg/L as Cl2	SM 4500-Cl F	1	0.10	12/7/98		12/8/98	n/a
1236	HAA-ICR	1,2,3-Trichloropropane (IS) (Internal Standard)	101.6	%	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1237	HAA-ICR	2-Bromopropionic acid (Surrogate)	98.4	%	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1238	HAA-ICR	Bromochloroacetic acid	1.8	µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1239	HAA-ICR	Bromodichloroacetic acid	1.6	µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1240	HAA-ICR	Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	12/8/98	12/14/98	12/15/98	0-289-0
1241	HAA-ICR	Dibromoacetic acid	1.2	µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1242	HAA-ICR	Dichloroacetic acid	2.0	µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1243	HAA-ICR	Monobromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1244	HAA-ICR	Monochloroacetic acid	ND	µg/L	EPA 552.2	1	2.0	12/8/98	12/14/98	12/15/98	0-289-0
1245	HAA-ICR	Tribromoacetic acid	ND	µg/L	EPA 552.2	1	4.0	12/8/98	12/14/98	12/15/98	0-289-0
1246	HAA-ICR	Trichloroacetic acid	1.6	µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1247	pH	Cl2 pH - Final	7.4	Unit	SM 4500-H+ B	1	n/a	12/7/98		12/8/98	n/a
1248	pH	Cl2 pH - Initial	7.3	Unit	SM 4500-H+ B	1	n/a	12/7/98		12/7/98	n/a
1249	pH	pH	7.3	Unit	SM 4500-H+ B	1	n/a	12/3/98		12/3/98	n/a
1250	TEMP	Cl2 Temperature	7.4	°C	SM 2550 B	1	n/a	12/7/98		12/8/98	n/a
1251	TEMP	Temperature	24.5	°C	SM 2550 B	1	n/a	12/3/98		12/3/98	n/a
1252	TIME	Cl2 Incubation Time	23.7	hrs	n/a	1	n/a	12/7/98		12/8/98	n/a
1253	TOC-ICR	TOC	1.18	mg/L	SM 5310 C	1	0.50	12/3/98		12/4/98	7-0-481
1254	TOC-ICR	TOC (Dupl)	1.21	mg/L	SM 5310 C	1	0.50	12/3/98		12/4/98	7-0-481
			1.19	mg/L	2.5 % RPD						
1255	TOX-ICR	TOX	38	µg Cl-/L	SM 5320 B	1	25	12/8/98		12/15/98	12-0-263
1256	TOX-ICR	TOX (Dupl)	39	µg Cl-/L	SM 5320 B	1	25	12/8/98		12/15/98	12-0-263
			39	µg Cl-/L	2.6 % RPD						
1257	THM-ICR	1,2,3-Trichloropropane (Surrogate)	93.2	%	EPA 551.1	1	1.0	12/8/98	12/11/98	12/11/98	0-288-0
1258	THM-ICR	Bromodichloromethane	3.3	µg/L	EPA 551.1	1	1.0	12/8/98	12/11/98	12/11/98	0-288-0
1259	THM-ICR	Bromoform	ND	µg/L	EPA 551.1	1	1.0	12/8/98	12/11/98	12/11/98	0-288-0
1260	THM-ICR	Chloroform	2.6	µg/L	EPA 551.1	1	1.0	12/8/98	12/11/98	12/11/98	0-288-0
1261	THM-ICR	Dibromochloromethane	3.0	µg/L	EPA 551.1	1	1.0	12/8/98	12/11/98	12/11/98	0-288-0
1262	UV-ICR	UV	0.015	1/cm	SM 5910 B	1	0.009	12/3/98		12/4/98	8-0-385
1263	UV-ICR	UV (Dupl)	0.015	1/cm	SM 5910 B	1	0.009	12/3/98		12/4/98	8-0-385
			0.015	1/cm	0.0 % RPD						

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

Sample ID: 185.10.pH6.5.Eff-8			S&H ID: 9811-557		Date Sampled: 12/4/98 1:24:00 AM						
#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
1264	Cl2Dose	Chlorine Dose	1.93	mg/L as Cl2	SM 4500-Cl B	1	n/a	12/10/98		12/10/98	n/a
1265	Cl2Res	Chlorine Residual	0.83	mg/L as Cl2	SM 4500-Cl F	1	0.10	12/10/98		12/11/98	n/a
1266	HAA-ICR	1,2,3-Trichloropropane (IS) (Internal Standard)	103.6	%	EPA 552.2	1	1.0	12/11/98	12/21/98	12/22/98	0-291-0
1267	HAA-ICR	2-Bromopropionic acid (Surrogate)	100.0	%	EPA 552.2	1	1.0	12/11/98	12/21/98	12/22/98	0-291-0
1268	HAA-ICR	Bromochloroacetic acid	2.2	µg/L	EPA 552.2	1	1.0	12/11/98	12/21/98	12/22/98	0-291-0
1269	HAA-ICR	Bromodichloroacetic acid	2.5	µg/L	EPA 552.2	1	1.0	12/11/98	12/21/98	12/22/98	0-291-0
1270	HAA-ICR	Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	12/11/98	12/21/98	12/22/98	0-291-0
1271	HAA-ICR	Dibromoacetic acid	1.0	µg/L	EPA 552.2	1	1.0	12/11/98	12/21/98	12/22/98	0-291-0
1272	HAA-ICR	Dichloroacetic acid	2.8	µg/L	EPA 552.2	1	1.0	12/11/98	12/21/98	12/22/98	0-291-0
1273	HAA-ICR	Monobromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	12/11/98	12/21/98	12/22/98	0-291-0
1274	HAA-ICR	Monochloroacetic acid	ND	µg/L	EPA 552.2	1	2.0	12/11/98	12/21/98	12/22/98	0-291-0
1275	HAA-ICR	Tribromoacetic acid	ND	µg/L	EPA 552.2	1	4.0	12/11/98	12/21/98	12/22/98	0-291-0
1276	HAA-ICR	Trichloroacetic acid	2.8	µg/L	EPA 552.2	1	1.0	12/11/98	12/21/98	12/22/98	0-291-0
1277	pH	Cl2 pH - Final	7.4	Unit	SM 4500-H+ B	1	n/a	12/10/98		12/11/98	n/a
1278	pH	Cl2 pH - Initial	7.3	Unit	SM 4500-H+ B	1	n/a	12/10/98		12/10/98	n/a
1279	pH	pH	7.3	Unit	SM 4500-H+ B	1	n/a	12/4/98		12/4/98	n/a
1280	TEMP	Cl2 Temperature	7.3	°C	SM 2550 B	1	n/a	12/10/98		12/11/98	n/a
1281	TEMP	Temperature	23.7	°C	SM 2550 B	1	n/a	12/4/98		12/4/98	n/a
1282	TIME	Cl2 Incubation Time	24.0	hrs	n/a	1	n/a	12/10/98		12/11/98	n/a
1283	TOC-ICR	TOC	1.27	mg/L	SM 5310 C	1	0.50	12/4/98		12/4/98	7-0-481
1284	TOC-ICR	TOC (Dupl)	1.33	mg/L	SM 5310 C	1	0.50	12/4/98		12/4/98	7-0-481
			1.30	mg/L	4.6 % RPD						
1285	TOX-ICR	TOX	48	µg Cl-/L	SM 5320 B	1	25	12/11/98		12/21/98	12-0-267
1286	TOX-ICR	TOX (Dupl)	52	µg Cl-/L	SM 5320 B	1	25	12/11/98		12/21/98	12-0-267
			50	µg Cl-/L	8.0 % RPD						
1287	THM-ICR	1,2,3-Trichloropropane (Surrogate)	103.2	%	EPA 551.1	1	1.0	12/11/98	12/15/98	12/15/98	0-290-0
1288	THM-ICR	Bromodichloromethane	4.3	µg/L	EPA 551.1	1	1.0	12/11/98	12/15/98	12/15/98	0-290-0
1289	THM-ICR	Bromoform	ND	µg/L	EPA 551.1	1	1.0	12/11/98	12/15/98	12/15/98	0-290-0
1290	THM-ICR	Chloroform	4.1	µg/L	EPA 551.1	1	1.0	12/11/98	12/15/98	12/15/98	0-290-0
1291	THM-ICR	Dibromochloromethane	2.9	µg/L	EPA 551.1	1	1.0	12/11/98	12/15/98	12/15/98	0-290-0
1292	UV-ICR	UV	0.017	1/cm	SM 5910 B	1	0.009	12/4/98		12/4/98	8-0-385
1293	UV-ICR	UV (Dupl)	0.017	1/cm	SM 5910 B	1	0.009	12/4/98		12/4/98	8-0-385
			0.017	1/cm	0.0 % RPD						

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

Sample ID: 185.10.pH6.5.Eff-15			S&H ID: 9811-564		Date Sampled: 12/5/98 5:37:00 PM						
#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
1294	Cl2Dose	Chlorine Dose	1.49	mg/L as Cl2	SM 4500-Cl B	1	n/a	12/8/98		12/8/98	n/a
1295	Cl2Res	Chlorine Residual	0.14	mg/L as Cl2	SM 4500-Cl F	1	0.10	12/8/98		12/9/98	n/a
1296	HAA-ICR	1,2,3-Trichloropropane (IS) (Internal Standard)	98.0	%	EPA 552.2	1	1.0	12/9/98	12/21/98	12/21/98	0-291-0
1297	HAA-ICR	2-Bromopropionic acid (Surrogate)	99.2	%	EPA 552.2	1	1.0	12/9/98	12/21/98	12/21/98	0-291-0
1298	HAA-ICR	Bromochloroacetic acid	2.6	µg/L	EPA 552.2	1	1.0	12/9/98	12/21/98	12/21/98	0-291-0
1299	HAA-ICR	Bromodichloroacetic acid	2.0	µg/L	EPA 552.2	1	1.0	12/9/98	12/21/98	12/21/98	0-291-0
1300	HAA-ICR	Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	12/9/98	12/21/98	12/21/98	0-291-0
1301	HAA-ICR	Dibromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	12/9/98	12/21/98	12/21/98	0-291-0
1302	HAA-ICR	Dichloroacetic acid	4.4	µg/L	EPA 552.2	1	1.0	12/9/98	12/21/98	12/21/98	0-291-0
1303	HAA-ICR	Monobromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	12/9/98	12/21/98	12/21/98	0-291-0
1304	HAA-ICR	Monochloroacetic acid	ND	µg/L	EPA 552.2	1	2.0	12/9/98	12/21/98	12/21/98	0-291-0
1305	HAA-ICR	Tribromoacetic acid	ND	µg/L	EPA 552.2	1	4.0	12/9/98	12/21/98	12/21/98	0-291-0
1306	HAA-ICR	Trichloroacetic acid	3.8	µg/L	EPA 552.2	1	1.0	12/9/98	12/21/98	12/21/98	0-291-0
1307	pH	Cl2 pH - Final	7.4	Unit	SM 4500-H+ B	1	n/a	12/8/98		12/9/98	n/a
1308	pH	Cl2 pH - Initial	7.3	Unit	SM 4500-H+ B	1	n/a	12/8/98		12/8/98	n/a
1309	pH	pH	7.3	Unit	SM 4500-H+ B	1	n/a	12/5/98		12/5/98	n/a
1310	TEMP	Cl2 Temperature	7.5	°C	SM 2550 B	1	n/a	12/8/98		12/9/98	n/a
1311	TEMP	Temperature	23.2	°C	SM 2550 B	1	n/a	12/5/98		12/5/98	n/a
1312	TIME	Cl2 Incubation Time	23.9	hrs	n/a	1	n/a	12/8/98		12/9/98	n/a
1313	TOC-ICR	TOC	1.79	mg/L	SM 5310 C	1	0.50	12/5/98		12/6/98	7-0-483
1314	TOC-ICR	TOC (Dupl)	1.81	mg/L	SM 5310 C	1	0.50	12/5/98		12/6/98	7-0-483
			1.80	mg/L	1.1 % RPD						
1315	TOX-ICR	TOX	80	µg Cl-/L	SM 5320 B	1	25	12/9/98		12/17/98	12-0-265
1316	TOX-ICR	TOX (Dupl)	81	µg Cl-/L	SM 5320 B	1	25	12/9/98		12/17/98	12-0-265
			81	µg Cl-/L	1.2 % RPD						
1317	THM-ICR	1,2,3-Trichloropropane (Surrogate)	105.6	%	EPA 551.1	1	1.0	12/9/98	12/15/98	12/15/98	0-290-0
1318	THM-ICR	Bromodichloromethane	6.2	µg/L	EPA 551.1	1	1.0	12/9/98	12/15/98	12/15/98	0-290-0
1319	THM-ICR	Bromoform	ND	µg/L	EPA 551.1	1	1.0	12/9/98	12/15/98	12/15/98	0-290-0
1320	THM-ICR	Chloroform	6.5	µg/L	EPA 551.1	1	1.0	12/9/98	12/15/98	12/15/98	0-290-0
1321	THM-ICR	Dibromochloromethane	3.1	µg/L	EPA 551.1	1	1.0	12/9/98	12/15/98	12/15/98	0-290-0
1322	UV-ICR	UV	0.029	1/cm	SM 5910 B	1	0.009	12/5/98		12/6/98	8-0-388
1323	UV-ICR	UV (Dupl)	0.029	1/cm	SM 5910 B	1	0.009	12/5/98		12/6/98	8-0-388
			0.029	1/cm	0.0 % RPD						

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

Sample ID: 185.10.pH6.5.Eff-16			S&H ID: 9811-565		Date Sampled: 12/5/98 11:40:00 PM						
#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
1324	Cl2Dose	Chlorine Dose	2.08	mg/L as Cl2	SM 4500-Cl B	1	n/a	12/10/98		12/10/98	n/a
1325	Cl2Res	Chlorine Residual	0.66	mg/L as Cl2	SM 4500-Cl F	1	0.10	12/10/98		12/11/98	n/a
1326	HAA-ICR	1,2,3-Trichloropropane (IS) (Internal Standard)	97.2	%	EPA 552.2	1	1.0	12/11/98	12/21/98	12/22/98	0-291-0
1327	HAA-ICR	2-Bromopropionic acid (Surrogate)	82.4	%	EPA 552.2	1	1.0	12/11/98	12/21/98	12/22/98	0-291-0
1328	HAA-ICR	Bromochloroacetic acid	2.7	µg/L	EPA 552.2	1	1.0	12/11/98	12/21/98	12/22/98	0-291-0
1329	HAA-ICR	Bromodichloroacetic acid	3.2	µg/L	EPA 552.2	1	1.0	12/11/98	12/21/98	12/22/98	0-291-0
1330	HAA-ICR	Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	12/11/98	12/21/98	12/22/98	0-291-0
1331	HAA-ICR	Dibromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	12/11/98	12/21/98	12/22/98	0-291-0
1332	HAA-ICR	Dichloroacetic acid	5.2	µg/L	EPA 552.2	1	1.0	12/11/98	12/21/98	12/22/98	0-291-0
1333	HAA-ICR	Monobromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	12/11/98	12/21/98	12/22/98	0-291-0
1334	HAA-ICR	Monochloroacetic acid	ND	µg/L	EPA 552.2	1	2.0	12/11/98	12/21/98	12/22/98	0-291-0
1335	HAA-ICR	Tribromoacetic acid	ND	µg/L	EPA 552.2	1	4.0	12/11/98	12/21/98	12/22/98	0-291-0
1336	HAA-ICR	Trichloroacetic acid	5.7	µg/L	EPA 552.2	1	1.0	12/11/98	12/21/98	12/22/98	0-291-0
1337	pH	Cl2 pH - Final	7.3	Unit	SM 4500-H+ B	1	n/a	12/10/98		12/11/98	n/a
1338	pH	Cl2 pH - Initial	7.2	Unit	SM 4500-H+ B	1	n/a	12/10/98		12/10/98	n/a
1339	pH	pH	7.3	Unit	SM 4500-H+ B	1	n/a	12/5/98		12/5/98	n/a
1340	TEMP	Cl2 Temperature	7.3	°C	SM 2550 B	1	n/a	12/10/98		12/11/98	n/a
1341	TEMP	Temperature	22.1	°C	SM 2550 B	1	n/a	12/5/98		12/5/98	n/a
1342	TIME	Cl2 Incubation Time	24.2	hrs	n/a	1	n/a	12/10/98		12/11/98	n/a
1343	TOC-ICR	TOC	1.88	mg/L	SM 5310 C	1	0.50	12/5/98		12/6/98	7-0-483
1344	TOC-ICR	TOC (Dupl)	1.81	mg/L	SM 5310 C	1	0.50	12/5/98		12/6/98	7-0-483
			1.85	mg/L	3.8 % RPD						
1345	TOX-ICR	TOX	89	µg Cl-/L	SM 5320 B	1	25	12/11/98		12/21/98	12-0-267
1346	TOX-ICR	TOX (Dupl)	95	µg Cl-/L	SM 5320 B	1	25	12/11/98		12/21/98	12-0-267
			92	µg Cl-/L	6.5 % RPD						
1347	THM-ICR	1,2,3-Trichloropropane (Surrogate)	93.2	%	EPA 551.1	1	1.0	12/11/98	12/15/98	12/15/98	0-290-0
1348	THM-ICR	Bromodichloromethane	6.6	µg/L	EPA 551.1	1	1.0	12/11/98	12/15/98	12/15/98	0-290-0
1349	THM-ICR	Bromoform	ND	µg/L	EPA 551.1	1	1.0	12/11/98	12/15/98	12/15/98	0-290-0
1350	THM-ICR	Chloroform	7.8	µg/L	EPA 551.1	1	1.0	12/11/98	12/15/98	12/15/98	0-290-0
1351	THM-ICR	Dibromochloromethane	3.0	µg/L	EPA 551.1	1	1.0	12/11/98	12/15/98	12/15/98	0-290-0
1352	UV-ICR	UV	0.029	1/cm	SM 5910 B	1	0.009	12/5/98		12/7/98	8-0-389
1353	UV-ICR	UV (Dupl)	0.028	1/cm	SM 5910 B	1	0.009	12/5/98		12/7/98	8-0-389
			0.029	1/cm	3.4 % RPD						

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.



**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

Sample ID: 185.10.pH6.5.Eff-18			S&H ID: 9811-567		Date Sampled: 12/6/98 11:14:00 AM						
#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
1354	Cl2Dose	Chlorine Dose	2.10	mg/L as Cl2	SM 4500-Cl B	1	n/a	12/10/98		12/10/98	n/a
1355	Cl2Res	Chlorine Residual	0.71	mg/L as Cl2	SM 4500-Cl F	1	0.10	12/10/98		12/11/98	n/a
1356	HAA-ICR	1,2,3-Trichloropropane (IS) (Internal Standard)	96.0	%	EPA 552.2	1	1.0	12/11/98	12/21/98	12/22/98	0-291-0
1357	HAA-ICR	2-Bromopropionic acid (Surrogate)	102.8	%	EPA 552.2	1	1.0	12/11/98	12/21/98	12/22/98	0-291-0
1358	HAA-ICR	Bromochloroacetic acid	2.9	µg/L	EPA 552.2	1	1.0	12/11/98	12/21/98	12/22/98	0-291-0
1359	HAA-ICR	Bromodichloroacetic acid	3.4	µg/L	EPA 552.2	1	1.0	12/11/98	12/21/98	12/22/98	0-291-0
1360	HAA-ICR	Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	12/11/98	12/21/98	12/22/98	0-291-0
1361	HAA-ICR	Dibromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	12/11/98	12/21/98	12/22/98	0-291-0
1362	HAA-ICR	Dichloroacetic acid	6.0	µg/L	EPA 552.2	1	1.0	12/11/98	12/21/98	12/22/98	0-291-0
1363	HAA-ICR	Monobromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	12/11/98	12/21/98	12/22/98	0-291-0
1364	HAA-ICR	Monochloroacetic acid	ND	µg/L	EPA 552.2	1	2.0	12/11/98	12/21/98	12/22/98	0-291-0
1365	HAA-ICR	Tribromoacetic acid	ND	µg/L	EPA 552.2	1	4.0	12/11/98	12/21/98	12/22/98	0-291-0
1366	HAA-ICR	Trichloroacetic acid	6.8	µg/L	EPA 552.2	1	1.0	12/11/98	12/21/98	12/22/98	0-291-0
1367	pH	Cl2 pH - Final	7.3	Unit	SM 4500-H+ B	1	n/a	12/10/98		12/11/98	n/a
1368	pH	Cl2 pH - Initial	7.2	Unit	SM 4500-H+ B	1	n/a	12/10/98		12/10/98	n/a
1369	pH	pH	7.2	Unit	SM 4500-H+ B	1	n/a	12/6/98		12/6/98	n/a
1370	TEMP	Cl2 Temperature	7.3	°C	SM 2550 B	1	n/a	12/10/98		12/11/98	n/a
1371	TEMP	Temperature	22.0	°C	SM 2550 B	1	n/a	12/6/98		12/6/98	n/a
1372	TIME	Cl2 Incubation Time	24.3	hrs	n/a	1	n/a	12/10/98		12/11/98	n/a
1373	TOC-ICR	TOC	1.93	mg/L	SM 5310 C	1	0.50	12/6/98		12/6/98	7-0-483
1374	TOC-ICR	TOC (Dupl)	1.94	mg/L	SM 5310 C	1	0.50	12/6/98		12/6/98	7-0-483
			1.94	mg/L	0.5 % RPD						
1375	TOX-ICR	TOX	110	µg Cl-/L	SM 5320 B	1	25	12/11/98		12/22/98	12-0-268
1376	TOX-ICR	TOX (Dupl)	102	µg Cl-/L	SM 5320 B	1	25	12/11/98		12/22/98	12-0-268
			106	µg Cl-/L	7.5 % RPD						
1377	THM-ICR	1,2,3-Trichloropropane (Surrogate)	88.0	%	EPA 551.1	1	1.0	12/11/98	12/15/98	12/15/98	0-290-0
1378	THM-ICR	Bromodichloromethane	7.2	µg/L	EPA 551.1	1	1.0	12/11/98	12/15/98	12/15/98	0-290-0
1379	THM-ICR	Bromoform	ND	µg/L	EPA 551.1	1	1.0	12/11/98	12/15/98	12/15/98	0-290-0
1380	THM-ICR	Chloroform	9.3	µg/L	EPA 551.1	1	1.0	12/11/98	12/15/98	12/15/98	0-290-0
1381	THM-ICR	Dibromochloromethane	2.9	µg/L	EPA 551.1	1	1.0	12/11/98	12/15/98	12/15/98	0-290-0
1382	UV-ICR	UV	0.032	1/cm	SM 5910 B	1	0.009	12/6/98		12/7/98	8-0-389
1383	UV-ICR	UV (Dupl)	0.032	1/cm	SM 5910 B	1	0.009	12/6/98		12/7/98	8-0-389
			0.032	1/cm	0.0 % RPD						

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

Sample ID: 185.10.pH6.5.Eff-20			S&H ID: 9811-569		Date Sampled: 12/7/98 10:37:00 AM						
#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
1384	Cl2Dose	Chlorine Dose	2.14	mg/L as Cl2	SM 4500-Cl B	1	n/a	12/10/98		12/10/98	n/a
1385	Cl2Res	Chlorine Residual	0.62	mg/L as Cl2	SM 4500-Cl F	1	0.10	12/10/98		12/11/98	n/a
1386	HAA-ICR	1,2,3-Trichloropropane (IS) (Internal Standard)	96.8	%	EPA 552.2	1	1.0	12/11/98	12/21/98	12/22/98	0-291-0
1387	HAA-ICR	2-Bromopropionic acid (Surrogate)	101.6	%	EPA 552.2	1	1.0	12/11/98	12/21/98	12/22/98	0-291-0
1388	HAA-ICR	Bromochloroacetic acid	2.9	µg/L	EPA 552.2	1	1.0	12/11/98	12/21/98	12/22/98	0-291-0
1389	HAA-ICR	Bromodichloroacetic acid	3.3	µg/L	EPA 552.2	1	1.0	12/11/98	12/21/98	12/22/98	0-291-0
1390	HAA-ICR	Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	12/11/98	12/21/98	12/22/98	0-291-0
1391	HAA-ICR	Dibromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	12/11/98	12/21/98	12/22/98	0-291-0
1392	HAA-ICR	Dichloroacetic acid	6.6	µg/L	EPA 552.2	1	1.0	12/11/98	12/21/98	12/22/98	0-291-0
1393	HAA-ICR	Monobromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	12/11/98	12/21/98	12/22/98	0-291-0
1394	HAA-ICR	Monochloroacetic acid	ND	µg/L	EPA 552.2	1	2.0	12/11/98	12/21/98	12/22/98	0-291-0
1395	HAA-ICR	Tribromoacetic acid	ND	µg/L	EPA 552.2	1	4.0	12/11/98	12/21/98	12/22/98	0-291-0
1396	HAA-ICR	Trichloroacetic acid	7.3	µg/L	EPA 552.2	1	1.0	12/11/98	12/21/98	12/22/98	0-291-0
1397	pH	Cl2 pH - Final	7.3	Unit	SM 4500-H+ B	1	n/a	12/10/98		12/11/98	n/a
1398	pH	Cl2 pH - Initial	7.2	Unit	SM 4500-H+ B	1	n/a	12/10/98		12/10/98	n/a
1399	pH	pH	7.1	Unit	SM 4500-H+ B	1	n/a	12/7/98		12/7/98	n/a
1400	TEMP	Cl2 Temperature	7.3	°C	SM 2550 B	1	n/a	12/10/98		12/11/98	n/a
1401	TEMP	Temperature	21.7	°C	SM 2550 B	1	n/a	12/7/98		12/7/98	n/a
1402	TIME	Cl2 Incubation Time	24.3	hrs	n/a	1	n/a	12/10/98		12/11/98	n/a
1403	TOC-ICR	TOC	2.07	mg/L	SM 5310 C	1	0.50	12/7/98		12/7/98	7-0-484
1404	TOC-ICR	TOC (Dupl)	2.09	mg/L	SM 5310 C	1	0.50	12/7/98		12/7/98	7-0-484
			2.08	mg/L	1.0 % RPD						
1405	TOX-ICR	TOX	110	µg Cl-/L	SM 5320 B	1	25	12/11/98		12/22/98	12-0-268
1406	TOX-ICR	TOX (Dupl)	115	µg Cl-/L	SM 5320 B	1	25	12/11/98		12/22/98	12-0-268
			113	µg Cl-/L	4.4 % RPD						
1407	THM-ICR	1,2,3-Trichloropropane (Surrogate)	105.6	%	EPA 551.1	1	1.0	12/11/98	12/15/98	12/15/98	0-290-0
1408	THM-ICR	Bromodichloromethane	9.2	µg/L	EPA 551.1	1	1.0	12/11/98	12/15/98	12/15/98	0-290-0
1409	THM-ICR	Bromoform	ND	µg/L	EPA 551.1	1	1.0	12/11/98	12/15/98	12/15/98	0-290-0
1410	THM-ICR	Chloroform	12.8	µg/L	EPA 551.1	1	1.0	12/11/98	12/15/98	12/15/98	0-290-0
1411	THM-ICR	Dibromochloromethane	3.4	µg/L	EPA 551.1	1	1.0	12/11/98	12/15/98	12/15/98	0-290-0
1412	UV-ICR	UV	0.035	1/cm	SM 5910 B	1	0.009	12/7/98		12/7/98	8-0-389
1413	UV-ICR	UV (Dupl)	0.034	1/cm	SM 5910 B	1	0.009	12/7/98		12/7/98	8-0-389
			0.035	1/cm	2.9 % RPD						

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

Sample ID: 185.10.pH6.5.Eff-22			S&H ID: 9811-571		Date Sampled: 12/8/98 1:59:00 PM						
#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
1414	pH	pH	7.3	Unit	SM 4500-H+ B	1	n/a	12/8/98		12/8/98	n/a
1415	TEMP	Temperature	21.1	°C	SM 2550 B	1	n/a	12/8/98		12/8/98	n/a
1416	TOC-ICR	TOC	2.25	mg/L	SM 5310 C	1	0.50	12/8/98		12/8/98	7-0-485
1417	TOC-ICR	TOC (Dupl)	2.24	mg/L	SM 5310 C	1	0.50	12/8/98		12/8/98	7-0-485
			2.25	mg/L	0.4 % RPD						
1418	UV-ICR	UV	0.038	1/cm	SM 5910 B	1	0.009	12/8/98		12/9/98	8-0-390
1419	UV-ICR	UV (Dupl)	0.038	1/cm	SM 5910 B	1	0.009	12/8/98		12/9/98	8-0-390
			0.038	1/cm	0.0 % RPD						

Sample ID: 185.10.pH6.5.Eff-6d			S&H ID: 9811-580		Date Sampled: 12/3/98 2:02:00 PM						
#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
1420	Cl2Dose	Chlorine Dose	1.52	mg/L as Cl2	SM 4500-Cl B	1	n/a	12/7/98		12/7/98	n/a
1421	Cl2Res	Chlorine Residual	0.41	mg/L as Cl2	SM 4500-Cl F	1	0.10	12/7/98		12/8/98	n/a
1422	HAA-ICR	1,2,3-Trichloropropane (IS) (Internal Standard)	107.2	%	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1423	HAA-ICR	2-Bromopropionic acid (Surrogate)	97.6	%	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1424	HAA-ICR	Bromochloroacetic acid	1.5	µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1425	HAA-ICR	Bromodichloroacetic acid	1.4	µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1426	HAA-ICR	Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	12/8/98	12/14/98	12/15/98	0-289-0
1427	HAA-ICR	Dibromoacetic acid	1.1	µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1428	HAA-ICR	Dichloroacetic acid	1.4	µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1429	HAA-ICR	Monobromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1430	HAA-ICR	Monochloroacetic acid	ND	µg/L	EPA 552.2	1	2.0	12/8/98	12/14/98	12/15/98	0-289-0
1431	HAA-ICR	Tribromoacetic acid	ND	µg/L	EPA 552.2	1	4.0	12/8/98	12/14/98	12/15/98	0-289-0
1432	HAA-ICR	Trichloroacetic acid	1.2	µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1433	pH	Cl2 pH - Final	7.3	Unit	SM 4500-H+ B	1	n/a	12/7/98		12/8/98	n/a
1434	pH	Cl2 pH - Initial	7.3	Unit	SM 4500-H+ B	1	n/a	12/7/98		12/7/98	n/a
1435	pH	pH	7.2	Unit	SM 4500-H+ B	1	n/a	12/3/98		12/3/98	n/a
1436	TEMP	Cl2 Temperature	7.4	°C	SM 2550 B	1	n/a	12/7/98		12/8/98	n/a
1437	TEMP	Temperature	23.1	°C	SM 2550 B	1	n/a	12/3/98		12/3/98	n/a
1438	TIME	Cl2 Incubation Time	23.7	hrs	n/a	1	n/a	12/7/98		12/8/98	n/a
1439	TOC-ICR	TOC	1.01	mg/L	SM 5310 C	1	0.50	12/3/98		12/3/98	7-0-480
1440	TOC-ICR	TOC (Dupl)	1.03	mg/L	SM 5310 C	1	0.50	12/3/98		12/3/98	7-0-480
			1.02	mg/L	2.0 % RPD						
1441	TOX-ICR	TOX	31	µg Cl-/L	SM 5320 B	1	25	12/8/98		12/15/98	12-0-263
1442	TOX-ICR	TOX (Dupl)	32	µg Cl-/L	SM 5320 B	1	25	12/8/98		12/15/98	12-0-263
			32	µg Cl-/L	3.1 % RPD						

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

1443	THM-ICR 1,2,3-Trichloropropane (Surrogate)	95.6 %	EPA 551.1	1	1.0	12/8/98	12/11/98	12/11/98	0-288-0
1444	THM-ICR Bromodichloromethane	2.7 µg/L	EPA 551.1	1	1.0	12/8/98	12/11/98	12/11/98	0-288-0
1445	THM-ICR Bromoform	ND µg/L	EPA 551.1	1	1.0	12/8/98	12/11/98	12/11/98	0-288-0
1446	THM-ICR Chloroform	2.1 µg/L	EPA 551.1	1	1.0	12/8/98	12/11/98	12/11/98	0-288-0
1447	THM-ICR Dibromochloromethane	2.7 µg/L	EPA 551.1	1	1.0	12/8/98	12/11/98	12/11/98	0-288-0
1448	UV-ICR UV	0.012 1/cm	SM 5910 B	1	0.009	12/3/98		12/4/98	8-0-385
1449	UV-ICR UV (Dupl)	0.012 1/cm	SM 5910 B	1	0.009	12/3/98		12/4/98	8-0-385
		<b>0.012 1/cm</b>	<b>0.0 % RPD</b>						

Sample ID: 185.10.pH6.5.Eff-8d

S&amp;H ID: 9811-581

Date Sampled: 12/4/98 1:24:00 AM

#	Analysis Type	Result Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
1450	Cl2Dose Chlorine Dose	1.93 mg/L as Cl2	SM 4500-Cl B	1	n/a	12/10/98		12/10/98	n/a
1451	Cl2Res Chlorine Residual	0.72 mg/L as Cl2	SM 4500-Cl F	1	0.10	12/10/98		12/11/98	n/a
1452	HAA-ICR 1,2,3-Trichloropropane (IS) (Internal Standard)	97.2 %	EPA 552.2	1	1.0	12/11/98	12/21/98	12/22/98	0-291-0
1453	HAA-ICR 2-Bromopropionic acid (Surrogate)	102.4 %	EPA 552.2	1	1.0	12/11/98	12/21/98	12/22/98	0-291-0
1454	HAA-ICR Bromochloroacetic acid	2.0 µg/L	EPA 552.2	1	1.0	12/11/98	12/21/98	12/22/98	0-291-0
1455	HAA-ICR Bromodichloroacetic acid	2.4 µg/L	EPA 552.2	1	1.0	12/11/98	12/21/98	12/22/98	0-291-0
1456	HAA-ICR Chlorodibromoacetic acid	ND µg/L	EPA 552.2	1	2.0	12/11/98	12/21/98	12/22/98	0-291-0
1457	HAA-ICR Dibromoacetic acid	1.0 µg/L	EPA 552.2	1	1.0	12/11/98	12/21/98	12/22/98	0-291-0
1458	HAA-ICR Dichloroacetic acid	2.8 µg/L	EPA 552.2	1	1.0	12/11/98	12/21/98	12/22/98	0-291-0
1459	HAA-ICR Monobromoacetic acid	ND µg/L	EPA 552.2	1	1.0	12/11/98	12/21/98	12/22/98	0-291-0
1460	HAA-ICR Monochloroacetic acid	ND µg/L	EPA 552.2	1	2.0	12/11/98	12/21/98	12/22/98	0-291-0
1461	HAA-ICR Tribromoacetic acid	ND µg/L	EPA 552.2	1	4.0	12/11/98	12/21/98	12/22/98	0-291-0
1462	HAA-ICR Trichloroacetic acid	2.7 µg/L	EPA 552.2	1	1.0	12/11/98	12/21/98	12/22/98	0-291-0
1463	pH Cl2 pH - Final	7.4 Unit	SM 4500-H+ B	1	n/a	12/10/98		12/11/98	n/a
1464	pH Cl2 pH - Initial	7.3 Unit	SM 4500-H+ B	1	n/a	12/10/98		12/10/98	n/a
1465	pH pH	7.3 Unit	SM 4500-H+ B	1	n/a	12/4/98		12/4/98	n/a
1466	TEMP Cl2 Temperature	7.3 °C	SM 2550 B	1	n/a	12/10/98		12/11/98	n/a
1467	TEMP Temperature	23.5 °C	SM 2550 B	1	n/a	12/4/98		12/4/98	n/a
1468	TIME Cl2 Incubation Time	24.1 hrs	n/a	1	n/a	12/10/98		12/11/98	n/a
1469	TOC-ICR TOC	1.30 mg/L	SM 5310 C	1	0.50	12/4/98		12/4/98	7-0-481
1470	TOC-ICR TOC (Dupl)	1.32 mg/L	SM 5310 C	1	0.50	12/4/98		12/4/98	7-0-481
		<b>1.31 mg/L</b>	<b>1.5 % RPD</b>						
1471	TOX-ICR TOX	54 µg Cl-/L	SM 5320 B	1	25	12/11/98		12/21/98	12-0-267
1472	TOX-ICR TOX (Dupl)	52 µg Cl-/L	SM 5320 B	1	25	12/11/98		12/21/98	12-0-267
		<b>53 µg Cl-/L</b>	<b>3.8 % RPD</b>						
1473	THM-ICR 1,2,3-Trichloropropane (Surrogate)	92.0 %	EPA 551.1	1	1.0	12/11/98	12/15/98	12/15/98	0-290-0

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

1474	THM-ICR Bromodichloromethane	4.0 µg/L	EPA 551.1	1	1.0	12/11/98	12/15/98	12/15/98	0-290-0
1475	THM-ICR Bromoform	ND µg/L	EPA 551.1	1	1.0	12/11/98	12/15/98	12/15/98	0-290-0
1476	THM-ICR Chloroform	3.8 µg/L	EPA 551.1	1	1.0	12/11/98	12/15/98	12/15/98	0-290-0
1477	THM-ICR Dibromochloromethane	2.8 µg/L	EPA 551.1	1	1.0	12/11/98	12/15/98	12/15/98	0-290-0
1478	UV-ICR UV	0.017 1/cm	SM 5910 B	1	0.009	12/4/98		12/4/98	8-0-385
1479	UV-ICR UV (Dupl)	0.017 1/cm	SM 5910 B	1	0.009	12/4/98		12/4/98	8-0-385
		<b>0.017 1/cm</b>	<b>0.0 % RPD</b>						

Sample ID: 185.10.pH6.5.Eff-12d

S&amp;H ID: 9811-583

Date Sampled: 12/5/98 12:30:00 AM

#	Analysis Type	Result Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
1480	Cl2Dose Chlorine Dose	2.01 mg/L as Cl2	SM 4500-Cl B	1	n/a	12/10/98		12/10/98	n/a
1481	Cl2Res Chlorine Residual	0.69 mg/L as Cl2	SM 4500-Cl F	1	0.10	12/10/98		12/11/98	n/a
1482	HAA-ICR 1,2,3-Trichloropropane (IS) (Internal Standard)	98.0 %	EPA 552.2	1	1.0	12/11/98	12/21/98	12/22/98	0-291-0
1483	HAA-ICR 2-Bromopropionic acid (Surrogate)	100.4 %	EPA 552.2	1	1.0	12/11/98	12/21/98	12/22/98	0-291-0
1484	HAA-ICR Bromochloroacetic acid	2.5 µg/L	EPA 552.2	1	1.0	12/11/98	12/21/98	12/22/98	0-291-0
1485	HAA-ICR Bromodichloroacetic acid	2.6 µg/L	EPA 552.2	1	1.0	12/11/98	12/21/98	12/22/98	0-291-0
1486	HAA-ICR Chlorodibromoacetic acid	ND µg/L	EPA 552.2	1	2.0	12/11/98	12/21/98	12/22/98	0-291-0
1487	HAA-ICR Dibromoacetic acid	ND µg/L	EPA 552.2	1	1.0	12/11/98	12/21/98	12/22/98	0-291-0
1488	HAA-ICR Dichloroacetic acid	4.0 µg/L	EPA 552.2	1	1.0	12/11/98	12/21/98	12/22/98	0-291-0
1489	HAA-ICR Monobromoacetic acid	ND µg/L	EPA 552.2	1	1.0	12/11/98	12/21/98	12/22/98	0-291-0
1490	HAA-ICR Monochloroacetic acid	ND µg/L	EPA 552.2	1	2.0	12/11/98	12/21/98	12/22/98	0-291-0
1491	HAA-ICR Tribromoacetic acid	ND µg/L	EPA 552.2	1	4.0	12/11/98	12/21/98	12/22/98	0-291-0
1492	HAA-ICR Trichloroacetic acid	4.2 µg/L	EPA 552.2	1	1.0	12/11/98	12/21/98	12/22/98	0-291-0
1493	pH Cl2 pH - Final	7.4 Unit	SM 4500-H+ B	1	n/a	12/10/98		12/11/98	n/a
1494	pH Cl2 pH - Initial	7.3 Unit	SM 4500-H+ B	1	n/a	12/10/98		12/10/98	n/a
1495	pH pH	7.3 Unit	SM 4500-H+ B	1	n/a	12/5/98		12/5/98	n/a
1496	TEMP Cl2 Temperature	7.3 °C	SM 2550 B	1	n/a	12/10/98		12/11/98	n/a
1497	TEMP Temperature	23.7 °C	SM 2550 B	1	n/a	12/5/98		12/5/98	n/a
1498	TIME Cl2 Incubation Time	24.1 hrs	n/a	1	n/a	12/10/98		12/11/98	n/a
1499	TOC-ICR TOC	1.65 mg/L	SM 5310 C	1	0.50	12/5/98		12/5/98	7-0-482
1500	TOC-ICR TOC (Dupl)	1.61 mg/L	SM 5310 C	1	0.50	12/5/98		12/5/98	7-0-482
		<b>1.63 mg/L</b>	<b>2.5 % RPD</b>						
1501	TOX-ICR TOX	80 µg Cl-/L	SM 5320 B	1	25	12/11/98		12/21/98	12-0-267
1502	TOX-ICR TOX (Dupl)	78 µg Cl-/L	SM 5320 B	1	25	12/11/98		12/21/98	12-0-267
		<b>79 µg Cl-/L</b>	<b>2.5 % RPD</b>						
1503	THM-ICR 1,2,3-Trichloropropane (Surrogate)	96.4 %	EPA 551.1	1	1.0	12/11/98	12/15/98	12/15/98	0-290-0
1504	THM-ICR Bromodichloromethane	5.8 µg/L	EPA 551.1	1	1.0	12/11/98	12/15/98	12/15/98	0-290-0
1505	THM-ICR Bromoform	ND µg/L	EPA 551.1	1	1.0	12/11/98	12/15/98	12/15/98	0-290-0

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

1506	THM-ICR Chloroform	6.2 µg/L	EPA 551.1	1	1.0	12/11/98	12/15/98	12/15/98	0-290-0
1507	THM-ICR Dibromochloromethane	3.0 µg/L	EPA 551.1	1	1.0	12/11/98	12/15/98	12/15/98	0-290-0
1508	UV-ICR UV	0.025 1/cm	SM 5910 B	1	0.009	12/5/98		12/5/98	8-0-387
1509	UV-ICR UV (Dupl)	0.025 1/cm	SM 5910 B	1	0.009	12/5/98		12/5/98	8-0-387
		<b>0.025 1/cm</b>	<b>0.0 % RPD</b>						

Sample ID: 185.10.pH6.5.Eff-15d

S&amp;H ID: 9811-585

Date Sampled: 12/5/98 5:37:00 PM

#	Analysis Type	Result Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
1510	Cl2Dose Chlorine Dose	1.49 mg/L as Cl2	SM 4500-Cl B	1	n/a	12/8/98		12/8/98	n/a
1511	Cl2Res Chlorine Residual	0.13 mg/L as Cl2	SM 4500-Cl F	1	0.10	12/8/98		12/9/98	n/a
1512	HAA-ICR 1,2,3-Trichloropropane (IS) (Internal Standard)	96.4 %	EPA 552.2	1	1.0	12/9/98	12/21/98	12/21/98	0-291-0
1513	HAA-ICR 2-Bromopropionic acid (Surrogate)	97.2 %	EPA 552.2	1	1.0	12/9/98	12/21/98	12/21/98	0-291-0
1514	HAA-ICR Bromochloroacetic acid	2.3 µg/L	EPA 552.2	1	1.0	12/9/98	12/21/98	12/21/98	0-291-0
1515	HAA-ICR Bromodichloroacetic acid	1.9 µg/L	EPA 552.2	1	1.0	12/9/98	12/21/98	12/21/98	0-291-0
1516	HAA-ICR Chlorodibromoacetic acid	ND µg/L	EPA 552.2	1	2.0	12/9/98	12/21/98	12/21/98	0-291-0
1517	HAA-ICR Dibromoacetic acid	ND µg/L	EPA 552.2	1	1.0	12/9/98	12/21/98	12/21/98	0-291-0
1518	HAA-ICR Dichloroacetic acid	4.1 µg/L	EPA 552.2	1	1.0	12/9/98	12/21/98	12/21/98	0-291-0
1519	HAA-ICR Monobromoacetic acid	ND µg/L	EPA 552.2	1	1.0	12/9/98	12/21/98	12/21/98	0-291-0
1520	HAA-ICR Monochloroacetic acid	ND µg/L	EPA 552.2	1	2.0	12/9/98	12/21/98	12/21/98	0-291-0
1521	HAA-ICR Tribromoacetic acid	ND µg/L	EPA 552.2	1	4.0	12/9/98	12/21/98	12/21/98	0-291-0
1522	HAA-ICR Trichloroacetic acid	3.3 µg/L	EPA 552.2	1	1.0	12/9/98	12/21/98	12/21/98	0-291-0
1523	pH Cl2 pH - Final	7.4 Unit	SM 4500-H+ B	1	n/a	12/8/98		12/9/98	n/a
1524	pH Cl2 pH - Initial	7.3 Unit	SM 4500-H+ B	1	n/a	12/8/98		12/8/98	n/a
1525	pH pH	7.4 Unit	SM 4500-H+ B	1	n/a	12/5/98		12/5/98	n/a
1526	TEMP Cl2 Temperature	7.5 °C	SM 2550 B	1	n/a	12/8/98		12/9/98	n/a
1527	TEMP Temperature	23.0 °C	SM 2550 B	1	n/a	12/5/98		12/5/98	n/a
1528	TIME Cl2 Incubation Time	23.9 hrs	n/a	1	n/a	12/8/98		12/9/98	n/a
1529	TOC-ICR TOC	1.83 mg/L	SM 5310 C	1	0.50	12/5/98		12/6/98	7-0-483
1530	TOC-ICR TOC (Dupl)	1.79 mg/L	SM 5310 C	1	0.50	12/5/98		12/6/98	7-0-483
		<b>1.81 mg/L</b>	<b>2.2 % RPD</b>						
1531	TOX-ICR TOX	77 µg Cl-/L	SM 5320 B	1	25	12/9/98		12/17/98	12-0-265
1532	TOX-ICR TOX (Dupl)	80 µg Cl-/L	SM 5320 B	1	25	12/9/98		12/17/98	12-0-265
		<b>79 µg Cl-/L</b>	<b>3.8 % RPD</b>						
1533	THM-ICR 1,2,3-Trichloropropane (Surrogate)	102.4 %	EPA 551.1	1	1.0	12/9/98	12/15/98	12/15/98	0-290-0
1534	THM-ICR Bromodichloromethane	6.2 µg/L	EPA 551.1	1	1.0	12/9/98	12/15/98	12/15/98	0-290-0
1535	THM-ICR Bromoform	ND µg/L	EPA 551.1	1	1.0	12/9/98	12/15/98	12/15/98	0-290-0
1536	THM-ICR Chloroform	6.6 µg/L	EPA 551.1	1	1.0	12/9/98	12/15/98	12/15/98	0-290-0
1537	THM-ICR Dibromochloromethane	3.0 µg/L	EPA 551.1	1	1.0	12/9/98	12/15/98	12/15/98	0-290-0

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

1538	UV-ICR	UV	0.029	1/cm	SM 5910 B	1	0.009	12/5/98	12/6/98	8-0-388
1539	UV-ICR	UV (Dupl)	0.029	1/cm	SM 5910 B	1	0.009	12/5/98	12/6/98	8-0-388
			<b>0.029</b>	<b>1/cm</b>	<b>0.0 % RPD</b>					

Sample ID: 185.Inf.pH6.5.A-1

S&amp;H ID: 9811-590

Date Sampled: 11/30/98 2:30:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
1540	ALK	Alkalinity	104	mg/L	SM 2320 B	1	5	11/30/98		11/30/98	1-0-39
1541	ALK	Alkalinity (Dupl)	103	mg/L	SM 2320 B	1	5	11/30/98		11/30/98	1-0-39
			<b>104</b>	<b>mg/L</b>	<b>1.0 % RPD</b>						
1542	NH3	Ammonia Nitrogen	ND	mg/L	EPA 350.1	1	0.05	11/30/98		12/9/98	MW88718
1543	BR	Bromide	0.032	mg/L	EPA 300.0 A	1	0.020	11/30/98		12/7/98	MW88492
1544	CaHardM	Calcium Hardness	138	mg/L CaCO3	EPA 200.7	1	5	11/30/98		12/9/98	MW n/a
1545	CaMW	Calcium, Total, ICAP	55	mg/L	EPA 200.7	1	1	11/30/98	12/9/98	12/9/98	MW88543
1546	MgMW	Magnesium, Total, ICAP	21	mg/L	EPA 200.7	1	0	11/30/98	12/9/98	12/9/98	MW88546
1547	TotHard	Total Hardness as CaCO3 by ICP	223	mg/L CaCO3	SM 2340B	1	7	11/30/98		12/9/98	MW n/a

Sample ID: 185.Inf.pH6.5.A-2

S&amp;H ID: 9811-591

Date Sampled: 12/7/98 1:35:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
1548	ALK	Alkalinity	71	mg/L	SM 2320 B	1	5	12/7/98		12/7/98	1-0-39
1549	ALK	Alkalinity (Dupl)	72	mg/L	SM 2320 B	1	5	12/7/98		12/7/98	1-0-39
			<b>72</b>	<b>mg/L</b>	<b>1.4 % RPD</b>						
1550	NH3	Ammonia Nitrogen	ND	mg/L	EPA 350.1	1	0.05	12/7/98		12/9/98	MW88721
1551	BR	Bromide	0.031	mg/L	EPA 300.0 A	1	0.020	12/7/98		12/15/98	MW89070
1552	CaHardM	Calcium Hardness	126	mg/L CaCO3	EPA 200.7	1	5	12/7/98		12/11/98	MW n/a
1553	CaMW	Calcium, Total, ICAP	50	mg/L	EPA 200.7	1	1	12/7/98	12/11/98	12/11/98	MW88787
1554	MgMW	Magnesium, Total, ICAP	20	mg/L	EPA 200.7	1	0	12/7/98	12/11/98	12/11/98	MW88799
1555	TotHard	Total Hardness as CaCO3 by ICP	208	mg/L CaCO3	SM 2340B	1	7	12/7/98		12/11/98	MW n/a

Sample ID: 185.Inf.pH6.5.B-1

S&amp;H ID: 9811-592

Date Sampled: 11/30/98 2:35:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
1556	Cl2Dose	Chlorine Dose	3.30	mg/L as Cl2	SM 4500-Cl B	1	n/a	12/3/98		12/3/98	n/a
1557	Cl2Res	Chlorine Residual	0.95	mg/L as Cl2	SM 4500-Cl F	1	0.10	12/3/98		12/4/98	n/a
1558	HAA-ICR	1,2,3-Trichloropropane (IS) (Internal Standard)	103.2	%	EPA 552.2	1	1.0	12/4/98	12/14/98	12/14/98	0-289-0
1559	HAA-ICR	2-Bromopropionic acid (Surrogate)	98.0	%	EPA 552.2	1	1.0	12/4/98	12/14/98	12/14/98	0-289-0

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

1560	HAA-ICR	Bromochloroacetic acid	3.0 µg/L	EPA 552.2	1	1.0	12/4/98	12/14/98	12/14/98	0-289-0
1561	HAA-ICR	Bromodichloroacetic acid	4.4 µg/L	EPA 552.2	1	1.0	12/4/98	12/14/98	12/14/98	0-289-0
1562	HAA-ICR	Chlorodibromoacetic acid	ND µg/L	EPA 552.2	1	2.0	12/4/98	12/14/98	12/14/98	0-289-0
1563	HAA-ICR	Dibromoacetic acid	ND µg/L	EPA 552.2	1	1.0	12/4/98	12/14/98	12/14/98	0-289-0
1564	HAA-ICR	Dichloroacetic acid	11.9 µg/L	EPA 552.2	1	1.0	12/4/98	12/14/98	12/14/98	0-289-0
1565	HAA-ICR	Monobromoacetic acid	ND µg/L	EPA 552.2	1	1.0	12/4/98	12/14/98	12/14/98	0-289-0
1566	HAA-ICR	Monochloroacetic acid	ND µg/L	EPA 552.2	1	2.0	12/4/98	12/14/98	12/14/98	0-289-0
1567	HAA-ICR	Tribromoacetic acid	ND µg/L	EPA 552.2	1	4.0	12/4/98	12/14/98	12/14/98	0-289-0
1568	HAA-ICR	Trichloroacetic acid	17.3 µg/L	EPA 552.2	1	1.0	12/4/98	12/14/98	12/14/98	0-289-0
1569	pH	Cl2 pH - Final	7.2 Unit	SM 4500-H+ B	1	n/a	12/3/98		12/4/98	n/a
1570	pH	Cl2 pH - Initial	7.2 Unit	SM 4500-H+ B	1	n/a	12/3/98		12/3/98	n/a
1571	pH	pH	6.7 Unit	SM 4500-H+ B	1	n/a	11/30/98		11/30/98	n/a
1572	TEMP	Cl2 Temperature	7.5 °C	SM 2550 B	1	n/a	12/3/98		12/4/98	n/a
1573	TEMP	Temperature	18.5 °C	SM 2550 B	1	n/a	11/30/98		11/30/98	n/a
1574	TIME	Cl2 Incubation Time	24.0 hrs	n/a	1	n/a	12/3/98		12/4/98	n/a
1575	TOC-ICR	TOC	2.79 mg/L	SM 5310 C	1	0.50	11/30/98		11/30/98	7-0-477
1576	TOC-ICR	TOC (Dupl)	2.82 mg/L	SM 5310 C	1	0.50	11/30/98		11/30/98	7-0-477
			<b>2.80 mg/L</b>	<b>1.1 % RPD</b>						
1577	TOX-ICR	TOX	226 µg Cl-/L	SM 5320 B	1	25	12/4/98		12/14/98	12-0-262
1578	TOX-ICR	TOX (Dupl)	215 µg Cl-/L	SM 5320 B	1	25	12/4/98		12/14/98	12-0-262
			<b>221 µg Cl-/L</b>	<b>5.0 % RPD</b>						
1579	THM-ICR	1,2,3-Trichloropropane (Surrogate)	101.2 %	EPA 551.1	1	1.0	12/4/98	12/11/98	12/11/98	0-288-0
1580	THM-ICR	Bromodichloromethane	9.8 µg/L	EPA 551.1	1	1.0	12/4/98	12/11/98	12/11/98	0-288-0
1581	THM-ICR	Bromoform	ND µg/L	EPA 551.1	1	1.0	12/4/98	12/11/98	12/11/98	0-288-0
1582	THM-ICR	Chloroform	23.4 µg/L	EPA 551.1	1	1.0	12/4/98	12/11/98	12/11/98	0-288-0
1583	THM-ICR	Dibromochloromethane	1.8 µg/L	EPA 551.1	1	1.0	12/4/98	12/11/98	12/11/98	0-288-0
1584	TURB	Turbidity	0.15 ntu	SM 2130 B	1	0.05	11/30/98		11/30/98	9-0-22
1585	UV-ICR	UV	0.060 1/cm	SM 5910 B	1	0.009	11/30/98		12/1/98	8-0-382
1586	UV-ICR	UV (Dupl)	0.060 1/cm	SM 5910 B	1	0.009	11/30/98		12/1/98	8-0-382
			<b>0.060 1/cm</b>	<b>0.0 % RPD</b>						

Sample ID: 185.Inf.pH6.5.B-2

S&amp;H ID: 9811-593

Date Sampled: 12/3/98 10:23:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Sample	Prep.	Anal.	QC Batch
1587	pH	pH	6.5	Unit	SM 4500-H+ B	1	n/a	12/3/98		12/3/98	n/a
1588	TEMP	Temperature	19.8	°C	SM 2550 B	1	n/a	12/3/98		12/3/98	n/a
1589	TOC-ICR	TOC	2.82	mg/L	SM 5310 C	1	0.50	12/3/98		12/3/98	7-0-480
1590	TOC-ICR	TOC (Dupl)	2.83	mg/L	SM 5310 C	1	0.50	12/3/98		12/3/98	7-0-480
			<b>2.83 mg/L</b>		<b>0.4 % RPD</b>						

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.



**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

Sample ID: 185.Inf.pH6.5.B-3			S&H ID: 9811-594		Date Sampled: 12/6/98 2:45:00 PM						
#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
1591	pH	pH	6.5	Unit	SM 4500-H+ B	1	n/a	12/6/98		12/6/98	n/a
1592	TEMP	Temperature	19.1	°C	SM 2550 B	1	n/a	12/6/98		12/6/98	n/a
1593	TOC-ICR	TOC	2.75	mg/L	SM 5310 C	1	0.50	12/6/98		12/6/98	7-0-483
1594	TOC-ICR	TOC (Dupl)	2.73	mg/L	SM 5310 C	1	0.50	12/6/98		12/6/98	7-0-483
			2.74	mg/L	0.7 % RPD						

Sample ID: 185.Inf.pH6.5.B-4			S&H ID: 9811-595		Date Sampled: 12/7/98 1:35:00 PM						
#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
1595	Cl2Dose	Chlorine Dose	3.15	mg/L as Cl2	SM 4500-Cl B	1	n/a	12/8/98		12/8/98	n/a
1596	Cl2Res	Chlorine Residual	0.89	mg/L as Cl2	SM 4500-Cl F	1	0.10	12/8/98		12/9/98	n/a
1597	HAA-ICR	1,2,3-Trichloropropane (IS) (Internal Standard)	106.0	%	EPA 552.2	1	1.0	12/9/98	12/21/98	12/21/98	0-291-0
1598	HAA-ICR	2-Bromopropionic acid (Surrogate)	96.8	%	EPA 552.2	1	1.0	12/9/98	12/21/98	12/21/98	0-291-0
1599	HAA-ICR	Bromochloroacetic acid	3.4	µg/L	EPA 552.2	1	1.0	12/9/98	12/21/98	12/21/98	0-291-0
1600	HAA-ICR	Bromodichloroacetic acid	4.8	µg/L	EPA 552.2	1	1.0	12/9/98	12/21/98	12/21/98	0-291-0
1601	HAA-ICR	Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	12/9/98	12/21/98	12/21/98	0-291-0
1602	HAA-ICR	Dibromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	12/9/98	12/21/98	12/21/98	0-291-0
1603	HAA-ICR	Dichloroacetic acid	13.2	µg/L	EPA 552.2	1	1.0	12/9/98	12/21/98	12/21/98	0-291-0
1604	HAA-ICR	Monobromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	12/9/98	12/21/98	12/21/98	0-291-0
1605	HAA-ICR	Monochloroacetic acid	ND	µg/L	EPA 552.2	1	2.0	12/9/98	12/21/98	12/21/98	0-291-0
1606	HAA-ICR	Tribromoacetic acid	ND	µg/L	EPA 552.2	1	4.0	12/9/98	12/21/98	12/21/98	0-291-0
1607	HAA-ICR	Trichloroacetic acid	18.2	µg/L	EPA 552.2	1	1.0	12/9/98	12/21/98	12/21/98	0-291-0
1608	pH	Cl2 pH - Final	7.3	Unit	SM 4500-H+ B	1	n/a	12/8/98		12/9/98	n/a
1609	pH	Cl2 pH - Initial	7.3	Unit	SM 4500-H+ B	1	n/a	12/8/98		12/8/98	n/a
1610	pH	pH	6.5	Unit	SM 4500-H+ B	1	n/a	12/7/98		12/7/98	n/a
1611	TEMP	Cl2 Temperature	7.5	°C	SM 2550 B	1	n/a	12/8/98		12/9/98	n/a
1612	TEMP	Temperature	18.2	°C	SM 2550 B	1	n/a	12/7/98		12/7/98	n/a
1613	TIME	Cl2 Incubation Time	23.9	hrs	n/a	1	n/a	12/8/98		12/9/98	n/a
1614	TOC-ICR	TOC	2.76	mg/L	SM 5310 C	1	0.50	12/7/98		12/7/98	7-0-484
1615	TOC-ICR	TOC (Dupl)	2.76	mg/L	SM 5310 C	1	0.50	12/7/98		12/7/98	7-0-484
			2.76	mg/L	0.0 % RPD						
1616	TOX-ICR	TOX	206	µg Cl-/L	SM 5320 B	1	25	12/9/98		12/18/98	12-0-266
1617	TOX-ICR	TOX (Dupl)	204	µg Cl-/L	SM 5320 B	1	25	12/9/98		12/18/98	12-0-266
			205	µg Cl-/L	1.0 % RPD						
1618	THM-ICR	1,2,3-Trichloropropane (Surrogate)	106.8	%	EPA 551.1	1	1.0	12/9/98	12/15/98	12/15/98	0-290-0
1619	THM-ICR	Bromodichloromethane	10.6	µg/L	EPA 551.1	1	1.0	12/9/98	12/15/98	12/15/98	0-290-0

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

1620	THM-ICR Bromoform	ND µg/L	EPA 551.1	1	1.0	12/9/98	12/15/98	12/15/98	0-290-0
1621	THM-ICR Chloroform	23.5 µg/L	EPA 551.1	1	1.0	12/9/98	12/15/98	12/15/98	0-290-0
1622	THM-ICR Dibromochloromethane	2.5 µg/L	EPA 551.1	1	1.0	12/9/98	12/15/98	12/15/98	0-290-0
1623	TURB Turbidity	0.20 ntu	SM 2130 B	1	0.05	12/7/98		12/7/98	9-0-22
1624	UV-ICR UV	0.060 1/cm	SM 5910 B	1	0.009	12/7/98		12/7/98	8-0-389
1625	UV-ICR UV (Dupl)	0.060 1/cm	SM 5910 B	1	0.009	12/7/98		12/7/98	8-0-389
		<b>0.060 1/cm</b>	<b>0.0 % RPD</b>						

Sample ID: 185.10.pH7.5.Eff-1

S&amp;H ID: 9811-596

Date Sampled: 11/30/98 8:24:00 PM

#	Analysis Type	Result Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
1626	Cl2Dose Chlorine Dose	1.77 mg/L as Cl2	SM 4500-Cl B	1	n/a	12/3/98		12/3/98	n/a
1627	Cl2Res Chlorine Residual	0.91 mg/L as Cl2	SM 4500-Cl F	1	0.10	12/3/98		12/4/98	n/a
1628	HAA-ICR 1,2,3-Trichloropropane (IS) (Internal Standard)	100.8 %	EPA 552.2	1	1.0	12/4/98	12/14/98	12/14/98	0-289-0
1629	HAA-ICR 2-Bromopropionic acid (Surrogate)	92.4 %	EPA 552.2	1	1.0	12/4/98	12/14/98	12/14/98	0-289-0
1630	HAA-ICR Bromochloroacetic acid	ND µg/L	EPA 552.2	1	1.0	12/4/98	12/14/98	12/14/98	0-289-0
1631	HAA-ICR Bromodichloroacetic acid	ND µg/L	EPA 552.2	1	1.0	12/4/98	12/14/98	12/14/98	0-289-0
1632	HAA-ICR Chlorodibromoacetic acid	ND µg/L	EPA 552.2	1	2.0	12/4/98	12/14/98	12/14/98	0-289-0
1633	HAA-ICR Dibromoacetic acid	ND µg/L	EPA 552.2	1	1.0	12/4/98	12/14/98	12/14/98	0-289-0
1634	HAA-ICR Dichloroacetic acid	ND µg/L	EPA 552.2	1	1.0	12/4/98	12/14/98	12/14/98	0-289-0
1635	HAA-ICR Monobromoacetic acid	ND µg/L	EPA 552.2	1	1.0	12/4/98	12/14/98	12/14/98	0-289-0
1636	HAA-ICR Monochloroacetic acid	ND µg/L	EPA 552.2	1	2.0	12/4/98	12/14/98	12/14/98	0-289-0
1637	HAA-ICR Tribromoacetic acid	ND µg/L	EPA 552.2	1	4.0	12/4/98	12/14/98	12/14/98	0-289-0
1638	HAA-ICR Trichloroacetic acid	ND µg/L	EPA 552.2	1	1.0	12/4/98	12/14/98	12/14/98	0-289-0
1639	pH Cl2 pH - Final	7.5 Unit	SM 4500-H+ B	1	n/a	12/3/98		12/4/98	n/a
1640	pH Cl2 pH - Initial	7.3 Unit	SM 4500-H+ B	1	n/a	12/3/98		12/3/98	n/a
1641	pH pH	8.4 Unit	SM 4500-H+ B	1	n/a	11/30/98		11/30/98	n/a
1642	TEMP Cl2 Temperature	7.5 °C	SM 2550 B	1	n/a	12/3/98		12/4/98	n/a
1643	TEMP Temperature	24.1 °C	SM 2550 B	1	n/a	11/30/98		11/30/98	n/a
1644	TIME Cl2 Incubation Time	24.0 hrs	n/a	1	n/a	12/3/98		12/4/98	n/a
1645	TOC-ICR TOC	ND mg/L	SM 5310 C	1	0.50	11/30/98		12/1/98	7-0-478
1646	TOC-ICR TOC (Dupl)	ND mg/L	SM 5310 C	1	0.50	11/30/98		12/1/98	7-0-478
		<b>ND mg/L</b>							
1647	TOX-ICR TOX	ND µg Cl-/L	SM 5320 B	1	25	12/4/98		12/14/98	12-0-262
1648	TOX-ICR TOX (Dupl)	ND µg Cl-/L	SM 5320 B	1	25	12/4/98		12/14/98	12-0-262
		<b>ND µg Cl-/L</b>							
1649	THM-ICR 1,2,3-Trichloropropane (Surrogate)	95.6 %	EPA 551.1	1	1.0	12/4/98	12/11/98	12/11/98	0-288-0
1650	THM-ICR Bromodichloromethane	ND µg/L	EPA 551.1	1	1.0	12/4/98	12/11/98	12/11/98	0-288-0
1651	THM-ICR Bromoform	ND µg/L	EPA 551.1	1	1.0	12/4/98	12/11/98	12/11/98	0-288-0

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

1652	THM-ICR Chloroform	ND µg/L	EPA 551.1	1	1.0	12/4/98	12/11/98	12/11/98	0-288-0
1653	THM-ICR Dibromochloromethane	ND µg/L	EPA 551.1	1	1.0	12/4/98	12/11/98	12/11/98	0-288-0
1654	UV-ICR UV	ND 1/cm	SM 5910 B	1	0.009	11/30/98		12/1/98	8-0-382
1655	UV-ICR UV (Dupl)	ND 1/cm	SM 5910 B	1	0.009	11/30/98		12/1/98	8-0-382
		<b>ND 1/cm</b>							

Sample ID: 185.10.pH7.5.Eff-2

S&amp;H ID: 9811-597

Date Sampled: 12/1/98 8:46:00 PM

#	Analysis Type	Result Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
1656	Cl2Dose Chlorine Dose	1.90 mg/L as Cl2	SM 4500-Cl B	1	n/a	12/3/98		12/3/98	n/a
1657	Cl2Res Chlorine Residual	1.05 mg/L as Cl2	SM 4500-Cl F	1	0.10	12/3/98		12/4/98	n/a
1658	HAA-ICR 1,2,3-Trichloropropane (IS) (Internal Standard)	105.2 %	EPA 552.2	1	1.0	12/4/98	12/14/98	12/14/98	0-289-0
1659	HAA-ICR 2-Bromopropionic acid (Surrogate)	94.8 %	EPA 552.2	1	1.0	12/4/98	12/14/98	12/14/98	0-289-0
1660	HAA-ICR Bromochloroacetic acid	ND µg/L	EPA 552.2	1	1.0	12/4/98	12/14/98	12/14/98	0-289-0
1661	HAA-ICR Bromodichloroacetic acid	ND µg/L	EPA 552.2	1	1.0	12/4/98	12/14/98	12/14/98	0-289-0
1662	HAA-ICR Chlorodibromoacetic acid	ND µg/L	EPA 552.2	1	2.0	12/4/98	12/14/98	12/14/98	0-289-0
1663	HAA-ICR Dibromoacetic acid	ND µg/L	EPA 552.2	1	1.0	12/4/98	12/14/98	12/14/98	0-289-0
1664	HAA-ICR Dichloroacetic acid	ND µg/L	EPA 552.2	1	1.0	12/4/98	12/14/98	12/14/98	0-289-0
1665	HAA-ICR Monobromoacetic acid	ND µg/L	EPA 552.2	1	1.0	12/4/98	12/14/98	12/14/98	0-289-0
1666	HAA-ICR Monochloroacetic acid	ND µg/L	EPA 552.2	1	2.0	12/4/98	12/14/98	12/14/98	0-289-0
1667	HAA-ICR Tribromoacetic acid	ND µg/L	EPA 552.2	1	4.0	12/4/98	12/14/98	12/14/98	0-289-0
1668	HAA-ICR Trichloroacetic acid	ND µg/L	EPA 552.2	1	1.0	12/4/98	12/14/98	12/14/98	0-289-0
1669	pH Cl2 pH - Final	7.4 Unit	SM 4500-H+ B	1	n/a	12/3/98		12/4/98	n/a
1670	pH Cl2 pH - Initial	7.3 Unit	SM 4500-H+ B	1	n/a	12/3/98		12/3/98	n/a
1671	pH pH	8.2 Unit	SM 4500-H+ B	1	n/a	12/1/98		12/1/98	n/a
1672	TEMP Cl2 Temperature	7.5 °C	SM 2550 B	1	n/a	12/3/98		12/4/98	n/a
1673	TEMP Temperature	23.7 °C	SM 2550 B	1	n/a	12/1/98		12/1/98	n/a
1674	TIME Cl2 Incubation Time	24.1 hrs	n/a	1	n/a	12/3/98		12/4/98	n/a
1675	TOC-ICR TOC	ND mg/L	SM 5310 C	1	0.50	12/1/98		12/2/98	7-0-479
1676	TOC-ICR TOC (Dupl)	ND mg/L	SM 5310 C	1	0.50	12/1/98		12/2/98	7-0-479
		<b>ND mg/L</b>							
1677	TOX-ICR TOX	ND µg Cl-/L	SM 5320 B	1	25	12/4/98		12/11/98	12-0-261
1678	TOX-ICR TOX (Dupl)	ND µg Cl-/L	SM 5320 B	1	25	12/4/98		12/11/98	12-0-261
		<b>ND µg Cl-/L</b>							
1679	THM-ICR 1,2,3-Trichloropropane (Surrogate)	102.0 %	EPA 551.1	1	1.0	12/4/98	12/11/98	12/11/98	0-288-0
1680	THM-ICR Bromodichloromethane	ND µg/L	EPA 551.1	1	1.0	12/4/98	12/11/98	12/11/98	0-288-0
1681	THM-ICR Bromoform	ND µg/L	EPA 551.1	1	1.0	12/4/98	12/11/98	12/11/98	0-288-0
1682	THM-ICR Chloroform	ND µg/L	EPA 551.1	1	1.0	12/4/98	12/11/98	12/11/98	0-288-0
1683	THM-ICR Dibromochloromethane	ND µg/L	EPA 551.1	1	1.0	12/4/98	12/11/98	12/11/98	0-288-0

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

1684	UV-ICR	UV	ND	1/cm	SM 5910 B	1	0.009	12/1/98	12/2/98	8-0-383
1685	UV-ICR	UV (Dupl)	ND	1/cm	SM 5910 B	1	0.009	12/1/98	12/2/98	8-0-383
			ND	1/cm						

Sample ID: 185.10.pH7.5.Eff-4			S&H ID: 9811-599			Date Sampled: 12/2/98 9:05:00 AM				
#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal. QC Batch
1686	Cl2Dose	Chlorine Dose	2.00	mg/L as Cl2	SM 4500-Cl B	1	n/a	12/3/98		12/3/98 n/a
1687	Cl2Res	Chlorine Residual	1.16	mg/L as Cl2	SM 4500-Cl F	1	0.10	12/3/98		12/4/98 n/a
1688	HAA-ICR	1,2,3-Trichloropropane (IS) (Internal Standard)	103.6	%	EPA 552.2	1	1.0	12/4/98	12/14/98	12/14/98 0-289-0
1689	HAA-ICR	2-Bromopropionic acid (Surrogate)	98.8	%	EPA 552.2	1	1.0	12/4/98	12/14/98	12/14/98 0-289-0
1690	HAA-ICR	Bromochloroacetic acid	ND	µg/L	EPA 552.2	1	1.0	12/4/98	12/14/98	12/14/98 0-289-0
1691	HAA-ICR	Bromodichloroacetic acid	ND	µg/L	EPA 552.2	1	1.0	12/4/98	12/14/98	12/14/98 0-289-0
1692	HAA-ICR	Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	12/4/98	12/14/98	12/14/98 0-289-0
1693	HAA-ICR	Dibromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	12/4/98	12/14/98	12/14/98 0-289-0
1694	HAA-ICR	Dichloroacetic acid	ND	µg/L	EPA 552.2	1	1.0	12/4/98	12/14/98	12/14/98 0-289-0
1695	HAA-ICR	Monobromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	12/4/98	12/14/98	12/14/98 0-289-0
1696	HAA-ICR	Monochloroacetic acid	ND	µg/L	EPA 552.2	1	2.0	12/4/98	12/14/98	12/14/98 0-289-0
1697	HAA-ICR	Tribromoacetic acid	ND	µg/L	EPA 552.2	1	4.0	12/4/98	12/14/98	12/14/98 0-289-0
1698	HAA-ICR	Trichloroacetic acid	ND	µg/L	EPA 552.2	1	1.0	12/4/98	12/14/98	12/14/98 0-289-0
1699	pH	Cl2 pH - Final	7.4	Unit	SM 4500-H+ B	1	n/a	12/3/98		12/4/98 n/a
1700	pH	Cl2 pH - Initial	7.3	Unit	SM 4500-H+ B	1	n/a	12/3/98		12/3/98 n/a
1701	pH	pH	8.1	Unit	SM 4500-H+ B	1	n/a	12/2/98		12/2/98 n/a
1702	TEMP	Cl2 Temperature	7.5	°C	SM 2550 B	1	n/a	12/3/98		12/4/98 n/a
1703	TEMP	Temperature	20.9	°C	SM 2550 B	1	n/a	12/2/98		12/2/98 n/a
1704	TIME	Cl2 Incubation Time	24.1	hrs	n/a	1	n/a	12/3/98		12/4/98 n/a
1705	TOC-ICR	TOC	ND	mg/L	SM 5310 C	1	0.50	12/2/98		12/2/98 7-0-479
1706	TOC-ICR	TOC (Dupl)	ND	mg/L	SM 5310 C	1	0.50	12/2/98		12/2/98 7-0-479
			ND	mg/L						
1707	TOX-ICR	TOX	ND	µg Cl-/L	SM 5320 B	1	25	12/4/98		12/11/98 12-0-261
1708	TOX-ICR	TOX (Dupl)	ND	µg Cl-/L	SM 5320 B	1	25	12/4/98		12/11/98 12-0-261
			ND	µg Cl-/L						
1709	THM-ICR	1,2,3-Trichloropropane (Surrogate)	105.6	%	EPA 551.1	1	1.0	12/4/98	12/11/98	12/11/98 0-288-0
1710	THM-ICR	Bromodichloromethane	1.6	µg/L	EPA 551.1	1	1.0	12/4/98	12/11/98	12/11/98 0-288-0
1711	THM-ICR	Bromoform	ND	µg/L	EPA 551.1	1	1.0	12/4/98	12/11/98	12/11/98 0-288-0
1712	THM-ICR	Chloroform	1.5	µg/L	EPA 551.1	1	1.0	12/4/98	12/11/98	12/11/98 0-288-0
1713	THM-ICR	Dibromochloromethane	1.5	µg/L	EPA 551.1	1	1.0	12/4/98	12/11/98	12/11/98 0-288-0
1714	UV-ICR	UV	ND	1/cm	SM 5910 B	1	0.009	12/2/98		12/2/98 8-0-383
1715	UV-ICR	UV (Dupl)	ND	1/cm	SM 5910 B	1	0.009	12/2/98		12/2/98 8-0-383

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

ND 1/cm

Sample ID: 185.10.pH7.5.Eff-5

S&amp;H ID: 9811-600

Date Sampled: 12/2/98 3:01:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
1716	Cl2Dose	Chlorine Dose	1.46	mg/L as Cl2	SM 4500-Cl B	1	n/a	12/7/98		12/7/98	n/a
1717	Cl2Res	Chlorine Residual	0.58	mg/L as Cl2	SM 4500-Cl F	1	0.10	12/7/98		12/8/98	n/a
1718	HAA-ICR	1,2,3-Trichloropropane (IS) (Internal Standard)	97.6	%	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1719	HAA-ICR	2-Bromopropionic acid (Surrogate)	98.0	%	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1720	HAA-ICR	Bromochloroacetic acid	1.3	µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1721	HAA-ICR	Bromodichloroacetic acid	1.4	µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1722	HAA-ICR	Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	12/8/98	12/14/98	12/15/98	0-289-0
1723	HAA-ICR	Dibromoacetic acid	1.0	µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1724	HAA-ICR	Dichloroacetic acid	1.0	µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1725	HAA-ICR	Monobromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1726	HAA-ICR	Monochloroacetic acid	ND	µg/L	EPA 552.2	1	2.0	12/8/98	12/14/98	12/15/98	0-289-0
1727	HAA-ICR	Tribromoacetic acid	ND	µg/L	EPA 552.2	1	4.0	12/8/98	12/14/98	12/15/98	0-289-0
1728	HAA-ICR	Trichloroacetic acid	ND	µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1729	pH	Cl2 pH - Final	7.4	Unit	SM 4500-H+ B	1	n/a	12/7/98		12/8/98	n/a
1730	pH	Cl2 pH - Initial	7.3	Unit	SM 4500-H+ B	1	n/a	12/7/98		12/7/98	n/a
1731	pH	pH	8.1	Unit	SM 4500-H+ B	1	n/a	12/2/98		12/2/98	n/a
1732	TEMP	Cl2 Temperature	7.4	°C	SM 2550 B	1	n/a	12/7/98		12/8/98	n/a
1733	TEMP	Temperature	22.5	°C	SM 2550 B	1	n/a	12/2/98		12/2/98	n/a
1734	TIME	Cl2 Incubation Time	23.7	hrs	n/a	1	n/a	12/7/98		12/8/98	n/a
1735	TOC-ICR	TOC	0.65	mg/L	SM 5310 C	1	0.50	12/2/98		12/3/98	7-0-480
1736	TOC-ICR	TOC (Dupl)	0.67	mg/L	SM 5310 C	1	0.50	12/2/98		12/3/98	7-0-480
			<b>0.66</b>	<b>mg/L</b>	<b>3.0 % RPD</b>						
1737	TOX-ICR	TOX	ND	µg Cl-/L	SM 5320 B	1	25	12/8/98		12/16/98	12-0-264
1738	TOX-ICR	TOX (Dupl)	ND	µg Cl-/L	SM 5320 B	1	25	12/8/98		12/16/98	12-0-264
			<b>ND</b>	<b>µg Cl-/L</b>							
1739	THM-ICR	1,2,3-Trichloropropane (Surrogate)	92.4	%	EPA 551.1	1	1.0	12/8/98	12/11/98	12/11/98	0-288-0
1740	THM-ICR	Bromodichloromethane	2.0	µg/L	EPA 551.1	1	1.0	12/8/98	12/11/98	12/11/98	0-288-0
1741	THM-ICR	Bromoform	ND	µg/L	EPA 551.1	1	1.0	12/8/98	12/11/98	12/11/98	0-288-0
1742	THM-ICR	Chloroform	1.4	µg/L	EPA 551.1	1	1.0	12/8/98	12/11/98	12/11/98	0-288-0
1743	THM-ICR	Dibromochloromethane	2.4	µg/L	EPA 551.1	1	1.0	12/8/98	12/11/98	12/11/98	0-288-0
1744	UV-ICR	UV	ND	1/cm	SM 5910 B	1	0.009	12/2/98		12/3/98	8-0-384
1745	UV-ICR	UV (Dupl)	0.009	1/cm	SM 5910 B	1	0.009	12/2/98		12/3/98	8-0-384
			<b>ND</b>	<b>1/cm</b>							

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

Sample ID: 185.10.pH7.5.Eff-6

S&amp;H ID: 9811-601

Date Sampled: 12/2/98 8:57:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
1746	Cl2Dose	Chlorine Dose	1.50	mg/L as Cl2	SM 4500-Cl B	1	n/a	12/7/98		12/7/98	n/a
1747	Cl2Res	Chlorine Residual	0.40	mg/L as Cl2	SM 4500-Cl F	1	0.10	12/7/98		12/8/98	n/a
1748	HAA-ICR	1,2,3-Trichloropropane (IS) (Internal Standard)	97.6	%	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1749	HAA-ICR	2-Bromopropionic acid (Surrogate)	102.4	%	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1750	HAA-ICR	Bromochloroacetic acid	1.5	µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1751	HAA-ICR	Bromodichloroacetic acid	1.6	µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1752	HAA-ICR	Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	12/8/98	12/14/98	12/15/98	0-289-0
1753	HAA-ICR	Dibromoacetic acid	1.1	µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1754	HAA-ICR	Dichloroacetic acid	1.4	µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1755	HAA-ICR	Monobromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1756	HAA-ICR	Monochloroacetic acid	ND	µg/L	EPA 552.2	1	2.0	12/8/98	12/14/98	12/15/98	0-289-0
1757	HAA-ICR	Tribromoacetic acid	ND	µg/L	EPA 552.2	1	4.0	12/8/98	12/14/98	12/15/98	0-289-0
1758	HAA-ICR	Trichloroacetic acid	1.2	µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1759	pH	Cl2 pH - Final	7.4	Unit	SM 4500-H+ B	1	n/a	12/7/98		12/8/98	n/a
1760	pH	Cl2 pH - Initial	7.3	Unit	SM 4500-H+ B	1	n/a	12/7/98		12/7/98	n/a
1761	pH	pH	8.1	Unit	SM 4500-H+ B	1	n/a	12/2/98		12/2/98	n/a
1762	TEMP	Cl2 Temperature	7.4	°C	SM 2550 B	1	n/a	12/7/98		12/8/98	n/a
1763	TEMP	Temperature	23.6	°C	SM 2550 B	1	n/a	12/2/98		12/2/98	n/a
1764	TIME	Cl2 Incubation Time	23.7	hrs	n/a	1	n/a	12/7/98		12/8/98	n/a
1765	TOC-ICR	TOC	0.87	mg/L	SM 5310 C	1	0.50	12/2/98		12/3/98	7-0-480
1766	TOC-ICR	TOC (Dupl)	0.93	mg/L	SM 5310 C	1	0.50	12/2/98		12/3/98	7-0-480
			<b>0.90</b>	<b>mg/L</b>	<b>6.7 % RPD</b>						
1767	TOX-ICR	TOX	28	µg Cl-/L	SM 5320 B	1	25	12/8/98		12/15/98	12-0-263
1768	TOX-ICR	TOX (Dupl)	33	µg Cl-/L	SM 5320 B	1	25	12/8/98		12/15/98	12-0-263
			<b>31</b>	<b>µg Cl-/L</b>	<b>16.1 % RPD</b>						
1769	THM-ICR	1,2,3-Trichloropropane (Surrogate)	96.0	%	EPA 551.1	1	1.0	12/8/98	12/11/98	12/11/98	0-288-0
1770	THM-ICR	Bromodichloromethane	3.1	µg/L	EPA 551.1	1	1.0	12/8/98	12/11/98	12/11/98	0-288-0
1771	THM-ICR	Bromoform	ND	µg/L	EPA 551.1	1	1.0	12/8/98	12/11/98	12/11/98	0-288-0
1772	THM-ICR	Chloroform	2.2	µg/L	EPA 551.1	1	1.0	12/8/98	12/11/98	12/11/98	0-288-0
1773	THM-ICR	Dibromochloromethane	3.2	µg/L	EPA 551.1	1	1.0	12/8/98	12/11/98	12/11/98	0-288-0
1774	UV-ICR	UV	0.012	1/cm	SM 5910 B	1	0.009	12/2/98		12/3/98	8-0-384
1775	UV-ICR	UV (Dupl)	0.011	1/cm	SM 5910 B	1	0.009	12/2/98		12/3/98	8-0-384
			<b>0.012</b>	<b>1/cm</b>	<b>8.3 % RPD</b>						

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

Sample ID: 185.10.pH7.5.Eff-7			S&H ID: 9811-602		Date Sampled: 12/3/98 3:01:00 AM						
#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
1776	Cl2Dose	Chlorine Dose	1.52	mg/L as Cl2	SM 4500-Cl B	1	n/a	12/7/98		12/7/98	n/a
1777	Cl2Res	Chlorine Residual	0.34	mg/L as Cl2	SM 4500-Cl F	1	0.10	12/7/98		12/8/98	n/a
1778	HAA-ICR	1,2,3-Trichloropropane (IS) (Internal Standard)	99.6	%	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1779	HAA-ICR	2-Bromopropionic acid (Surrogate)	95.2	%	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1780	HAA-ICR	Bromochloroacetic acid	1.6	µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1781	HAA-ICR	Bromodichloroacetic acid	1.5	µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1782	HAA-ICR	Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	12/8/98	12/14/98	12/15/98	0-289-0
1783	HAA-ICR	Dibromoacetic acid	1.0	µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1784	HAA-ICR	Dichloroacetic acid	1.7	µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1785	HAA-ICR	Monobromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1786	HAA-ICR	Monochloroacetic acid	ND	µg/L	EPA 552.2	1	2.0	12/8/98	12/14/98	12/15/98	0-289-0
1787	HAA-ICR	Tribromoacetic acid	ND	µg/L	EPA 552.2	1	4.0	12/8/98	12/14/98	12/15/98	0-289-0
1788	HAA-ICR	Trichloroacetic acid	1.2	µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1789	pH	Cl2 pH - Final	7.4	Unit	SM 4500-H+ B	1	n/a	12/7/98		12/8/98	n/a
1790	pH	Cl2 pH - Initial	7.3	Unit	SM 4500-H+ B	1	n/a	12/7/98		12/7/98	n/a
1791	pH	pH	8.1	Unit	SM 4500-H+ B	1	n/a	12/3/98		12/3/98	n/a
1792	TEMP	Cl2 Temperature	7.4	°C	SM 2550 B	1	n/a	12/7/98		12/8/98	n/a
1793	TEMP	Temperature	22.3	°C	SM 2550 B	1	n/a	12/3/98		12/3/98	n/a
1794	TIME	Cl2 Incubation Time	23.7	hrs	n/a	1	n/a	12/7/98		12/8/98	n/a
1795	TOC-ICR	TOC	1.00	mg/L	SM 5310 C	1	0.50	12/3/98		12/3/98	7-0-480
1796	TOC-ICR	TOC (Dupl)	1.03	mg/L	SM 5310 C	1	0.50	12/3/98		12/3/98	7-0-480
			1.02	mg/L	2.9 % RPD						
1797	TOX-ICR	TOX	36	µg Cl-/L	SM 5320 B	1	25	12/8/98		12/15/98	12-0-263
1798	TOX-ICR	TOX (Dupl)	38	µg Cl-/L	SM 5320 B	1	25	12/8/98		12/15/98	12-0-263
			37	µg Cl-/L	5.4 % RPD						
1799	THM-ICR	1,2,3-Trichloropropane (Surrogate)	94.0	%	EPA 551.1	1	1.0	12/8/98	12/11/98	12/11/98	0-288-0
1800	THM-ICR	Bromodichloromethane	3.7	µg/L	EPA 551.1	1	1.0	12/8/98	12/11/98	12/11/98	0-288-0
1801	THM-ICR	Bromoform	ND	µg/L	EPA 551.1	1	1.0	12/8/98	12/11/98	12/11/98	0-288-0
1802	THM-ICR	Chloroform	2.8	µg/L	EPA 551.1	1	1.0	12/8/98	12/11/98	12/11/98	0-288-0
1803	THM-ICR	Dibromochloromethane	3.1	µg/L	EPA 551.1	1	1.0	12/8/98	12/11/98	12/11/98	0-288-0
1804	UV-ICR	UV	0.014	1/cm	SM 5910 B	1	0.009	12/3/98		12/3/98	8-0-384
1805	UV-ICR	UV (Dupl)	0.014	1/cm	SM 5910 B	1	0.009	12/3/98		12/3/98	8-0-384
			0.014	1/cm	0.0 % RPD						

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

Sample ID: 185.10.pH7.5.Eff-8			S&H ID: 9811-603		Date Sampled: 12/3/98 9:15:00 AM				
#	Analysis Type	Result Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
1806	Cl2Dose Chlorine Dose	1.55 mg/L as Cl2	SM 4500-Cl B	1	n/a	12/7/98		12/7/98	n/a
1807	Cl2Res Chlorine Residual	0.43 mg/L as Cl2	SM 4500-Cl F	1	0.10	12/7/98		12/8/98	n/a
1808	HAA-ICR 1,2,3-Trichloropropane (IS) (Internal Standard)	107.2 %	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1809	HAA-ICR 2-Bromopropionic acid (Surrogate)	94.8 %	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1810	HAA-ICR Bromochloroacetic acid	1.8 µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1811	HAA-ICR Bromodichloroacetic acid	1.8 µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1812	HAA-ICR Chlorodibromoacetic acid	ND µg/L	EPA 552.2	1	2.0	12/8/98	12/14/98	12/15/98	0-289-0
1813	HAA-ICR Dibromoacetic acid	1.0 µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1814	HAA-ICR Dichloroacetic acid	2.0 µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1815	HAA-ICR Monobromoacetic acid	ND µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1816	HAA-ICR Monochloroacetic acid	ND µg/L	EPA 552.2	1	2.0	12/8/98	12/14/98	12/15/98	0-289-0
1817	HAA-ICR Tribromoacetic acid	ND µg/L	EPA 552.2	1	4.0	12/8/98	12/14/98	12/15/98	0-289-0
1818	HAA-ICR Trichloroacetic acid	1.6 µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1819	pH Cl2 pH - Final	7.4 Unit	SM 4500-H+ B	1	n/a	12/7/98		12/8/98	n/a
1820	pH Cl2 pH - Initial	7.4 Unit	SM 4500-H+ B	1	n/a	12/7/98		12/7/98	n/a
1821	pH pH	8.1 Unit	SM 4500-H+ B	1	n/a	12/3/98		12/3/98	n/a
1822	TEMP Cl2 Temperature	7.4 °C	SM 2550 B	1	n/a	12/7/98		12/8/98	n/a
1823	TEMP Temperature	21.6 °C	SM 2550 B	1	n/a	12/3/98		12/3/98	n/a
1824	TIME Cl2 Incubation Time	23.7 hrs	n/a	1	n/a	12/7/98		12/8/98	n/a
1825	TOC-ICR TOC	1.13 mg/L	SM 5310 C	1	0.50	12/3/98		12/3/98	7-0-480
1826	TOC-ICR TOC (Dupl)	1.14 mg/L	SM 5310 C	1	0.50	12/3/98		12/3/98	7-0-480
		<b>1.13 mg/L</b>	<b>0.9 % RPD</b>						
1827	TOX-ICR TOX	44 µg Cl-/L	SM 5320 B	1	25	12/8/98		12/16/98	12-0-264
1828	TOX-ICR TOX (Dupl)	44 µg Cl-/L	SM 5320 B	1	25	12/8/98		12/16/98	12-0-264
		<b>44 µg Cl-/L</b>	<b>0.0 % RPD</b>						
1829	THM-ICR 1,2,3-Trichloropropane (Surrogate)	92.8 %	EPA 551.1	1	1.0	12/8/98	12/11/98	12/11/98	0-288-0
1830	THM-ICR Bromodichloromethane	4.2 µg/L	EPA 551.1	1	1.0	12/8/98	12/11/98	12/11/98	0-288-0
1831	THM-ICR Bromoform	ND µg/L	EPA 551.1	1	1.0	12/8/98	12/11/98	12/11/98	0-288-0
1832	THM-ICR Chloroform	3.3 µg/L	EPA 551.1	1	1.0	12/8/98	12/11/98	12/11/98	0-288-0
1833	THM-ICR Dibromochloromethane	3.3 µg/L	EPA 551.1	1	1.0	12/8/98	12/11/98	12/11/98	0-288-0
1834	UV-ICR UV	0.016 1/cm	SM 5910 B	1	0.009	12/8/98		12/3/98	8-0-384
1835	UV-ICR UV (Dupl)	0.016 1/cm	SM 5910 B	1	0.009	12/8/98		12/3/98	8-0-384
		<b>0.016 1/cm</b>	<b>0.0 % RPD</b>						

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.



**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

Sample ID: 185.10.pH7.5.Eff-9			S&H ID: 9811-604		Date Sampled: 12/3/98 3:09:00 PM				
#	Analysis Type	Result Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
1836	Cl2Dose Chlorine Dose	1.59 mg/L as Cl2	SM 4500-Cl B	1	n/a	12/7/98		12/7/98	n/a
1837	Cl2Res Chlorine Residual	0.23 mg/L as Cl2	SM 4500-Cl F	1	0.10	12/7/98		12/8/98	n/a
1838	HAA-ICR 1,2,3-Trichloropropane (IS) (Internal Standard)	105.6 %	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1839	HAA-ICR 2-Bromopropionic acid (Surrogate)	95.2 %	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1840	HAA-ICR Bromochloroacetic acid	1.9 µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1841	HAA-ICR Bromodichloroacetic acid	1.8 µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1842	HAA-ICR Chlorodibromoacetic acid	ND µg/L	EPA 552.2	1	2.0	12/8/98	12/14/98	12/15/98	0-289-0
1843	HAA-ICR Dibromoacetic acid	1.0 µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1844	HAA-ICR Dichloroacetic acid	2.5 µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1845	HAA-ICR Monobromoacetic acid	ND µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1846	HAA-ICR Monochloroacetic acid	ND µg/L	EPA 552.2	1	2.0	12/8/98	12/14/98	12/15/98	0-289-0
1847	HAA-ICR Tribromoacetic acid	ND µg/L	EPA 552.2	1	4.0	12/8/98	12/14/98	12/15/98	0-289-0
1848	HAA-ICR Trichloroacetic acid	2.0 µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1849	pH Cl2 pH - Final	7.4 Unit	SM 4500-H+ B	1	n/a	12/7/98		12/8/98	n/a
1850	pH Cl2 pH - Initial	7.3 Unit	SM 4500-H+ B	1	n/a	12/7/98		12/7/98	n/a
1851	pH pH	8.1 Unit	SM 4500-H+ B	1	n/a	12/3/98		12/3/98	n/a
1852	TEMP Cl2 Temperature	7.4 °C	SM 2550 B	1	n/a	12/7/98		12/8/98	n/a
1853	TEMP Temperature	23.5 °C	SM 2550 B	1	n/a	12/3/98		12/3/98	n/a
1854	TIME Cl2 Incubation Time	23.7 hrs	n/a	1	n/a	12/7/98		12/8/98	n/a
1855	TOC-ICR TOC	1.34 mg/L	SM 5310 C	1	0.50	12/3/98		12/3/98	7-0-480
1856	TOC-ICR TOC (Dupl)	1.36 mg/L	SM 5310 C	1	0.50	12/3/98		12/3/98	7-0-480
		<b>1.35 mg/L</b>	<b>1.5 % RPD</b>						
1857	TOX-ICR TOX	53 µg Cl-/L	SM 5320 B	1	25	12/8/98		12/16/98	12-0-264
1858	TOX-ICR TOX (Dupl)	54 µg Cl-/L	SM 5320 B	1	25	12/8/98		12/16/98	12-0-264
		<b>54 µg Cl-/L</b>	<b>1.9 % RPD</b>						
1859	THM-ICR 1,2,3-Trichloropropane (Surrogate)	92.0 %	EPA 551.1	1	1.0	12/8/98	12/11/98	12/11/98	0-288-0
1860	THM-ICR Bromodichloromethane	4.8 µg/L	EPA 551.1	1	1.0	12/8/98	12/11/98	12/11/98	0-288-0
1861	THM-ICR Bromoform	ND µg/L	EPA 551.1	1	1.0	12/8/98	12/11/98	12/11/98	0-288-0
1862	THM-ICR Chloroform	4.0 µg/L	EPA 551.1	1	1.0	12/8/98	12/11/98	12/11/98	0-288-0
1863	THM-ICR Dibromochloromethane	4.0 µg/L	EPA 551.1	1	1.0	12/8/98	12/11/98	12/11/98	0-288-0
1864	UV-ICR UV	0.020 1/cm	SM 5910 B	1	0.009	12/3/98		12/4/98	8-0-385
1865	UV-ICR UV (Dupl)	0.020 1/cm	SM 5910 B	1	0.009	12/3/98		12/4/98	8-0-385
		<b>0.020 1/cm</b>	<b>0.0 % RPD</b>						

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

Sample ID: 185.10.pH7.5.Eff-11			S&H ID: 9811-606		Date Sampled: 12/4/98 2:59:00 AM						
#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
1866	Cl2Dose	Chlorine Dose	1.61	mg/L as Cl2	SM 4500-Cl B	1	n/a	12/7/98		12/7/98	n/a
1867	Cl2Res	Chlorine Residual	0.34	mg/L as Cl2	SM 4500-Cl F	1	0.10	12/7/98		12/8/98	n/a
1868	HAA-ICR	1,2,3-Trichloropropane (IS) (Internal Standard)	105.2	%	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1869	HAA-ICR	2-Bromopropionic acid (Surrogate)	100.0	%	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1870	HAA-ICR	Bromochloroacetic acid	2.6	µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1871	HAA-ICR	Bromodichloroacetic acid	2.6	µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1872	HAA-ICR	Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	12/8/98	12/14/98	12/15/98	0-289-0
1873	HAA-ICR	Dibromoacetic acid	1.1	µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1874	HAA-ICR	Dichloroacetic acid	3.5	µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1875	HAA-ICR	Monobromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1876	HAA-ICR	Monochloroacetic acid	ND	µg/L	EPA 552.2	1	2.0	12/8/98	12/14/98	12/15/98	0-289-0
1877	HAA-ICR	Tribromoacetic acid	ND	µg/L	EPA 552.2	1	4.0	12/8/98	12/14/98	12/15/98	0-289-0
1878	HAA-ICR	Trichloroacetic acid	3.8	µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1879	pH	Cl2 pH - Final	7.4	Unit	SM 4500-H+ B	1	n/a	12/7/98		12/8/98	n/a
1880	pH	Cl2 pH - Initial	7.3	Unit	SM 4500-H+ B	1	n/a	12/7/98		12/7/98	n/a
1881	pH	pH	8.1	Unit	SM 4500-H+ B	1	n/a	12/4/98		12/4/98	n/a
1882	TEMP	Cl2 Temperature	7.4	°C	SM 2550 B	1	n/a	12/7/98		12/8/98	n/a
1883	TEMP	Temperature	23.0	°C	SM 2550 B	1	n/a	12/4/98		12/4/98	n/a
1884	TIME	Cl2 Incubation Time	23.8	hrs	n/a	1	n/a	12/7/98		12/8/98	n/a
1885	TOC-ICR	TOC	1.47	mg/L	SM 5310 C	1	0.50	12/4/98		12/4/98	7-0-481
1886	TOC-ICR	TOC (Dupl)	1.46	mg/L	SM 5310 C	1	0.50	12/4/98		12/4/98	7-0-481
			1.46	mg/L	0.7 % RPD						
1887	TOX-ICR	TOX	65	µg Cl-/L	SM 5320 B	1	25	12/8/98		12/16/98	12-0-264
1888	TOX-ICR	TOX (Dupl)	66	µg Cl-/L	SM 5320 B	1	25	12/8/98		12/16/98	12-0-264
			66	µg Cl-/L	1.5 % RPD						
1889	THM-ICR	1,2,3-Trichloropropane (Surrogate)	93.6	%	EPA 551.1	1	1.0	12/8/98	12/11/98	12/11/98	0-288-0
1890	THM-ICR	Bromodichloromethane	6.1	µg/L	EPA 551.1	1	1.0	12/8/98	12/11/98	12/11/98	0-288-0
1891	THM-ICR	Bromoform	ND	µg/L	EPA 551.1	1	1.0	12/8/98	12/11/98	12/11/98	0-288-0
1892	THM-ICR	Chloroform	5.6	µg/L	EPA 551.1	1	1.0	12/8/98	12/11/98	12/11/98	0-288-0
1893	THM-ICR	Dibromochloromethane	3.7	µg/L	EPA 551.1	1	1.0	12/8/98	12/11/98	12/11/98	0-288-0
1894	UV-ICR	UV	0.023	1/cm	SM 5910 B	1	0.009	12/4/98		12/4/98	8-0-386
1895	UV-ICR	UV (Dupl)	0.023	1/cm	SM 5910 B	1	0.009	12/4/98		12/4/98	8-0-386
			0.023	1/cm	0.0 % RPD						

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

Sample ID: 185.10.pH7.5.Eff-13			S&H ID: 9811-608		Date Sampled: 12/4/98 8:58:00 PM						
#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
1896	Cl2Dose	Chlorine Dose	1.48	mg/L as Cl2	SM 4500-Cl B	1	n/a	12/8/98		12/8/98	n/a
1897	Cl2Res	Chlorine Residual	0.32	mg/L as Cl2	SM 4500-Cl F	1	0.10	12/8/98		12/9/98	n/a
1898	HAA-ICR	1,2,3-Trichloropropane (IS) (Internal Standard)	98.4	%	EPA 552.2	1	1.0	12/9/98	12/21/98	12/21/98	0-291-0
1899	HAA-ICR	2-Bromopropionic acid (Surrogate)	98.8	%	EPA 552.2	1	1.0	12/9/98	12/21/98	12/21/98	0-291-0
1900	HAA-ICR	Bromochloroacetic acid	2.6	µg/L	EPA 552.2	1	1.0	12/9/98	12/21/98	12/21/98	0-291-0
1901	HAA-ICR	Bromodichloroacetic acid	2.4	µg/L	EPA 552.2	1	1.0	12/9/98	12/21/98	12/21/98	0-291-0
1902	HAA-ICR	Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	12/9/98	12/21/98	12/21/98	0-291-0
1903	HAA-ICR	Dibromoacetic acid	1.0	µg/L	EPA 552.2	1	1.0	12/9/98	12/21/98	12/21/98	0-291-0
1904	HAA-ICR	Dichloroacetic acid	4.3	µg/L	EPA 552.2	1	1.0	12/9/98	12/21/98	12/21/98	0-291-0
1905	HAA-ICR	Monobromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	12/9/98	12/21/98	12/21/98	0-291-0
1906	HAA-ICR	Monochloroacetic acid	ND	µg/L	EPA 552.2	1	2.0	12/9/98	12/21/98	12/21/98	0-291-0
1907	HAA-ICR	Tribromoacetic acid	ND	µg/L	EPA 552.2	1	4.0	12/9/98	12/21/98	12/21/98	0-291-0
1908	HAA-ICR	Trichloroacetic acid	4.1	µg/L	EPA 552.2	1	1.0	12/9/98	12/21/98	12/21/98	0-291-0
1909	pH	Cl2 pH - Final	7.5	Unit	SM 4500-H+ B	1	n/a	12/8/98		12/9/98	n/a
1910	pH	Cl2 pH - Initial	7.3	Unit	SM 4500-H+ B	1	n/a	12/8/98		12/8/98	n/a
1911	pH	pH	8.1	Unit	SM 4500-H+ B	1	n/a	12/4/98		12/4/98	n/a
1912	TEMP	Cl2 Temperature	7.5	°C	SM 2550 B	1	n/a	12/8/98		12/9/98	n/a
1913	TEMP	Temperature	23.6	°C	SM 2550 B	1	n/a	12/4/98		12/4/98	n/a
1914	TIME	Cl2 Incubation Time	23.9	hrs	n/a	1	n/a	12/8/98		12/9/98	n/a
1915	TOC-ICR	TOC	1.71	mg/L	SM 5310 C	1	0.50	12/4/98		12/5/98	7-0-482
1916	TOC-ICR	TOC (Dupl)	1.71	mg/L	SM 5310 C	1	0.50	12/4/98		12/5/98	7-0-482
			1.71	mg/L	0.0 % RPD						
1917	TOX-ICR	TOX	78	µg Cl-/L	SM 5320 B	1	25	12/9/98		12/18/98	12-0-266
1918	TOX-ICR	TOX (Dupl)	80	µg Cl-/L	SM 5320 B	1	25	12/9/98		12/18/98	12-0-266
			79	µg Cl-/L	2.5 % RPD						
1919	THM-ICR	1,2,3-Trichloropropane (Surrogate)	106.8	%	EPA 551.1	1	1.0	12/9/98	12/15/98	12/15/98	0-290-0
1920	THM-ICR	Bromodichloromethane	7.1	µg/L	EPA 551.1	1	1.0	12/9/98	12/15/98	12/15/98	0-290-0
1921	THM-ICR	Bromoform	ND	µg/L	EPA 551.1	1	1.0	12/9/98	12/15/98	12/15/98	0-290-0
1922	THM-ICR	Chloroform	7.2	µg/L	EPA 551.1	1	1.0	12/9/98	12/15/98	12/15/98	0-290-0
1923	THM-ICR	Dibromochloromethane	3.5	µg/L	EPA 551.1	1	1.0	12/9/98	12/15/98	12/15/98	0-290-0
1924	UV-ICR	UV	0.028	1/cm	SM 5910 B	1	0.009	12/4/98		12/5/98	8-0-387
1925	UV-ICR	UV (Dupl)	0.028	1/cm	SM 5910 B	1	0.009	12/4/98		12/5/98	8-0-387
			0.028	1/cm	0.0 % RPD						

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

Sample ID: 185.10.pH7.5.Eff-15			S&H ID: 9811-610		Date Sampled: 12/5/98 3:01:00 PM						
#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
1926	Cl2Dose	Chlorine Dose	1.51	mg/L as Cl2	SM 4500-Cl B	1	n/a	12/8/98		12/8/98	n/a
1927	Cl2Res	Chlorine Residual	0.27	mg/L as Cl2	SM 4500-Cl F	1	0.10	12/8/98		12/9/98	n/a
1928	HAA-ICR	1,2,3-Trichloropropane (IS) (Internal Standard)	104.0	%	EPA 552.2	1	1.0	12/9/98	12/21/98	12/21/98	0-291-0
1929	HAA-ICR	2-Bromopropionic acid (Surrogate)	98.0	%	EPA 552.2	1	1.0	12/9/98	12/21/98	12/21/98	0-291-0
1930	HAA-ICR	Bromochloroacetic acid	2.8	µg/L	EPA 552.2	1	1.0	12/9/98	12/21/98	12/21/98	0-291-0
1931	HAA-ICR	Bromodichloroacetic acid	2.8	µg/L	EPA 552.2	1	1.0	12/9/98	12/21/98	12/21/98	0-291-0
1932	HAA-ICR	Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	12/9/98	12/21/98	12/21/98	0-291-0
1933	HAA-ICR	Dibromoacetic acid	1.0	µg/L	EPA 552.2	1	1.0	12/9/98	12/21/98	12/21/98	0-291-0
1934	HAA-ICR	Dichloroacetic acid	5.3	µg/L	EPA 552.2	1	1.0	12/9/98	12/21/98	12/21/98	0-291-0
1935	HAA-ICR	Monobromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	12/9/98	12/21/98	12/21/98	0-291-0
1936	HAA-ICR	Monochloroacetic acid	ND	µg/L	EPA 552.2	1	2.0	12/9/98	12/21/98	12/21/98	0-291-0
1937	HAA-ICR	Tribromoacetic acid	ND	µg/L	EPA 552.2	1	4.0	12/9/98	12/21/98	12/21/98	0-291-0
1938	HAA-ICR	Trichloroacetic acid	5.2	µg/L	EPA 552.2	1	1.0	12/9/98	12/21/98	12/21/98	0-291-0
1939	pH	Cl2 pH - Final	7.5	Unit	SM 4500-H+ B	1	n/a	12/8/98		12/9/98	n/a
1940	pH	Cl2 pH - Initial	7.3	Unit	SM 4500-H+ B	1	n/a	12/8/98		12/8/98	n/a
1941	pH	pH	8.1	Unit	SM 4500-H+ B	1	n/a	12/5/98		12/5/98	n/a
1942	TEMP	Cl2 Temperature	7.5	°C	SM 2550 B	1	n/a	12/8/98		12/9/98	n/a
1943	TEMP	Temperature	22.7	°C	SM 2550 B	1	n/a	12/5/98		12/5/98	n/a
1944	TIME	Cl2 Incubation Time	23.9	hrs	n/a	1	n/a	12/8/98		12/9/98	n/a
1945	TOC-ICR	TOC	1.87	mg/L	SM 5310 C	1	0.50	12/5/98		12/5/98	7-0-482
1946	TOC-ICR	TOC (Dupl)	1.85	mg/L	SM 5310 C	1	0.50	12/5/98		12/5/98	7-0-482
			1.86	mg/L	1.1 % RPD						
1947	TOX-ICR	TOX	93	µg Cl-/L	SM 5320 B	1	25	12/9/98		12/17/98	12-0-265
1948	TOX-ICR	TOX (Dupl)	92	µg Cl-/L	SM 5320 B	1	25	12/9/98		12/17/98	12-0-265
			93	µg Cl-/L	1.1 % RPD						
1949	THM-ICR	1,2,3-Trichloropropane (Surrogate)	106.0	%	EPA 551.1	1	1.0	12/9/98	12/15/98	12/15/98	0-290-0
1950	THM-ICR	Bromodichloromethane	7.6	µg/L	EPA 551.1	1	1.0	12/9/98	12/15/98	12/15/98	0-290-0
1951	THM-ICR	Bromoform	ND	µg/L	EPA 551.1	1	1.0	12/9/98	12/15/98	12/15/98	0-290-0
1952	THM-ICR	Chloroform	8.4	µg/L	EPA 551.1	1	1.0	12/9/98	12/15/98	12/15/98	0-290-0
1953	THM-ICR	Dibromochloromethane	3.3	µg/L	EPA 551.1	1	1.0	12/9/98	12/15/98	12/15/98	0-290-0
1954	UV-ICR	UV	0.031	1/cm	SM 5910 B	1	0.009	12/5/98		12/6/98	8-0-388
1955	UV-ICR	UV (Dupl)	0.031	1/cm	SM 5910 B	1	0.009	12/5/98		12/6/98	8-0-388
			0.031	1/cm	0.0 % RPD						

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

Sample ID: 185.10.pH7.5.Eff-17			S&H ID: 9811-612		Date Sampled: 12/6/98 1:53:00 PM						
#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
1956	Cl2Dose	Chlorine Dose	1.54	mg/L as Cl2	SM 4500-Cl B	1	n/a	12/8/98		12/8/98	n/a
1957	Cl2Res	Chlorine Residual	0.29	mg/L as Cl2	SM 4500-Cl F	1	0.10	12/8/98		12/9/98	n/a
1958	HAA-ICR	1,2,3-Trichloropropane (IS) (Internal Standard)	104.8	%	EPA 552.2	1	1.0	12/9/98	12/21/98	12/22/98	0-291-0
1959	HAA-ICR	2-Bromopropionic acid (Surrogate)	96.8	%	EPA 552.2	1	1.0	12/9/98	12/21/98	12/22/98	0-291-0
1960	HAA-ICR	Bromochloroacetic acid	3.2	µg/L	EPA 552.2	1	1.0	12/9/98	12/21/98	12/22/98	0-291-0
1961	HAA-ICR	Bromodichloroacetic acid	3.5	µg/L	EPA 552.2	1	1.0	12/9/98	12/21/98	12/22/98	0-291-0
1962	HAA-ICR	Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	12/9/98	12/21/98	12/22/98	0-291-0
1963	HAA-ICR	Dibromoacetic acid	1.0	µg/L	EPA 552.2	1	1.0	12/9/98	12/21/98	12/22/98	0-291-0
1964	HAA-ICR	Dichloroacetic acid	6.4	µg/L	EPA 552.2	1	1.0	12/9/98	12/21/98	12/22/98	0-291-0
1965	HAA-ICR	Monobromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	12/9/98	12/21/98	12/22/98	0-291-0
1966	HAA-ICR	Monochloroacetic acid	ND	µg/L	EPA 552.2	1	2.0	12/9/98	12/21/98	12/22/98	0-291-0
1967	HAA-ICR	Tribromoacetic acid	ND	µg/L	EPA 552.2	1	4.0	12/9/98	12/21/98	12/22/98	0-291-0
1968	HAA-ICR	Trichloroacetic acid	7.3	µg/L	EPA 552.2	1	1.0	12/9/98	12/21/98	12/22/98	0-291-0
1969	pH	Cl2 pH - Final	7.4	Unit	SM 4500-H+ B	1	n/a	12/8/98		12/9/98	n/a
1970	pH	Cl2 pH - Initial	7.2	Unit	SM 4500-H+ B	1	n/a	12/8/98		12/8/98	n/a
1971	pH	pH	8.1	Unit	SM 4500-H+ B	1	n/a	12/6/98		12/6/98	n/a
1972	TEMP	Cl2 Temperature	7.5	°C	SM 2550 B	1	n/a	12/8/98		12/9/98	n/a
1973	TEMP	Temperature	22.1	°C	SM 2550 B	1	n/a	12/6/98		12/6/98	n/a
1974	TIME	Cl2 Incubation Time	23.9	hrs	n/a	1	n/a	12/8/98		12/9/98	n/a
1975	TOC-ICR	TOC	2.04	mg/L	SM 5310 C	1	0.50	12/6/98		12/6/98	7-0-483
1976	TOC-ICR	TOC (Dupl)	2.03	mg/L	SM 5310 C	1	0.50	12/6/98		12/6/98	7-0-483
			2.04	mg/L	0.5 % RPD						
1977	TOX-ICR	TOX	106	µg Cl-/L	SM 5320 B	1	25	12/9/98		12/17/98	12-0-265
1978	TOX-ICR	TOX (Dupl)	104	µg Cl-/L	SM 5320 B	1	25	12/9/98		12/17/98	12-0-265
			105	µg Cl-/L	1.9 % RPD						
1979	THM-ICR	1,2,3-Trichloropropane (Surrogate)	99.6	%	EPA 551.1	1	1.0	12/9/98	12/15/98	12/15/98	0-290-0
1980	THM-ICR	Bromodichloromethane	7.8	µg/L	EPA 551.1	1	1.0	12/9/98	12/15/98	12/15/98	0-290-0
1981	THM-ICR	Bromoform	ND	µg/L	EPA 551.1	1	1.0	12/9/98	12/15/98	12/15/98	0-290-0
1982	THM-ICR	Chloroform	9.4	µg/L	EPA 551.1	1	1.0	12/9/98	12/15/98	12/15/98	0-290-0
1983	THM-ICR	Dibromochloromethane	3.0	µg/L	EPA 551.1	1	1.0	12/9/98	12/15/98	12/15/98	0-290-0
1984	UV-ICR	UV	0.035	1/cm	SM 5910 B	1	0.009	12/6/98		12/7/98	8-0-389
1985	UV-ICR	UV (Dupl)	0.035	1/cm	SM 5910 B	1	0.009	12/6/98		12/7/98	8-0-389
			0.035	1/cm	0.0 % RPD						

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

Sample ID: 185.10.pH7.5.Eff-18			S&H ID: 9811-613		Date Sampled: 12/7/98 4:41:00 PM						
#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
1986	pH	pH	8.2	Unit	SM 4500-H+ B	1	n/a	12/7/98		12/7/98	n/a
1987	TEMP	Temperature	23.0	°C	SM 2550 B	1	n/a	12/7/98		12/7/98	n/a
1988	TOC-ICR	TOC	2.10	mg/L	SM 5310 C	1	0.50	12/7/98		12/8/98	7-0-485
1989	TOC-ICR	TOC (Dupl)	2.17	mg/L	SM 5310 C	1	0.50	12/7/98		12/8/98	7-0-485
			2.13	mg/L	3.3 % RPD						
1990	UV-ICR	UV	0.037	1/cm	SM 5910 B	1	0.009	12/7/98		12/9/98	8-0-390
1991	UV-ICR	UV (Dupl)	0.037	1/cm	SM 5910 B	1	0.009	12/7/98		12/9/98	8-0-390
			0.037	1/cm	0.0 % RPD						

Sample ID: 185.10.pH7.5.Eff-5d			S&H ID: 9811-626		Date Sampled: 12/2/98 3:01:00 PM						
#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
1992	Cl2Dose	Chlorine Dose	1.46	mg/L as Cl2	SM 4500-Cl B	1	n/a	12/7/98		12/7/98	n/a
1993	Cl2Res	Chlorine Residual	0.41	mg/L as Cl2	SM 4500-Cl F	1	0.10	12/7/98		12/8/98	n/a
1994	HAA-ICR	1,2,3-Trichloropropane (IS) (Internal Standard)	107.6	%	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1995	HAA-ICR	2-Bromopropionic acid (Surrogate)	96.4	%	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1996	HAA-ICR	Bromochloroacetic acid	1.2	µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1997	HAA-ICR	Bromodichloroacetic acid	1.4	µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
1998	HAA-ICR	Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	12/8/98	12/14/98	12/15/98	0-289-0
1999	HAA-ICR	Dibromoacetic acid	1.1	µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
2000	HAA-ICR	Dichloroacetic acid	1.1	µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
2001	HAA-ICR	Monobromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
2002	HAA-ICR	Monochloroacetic acid	ND	µg/L	EPA 552.2	1	2.0	12/8/98	12/14/98	12/15/98	0-289-0
2003	HAA-ICR	Tribromoacetic acid	ND	µg/L	EPA 552.2	1	4.0	12/8/98	12/14/98	12/15/98	0-289-0
2004	HAA-ICR	Trichloroacetic acid	ND	µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
2005	pH	Cl2 pH - Final	7.4	Unit	SM 4500-H+ B	1	n/a	12/7/98		12/8/98	n/a
2006	pH	Cl2 pH - Initial	7.3	Unit	SM 4500-H+ B	1	n/a	12/7/98		12/7/98	n/a
2007	pH	pH	8.1	Unit	SM 4500-H+ B	1	n/a	12/2/98		12/2/98	n/a
2008	TEMP	Cl2 Temperature	7.4	°C	SM 2550 B	1	n/a	12/7/98		12/8/98	n/a
2009	TEMP	Temperature	22.6	°C	SM 2550 B	1	n/a	12/2/98		12/2/98	n/a
2010	TIME	Cl2 Incubation Time	23.7	hrs	n/a	1	n/a	12/7/98		12/8/98	n/a
2011	TOC-ICR	TOC	0.66	mg/L	SM 5310 C	1	0.50	12/2/98		12/3/98	7-0-480
2012	TOC-ICR	TOC (Dupl)	0.69	mg/L	SM 5310 C	1	0.50	12/2/98		12/3/98	7-0-480
			0.68	mg/L	4.4 % RPD						
2013	TOX-ICR	TOX	ND	µg Cl-/L	SM 5320 B	1	25	12/8/98		12/15/98	12-0-263
2014	TOX-ICR	TOX (Dupl)	ND	µg Cl-/L	SM 5320 B	1	25	12/8/98		12/15/98	12-0-263
			ND	µg Cl-/L							

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

2015	THM-ICR 1,2,3-Trichloropropane (Surrogate)	94.0 %	EPA 551.1	1	1.0	12/8/98	12/11/98	12/11/98	0-288-0
2016	THM-ICR Bromodichloromethane	2.1 µg/L	EPA 551.1	1	1.0	12/8/98	12/11/98	12/11/98	0-288-0
2017	THM-ICR Bromoform	ND µg/L	EPA 551.1	1	1.0	12/8/98	12/11/98	12/11/98	0-288-0
2018	THM-ICR Chloroform	1.6 µg/L	EPA 551.1	1	1.0	12/8/98	12/11/98	12/11/98	0-288-0
2019	THM-ICR Dibromochloromethane	2.3 µg/L	EPA 551.1	1	1.0	12/8/98	12/11/98	12/11/98	0-288-0
2020	UV-ICR UV	0.009 1/cm	SM 5910 B	1	0.009	12/2/98		12/3/98	8-0-384
2021	UV-ICR UV (Dupl)	ND 1/cm	SM 5910 B	1	0.009	12/2/98		12/3/98	8-0-384
		<b>ND 1/cm</b>							

Sample ID: 185.10.pH7.5.Eff-11d

S&amp;H ID: 9811-629

Date Sampled: 12/4/98 2:59:00 AM

#	Analysis Type	Result Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
2022	Cl2Dose Chlorine Dose	1.61 mg/L as Cl2	SM 4500-Cl B	1	n/a	12/7/98		12/7/98	n/a
2023	Cl2Res Chlorine Residual	0.39 mg/L as Cl2	SM 4500-Cl F	1	0.10	12/7/98		12/8/98	n/a
2024	HAA-ICR 1,2,3-Trichloropropane (IS) (Internal Standard)	105.2 %	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
2025	HAA-ICR 2-Bromopropionic acid (Surrogate)	96.0 %	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
2026	HAA-ICR Bromochloroacetic acid	2.5 µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
2027	HAA-ICR Bromodichloroacetic acid	2.2 µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
2028	HAA-ICR Chlorodibromoacetic acid	ND µg/L	EPA 552.2	1	2.0	12/8/98	12/14/98	12/15/98	0-289-0
2029	HAA-ICR Dibromoacetic acid	1.1 µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
2030	HAA-ICR Dichloroacetic acid	3.1 µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
2031	HAA-ICR Monobromoacetic acid	ND µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
2032	HAA-ICR Monochloroacetic acid	ND µg/L	EPA 552.2	1	2.0	12/8/98	12/14/98	12/15/98	0-289-0
2033	HAA-ICR Tribromoacetic acid	ND µg/L	EPA 552.2	1	4.0	12/8/98	12/14/98	12/15/98	0-289-0
2034	HAA-ICR Trichloroacetic acid	3.3 µg/L	EPA 552.2	1	1.0	12/8/98	12/14/98	12/15/98	0-289-0
2035	pH Cl2 pH - Final	7.4 Unit	SM 4500-H+ B	1	n/a	12/7/98		12/8/98	n/a
2036	pH Cl2 pH - Initial	7.3 Unit	SM 4500-H+ B	1	n/a	12/7/98		12/7/98	n/a
2037	pH pH	8.1 Unit	SM 4500-H+ B	1	n/a	12/4/98		12/4/98	n/a
2038	TEMP Cl2 Temperature	7.4 °C	SM 2550 B	1	n/a	12/7/98		12/8/98	n/a
2039	TEMP Temperature	22.8 °C	SM 2550 B	1	n/a	12/4/98		12/4/98	n/a
2040	TIME Cl2 Incubation Time	23.8 hrs	n/a	1	n/a	12/7/98		12/8/98	n/a
2041	TOC-ICR TOC	1.44 mg/L	SM 5310 C	1	0.50	12/4/98		12/4/98	7-0-481
2042	TOC-ICR TOC (Dupl)	1.45 mg/L	SM 5310 C	1	0.50	12/4/98		12/4/98	7-0-481
		<b>1.44 mg/L</b>	<b>0.7 % RPD</b>						
2043	TOX-ICR TOX	67 µg Cl-/L	SM 5320 B	1	25	12/8/98		12/16/98	12-0-264
2044	TOX-ICR TOX (Dupl)	64 µg Cl-/L	SM 5320 B	1	25	12/8/98		12/16/98	12-0-264
		<b>66 µg Cl-/L</b>	<b>4.5 % RPD</b>						
2045	THM-ICR 1,2,3-Trichloropropane (Surrogate)	90.8 %	EPA 551.1	1	1.0	12/8/98	12/11/98	12/11/98	0-288-0

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

2046	THM-ICR Bromodichloromethane	5.7 µg/L	EPA 551.1	1	1.0	12/8/98	12/11/98	12/11/98	0-288-0
2047	THM-ICR Bromoform	ND µg/L	EPA 551.1	1	1.0	12/8/98	12/11/98	12/11/98	0-288-0
2048	THM-ICR Chloroform	5.1 µg/L	EPA 551.1	1	1.0	12/8/98	12/11/98	12/11/98	0-288-0
2049	THM-ICR Dibromochloromethane	3.2 µg/L	EPA 551.1	1	1.0	12/8/98	12/11/98	12/11/98	0-288-0
2050	UV-ICR UV	0.023 1/cm	SM 5910 B	1	0.009	12/4/98		12/4/98	8-0-386
2051	UV-ICR UV (Dupl)	0.023 1/cm	SM 5910 B	1	0.009	12/4/98		12/4/98	8-0-386
		<b>0.023 1/cm</b>	<b>0.0 % RPD</b>						

Sample ID: 185.10.pH7.5.Eff-15d

S&amp;H ID: 9811-630

Date Sampled: 12/5/98 3:01:00 PM

#	Analysis Type	Result Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
2052	Cl2Dose Chlorine Dose	1.51 mg/L as Cl2	SM 4500-Cl B	1	n/a	12/8/98		12/8/98	n/a
2053	Cl2Res Chlorine Residual	0.24 mg/L as Cl2	SM 4500-Cl F	1	0.10	12/8/98		12/9/98	n/a
2054	HAA-ICR 1,2,3-Trichloropropane (IS) (Internal Standard)	99.2 %	EPA 552.2	1	1.0	12/9/98	12/21/98	12/22/98	0-291-0
2055	HAA-ICR 1,2,3-Trichloropropane (IS) (Internal Standard) (Lab Dupl)	100.8 %	EPA 552.2	1	1.0	12/9/98	12/21/98	12/22/98	0-291-0
		<b>100.0 %</b>	<b>1.6 % RPD</b>						
2056	HAA-ICR 2-Bromopropionic acid (Surrogate)	100.8 %	EPA 552.2	1	1.0	12/9/98	12/21/98	12/22/98	0-291-0
2057	HAA-ICR 2-Bromopropionic acid (Surrogate) (Lab Dupl)	98.8 %	EPA 552.2	1	1.0	12/9/98	12/21/98	12/22/98	0-291-0
		<b>99.8 %</b>	<b>2.0 % RPD</b>						
2058	HAA-ICR Bromochloroacetic acid	2.8 µg/L	EPA 552.2	1	1.0	12/9/98	12/21/98	12/22/98	0-291-0
2059	HAA-ICR Bromochloroacetic acid (Lab Dupl)	2.9 µg/L	EPA 552.2	1	1.0	12/9/98	12/21/98	12/22/98	0-291-0
		<b>2.8 µg/L</b>	<b>3.6 % RPD</b>						
2060	HAA-ICR Bromodichloroacetic acid	2.8 µg/L	EPA 552.2	1	1.0	12/9/98	12/21/98	12/22/98	0-291-0
2061	HAA-ICR Bromodichloroacetic acid (Lab Dupl)	2.7 µg/L	EPA 552.2	1	1.0	12/9/98	12/21/98	12/22/98	0-291-0
		<b>2.8 µg/L</b>	<b>3.6 % RPD</b>						
2062	HAA-ICR Chlorodibromoacetic acid	ND µg/L	EPA 552.2	1	2.0	12/9/98	12/21/98	12/22/98	0-291-0
2063	HAA-ICR Chlorodibromoacetic acid (Lab Dupl)	ND µg/L	EPA 552.2	1	2.0	12/9/98	12/21/98	12/22/98	0-291-0
		<b>ND µg/L</b>							
2064	HAA-ICR Dibromoacetic acid	1.0 µg/L	EPA 552.2	1	1.0	12/9/98	12/21/98	12/22/98	0-291-0
2065	HAA-ICR Dibromoacetic acid (Lab Dupl)	1.0 µg/L	EPA 552.2	1	1.0	12/9/98	12/21/98	12/22/98	0-291-0
		<b>1.0 µg/L</b>	<b>0.0 % RPD</b>						
2066	HAA-ICR Dichloroacetic acid	5.2 µg/L	EPA 552.2	1	1.0	12/9/98	12/21/98	12/22/98	0-291-0
2067	HAA-ICR Dichloroacetic acid (Lab Dupl)	5.3 µg/L	EPA 552.2	1	1.0	12/9/98	12/21/98	12/22/98	0-291-0
		<b>5.3 µg/L</b>	<b>1.9 % RPD</b>						
2068	HAA-ICR Monobromoacetic acid	ND µg/L	EPA 552.2	1	1.0	12/9/98	12/21/98	12/22/98	0-291-0
2069	HAA-ICR Monobromoacetic acid (Lab Dupl)	ND µg/L	EPA 552.2	1	1.0	12/9/98	12/21/98	12/22/98	0-291-0
		<b>ND µg/L</b>							

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.



**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

2070	HAA-ICR	Monochloroacetic acid	ND µg/L	EPA 552.2	1	2.0	12/9/98	12/21/98	12/22/98	0-291-0
2071	HAA-ICR	Monochloroacetic acid (Lab Dupl)	ND µg/L	EPA 552.2	1	2.0	12/9/98	12/21/98	12/22/98	0-291-0
			<b>ND µg/L</b>							
2072	HAA-ICR	Tribromoacetic acid	ND µg/L	EPA 552.2	1	4.0	12/9/98	12/21/98	12/22/98	0-291-0
2073	HAA-ICR	Tribromoacetic acid (Lab Dupl)	ND µg/L	EPA 552.2	1	4.0	12/9/98	12/21/98	12/22/98	0-291-0
			<b>ND µg/L</b>							
2074	HAA-ICR	Trichloroacetic acid	5.2 µg/L	EPA 552.2	1	1.0	12/9/98	12/21/98	12/22/98	0-291-0
2075	HAA-ICR	Trichloroacetic acid (Lab Dupl)	5.1 µg/L	EPA 552.2	1	1.0	12/9/98	12/21/98	12/22/98	0-291-0
			<b>5.2 µg/L</b>	<b>1.9 % RPD</b>						
2076	pH	Cl2 pH - Final	7.5 Unit	SM 4500-H+ B	1	n/a	12/8/98		12/9/98	n/a
2077	pH	Cl2 pH - Initial	7.3 Unit	SM 4500-H+ B	1	n/a	12/8/98		12/8/98	n/a
2078	pH	pH	8.1 Unit	SM 4500-H+ B	1	n/a	12/5/98		12/5/98	n/a
2079	TEMP	Cl2 Temperature	7.5 °C	SM 2550 B	1	n/a	12/8/98		12/9/98	n/a
2080	TEMP	Temperature	22.7 °C	SM 2550 B	1	n/a	12/5/98		12/5/98	n/a
2081	TIME	Cl2 Incubation Time	23.9 hrs	n/a	1	n/a	12/8/98		12/9/98	n/a
2082	TOC-ICR	TOC	1.91 mg/L	SM 5310 C	1	0.50	12/5/98		12/5/98	7-0-482
2083	TOC-ICR	TOC (Dupl)	1.84 mg/L	SM 5310 C	1	0.50	12/5/98		12/5/98	7-0-482
			<b>1.88 mg/L</b>	<b>3.7 % RPD</b>						
2084	TOX-ICR	TOX	87 µg Cl-/L	SM 5320 B	1	25	12/9/98		12/17/98	12-0-265
2085	TOX-ICR	TOX (Dupl)	88 µg Cl-/L	SM 5320 B	1	25	12/9/98		12/17/98	12-0-265
			<b>88 µg Cl-/L</b>	<b>1.1 % RPD</b>						
2086	THM-ICR	1,2,3-Trichloropropane (Surrogate)	96.4 %	EPA 551.1	1	1.0	12/9/98	12/15/98	12/15/98	0-290-0
2087	THM-ICR	Bromodichloromethane	7.4 µg/L	EPA 551.1	1	1.0	12/9/98	12/15/98	12/15/98	0-290-0
2088	THM-ICR	Bromoform	ND µg/L	EPA 551.1	1	1.0	12/9/98	12/15/98	12/15/98	0-290-0
2089	THM-ICR	Chloroform	8.2 µg/L	EPA 551.1	1	1.0	12/9/98	12/15/98	12/15/98	0-290-0
2090	THM-ICR	Dibromochloromethane	3.3 µg/L	EPA 551.1	1	1.0	12/9/98	12/15/98	12/15/98	0-290-0
2091	UV-ICR	UV	0.031 1/cm	SM 5910 B	1	0.009	12/5/98		12/6/98	8-0-388
2092	UV-ICR	UV (Dupl)	0.031 1/cm	SM 5910 B	1	0.009	12/5/98		12/6/98	8-0-388
			<b>0.031 1/cm</b>	<b>0.0 % RPD</b>						

Sample ID: 185.Inf.pH7.5.A-1

S&amp;H ID: 9811-636

Date Sampled: 11/30/98 2:40:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
2093	ALK	Alkalinity	163	mg/L	SM 2320 B	1	5	11/30/98		11/30/98	1-0-39
2094	ALK	Alkalinity (Dupl)	164	mg/L	SM 2320 B	1	5	11/30/98		11/30/98	1-0-39
			<b>164 mg/L</b>		<b>0.6 % RPD</b>						
2095	NH3	Ammonia Nitrogen	ND	mg/L	EPA 350.1	1	0.05	11/30/98		12/9/98	MW88718
2096	BR	Bromide	0.031	mg/L	EPA 300.0 A	1	0.020	11/30/98		12/7/98	MW88492
2097	CaHardM	Calcium Hardness	138	mg/L CaCO3	EPA 200.7	1	5	11/30/98		12/9/98	MW n/a

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

2098	CaMW	Calcium, Total, ICAP	55 mg/L	EPA 200.7	1	1	11/30/98	12/9/98	12/9/98	MW88543
2099	MgMW	Magnesium, Total, ICAP	21 mg/L	EPA 200.7	1	0	11/30/98	12/9/98	12/9/98	MW88546
2100	TotHard	Total Hardness as CaCO3 by ICP	224 mg/L CaCO3	SM 2340B	1	7	11/30/98		12/9/98	MW n/a

Sample ID: 185.Inf.pH7.5.A-2

S&amp;H ID: 9811-637

Date Sampled: 12/7/98 8:35:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
2101	ALK	Alkalinity	156	mg/L	SM 2320 B	1	5	12/7/98		12/7/98	1-0-39
2102	ALK	Alkalinity (Dupl)	159	mg/L	SM 2320 B	1	5	12/7/98		12/7/98	1-0-39
			158	mg/L	1.9 % RPD						
2103	NH3	Ammonia Nitrogen	ND	mg/L	EPA 350.1	1	0.05	12/7/98		12/9/98	MW88721
2104	BR	Bromide	0.031	mg/L	EPA 300.0 A	1	0.020	12/7/98		12/15/98	MW89070
2105	CaHardM	Calcium Hardness	131	mg/L CaCO3	EPA 200.7	1	5	12/7/98		12/11/98	MW n/a
2106	CaMW	Calcium, Total, ICAP	53	mg/L	EPA 200.7	1	1	12/7/98	12/11/98	12/11/98	MW88787
2107	MgMW	Magnesium, Total, ICAP	21	mg/L	EPA 200.7	1	0	12/7/98	12/11/98	12/11/98	MW88799
2108	TotHard	Total Hardness as CaCO3 by ICP	217	mg/L CaCO3	SM 2340B	1	7	12/7/98		12/11/98	MW n/a

Sample ID: 185.Inf.pH7.5.B-1

S&amp;H ID: 9811-638

Date Sampled: 11/30/98 2:45:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
2109	Cl2Dose	Chlorine Dose	3.80	mg/L as Cl2	SM 4500-Cl B	1	n/a	12/3/98		12/3/98	n/a
2110	Cl2Res	Chlorine Residual	1.38	mg/L as Cl2	SM 4500-Cl F	1	0.10	12/3/98		12/4/98	n/a
2111	HAA-ICR	1,2,3-Trichloropropane (IS) (Internal Standard)	105.2	%	EPA 552.2	1	1.0	12/4/98	12/14/98	12/14/98	0-289-0
2112	HAA-ICR	2-Bromopropionic acid (Surrogate)	96.8	%	EPA 552.2	1	1.0	12/4/98	12/14/98	12/14/98	0-289-0
2113	HAA-ICR	Bromochloroacetic acid	3.6	µg/L	EPA 552.2	1	1.0	12/4/98	12/14/98	12/14/98	0-289-0
2114	HAA-ICR	Bromodichloroacetic acid	6.2	µg/L	EPA 552.2	1	1.0	12/4/98	12/14/98	12/14/98	0-289-0
2115	HAA-ICR	Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	12/4/98	12/14/98	12/14/98	0-289-0
2116	HAA-ICR	Dibromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	12/4/98	12/14/98	12/14/98	0-289-0
2117	HAA-ICR	Dichloroacetic acid	14.3	µg/L	EPA 552.2	1	1.0	12/4/98	12/14/98	12/14/98	0-289-0
2118	HAA-ICR	Monobromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	12/4/98	12/14/98	12/14/98	0-289-0
2119	HAA-ICR	Monochloroacetic acid	ND	µg/L	EPA 552.2	1	2.0	12/4/98	12/14/98	12/14/98	0-289-0
2120	HAA-ICR	Tribromoacetic acid	ND	µg/L	EPA 552.2	1	4.0	12/4/98	12/14/98	12/14/98	0-289-0
2121	HAA-ICR	Trichloroacetic acid	23.3	µg/L	EPA 552.2	1	1.0	12/4/98	12/14/98	12/14/98	0-289-0
2122	pH	Cl2 pH - Final	7.4	Unit	SM 4500-H+ B	1	n/a	12/3/98		12/4/98	n/a
2123	pH	Cl2 pH - Initial	7.3	Unit	SM 4500-H+ B	1	n/a	12/3/98		12/3/98	n/a
2124	pH	pH	7.5	Unit	SM 4500-H+ B	1	n/a	11/30/98		11/30/98	n/a
2125	TEMP	Cl2 Temperature	7.5	°C	SM 2550 B	1	n/a	12/3/98		12/4/98	n/a

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

2126	TEMP	Temperature	20.1 °C	SM 2550 B	1	n/a	11/30/98	11/30/98	n/a
2127	TIME	Cl2 Incubation Time	24.1 hrs	n/a	1	n/a	12/3/98	12/4/98	n/a
2128	TOC-ICR	TOC	2.81 mg/L	SM 5310 C	1	0.50	11/30/98	11/30/98	7-0-477
2129	TOC-ICR	TOC (Dupl)	2.81 mg/L	SM 5310 C	1	0.50	11/30/98	11/30/98	7-0-477
			<b>2.81 mg/L</b>	<b>0.0 % RPD</b>					
2130	TOX-ICR	TOX	204 µg Cl-/L	SM 5320 B	1	25	12/4/98	12/11/98	12-0-261
2131	TOX-ICR	TOX (Dupl)	217 µg Cl-/L	SM 5320 B	1	25	12/4/98	12/11/98	12-0-261
			<b>211 µg Cl-/L</b>	<b>6.2 % RPD</b>					
2132	THM-ICR	1,2,3-Trichloropropane (Surrogate)	100.8 %	EPA 551.1	1	1.0	12/4/98	12/11/98	12/11/98 0-288-0
2133	THM-ICR	Bromodichloromethane	11.5 µg/L	EPA 551.1	1	1.0	12/4/98	12/11/98	12/11/98 0-288-0
2134	THM-ICR	Bromoform	ND µg/L	EPA 551.1	1	1.0	12/4/98	12/11/98	12/11/98 0-288-0
2135	THM-ICR	Chloroform	28.6 µg/L	EPA 551.1	1	1.0	12/4/98	12/11/98	12/11/98 0-288-0
2136	THM-ICR	Dibromochloromethane	2.1 µg/L	EPA 551.1	1	1.0	12/4/98	12/11/98	12/11/98 0-288-0
2137	TURB	Turbidity	0.10 ntu	SM 2130 B	1	0.05	11/30/98	11/30/98	9-0-22
2138	UV-ICR	UV	0.060 1/cm	SM 5910 B	1	0.009	11/30/98	12/1/98	8-0-382
2139	UV-ICR	UV (Dupl)	0.060 1/cm	SM 5910 B	1	0.009	11/30/98	12/1/98	8-0-382
			<b>0.060 1/cm</b>	<b>0.0 % RPD</b>					

Sample ID: 185.Inf.pH7.5.B-2

S&amp;H ID: 9811-639

Date Sampled: 12/3/98 10:25:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
2140	pH	pH	7.6	Unit	SM 4500-H+ B	1	n/a	12/3/98		12/3/98	n/a
2141	TEMP	Temperature	20.0	°C	SM 2550 B	1	n/a	12/3/98		12/3/98	n/a
2142	TOC-ICR	TOC	2.78	mg/L	SM 5310 C	1	0.50	12/3/98		12/3/98	7-0-480
2143	TOC-ICR	TOC (Dupl)	2.82	mg/L	SM 5310 C	1	0.50	12/3/98		12/3/98	7-0-480
			<b>2.80 mg/L</b>		<b>1.4 % RPD</b>						

Sample ID: 185.Inf.pH7.5.B-3

S&amp;H ID: 9811-640

Date Sampled: 12/6/98 2:45:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
2144	pH	pH	7.5	Unit	SM 4500-H+ B	1	n/a	12/6/98		12/6/98	n/a
2145	TEMP	Temperature	18.7	°C	SM 2550 B	1	n/a	12/6/98		12/6/98	n/a
2146	TOC-ICR	TOC	2.78	mg/L	SM 5310 C	1	0.50	12/6/98		12/6/98	7-0-483
2147	TOC-ICR	TOC (Dupl)	2.81	mg/L	SM 5310 C	1	0.50	12/6/98		12/6/98	7-0-483
			<b>2.79 mg/L</b>		<b>1.1 % RPD</b>						

Sample ID: 185.Inf.pH7.5.B-4

S&amp;H ID: 9811-641

Date Sampled: 12/7/98 8:30:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
2148	Cl2Dose	Chlorine Dose	3.15	mg/L as Cl2	SM 4500-Cl B	1	n/a	12/8/98		12/8/98	n/a
2149	Cl2Res	Chlorine Residual	0.55	mg/L as Cl2	SM 4500-Cl F	1	0.10	12/8/98		12/9/98	n/a

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

2150	HAA-ICR	1,2,3-Trichloropropane (IS) (Internal Standard)	96.4 %	EPA 552.2	1	1.0	12/9/98	12/21/98	12/22/98	0-291-0
2151	HAA-ICR	2-Bromopropionic acid (Surrogate)	101.2 %	EPA 552.2	1	1.0	12/9/98	12/21/98	12/22/98	0-291-0
2152	HAA-ICR	Bromochloroacetic acid	3.4 µg/L	EPA 552.2	1	1.0	12/9/98	12/21/98	12/22/98	0-291-0
2153	HAA-ICR	Bromodichloroacetic acid	4.7 µg/L	EPA 552.2	1	1.0	12/9/98	12/21/98	12/22/98	0-291-0
2154	HAA-ICR	Chlorodibromoacetic acid	ND µg/L	EPA 552.2	1	2.0	12/9/98	12/21/98	12/22/98	0-291-0
2155	HAA-ICR	Dibromoacetic acid	ND µg/L	EPA 552.2	1	1.0	12/9/98	12/21/98	12/22/98	0-291-0
2156	HAA-ICR	Dichloroacetic acid	12.9 µg/L	EPA 552.2	1	1.0	12/9/98	12/21/98	12/22/98	0-291-0
2157	HAA-ICR	Monobromoacetic acid	ND µg/L	EPA 552.2	1	1.0	12/9/98	12/21/98	12/22/98	0-291-0
2158	HAA-ICR	Monochloroacetic acid	ND µg/L	EPA 552.2	1	2.0	12/9/98	12/21/98	12/22/98	0-291-0
2159	HAA-ICR	Tribromoacetic acid	ND µg/L	EPA 552.2	1	4.0	12/9/98	12/21/98	12/22/98	0-291-0
2160	HAA-ICR	Trichloroacetic acid	16.8 µg/L	EPA 552.2	1	1.0	12/9/98	12/21/98	12/22/98	0-291-0
2161	pH	Cl2 pH - Final	7.5 Unit	SM 4500-H+ B	1	n/a	12/8/98		12/9/98	n/a
2162	pH	Cl2 pH - Initial	7.3 Unit	SM 4500-H+ B	1	n/a	12/8/98		12/8/98	n/a
2163	pH	pH	7.6 Unit	SM 4500-H+ B	1	n/a	12/7/98		12/7/98	n/a
2164	TEMP	Cl2 Temperature	7.5 °C	SM 2550 B	1	n/a	12/8/98		12/9/98	n/a
2165	TEMP	Temperature	19.8 °C	SM 2550 B	1	n/a	12/7/98		12/7/98	n/a
2166	TIME	Cl2 Incubation Time	23.9 hrs	n/a	1	n/a	12/8/98		12/9/98	n/a
2167	TOC-ICR	TOC	2.79 mg/L	SM 5310 C	1	0.50	12/7/98		12/7/98	7-0-484
2168	TOC-ICR	TOC (Dupl)	2.79 mg/L	SM 5310 C	1	0.50	12/7/98		12/7/98	7-0-484
			<b>2.79 mg/L</b>	<b>0.0 % RPD</b>						
2169	TOX-ICR	TOX	202 µg Cl-/L	SM 5320 B	1	25	12/9/98		12/17/98	12-0-265
2170	TOX-ICR	TOX (Dupl)	204 µg Cl-/L	SM 5320 B	1	25	12/9/98		12/17/98	12-0-265
			<b>203 µg Cl-/L</b>	<b>1.0 % RPD</b>						
2171	THM-ICR	1,2,3-Trichloropropane (Surrogate)	108.0 %	EPA 551.1	1	1.0	12/9/98	12/15/98	12/15/98	0-290-0
2172	THM-ICR	1,2,3-Trichloropropane (Surrogate) (Lab Dupl)	104.4 %	EPA 551.1	1	1.0	12/9/98	12/15/98	12/15/98	0-290-0
			<b>106.2 %</b>	<b>3.4 % RPD</b>						
2173	THM-ICR	Bromodichloromethane	11.1 µg/L	EPA 551.1	1	1.0	12/9/98	12/15/98	12/15/98	0-290-0
2174	THM-ICR	Bromodichloromethane (Lab Dupl)	11.4 µg/L	EPA 551.1	1	1.0	12/9/98	12/15/98	12/15/98	0-290-0
			<b>11.3 µg/L</b>	<b>2.7 % RPD</b>						
2175	THM-ICR	Bromoform	ND µg/L	EPA 551.1	1	1.0	12/9/98	12/15/98	12/15/98	0-290-0
2176	THM-ICR	Bromoform (Lab Dupl)	ND µg/L	EPA 551.1	1	1.0	12/9/98	12/15/98	12/15/98	0-290-0
			<b>ND µg/L</b>							
2177	THM-ICR	Chloroform	25.2 µg/L	EPA 551.1	1	1.0	12/9/98	12/15/98	12/15/98	0-290-0
2178	THM-ICR	Chloroform (Lab Dupl)	25.8 µg/L	EPA 551.1	1	1.0	12/9/98	12/15/98	12/15/98	0-290-0
			<b>25.5 µg/L</b>	<b>2.4 % RPD</b>						
2179	THM-ICR	Dibromochloromethane	2.1 µg/L	EPA 551.1	1	1.0	12/9/98	12/15/98	12/15/98	0-290-0
2180	THM-ICR	Dibromochloromethane (Lab Dupl)	2.3 µg/L	EPA 551.1	1	1.0	12/9/98	12/15/98	12/15/98	0-290-0
			<b>2.2 µg/L</b>	<b>9.1 % RPD</b>						
2181	TURB	Turbidity	0.15 ntu	SM 2130 B	1	0.05	12/7/98		12/7/98	9-0-22

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

2182	UV-ICR	UV	0.059	1/cm	SM 5910 B	1	0.009	12/7/98	12/7/98	8-0-389
2183	UV-ICR	UV (Dupl)	0.059	1/cm	SM 5910 B	1	0.009	12/7/98	12/7/98	8-0-389
			<b>0.059</b>	<b>1/cm</b>	<b>0.0 % RPD</b>					

Sample ID: Iowa Settled On Arrival      S&amp;H ID: 9811-642      Date Sampled: 11/19/98

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
2184	TOC-ICR	TOC	2.78	mg/L	SM 5310 C	1	0.50	11/19/98		11/19/98	7-0-467
2185	TOC-ICR	TOC (Dupl)	2.85	mg/L	SM 5310 C	1	0.50	11/19/98		11/19/98	7-0-467
			<b>2.81</b>	<b>mg/L</b>	<b>2.5 % RPD</b>						

Sample ID: Iowa Filtered S&amp;H      S&amp;H ID: 9811-643      Date Sampled: 11/19/98

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
2186	TOC-ICR	TOC	2.71	mg/L	SM 5310 C	1	0.50	11/19/98		11/19/98	7-0-467
2187	TOC-ICR	TOC (Dupl)	2.78	mg/L	SM 5310 C	1	0.50	11/19/98		11/19/98	7-0-467
			<b>2.75</b>	<b>mg/L</b>	<b>2.5 % RPD</b>						

Sample ID: 185.20.Eff-34      S&amp;H ID: 9812-69      Date Sampled: 12/7/98 1:17:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
2188	Cl2Dose	Chlorine Dose	1.75	mg/L as Cl2	SM 4500-Cl B	1	n/a	12/8/98		12/8/98	n/a
2189	Cl2Res	Chlorine Residual	0.97	mg/L as Cl2	SM 4500-Cl F	1	0.10	12/8/98		12/9/98	n/a
2190	HAA-ICR	1,2,3-Trichloropropane (IS) (Internal Standard)	97.6	%	EPA 552.2	1	1.0	12/9/98	12/21/98	12/22/98	0-291-0
2191	HAA-ICR	2-Bromopropionic acid (Surrogate)	100.0	%	EPA 552.2	1	1.0	12/9/98	12/21/98	12/22/98	0-291-0
2192	HAA-ICR	Bromochloroacetic acid	3.3	µg/L	EPA 552.2	1	1.0	12/9/98	12/21/98	12/22/98	0-291-0
2193	HAA-ICR	Bromodichloroacetic acid	4.0	µg/L	EPA 552.2	1	1.0	12/9/98	12/21/98	12/22/98	0-291-0
2194	HAA-ICR	Chlorodibromoacetic acid	ND	µg/L	EPA 552.2	1	2.0	12/9/98	12/21/98	12/22/98	0-291-0
2195	HAA-ICR	Dibromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	12/9/98	12/21/98	12/22/98	0-291-0
2196	HAA-ICR	Dichloroacetic acid	6.6	µg/L	EPA 552.2	1	1.0	12/9/98	12/21/98	12/22/98	0-291-0
2197	HAA-ICR	Monobromoacetic acid	ND	µg/L	EPA 552.2	1	1.0	12/9/98	12/21/98	12/22/98	0-291-0
2198	HAA-ICR	Monochloroacetic acid	ND	µg/L	EPA 552.2	1	2.0	12/9/98	12/21/98	12/22/98	0-291-0
2199	HAA-ICR	Tribromoacetic acid	ND	µg/L	EPA 552.2	1	4.0	12/9/98	12/21/98	12/22/98	0-291-0
2200	HAA-ICR	Trichloroacetic acid	7.2	µg/L	EPA 552.2	1	1.0	12/9/98	12/21/98	12/22/98	0-291-0
2201	pH	Cl2 pH - Final	7.5	Unit	SM 4500-H+ B	1	n/a	12/8/98		12/9/98	n/a
2202	pH	Cl2 pH - Initial	7.3	Unit	SM 4500-H+ B	1	n/a	12/8/98		12/8/98	n/a
2203	pH	pH	7.8	Unit	SM 4500-H+ B	1	n/a	12/7/98		12/7/98	n/a
2204	TEMP	Cl2 Temperature	7.5	°C	SM 2550 B	1	n/a	12/8/98		12/9/98	n/a
2205	TEMP	Temperature	22.5	°C	SM 2550 B	1	n/a	12/7/98		12/7/98	n/a
2206	TIME	Cl2 Incubation Time	24.0	hrs	n/a	1	n/a	12/8/98		12/9/98	n/a

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Laboratory Test Results**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

2207	TOC-ICR TOC	2.11 mg/L	SM 5310 C	1	0.50	12/7/98	12/7/98	7-0-484
2208	TOC-ICR TOC (Dupl)	2.07 mg/L	SM 5310 C	1	0.50	12/7/98	12/7/98	7-0-484
		<b>2.09 mg/L</b>	<b>1.9 % RPD</b>					
2209	TOX-ICR TOX	110 µg Cl-/L	SM 5320 B	1	25	12/9/98	12/18/98	12-0-266
2210	TOX-ICR TOX (Dupl)	108 µg Cl-/L	SM 5320 B	1	25	12/9/98	12/18/98	12-0-266
		<b>109 µg Cl-/L</b>	<b>1.8 % RPD</b>					
2211	THM-ICR 1,2,3-Trichloropropane (Surrogate)	104.4 %	EPA 551.1	1	1.0	12/9/98	12/15/98	12/15/98 0-290-0
2212	THM-ICR Bromodichloromethane	8.7 µg/L	EPA 551.1	1	1.0	12/9/98	12/15/98	12/15/98 0-290-0
2213	THM-ICR Bromoform	ND µg/L	EPA 551.1	1	1.0	12/9/98	12/15/98	12/15/98 0-290-0
2214	THM-ICR Chloroform	10.0 µg/L	EPA 551.1	1	1.0	12/9/98	12/15/98	12/15/98 0-290-0
2215	THM-ICR Dibromochloromethane	3.4 µg/L	EPA 551.1	1	1.0	12/9/98	12/15/98	12/15/98 0-290-0
2216	UV-ICR UV	0.035 1/cm	SM 5910 B	1	0.009	12/7/98	12/7/98	8-0-389
2217	UV-ICR UV (Dupl)	0.034 1/cm	SM 5910 B	1	0.009	12/7/98	12/7/98	8-0-389
		<b>0.035 1/cm</b>	<b>2.9 % RPD</b>					

Sample ID: 185.20.Eff-35

S&amp;H ID: 9812-70

Date Sampled: 12/8/98 1:58:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
2218	pH	pH	7.7	Unit	SM 4500-H+ B	1	n/a	12/8/98		12/8/98	n/a
2219	TEMP	Temperature	21.2	°C	SM 2550 B	1	n/a	12/8/98		12/8/98	n/a
2220	TOC-ICR TOC		2.11	mg/L	SM 5310 C	1	0.50	12/8/98		12/8/98	7-0-485
2221	TOC-ICR TOC (Dupl)		2.15	mg/L	SM 5310 C	1	0.50	12/8/98		12/8/98	7-0-485
			<b>2.13</b>	<b>mg/L</b>	<b>1.9 % RPD</b>						
2222	UV-ICR UV		0.035	1/cm	SM 5910 B	1	0.009	12/8/98		12/9/98	8-0-390
2223	UV-ICR UV (Dupl)		0.035	1/cm	SM 5910 B	1	0.009	12/8/98		12/9/98	8-0-390
			<b>0.035</b>	<b>1/cm</b>	<b>0.0 % RPD</b>						

**End of laboratory test results**

ND (non-detect): Result is below minimum reporting level (MRL).

NR (not reportable): Result did not meet QC criteria.

**Quality Control Report**

Mr. Joel Mohr  
Iowa-American Water Company  
230 East 2nd Street  
P.O. Box 979  
Davenport, IA 52805

Phone: 319-322-0161 Fax: 319-322-2190

**Study#:** 185  
**Study Title:** ICR RSSCT #3,4

**Analysis:** ALK (Alkalinity)

**Method:** SM 2320 B

**QC Batch ID:** 1-0-38

										Acceptance Criteria	
<u>QC Type</u>		<u>Spike</u>	<u>Recovery</u>	<u>Unit</u>	<u>Yield</u>	<u>RPD</u>	<u>Date Run</u>	<u>S&amp;H ID</u>	<u>MRL</u>	<u>Range</u>	<u>RPD</u>
Matrix Spike	Matrix Spike	100	97	mg/L	97%		11/20/98	9811-453	5		
Matrix Spike (Dupl)	Matrix Spike	100	99	mg/L	99%		11/20/98	9811-453	5		
		<b>100</b>	<b>98</b>	<b>mg/L</b>	<b>98%</b>	<b>2.0 %</b>					
Method Blank	Method Blank		ND*	mg/L			11/20/98	9811-647	5		
Standard	Standard	100	101	mg/L	101%		11/20/98	9811-648	5		
Standard (Dupl)	Standard	100	100	mg/L	100%		11/20/98	9811-648	5		
		<b>100</b>	<b>100</b>	<b>mg/L</b>	<b>100%</b>	<b>1.0 %</b>					
Matrix Spike	Matrix Spike	100	100	mg/L	100%		11/21/98	9811-542	5		
Matrix Spike (Dupl)	Matrix Spike	100	98	mg/L	98%		11/21/98	9811-542	5		
		<b>100</b>	<b>98</b>	<b>mg/L</b>	<b>98%</b>	<b>2.0 %</b>					
Method Blank	Method Blank		ND*	mg/L			11/21/98	9811-654	5		
Standard	Standard	100	100	mg/L	100%		11/21/98	9811-655	5		
Standard (Dupl)	Standard	100	100	mg/L	100%		11/21/98	9811-655	5		
		<b>100</b>	<b>100</b>	<b>mg/L</b>	<b>100%</b>	<b>0.0 %</b>					
Matrix Spike	Matrix Spike	100	94	mg/L	94%		11/29/98	9811-543	5		
Matrix Spike (Dupl)	Matrix Spike	100	92	mg/L	92%		11/29/98	9811-543	5		
		<b>100</b>	<b>92</b>	<b>mg/L</b>	<b>92%</b>	<b>2.2 %</b>					
Method Blank	Method Blank		ND*	mg/L			11/29/98	9811-698	5		
Standard	Standard	100	99	mg/L	99%		11/29/98	9811-699	5		
Standard (Dupl)	Standard	100	100	mg/L	100%		11/29/98	9811-699	5		
		<b>100</b>	<b>100</b>	<b>mg/L</b>	<b>100%</b>	<b>1.0 %</b>					

**Analysis:** ALK (Alkalinity)

**Method:** SM 2320 B

**QC Batch ID:** 1-0-39

										Acceptance Criteria	
<u>QC Type</u>		<u>Spike</u>	<u>Recovery</u>	<u>Unit</u>	<u>Yield</u>	<u>RPD</u>	<u>Date Run</u>	<u>S&amp;H ID</u>	<u>MRL</u>	<u>Range</u>	<u>RPD</u>
Matrix Spike	Matrix Spike	100	96	mg/L	96%		11/30/98	9811-590	5		
Matrix Spike (Dupl)	Matrix Spike	100	94	mg/L	94%		11/30/98	9811-590	5		
		<b>100</b>	<b>95</b>	<b>mg/L</b>	<b>95%</b>	<b>1.1 %</b>					
Method Blank	Method Blank		ND*	mg/L			11/30/98	9811-712	5		
Standard	Standard	100	98	mg/L	98%		11/30/98	9811-713	5		
Standard (Dupl)	Standard	100	99	mg/L	99%		11/30/98	9811-713	5		
		<b>100</b>	<b>98</b>	<b>mg/L</b>	<b>98%</b>	<b>1.0 %</b>					
Matrix Spike	Matrix Spike	100	98	mg/L	98%		12/07/98	9811-637	5		

ND: non-detect. \*Recovery is below 1/2 minimum reporting level (MRL). NA (not applicable): RPD calculation is not applicable.

**Quality Control Report**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

Matrix Spike (Dupl)	Matrix Spike	100	98 mg/L	98%	12/07/98	9811-637	5
		<b>100</b>	<b>98 mg/L</b>	<b>98%</b>	<b>0.0 %</b>		
Method Blank	Method Blank		ND* mg/L		12/07/98	9812-87	5
Standard	Standard	100	97 mg/L	97%	12/07/98	9812-88	5
Standard (Dupl)	Standard	100	98 mg/L	98%	12/07/98	9812-88	5
		<b>100</b>	<b>97 mg/L</b>	<b>97%</b>	<b>1.0 %</b>		

Analysis: TOC-ICR (Total Organic Carbon)

Method: SM 5310 C

QC Batch ID: 7-0-465

								Acceptance Criteria	
<u>QC Type</u>		<u>Spike</u>	<u>Recovery</u>	<u>Unit</u>	<u>Yield</u>	<u>RPD</u>	<u>S&amp;H ID</u>	<u>MRL</u>	<u>Range</u>
Matrix Spike	Matrix Spike	4.00	3.98	mg/L	100%		9811-185	0.5	
Matrix Spike (Dupl)	Matrix Spike	4.00	3.92	mg/L	98%		9811-185	0.5	
		<b>4.00</b>	<b>3.95</b>	<b>mg/L</b>	<b>99%</b>	<b>1.3 %</b>			
Method Blank	Method Blank		ND*	mg/L			9811-322	0.5	
Method Blank (Dupl)	Method Blank		ND*	mg/L			9811-322	0.5	
			<b>ND*</b>	<b>mg/L</b>					
Standard	Standard	0.50	0.54	mg/L	108%		9810-462	0.5	50-150%
Standard (Dupl)	Standard	0.50	0.55	mg/L	110%		9810-462	0.5	50-150%
		<b>0.50</b>	<b>0.55</b>	<b>mg/L</b>	<b>110%</b>	<b>1.8 %</b>			50-150% 20%
Standard	Standard	4.00	4.08	mg/L	102%		9810-493	0.5	90-110%
Standard (Dupl)	Standard	4.00	4.10	mg/L	102%		9810-493	0.5	90-110%
		<b>4.00</b>	<b>4.09</b>	<b>mg/L</b>	<b>102%</b>	<b>0.5 %</b>			90-110% 10%

Analysis: TOC-ICR (Total Organic Carbon)

Method: SM 5310 C

QC Batch ID: 7-0-467

								Acceptance Criteria	
<u>QC Type</u>		<u>Spike</u>	<u>Recovery</u>	<u>Unit</u>	<u>Yield</u>	<u>RPD</u>	<u>S&amp;H ID</u>	<u>MRL</u>	<u>Range</u>
Matrix Spike	Matrix Spike	4.00	3.88	mg/L	97%		9811-348	0.5	
Matrix Spike (Dupl)	Matrix Spike	4.00	3.97	mg/L	99%		9811-348	0.5	
		<b>4.00</b>	<b>3.93</b>	<b>mg/L</b>	<b>98%</b>	<b>2.3 %</b>			
Method Blank	Method Blank		ND*	mg/L			9811-342	0.5	
Method Blank (Dupl)	Method Blank		ND*	mg/L			9811-342	0.5	
			<b>ND*</b>	<b>mg/L</b>					
Standard	Standard	0.50	0.54	mg/L	108%		9810-462	0.5	50-150%
Standard (Dupl)	Standard	0.50	0.54	mg/L	108%		9810-462	0.5	50-150%
		<b>0.50</b>	<b>0.54</b>	<b>mg/L</b>	<b>108%</b>	<b>0.0 %</b>			50-150% 20%
Standard	Standard	4.00	3.92	mg/L	98%		9810-493	0.5	90-110%
Standard (Dupl)	Standard	4.00	4.02	mg/L	100%		9810-493	0.5	90-110%
		<b>4.00</b>	<b>3.97</b>	<b>mg/L</b>	<b>99%</b>	<b>2.5 %</b>			90-110% 10%
Standard	Standard	10.00	9.45	mg/L	94%		9811-152	0.5	90-110%
Standard (Dupl)	Standard	10.00	9.53	mg/L	95%		9811-152	0.5	90-110%
		<b>10.00</b>	<b>9.49</b>	<b>mg/L</b>	<b>95%</b>	<b>0.8 %</b>			90-110% 10%

ND: non-detect. \*Recovery is below 1/2 minimum reporting level (MRL). NA (not applicable): RPD calculation is not applicable.



**Quality Control Report**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

Analysis: TOC-ICR (Total Organic Carbon)

Method: SM 5310 C

QC Batch ID: 7-0-468

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range	RPD
Matrix Spike	Matrix Spike	4.00	4.08	mg/L	102%		9811-413	0.5		
	Matrix Spike (Dupl)	4.00	4.10	mg/L	102%		9811-413	0.5		
		<b>4.00</b>	<b>4.09</b>	<b>mg/L</b>	<b>102%</b>	<b>0.5 %</b>				
Method Blank	Method Blank		ND*	mg/L			9811-645	0.5		
Method Blank (Dupl)	Method Blank		ND*	mg/L			9811-645	0.5		
			<b>ND*</b>	<b>mg/L</b>						
Standard	Standard	0.50	0.54	mg/L	108%		9810-462	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.54	mg/L	108%		9810-462	0.5	50-150%	
		<b>0.50</b>	<b>0.54</b>	<b>mg/L</b>	<b>108%</b>	<b>0.0 %</b>			50-150%	20%
Standard	Standard	4.00	4.04	mg/L	101%		9810-493	0.5	90-110%	
Standard (Dupl)	Standard	4.00	4.03	mg/L	101%		9810-493	0.5	90-110%	
		<b>4.00</b>	<b>4.04</b>	<b>mg/L</b>	<b>101%</b>	<b>0.2 %</b>			90-110%	10%
Standard	Standard	10.00	10.10	mg/L	101%		9811-152	0.5	90-110%	
Standard (Dupl)	Standard	10.00	10.22	mg/L	102%		9811-152	0.5	90-110%	
		<b>10.00</b>	<b>10.16</b>	<b>mg/L</b>	<b>102%</b>	<b>1.2 %</b>			90-110%	10%

Analysis: TOC-ICR (Total Organic Carbon)

Method: SM 5310 C

QC Batch ID: 7-0-469

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range	RPD
Matrix Spike	Matrix Spike	4.00	4.02	mg/L	100%		9811-461	0.5		
	Matrix Spike (Dupl)	4.00	3.97	mg/L	99%		9811-461	0.5		
		<b>4.00</b>	<b>4.00</b>	<b>mg/L</b>	<b>100%</b>	<b>1.2 %</b>				
Method Blank	Method Blank		ND*	mg/L			9811-653	0.5		
Method Blank (Dupl)	Method Blank		ND*	mg/L			9811-653	0.5		
			<b>ND*</b>	<b>mg/L</b>						
Standard	Standard	0.50	0.55	mg/L	110%		9811-301	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.52	mg/L	104%		9811-301	0.5	50-150%	
		<b>0.50</b>	<b>0.54</b>	<b>mg/L</b>	<b>108%</b>	<b>5.6 %</b>			50-150%	20%
Standard	Standard	4.00	3.97	mg/L	99%		9811-646	0.5	90-110%	
Standard (Dupl)	Standard	4.00	4.02	mg/L	100%		9811-646	0.5	90-110%	
		<b>4.00</b>	<b>3.99</b>	<b>mg/L</b>	<b>100%</b>	<b>1.3 %</b>			90-110%	10%
Standard	Standard	10.00	9.82	mg/L	98%		9811-152	0.5	90-110%	
Standard (Dupl)	Standard	10.00	9.90	mg/L	99%		9811-152	0.5	90-110%	
		<b>10.00</b>	<b>9.86</b>	<b>mg/L</b>	<b>99%</b>	<b>0.8 %</b>			90-110%	10%

**Quality Control Report**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

Analysis: TOC-ICR (Total Organic Carbon)

Method: SM 5310 C

QC Batch ID: 7-0-470

C Batch ID: 7-0-470

										Acceptance Criteria	
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range	RPD	
Matrix Spike	Matrix Spike	4.00	3.91	mg/L	98%		9811-379	0.5			
Matrix Spike (Dupl)	Matrix Spike	4.00	3.96	mg/L	99%		9811-379	0.5			
		4.00	3.93	mg/L	98%	1.0 %					
Method Blank	Method Blank		ND*	mg/L			9811-657	0.5			
Method Blank (Dupl)	Method Blank		ND*	mg/L			9811-657	0.5			
			ND*	mg/L							
Standard	Standard	0.50	0.50	mg/L	100%		9811-301	0.5	50-150%		
Standard (Dupl)	Standard	0.50	0.50	mg/L	100%		9811-301	0.5	50-150%		
		0.50	0.50	mg/L	100%	0.0 %			50-150%	20%	
Standard	Standard	4.00	3.91	mg/L	98%		9811-646	0.5	90-110%		
Standard (Dupl)	Standard	4.00	3.96	mg/L	99%		9811-646	0.5	90-110%		
		4.00	3.94	mg/L	98%	1.3 %			90-110%	10%	
Standard	Standard	10.00	9.73	mg/L	97%		9811-152	0.5	90-110%		
Standard (Dupl)	Standard	10.00	9.85	mg/L	98%		9811-152	0.5	90-110%		
		10.00	9.79	mg/L	98%	1.2 %			90-110%	10%	

Analysis: TOC-ICR (Total Organic Carbon)

Method: SM 5310 C

QC Batch ID: 7-0-471

C Batch ID: 7-0-471

										Acceptance Criteria	
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range	RPD	
Matrix Spike	Matrix Spike	4.00	4.16	mg/L	104%		9811-466	0.5			
Matrix Spike (Dupl)	Matrix Spike	4.00	4.24	mg/L	106%		9811-466	0.5			
		4.00	4.20	mg/L	105%	1.9 %					
Method Blank	Method Blank		ND*	mg/L			9811-662	0.5			
Method Blank (Dupl)	Method Blank		ND*	mg/L			9811-662	0.5			
			ND*	mg/L							
Standard	Standard	0.50	0.54	mg/L	108%		9811-301	0.5	50-150%		
Standard (Dupl)	Standard	0.50	0.52	mg/L	104%		9811-301	0.5	50-150%		
		0.50	0.53	mg/L	106%	3.8 %			50-150%	20%	
Standard	Standard	4.00	4.04	mg/L	101%		9811-646	0.5	90-110%		
Standard (Dupl)	Standard	4.00	4.08	mg/L	102%		9811-646	0.5	90-110%		
		4.00	4.06	mg/L	101%	1.0 %			90-110%	10%	
Standard	Standard	10.00	10.00	mg/L	100%		9811-152	0.5	90-110%		
Standard (Dupl)	Standard	10.00	9.98	mg/L	100%		9811-152	0.5	90-110%		
		10.00	9.99	mg/L	100%	0.2 %			90-110%	10%	

Analysis: TOC-ICR (Total Organic Carbon)

Method: SM 5310 C

QC Batch ID: 7-0-472

C Batch ID: 7-0-472										Acceptance Criteria		
QC Type		Spike	Recovery	Unit		Yield	RPD		S&H ID	MRL	Range	RPD

ND: non-detect. \*Recovery is below 1/2 minimum reporting level (MRL). NA (not applicable): RPD calculation is not applicable.

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Matrix Spike	Matrix Spike	4.00	4.01 mg/L	100%	9811-471	0.5		
Matrix Spike (Dupl)	Matrix Spike	4.00	4.02 mg/L	100%	9811-471	0.5		
		<b>4.00</b>	<b>4.02 mg/L</b>	<b>100%</b>			<b>0.2 %</b>	
Method Blank	Method Blank		ND* mg/L		9811-672	0.5		
Method Blank (Dupl)	Method Blank		ND* mg/L		9811-672	0.5		
			<b>ND* mg/L</b>					
Standard	Standard	0.50	0.54 mg/L	108%	9811-301	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.52 mg/L	104%	9811-301	0.5	50-150%	
		<b>0.50</b>	<b>0.53 mg/L</b>	<b>106%</b>			<b>3.8 %</b>	
							50-150%	20%
Standard	Standard	4.00	4.01 mg/L	100%	9811-646	0.5	90-110%	
Standard (Dupl)	Standard	4.00	4.01 mg/L	100%	9811-646	0.5	90-110%	
		<b>4.00</b>	<b>4.01 mg/L</b>	<b>100%</b>			<b>0.0 %</b>	
							90-110%	10%
Standard	Standard	10.00	9.71 mg/L	97%	9811-152	0.5	90-110%	
Standard (Dupl)	Standard	10.00	9.76 mg/L	98%	9811-152	0.5	90-110%	
		<b>10.00</b>	<b>9.73 mg/L</b>	<b>97%</b>			<b>0.5 %</b>	
							90-110%	10%

Analysis: TOC-ICR (Total Organic Carbon)

Method: SM 5310 C

QC Batch ID: 7-0-473

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range	RPD	Acceptance Criteria
Matrix Spike	Matrix Spike	4.00	3.99	mg/L	100%		9811-389	0.5			
Matrix Spike (Dupl)	Matrix Spike	4.00	3.99	mg/L	100%		9811-389	0.5			
		<b>4.00</b>	<b>3.99</b>	<b>mg/L</b>	<b>100%</b>	<b>0.0 %</b>					
Method Blank	Method Blank		ND*	mg/L			9811-682	0.5			
Method Blank (Dupl)	Method Blank		ND*	mg/L			9811-682	0.5			
			<b>ND*</b>	<b>mg/L</b>							
Standard	Standard	0.50	0.52	mg/L	104%		9811-301	0.5	50-150%		
Standard (Dupl)	Standard	0.50	0.50	mg/L	100%		9811-301	0.5	50-150%		
		<b>0.50</b>	<b>0.51</b>	<b>mg/L</b>	<b>102%</b>	<b>3.9 %</b>			<b>50-150%</b>	<b>20%</b>	
Standard	Standard	4.00	3.93	mg/L	98%		9811-646	0.5	90-110%		
Standard (Dupl)	Standard	4.00	3.95	mg/L	99%		9811-646	0.5	90-110%		
		<b>4.00</b>	<b>3.94</b>	<b>mg/L</b>	<b>98%</b>	<b>0.5 %</b>			<b>90-110%</b>	<b>10%</b>	
Standard	Standard	10.00	9.76	mg/L	98%		9811-152	0.5	90-110%		
Standard (Dupl)	Standard	10.00	9.86	mg/L	99%		9811-152	0.5	90-110%		
		<b>10.00</b>	<b>9.81</b>	<b>mg/L</b>	<b>98%</b>	<b>1.0 %</b>			<b>90-110%</b>	<b>10%</b>	

Analysis: TOC-ICR (Total Organic Carbon)

Method: SM 5310 C

QC Batch ID: 7-0-474

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range	RPD	Acceptance Criteria
Matrix Spike	Matrix Spike	4.00	3.98	mg/L	100%		9811-513	0.5			
Matrix Spike (Dupl)	Matrix Spike	4.00	3.99	mg/L	100%		9811-513	0.5			
		<b>4.00</b>	<b>3.99</b>	<b>mg/L</b>	<b>100%</b>	<b>0.3 %</b>					
Method Blank	Method Blank		ND*	mg/L			9811-692	0.5			

ND: non-detect. \*Recovery is below 1/2 minimum reporting level (MRL). NA (not applicable): RPD calculation is not applicable.

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Method Blank (Dupl)	Method Blank		ND* mg/L			9811-692	0.5		
			ND* mg/L						
Standard	Standard	0.50	0.52 mg/L	104%		9811-301	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.53 mg/L	106%		9811-301	0.5	50-150%	
		<b>0.50</b>	<b>0.52 mg/L</b>	<b>104%</b>	<b>1.9 %</b>			50-150%	20%
Standard	Standard	4.00	3.90 mg/L	97%		9811-646	0.5	90-110%	
Standard (Dupl)	Standard	4.00	3.97 mg/L	99%		9811-646	0.5	90-110%	
		<b>4.00</b>	<b>3.93 mg/L</b>	<b>98%</b>	<b>1.8 %</b>			90-110%	10%
Standard	Standard	10.00	9.79 mg/L	98%		9811-152	0.5	90-110%	
Standard (Dupl)	Standard	10.00	9.96 mg/L	100%		9811-152	0.5	90-110%	
		<b>10.00</b>	<b>9.88 mg/L</b>	<b>99%</b>	<b>1.7 %</b>			90-110%	10%

Analysis: TOC-ICR (Total Organic Carbon)

Method: SM 5310 C

QC Batch ID: 7-0-475

		Acceptance Criteria							
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range RPD
Matrix Spike	Matrix Spike	4.00	3.90	mg/L	97%		9811-447	0.5	
Matrix Spike (Dupl)	Matrix Spike	4.00	3.96	mg/L	99%		9811-447	0.5	
		<b>4.00</b>	<b>3.93</b>	<b>mg/L</b>	<b>98%</b>	<b>1.5 %</b>			
Method Blank	Method Blank		ND*	mg/L			9811-697	0.5	
Method Blank (Dupl)	Method Blank		ND*	mg/L			9811-697	0.5	
			ND*	mg/L					
Standard	Standard	0.50	0.52	mg/L	104%		9811-301	0.5	50-150%
Standard (Dupl)	Standard	0.50	0.53	mg/L	106%		9811-301	0.5	50-150%
		<b>0.50</b>	<b>0.52</b>	<b>mg/L</b>	<b>104%</b>	<b>1.9 %</b>			50-150% 20%
Standard	Standard	4.00	3.94	mg/L	98%		9811-646	0.5	90-110%
Standard (Dupl)	Standard	4.00	3.94	mg/L	98%		9811-646	0.5	90-110%
		<b>4.00</b>	<b>3.94</b>	<b>mg/L</b>	<b>98%</b>	<b>0.0 %</b>			90-110% 10%
Standard	Standard	10.00	9.81	mg/L	98%		9811-152	0.5	90-110%
Standard (Dupl)	Standard	10.00	9.88	mg/L	99%		9811-152	0.5	90-110%
		<b>10.00</b>	<b>9.85</b>	<b>mg/L</b>	<b>98%</b>	<b>0.7 %</b>			90-110% 10%

Analysis: TOC-ICR (Total Organic Carbon)

Method: SM 5310 C

QC Batch ID: 7-0-476

		Acceptance Criteria							
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range RPD
Matrix Spike	Matrix Spike	4.00	3.92	mg/L	98%		9811-524	0.5	
Matrix Spike (Dupl)	Matrix Spike	4.00	3.94	mg/L	98%		9811-524	0.5	
		<b>4.00</b>	<b>3.93</b>	<b>mg/L</b>	<b>98%</b>	<b>0.3 %</b>			
Method Blank	Method Blank		ND*	mg/L			9811-700	0.5	
Method Blank (Dupl)	Method Blank		ND*	mg/L			9811-700	0.5	
			ND*	mg/L					
Standard	Standard	0.50	0.52	mg/L	104%		9811-301	0.5	50-150%
Standard (Dupl)	Standard	0.50	0.51	mg/L	102%		9811-301	0.5	50-150%

ND: non-detect. \*Recovery is below 1/2 minimum reporting level (MRL). NA (not applicable): RPD calculation is not applicable.

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		<b>0.50</b>	<b>0.52 mg/L</b>	<b>104%</b>	<b>1.9 %</b>		50-150%	20%
Standard	Standard	4.00	3.98 mg/L	100%		9811-646	0.5 90-110%	
Standard (Dupl)	Standard	4.00	4.00 mg/L	100%		9811-646	0.5 90-110%	
		<b>4.00</b>	<b>3.99 mg/L</b>	<b>100%</b>	<b>0.5 %</b>		90-110%	10%
Standard	Standard	10.00	9.75 mg/L	97%		9811-152	0.5 90-110%	
Standard (Dupl)	Standard	10.00	9.85 mg/L	98%		9811-152	0.5 90-110%	
		<b>10.00</b>	<b>9.80 mg/L</b>	<b>98%</b>	<b>1.0 %</b>		90-110%	10%

Analysis: TOC-ICR (Total Organic Carbon)

Method: SM 5310 C

QC Batch ID: 7-0-477

C Batch ID: 7-0-477

									Acceptance Criteria	
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range	RPD
Matrix Spike	Matrix Spike	4.00	4.05	mg/L	101%		9811-398	0.5		
Matrix Spike (Dupl)	Matrix Spike	4.00	4.07	mg/L	102%		9811-398	0.5		
		4.00	4.06	mg/L	101%	0.5 %				
Method Blank	Method Blank		ND*	mg/L			9811-702	0.5		
Method Blank (Dupl)	Method Blank		ND*	mg/L			9811-702	0.5		
			ND*	mg/L						
Standard	Standard	0.50	0.54	mg/L	108%		9811-301	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.53	mg/L	106%		9811-301	0.5	50-150%	
		0.50	0.54	mg/L	108%	1.9 %			50-150%	20%
Standard	Standard	4.00	4.01	mg/L	100%		9811-646	0.5	90-110%	
Standard (Dupl)	Standard	4.00	4.05	mg/L	101%		9811-646	0.5	90-110%	
		4.00	4.03	mg/L	101%	1.0 %			90-110%	10%
Standard	Standard	10.00	9.96	mg/L	100%		9811-152	0.5	90-110%	
Standard (Dupl)	Standard	10.00	9.95	mg/L	99%		9811-152	0.5	90-110%	
		10.00	9.95	mg/L	99%	0.1 %			90-110%	10%

Analysis: TOC-ICR (Total Organic Carbon)

Method: SM 5310 C

QC Batch ID: 7-0-478

C Batch ID: 7-0-478									Acceptance Criteria	
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range	RPD
Matrix Spike	Matrix Spike	4.00	4.10	mg/L	102%		9811-550	0.5		
Matrix Spike (Dupl)	Matrix Spike	4.00	4.14	mg/L	103%		9811-550	0.5		
		4.00	4.12	mg/L	103%	1.0 %				
Method Blank	Method Blank		ND*	mg/L			9812-1	0.5		
Method Blank (Dupl)	Method Blank		ND*	mg/L			9812-1	0.5		
			ND*	mg/L						
Standard	Standard	0.50	0.53	mg/L	106%		9811-301	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.53	mg/L	106%		9811-301	0.5	50-150%	
		0.50	0.53	mg/L	106%	0.0 %			50-150%	20%
Standard	Standard	4.00	4.03	mg/L	101%		9811-646	0.5	90-110%	
Standard (Dupl)	Standard	4.00	4.06	mg/L	101%		9811-646	0.5	90-110%	
		4.00	4.05	mg/L	101%	0.7 %			90-110%	10%

ND: non-detect. \*Recovery is below 1/2 minimum reporting level (MRL). NA (not applicable): RPD calculation is not applicable.

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Study Title: ICR RSSCT #3,4

Analysis: TOC-ICR (Total Organic Carbon)

Method: SM 5310 C

QC Batch ID: 7-0-479

C Batch ID: 7-0-479

									Acceptance Criteria	
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range	RPD
Matrix Spike	Matrix Spike	4.00	4.00	mg/L	100%		9811-551	0.5		
Matrix Spike (Dupl)	Matrix Spike	4.00	4.06	mg/L	101%		9811-551	0.5		
		4.00	4.03	mg/L	101%	1.5 %				
Method Blank	Method Blank		ND*	mg/L			9812-38	0.5		
Method Blank (Dupl)	Method Blank		ND*	mg/L			9812-38	0.5		
			ND*	mg/L						
Standard	Standard	0.50	0.51	mg/L	102%		9811-301	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.51	mg/L	102%		9811-301	0.5	50-150%	
		0.50	0.51	mg/L	102%	0.0 %			50-150%	20%
Standard	Standard	4.00	4.00	mg/L	100%		9811-646	0.5	90-110%	
Standard (Dupl)	Standard	4.00	4.06	mg/L	101%		9811-646	0.5	90-110%	
		4.00	4.03	mg/L	101%	1.5 %			90-110%	10%

Analysis: TOC-ICR (Total Organic Carbon)

Method: SM 5310 C

QC Batch ID: 7-0-480

C Batch ID: 7-0-480

									Acceptance Criteria	
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range	RPD
Matrix Spike	Matrix Spike	4.00	4.00	mg/L	100%		9811-602	0.5		
Matrix Spike (Dupl)	Matrix Spike	4.00	4.10	mg/L	102%		9811-602	0.5		
		4.00	4.05	mg/L	101%	2.5 %				
Method Blank	Method Blank		ND*	mg/L			9812-48	0.5		
Method Blank (Dupl)	Method Blank		ND*	mg/L			9812-48	0.5		
			ND*	mg/L						
Standard	Standard	0.50	0.52	mg/L	104%		9811-301	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.52	mg/L	104%		9811-301	0.5	50-150%	
		0.50	0.52	mg/L	104%	0.0 %			50-150%	20%
Standard	Standard	4.00	4.03	mg/L	101%		9811-646	0.5	90-110%	
Standard (Dupl)	Standard	4.00	4.13	mg/L	103%		9811-646	0.5	90-110%	
		4.00	4.08	mg/L	102%	2.5 %			90-110%	10%
Standard	Standard	10.00	10.07	mg/L	101%		9812-54	0.5	90-110%	
Standard (Dupl)	Standard	10.00	10.16	mg/L	102%		9812-54	0.5	90-110%	
		10.00	10.12	mg/L	101%	0.9 %			90-110%	10%

Analysis: TOC-ICR (Total Organic Carbon)

Method: SM 5310 C

QC Batch ID: 7-0-481

C Batch ID: 7-0-481									Acceptance Criteria	
<u>QC Type</u>		<u>Spike</u>	<u>Recovery</u>	<u>Unit</u>	<u>Yield</u>	<u>RPD</u>	<u>S&amp;H ID</u>	<u>MRL</u>	<u>Range</u>	<u>RPD</u>
Matrix Spike	Matrix Spike	4.00	3.81	mg/L	95%		9811-558	0.5		
Matrix Spike (Dupl)	Matrix Spike	4.00	3.99	mg/L	100%		9811-558	0.5		

ND: non-detect. \*Recovery is below 1/2 minimum reporting level (MRL). NA (not applicable): RPD calculation is not applicable.

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		4.00	3.90 mg/L	97%	4.6 %			
Method Blank	Method Blank		ND* mg/L			9812-55	0.5	
Method Blank (Dupl)	Method Blank		ND* mg/L			9812-55	0.5	
			ND* mg/L					
Standard	Standard	0.50	0.52 mg/L	104%		9811-301	0.5	50-150%
Standard (Dupl)	Standard	0.50	0.52 mg/L	104%		9811-301	0.5	50-150%
		0.50	0.52 mg/L	104%	0.0 %			50-150% 20%
Standard	Standard	4.00	3.91 mg/L	98%		9811-646	0.5	90-110%
Standard (Dupl)	Standard	4.00	3.93 mg/L	98%		9811-646	0.5	90-110%
		4.00	3.92 mg/L	98%	0.5 %			90-110% 10%
Standard	Standard	10.00	9.94 mg/L	99%		9812-54	0.5	90-110%
Standard (Dupl)	Standard	10.00	9.99 mg/L	100%		9812-54	0.5	90-110%
		10.00	9.97 mg/L	100%	0.5 %			90-110% 10%

Analysis: TOC-ICR (Total Organic Carbon)

Method: SM 5310 C

QC Batch ID: 7-0-482

										Acceptance Criteria
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range	RPD
Matrix Spike	Matrix Spike	4.00	3.89	mg/L	97%		9811-608	0.5		
Matrix Spike (Dupl)	Matrix Spike	4.00	3.98	mg/L	100%		9811-608	0.5		
		4.00	3.94	mg/L	98%	2.3 %				
Method Blank	Method Blank			ND* mg/L			9812-71	0.5		
Method Blank (Dupl)	Method Blank			ND* mg/L			9812-71	0.5		
				ND* mg/L						
Standard	Standard	0.50	0.51	mg/L	102%		9811-301	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.52	mg/L	104%		9811-301	0.5	50-150%	
		0.50	0.51	mg/L	102%	2.0 %			50-150%	20%
Standard	Standard	4.00	3.98	mg/L	100%		9811-646	0.5	90-110%	
Standard (Dupl)	Standard	4.00	4.01	mg/L	100%		9811-646	0.5	90-110%	
		4.00	4.00	mg/L	100%	0.7 %			90-110%	10%
Standard	Standard	10.00	9.79	mg/L	98%		9812-54	0.5	90-110%	
Standard (Dupl)	Standard	10.00	9.92	mg/L	99%		9812-54	0.5	90-110%	
		10.00	9.86	mg/L	99%	1.3 %			90-110%	10%

Analysis: TOC-ICR (Total Organic Carbon)

Method: SM 5310 C

QC Batch ID: 7-0-483

										Acceptance Criteria
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range	RPD
Matrix Spike	Matrix Spike	4.00	3.89	mg/L	97%		9811-566	0.5		
Matrix Spike (Dupl)	Matrix Spike	4.00	3.96	mg/L	99%		9811-566	0.5		
		4.00	3.93	mg/L	98%	2.0 %				
Method Blank	Method Blank			ND* mg/L			9812-73	0.5		
Method Blank (Dupl)	Method Blank			ND* mg/L			9812-73	0.5		
				ND* mg/L						

ND: non-detect. \*Recovery is below 1/2 minimum reporting level (MRL). NA (not applicable): RPD calculation is not applicable.

**Quality Control Report**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

Standard	Standard	0.50	0.52 mg/L	104%		9811-301	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.53 mg/L	106%		9811-301	0.5	50-150%	
		<b>0.50</b>	<b>0.52 mg/L</b>	<b>104%</b>	<b>1.9 %</b>			50-150%	20%
Standard	Standard	4.00	3.94 mg/L	98%		9811-646	0.5	90-110%	
Standard (Dupl)	Standard	4.00	4.00 mg/L	100%		9811-646	0.5	90-110%	
		<b>4.00</b>	<b>3.97 mg/L</b>	<b>99%</b>	<b>1.5 %</b>			90-110%	10%
Standard	Standard	10.00	9.83 mg/L	98%		9812-54	0.5	90-110%	
Standard (Dupl)	Standard	10.00	9.91 mg/L	99%		9812-54	0.5	90-110%	
		<b>10.00</b>	<b>9.87 mg/L</b>	<b>99%</b>	<b>0.8 %</b>			90-110%	10%

Analysis: TOC-ICR (Total Organic Carbon)

Method: SM 5310 C

QC Batch ID: 7-0-484

										Acceptance Criteria
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range	RPD
Matrix Spike	Matrix Spike	4.00	3.87	mg/L	97%		9812-69	0.5		
Matrix Spike (Dupl)	Matrix Spike	4.00	3.89	mg/L	97%		9812-69	0.5		
		<b>4.00</b>	<b>3.88</b>	<b>mg/L</b>	<b>97%</b>	<b>0.5 %</b>				
Method Blank	Method Blank		ND*	mg/L			9812-55	0.5		
Method Blank (Dupl)	Method Blank		ND*	mg/L			9812-55	0.5		
			<b>ND*</b>	<b>mg/L</b>						
Standard	Standard	0.50	0.52 mg/L	104%			9811-301	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.52 mg/L	104%			9811-301	0.5	50-150%	
		<b>0.50</b>	<b>0.52 mg/L</b>	<b>104%</b>	<b>0.0 %</b>				50-150%	20%
Standard	Standard	4.00	3.88 mg/L	97%			9811-646	0.5	90-110%	
Standard (Dupl)	Standard	4.00	3.92 mg/L	98%			9811-646	0.5	90-110%	
		<b>4.00</b>	<b>3.90</b>	<b>mg/L</b>	<b>97%</b>	<b>1.0 %</b>			90-110%	10%

Analysis: TOC-ICR (Total Organic Carbon)

Method: SM 5310 C

QC Batch ID: 7-0-485

										Acceptance Criteria
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range	RPD
Matrix Spike	Matrix Spike	4.00	3.96	mg/L	99%		9811-436	0.5		
Matrix Spike (Dupl)	Matrix Spike	4.00	3.99	mg/L	100%		9811-436	0.5		
		<b>4.00</b>	<b>3.98</b>	<b>mg/L</b>	<b>100%</b>	<b>0.5 %</b>				
Method Blank	Method Blank		ND*	mg/L			9812-92	0.5		
Method Blank (Dupl)	Method Blank		ND*	mg/L			9812-92	0.5		
			<b>ND*</b>	<b>mg/L</b>						
Standard	Standard	0.50	0.54 mg/L	108%			9811-301	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.55 mg/L	110%			9811-301	0.5	50-150%	
		<b>0.50</b>	<b>0.55</b>	<b>mg/L</b>	<b>110%</b>	<b>1.8 %</b>			50-150%	20%
Standard	Standard	4.00	4.00 mg/L	100%			9811-646	0.5	90-110%	
Standard (Dupl)	Standard	4.00	4.02 mg/L	100%			9811-646	0.5	90-110%	
		<b>4.00</b>	<b>4.01</b>	<b>mg/L</b>	<b>100%</b>	<b>0.5 %</b>			90-110%	10%

ND: non-detect. \*Recovery is below 1/2 minimum reporting level (MRL). NA (not applicable): RPD calculation is not applicable.



**Quality Control Report**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

Analysis: UV-ICR (UV-254)

Method: SM 5910 B

QC Batch ID: 8-0-367

C Batch ID: 8-0-367

										Acceptance Criteria	
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range	RPD	
Method Blank	Method Blank		ND*	1/cm			9811-656	0.009			
Method Blank (Dupl)	Method Blank		ND*	1/cm			9811-656	0.009			
			ND*	1/cm							
Method Blank	Method Blank		ND*	1/cm			9811-656	0.009			
Method Blank (Dupl)	Method Blank		ND*	1/cm			9811-656	0.009			
			ND*	1/cm							
Standard	Standard	0.009	0.007	1/cm	78%		9811-299	0.009	75-125%		
Standard (Dupl)	Standard	0.009	0.007	1/cm	78%		9811-299	0.009	75-125%		
		0.009	0.007	1/cm	78%	0.0 %			75-125%	20%	
Standard	Standard	0.088	0.083	1/cm	94%		9811-300	0.009	85-115%		
Standard (Dupl)	Standard	0.088	0.084	1/cm	95%		9811-300	0.009	85-115%		
		0.088	0.083	1/cm	94%	1.2 %			85-115%	10%	

Analysis: UV-ICR (UV-254)

Method: SM 5910 B

QC Batch ID: 8-0-368

C Batch ID: 8-0-368

									Acceptance Criteria	
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range	RPD
Method Blank	Method Blank		ND*	1/cm			9811-658	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9811-658	0.009		
			ND*	1/cm						
Method Blank	Method Blank		ND*	1/cm			9811-658	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9811-658	0.009		
			ND*	1/cm						
Standard	Standard	0.009	0.008	1/cm	89%		9811-299	0.009	75-125%	
Standard (Dupl)	Standard	0.009	0.008	1/cm	89%		9811-299	0.009	75-125%	
		0.009	0.008	1/cm	89%	0.0 %			75-125%	20%
Standard	Standard	0.088	0.084	1/cm	95%		9811-300	0.009	85-115%	
Standard (Dupl)	Standard	0.088	0.084	1/cm	95%		9811-300	0.009	85-115%	
		0.088	0.084	1/cm	95%	0.0 %			85-115%	10%

Analysis: UV-ICR (UV-254)

Method: SM 5910 B

QC Batch ID: 8-0-369

C Batch ID: 8-0-369									Acceptance Criteria	
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range	RPD
Method Blank	Method Blank		ND*	1/cm			9811-671	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9811-671	0.009		
			ND*	1/cm						
Method Blank	Method Blank		ND*	1/cm			9811-671	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9811-671	0.009		
			ND*	1/cm						

ND: non-detect. \*Recovery is below 1/2 minimum reporting level (MRL). NA (not applicable): RPD calculation is not applicable.

**Quality Control Report**Mr. Joel Mohr  
Iowa-American Water Company**Study#:** 185  
**Study Title:** ICR RSSCT #3,4

Standard	Standard	0.009	0.008	1/cm	89%	9811-299	0.009	75-125%	
Standard (Dupl)	Standard	0.009	0.008	1/cm	89%	9811-299	0.009	75-125%	
		<b>0.009</b>	<b>0.008</b>	<b>1/cm</b>	<b>89%</b>			75-125%	20%
Standard	Standard	0.088	0.085	1/cm	97%	9811-300	0.009	85-115%	
Standard (Dupl)	Standard	0.088	0.085	1/cm	97%	9811-300	0.009	85-115%	
		<b>0.088</b>	<b>0.085</b>	<b>1/cm</b>	<b>97%</b>			85-115%	10%

**Analysis:** UV-ICR (UV-254)**Method:** SM 5910 B**QC Batch ID:** 8-0-370

										Acceptance Criteria
<u>QC Type</u>		<u>Spike</u>	<u>Recovery</u>	<u>Unit</u>	<u>Yield</u>	<u>RPD</u>	<u>S&amp;H ID</u>	<u>MRL</u>	<u>Range</u>	<u>RPD</u>
Method Blank	Method Blank		ND*	1/cm			9811-671	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9811-671	0.009		
			<b>ND*</b>	<b>1/cm</b>						
Method Blank	Method Blank		ND*	1/cm			9811-671	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9811-671	0.009		
			<b>ND*</b>	<b>1/cm</b>						
Standard	Standard	0.009	0.008	1/cm	89%		9811-299	0.009	75-125%	
Standard (Dupl)	Standard	0.009	0.008	1/cm	89%		9811-299	0.009	75-125%	
		<b>0.009</b>	<b>0.008</b>	<b>1/cm</b>	<b>89%</b>	<b>0.0 %</b>			75-125%	20%
Standard	Standard	0.088	0.084	1/cm	95%		9811-300	0.009	85-115%	
Standard (Dupl)	Standard	0.088	0.085	1/cm	97%		9811-300	0.009	85-115%	
		<b>0.088</b>	<b>0.085</b>	<b>1/cm</b>	<b>97%</b>	<b>1.2 %</b>			85-115%	10%

**Analysis:** UV-ICR (UV-254)**Method:** SM 5910 B**QC Batch ID:** 8-0-371

										Acceptance Criteria
<u>QC Type</u>		<u>Spike</u>	<u>Recovery</u>	<u>Unit</u>	<u>Yield</u>	<u>RPD</u>	<u>S&amp;H ID</u>	<u>MRL</u>	<u>Range</u>	<u>RPD</u>
Method Blank	Method Blank		ND*	1/cm			9811-676	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9811-676	0.009		
			<b>ND*</b>	<b>1/cm</b>						
Method Blank	Method Blank		ND*	1/cm			9811-676	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9811-676	0.009		
			<b>ND*</b>	<b>1/cm</b>						
Standard	Standard	0.009	0.008	1/cm	89%		9811-299	0.009	75-125%	
Standard (Dupl)	Standard	0.009	0.008	1/cm	89%		9811-299	0.009	75-125%	
		<b>0.009</b>	<b>0.008</b>	<b>1/cm</b>	<b>89%</b>	<b>0.0 %</b>			75-125%	20%
Standard	Standard	0.088	0.085	1/cm	97%		9811-300	0.009	85-115%	
Standard (Dupl)	Standard	0.088	0.085	1/cm	97%		9811-300	0.009	85-115%	
		<b>0.088</b>	<b>0.085</b>	<b>1/cm</b>	<b>97%</b>	<b>0.0 %</b>			85-115%	10%

**Quality Control Report**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

Analysis: UV-ICR (UV-254)

Method: SM 5910 B

QC Batch ID: 8-0-373

C Batch ID: 8-0-373

										Acceptance Criteria	
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range	RPD	
Method Blank	Method Blank		ND*	1/cm			9811-687	0.009			
Method Blank (Dupl)	Method Blank		ND*	1/cm			9811-687	0.009			
			ND*	1/cm							
Method Blank	Method Blank		ND*	1/cm			9811-687	0.009			
Method Blank (Dupl)	Method Blank		ND*	1/cm			9811-687	0.009			
			ND*	1/cm							
Standard	Standard	0.009	0.008	1/cm	89%		9811-299	0.009	75-125%		
Standard (Dupl)	Standard	0.009	0.008	1/cm	89%		9811-299	0.009	75-125%		
		0.009	0.008	1/cm	89%	0.0 %			75-125%	20%	
Standard	Standard	0.088	0.084	1/cm	95%		9811-300	0.009	85-115%		
Standard (Dupl)	Standard	0.088	0.084	1/cm	95%		9811-300	0.009	85-115%		
		0.088	0.084	1/cm	95%	0.0 %			85-115%	10%	

Analysis: UV-ICR (UV-254)

Method: SM 5910 B

QC Batch ID: 8-0-374

C Batch ID: 8-0-374

									Acceptance Criteria	
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range	RPD
Method Blank	Method Blank		ND*	1/cm			9811-688	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9811-688	0.009		
			ND*	1/cm						
Method Blank	Method Blank		ND*	1/cm			9811-688	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9811-688	0.009		
			ND*	1/cm						
Standard	Standard	0.009	0.008	1/cm	89%		9811-299	0.009	75-125%	
Standard (Dupl)	Standard	0.009	0.007	1/cm	78%		9811-299	0.009	75-125%	
		0.009	0.007	1/cm	78%	14.3 %			75-125%	20%
Standard	Standard	0.088	0.084	1/cm	95%		9811-300	0.009	85-115%	
Standard (Dupl)	Standard	0.088	0.084	1/cm	95%		9811-300	0.009	85-115%	
		0.088	0.084	1/cm	95%	0.0 %			85-115%	10%

Analysis: UV-ICR (UV-254)

Method: SM 5910 B

QC Batch ID: 8-0-375

C Batch ID: 8-0-375									Acceptance Criteria	
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range	RPD
Method Blank	Method Blank		ND*	1/cm			9811-691	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9811-691	0.009		
			ND*	1/cm						
Method Blank	Method Blank		ND*	1/cm			9811-691	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9811-691	0.009		
			ND*	1/cm						

ND: non-detect. \*Recovery is below 1/2 minimum reporting level (MRL). NA (not applicable): RPD calculation is not applicable.

**Quality Control Report**Mr. Joel Mohr  
Iowa-American Water Company**Study#:** 185  
**Study Title:** ICR RSSCT #3,4

Standard	Standard	0.009	0.008	1/cm	89%	9811-299	0.009	75-125%	
Standard (Dupl)	Standard	0.009	0.008	1/cm	89%	9811-299	0.009	75-125%	
		<b>0.009</b>	<b>0.008</b>	<b>1/cm</b>	<b>89%</b>			75-125%	20%
Standard	Standard	0.088	0.083	1/cm	94%	9811-689	0.009	85-115%	
Standard (Dupl)	Standard	0.088	0.083	1/cm	94%	9811-689	0.009	85-115%	
		<b>0.088</b>	<b>0.083</b>	<b>1/cm</b>	<b>94%</b>			85-115%	10%

**Analysis:** UV-ICR (UV-254)**Method:** SM 5910 B**QC Batch ID:** 8-0-376

										Acceptance Criteria
<u>QC Type</u>		<u>Spike</u>	<u>Recovery</u>	<u>Unit</u>	<u>Yield</u>	<u>RPD</u>	<u>S&amp;H ID</u>	<u>MRL</u>	<u>Range</u>	<u>RPD</u>
Method Blank	Method Blank		ND*	1/cm			9811-691	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9811-691	0.009		
			<b>ND*</b>	<b>1/cm</b>						
Method Blank	Method Blank		ND*	1/cm			9811-691	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9811-691	0.009		
			<b>ND*</b>	<b>1/cm</b>						
Standard	Standard	0.009	0.007	1/cm	78%		9811-690	0.009	75-125%	
Standard (Dupl)	Standard	0.009	0.007	1/cm	78%		9811-690	0.009	75-125%	
		<b>0.009</b>	<b>0.007</b>	<b>1/cm</b>	<b>78%</b>	<b>0.0 %</b>			75-125%	20%
Standard	Standard	0.088	0.083	1/cm	94%		9811-689	0.009	85-115%	
Standard (Dupl)	Standard	0.088	0.083	1/cm	94%		9811-689	0.009	85-115%	
		<b>0.088</b>	<b>0.083</b>	<b>1/cm</b>	<b>94%</b>	<b>0.0 %</b>			85-115%	10%

**Analysis:** UV-ICR (UV-254)**Method:** SM 5910 B**QC Batch ID:** 8-0-377

										Acceptance Criteria
<u>QC Type</u>		<u>Spike</u>	<u>Recovery</u>	<u>Unit</u>	<u>Yield</u>	<u>RPD</u>	<u>S&amp;H ID</u>	<u>MRL</u>	<u>Range</u>	<u>RPD</u>
Method Blank	Method Blank		ND*	1/cm			9811-693	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9811-693	0.009		
			<b>ND*</b>	<b>1/cm</b>						
Method Blank	Method Blank		ND*	1/cm			9811-693	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9811-693	0.009		
			<b>ND*</b>	<b>1/cm</b>						
Standard	Standard	0.009	0.007	1/cm	78%		9811-690	0.009	75-125%	
Standard (Dupl)	Standard	0.009	0.007	1/cm	78%		9811-690	0.009	75-125%	
		<b>0.009</b>	<b>0.007</b>	<b>1/cm</b>	<b>78%</b>	<b>0.0 %</b>			75-125%	20%
Standard	Standard	0.088	0.083	1/cm	94%		9811-689	0.009	85-115%	
Standard (Dupl)	Standard	0.088	0.083	1/cm	94%		9811-689	0.009	85-115%	
		<b>0.088</b>	<b>0.083</b>	<b>1/cm</b>	<b>94%</b>	<b>0.0 %</b>			85-115%	10%

**Quality Control Report**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

Analysis: UV-ICR (UV-254)

Method: SM 5910 B

QC Batch ID: 8-0-379

C Batch ID: 8-0-379

										Acceptance Criteria	
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range	RPD	
Method Blank	Method Blank		ND*	1/cm			9811-696	0.009			
Method Blank (Dupl)	Method Blank		ND*	1/cm			9811-696	0.009			
			ND*	1/cm							
Method Blank	Method Blank		ND*	1/cm			9811-696	0.009			
Method Blank (Dupl)	Method Blank		ND*	1/cm			9811-696	0.009			
			ND*	1/cm							
Standard	Standard	0.009	0.008	1/cm	89%		9811-695	0.009	75-125%		
Standard (Dupl)	Standard	0.009	0.008	1/cm	89%		9811-695	0.009	75-125%		
		0.009	0.008	1/cm	89%	0.0 %			75-125%	20%	
Standard	Standard	0.088	0.083	1/cm	94%		9811-689	0.009	85-115%		
Standard (Dupl)	Standard	0.088	0.083	1/cm	94%		9811-689	0.009	85-115%		
		0.088	0.083	1/cm	94%	0.0 %			85-115%	10%	

Analysis: UV-ICR (UV-254)

Method: SM 5910 B

QC Batch ID: 8-0-380

C Batch ID: 8-0-380										Acceptance Criteria	
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range	RPD	
Method Blank	Method Blank		ND*	1/cm			9811-701	0.009			
Method Blank (Dupl)	Method Blank		ND*	1/cm			9811-701	0.009			
			ND*	1/cm							
Method Blank	Method Blank		ND*	1/cm			9811-701	0.009			
Method Blank (Dupl)	Method Blank		ND*	1/cm			9811-701	0.009			
			ND*	1/cm							
Standard	Standard	0.009	0.008	1/cm	89%		9811-695	0.009	75-125%		
Standard (Dupl)	Standard	0.009	0.008	1/cm	89%		9811-695	0.009	75-125%		
		0.009	0.008	1/cm	89%	0.0 %			75-125%	20%	
Standard	Standard	0.088	0.083	1/cm	94%		9811-689	0.009	85-115%		
Standard (Dupl)	Standard	0.088	0.083	1/cm	94%		9811-689	0.009	85-115%		
		0.088	0.083	1/cm	94%	0.0 %			85-115%	10%	

Analysis: UV-ICR (UV-254)

Method: SM 5910 B

QC Batch ID: 8-0-381

C Batch ID: 8-0-381									Acceptance Criteria	
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range	RPD
Method Blank	Method Blank		ND*	1/cm			9811-707	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9811-707	0.009		
			ND*	1/cm						
Method Blank	Method Blank		ND*	1/cm			9811-707	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9811-707	0.009		
			ND*	1/cm						

ND: non-detect. \*Recovery is below 1/2 minimum reporting level (MRL). NA (not applicable): RPD calculation is not applicable.

**Quality Control Report**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

Standard	Standard	0.009	0.008	1/cm	89%	9811-695	0.009	75-125%	
Standard (Dupl)	Standard	0.009	0.008	1/cm	89%	9811-695	0.009	75-125%	
		<b>0.009</b>	<b>0.008</b>	<b>1/cm</b>	<b>89%</b>			75-125%	20%
Standard	Standard	0.088	0.084	1/cm	95%	9811-689	0.009	85-115%	
Standard (Dupl)	Standard	0.088	0.084	1/cm	95%	9811-689	0.009	85-115%	
		<b>0.088</b>	<b>0.084</b>	<b>1/cm</b>	<b>95%</b>			85-115%	10%

Analysis: UV-ICR (UV-254)

Method: SM 5910 B

QC Batch ID: 8-0-382

										Acceptance Criteria
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range	RPD
Method Blank	Method Blank		ND*	1/cm			9812-37	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9812-37	0.009		
			<b>ND*</b>	<b>1/cm</b>						
Method Blank	Method Blank		ND*	1/cm			9812-37	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9812-37	0.009		
			<b>ND*</b>	<b>1/cm</b>						
Standard	Standard	0.009	0.008	1/cm	89%		9811-695	0.009	75-125%	
Standard (Dupl)	Standard	0.009	0.008	1/cm	89%		9811-695	0.009	75-125%	
		<b>0.009</b>	<b>0.008</b>	<b>1/cm</b>	<b>89%</b>	<b>0.0 %</b>			75-125%	20%
Standard	Standard	0.088	0.084	1/cm	95%		9811-689	0.009	85-115%	
Standard (Dupl)	Standard	0.088	0.083	1/cm	94%		9811-689	0.009	85-115%	
		<b>0.088</b>	<b>0.084</b>	<b>1/cm</b>	<b>95%</b>	<b>1.2 %</b>			85-115%	10%

Analysis: UV-ICR (UV-254)

Method: SM 5910 B

QC Batch ID: 8-0-383

										Acceptance Criteria
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range	RPD
Method Blank	Method Blank		ND*	1/cm			9812-43	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9812-43	0.009		
			<b>ND*</b>	<b>1/cm</b>						
Method Blank	Method Blank		ND*	1/cm			9812-43	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9812-43	0.009		
			<b>ND*</b>	<b>1/cm</b>						
Standard	Standard	0.009	0.008	1/cm	89%		9811-695	0.009	75-125%	
Standard (Dupl)	Standard	0.009	0.008	1/cm	89%		9811-695	0.009	75-125%	
		<b>0.009</b>	<b>0.008</b>	<b>1/cm</b>	<b>89%</b>	<b>0.0 %</b>			75-125%	20%
Standard	Standard	0.088	0.084	1/cm	95%		9811-689	0.009	85-115%	
Standard (Dupl)	Standard	0.088	0.084	1/cm	95%		9811-689	0.009	85-115%	
		<b>0.088</b>	<b>0.084</b>	<b>1/cm</b>	<b>95%</b>	<b>0.0 %</b>			85-115%	10%

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Study Title: ICR RSSCT #3,4

Analysis: UV-ICR (UV-254)

Method: SM 5910 B

QC Batch ID: 8-0-384

C Batch ID: 8-0-384

										Acceptance Criteria	
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range	RPD	
Method Blank	Method Blank		ND*	1/cm			9812-49	0.009			
Method Blank (Dupl)	Method Blank		ND*	1/cm			9812-49	0.009			
			ND*	1/cm							
Method Blank	Method Blank		ND*	1/cm			9812-49	0.009			
Method Blank (Dupl)	Method Blank		ND*	1/cm			9812-49	0.009			
			ND*	1/cm							
Standard	Standard	0.009	0.008	1/cm	89%		9811-695	0.009	75-125%		
Standard (Dupl)	Standard	0.009	0.008	1/cm	89%		9811-695	0.009	75-125%		
		0.009	0.008	1/cm	89%	0.0 %			75-125%	20%	
Standard	Standard	0.088	0.084	1/cm	95%		9811-689	0.009	85-115%		
Standard (Dupl)	Standard	0.088	0.084	1/cm	95%		9811-689	0.009	85-115%		
		0.088	0.084	1/cm	95%	0.0 %			85-115%	10%	

Analysis: UV-ICR (UV-254)

Method: SM 5910 B

QC Batch ID: 8-0-385

C Batch ID: 8-0-385

									Acceptance Criteria	
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range	RPD
Method Blank	Method Blank		ND*	1/cm			9812-60	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9812-60	0.009		
			ND*	1/cm						
Method Blank	Method Blank		ND*	1/cm			9812-60	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9812-60	0.009		
			ND*	1/cm						
Standard	Standard	0.009	0.008	1/cm	89%		9811-695	0.009	75-125%	
Standard (Dupl)	Standard	0.009	0.008	1/cm	89%		9811-695	0.009	75-125%	
		0.009	0.008	1/cm	89%	0.0 %			75-125%	20%
Standard	Standard	0.088	0.084	1/cm	95%		9811-689	0.009	85-115%	
Standard (Dupl)	Standard	0.088	0.085	1/cm	97%		9811-689	0.009	85-115%	
		0.088	0.085	1/cm	97%	1.2 %			85-115%	10%

Analysis: UV-ICR (UV-254)

Method: SM 5910 B

QC Batch ID: 8-0-386

C Batch ID: 8-0-386									Acceptance Criteria	
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range	RPD
Method Blank	Method Blank		ND*	1/cm			9812-61	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9812-61	0.009		
			ND*	1/cm						
Method Blank	Method Blank		ND*	1/cm			9812-61	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9812-61	0.009		
			ND*	1/cm						

ND: non-detect. \*Recovery is below 1/2 minimum reporting level (MRL). NA (not applicable): RPD calculation is not applicable.

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Standard	Standard	0.009	0.008	1/cm	89%	9811-695	0.009	75-125%	
Standard (Dupl)	Standard	0.009	0.008	1/cm	89%	9811-695	0.009	75-125%	
		<b>0.009</b>	<b>0.008</b>	<b>1/cm</b>	<b>89%</b>			75-125%	20%
Standard	Standard	0.088	0.085	1/cm	97%	9811-689	0.009	85-115%	
Standard (Dupl)	Standard	0.088	0.085	1/cm	97%	9811-689	0.009	85-115%	
		<b>0.088</b>	<b>0.085</b>	<b>1/cm</b>	<b>97%</b>			85-115%	10%

Analysis: UV-ICR (UV-254)

Method: SM 5910 B

QC Batch ID: 8-0-387

										Acceptance Criteria
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range	RPD
Method Blank	Method Blank		ND*	1/cm			9812-72	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9812-72	0.009		
			<b>ND*</b>	<b>1/cm</b>						
Method Blank	Method Blank		ND*	1/cm			9812-72	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9812-72	0.009		
			<b>ND*</b>	<b>1/cm</b>						
Standard	Standard	0.009	0.008	1/cm	89%		9811-695	0.009	75-125%	
Standard (Dupl)	Standard	0.009	0.008	1/cm	89%		9811-695	0.009	75-125%	
		<b>0.009</b>	<b>0.008</b>	<b>1/cm</b>	<b>89%</b>	<b>0.0 %</b>			75-125%	20%
Standard	Standard	0.088	0.084	1/cm	95%		9811-689	0.009	85-115%	
Standard (Dupl)	Standard	0.088	0.084	1/cm	95%		9811-689	0.009	85-115%	
		<b>0.088</b>	<b>0.084</b>	<b>1/cm</b>	<b>95%</b>	<b>0.0 %</b>			85-115%	10%

Analysis: UV-ICR (UV-254)

Method: SM 5910 B

QC Batch ID: 8-0-388

										Acceptance Criteria
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range	RPD
Method Blank	Method Blank		ND*	1/cm			9812-74	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9812-74	0.009		
			<b>ND*</b>	<b>1/cm</b>						
Method Blank	Method Blank		ND*	1/cm			9812-74	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9812-74	0.009		
			<b>ND*</b>	<b>1/cm</b>						
Standard	Standard	0.009	0.008	1/cm	89%		9811-695	0.009	75-125%	
Standard (Dupl)	Standard	0.009	0.008	1/cm	89%		9811-695	0.009	75-125%	
		<b>0.009</b>	<b>0.008</b>	<b>1/cm</b>	<b>89%</b>	<b>0.0 %</b>			75-125%	20%
Standard	Standard	0.088	0.084	1/cm	95%		9811-689	0.009	85-115%	
Standard (Dupl)	Standard	0.088	0.084	1/cm	95%		9811-689	0.009	85-115%	
		<b>0.088</b>	<b>0.084</b>	<b>1/cm</b>	<b>95%</b>	<b>0.0 %</b>			85-115%	10%



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Study Title: ICR RSSCT #3,4

Analysis: UV-ICR (UV-254)

Method: SM 5910 B

QC Batch ID: 8-0-389

C Batch ID: 8-0-389

										Acceptance Criteria	
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range	RPD	
Method Blank	Method Blank		ND*	1/cm			9812-89	0.009			
Method Blank (Dupl)	Method Blank		ND*	1/cm			9812-89	0.009			
			ND*	1/cm							
Method Blank	Method Blank		ND*	1/cm			9812-89	0.009			
Method Blank (Dupl)	Method Blank		ND*	1/cm			9812-89	0.009			
			ND*	1/cm							
Standard	Standard	0.009	0.008	1/cm	89%		9811-695	0.009	75-125%		
Standard (Dupl)	Standard	0.009	0.008	1/cm	89%		9811-695	0.009	75-125%		
		0.009	0.008	1/cm	89%	0.0 %			75-125%	20%	
Standard	Standard	0.088	0.086	1/cm	98%		9812-85	0.009	85-115%		
Standard (Dupl)	Standard	0.088	0.086	1/cm	98%		9812-85	0.009	85-115%		
		0.088	0.086	1/cm	98%	0.0 %			85-115%	10%	

Analysis: UV-ICR (UV-254)

Method: SM 5910 B

QC Batch ID: 8-0-390

C Batch ID: 8-0-390

										Acceptance Criteria	
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range	RPD	
Method Blank	Method Blank		ND*	1/cm			9812-101	0.009			
Method Blank (Dupl)	Method Blank		ND*	1/cm			9812-101	0.009			
			ND*	1/cm							
Method Blank	Method Blank		ND*	1/cm			9812-101	0.009			
Method Blank (Dupl)	Method Blank		ND*	1/cm			9812-101	0.009			
			ND*	1/cm							
Standard	Standard	0.009	0.008	1/cm	89%		9811-695	0.009	75-125%		
Standard (Dupl)	Standard	0.009	0.008	1/cm	89%		9811-695	0.009	75-125%		
		0.009	0.008	1/cm	89%	0.0 %			75-125%	20%	
Standard	Standard	0.088	0.087	1/cm	99%		9812-85	0.009	85-115%		
Standard (Dupl)	Standard	0.088	0.088	1/cm	100%		9812-85	0.009	85-115%		
		0.088	0.087	1/cm	99%	1.1 %			85-115%	10%	

Analysis: TURB (Turbidity)

Method: SM 2130 B

QC Batch ID: 9-0-21

										Acceptance Criteria	
QC Type		Spike	Recovery	Unit	Yield	RPD	Date Run	S&H ID	MRL	Range	RPD
Standard	Standard	5.41	5.55	ntu	103%		11/06/98	9807-108	0.05		
Standard	Standard	5.41	5.55	ntu	103%		11/06/98	9807-108	0.05		
Standard	Standard	5.41	5.58	ntu	103%		11/10/98	9807-108	0.05		
Standard	Standard	5.41	5.51	ntu	102%		11/16/98	9807-108	0.05		
Standard	Standard	5.41	5.55	ntu	103%		11/17/98	9807-108	0.05		

ND: non-detect. \*Recovery is below 1/2 minimum reporting level (MRL). NA (not applicable): RPD calculation is not applicable.

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Standard	Standard	5.41	5.60	ntu	104%	11/19/98	9807-108	0.05
Standard	Standard	5.41	5.57	ntu	103%	11/20/98	9807-108	0.05
Standard	Standard	5.41	5.59	ntu	103%	11/23/98	9807-108	0.05
Standard	Standard	5.41	5.58	ntu	103%	11/28/98	9807-108	0.05
Standard	Standard	5.41	5.56	ntu	103%	11/30/98	9807-108	0.05

**Analysis:** TURB (Turbidity)**Method:** SM 2130 B**QC Batch ID:** 9-0-22

									Acceptance Criteria	
<u>QC Type</u>		<u>Spike</u>	<u>Recovery</u>	<u>Unit</u>	<u>Yield</u>	<u>RPD</u>	<u>Date Run</u>	<u>S&amp;H ID</u>	<u>MRL</u>	<u>Range</u> <u>RPD</u>
Standard	Standard	5.41	5.52	ntu	102%		11/30/98	9807-108	0.05	
Standard	Standard	5.41	5.53	ntu	102%		12/07/98	9807-108	0.05	
Standard	Standard	5.41	5.56	ntu	103%		12/07/98	9807-108	0.05	
Standard	Standard	5.41	5.53	ntu	102%		12/08/98	9807-108	0.05	
Standard	Standard	5.41	5.56	ntu	103%		12/10/98	9807-108	0.05	
Standard	Standard	5.41	5.55	ntu	103%		01/10/99	9807-108	0.05	
Standard	Standard	5.41	5.57	ntu	103%		01/19/99	9807-108	0.05	
Standard	Standard	5.41	5.60	ntu	104%		01/23/99	9807-108	0.05	
Standard	Standard	5.41	5.54	ntu	102%		01/28/99	9807-108	0.05	

**Analysis:** TOX-ICR (Total Organic Halide)**Method:** SM 5320 B**QC Batch ID:** 12-0-255

									Acceptance Criteria	
<u>QC Type</u>		<u>Spike</u>	<u>Recovery</u>	<u>Unit</u>	<u>Yield</u>	<u>RPD</u>		<u>S&amp;H ID</u>	<u>MRL</u>	<u>Range</u> <u>RPD</u>
Standard - TCP Aqueous	Standard	25	24	µg Cl-/L	96%			9812-52	25	75-125%
Standard - TCP Aqueous	Standard	200	200	µg Cl-/L	100%			9812-51	25	85-115%
System Blank	Blank		ND*	µg Cl-/L				9812-53	25	

**Analysis:** TOX-ICR (Total Organic Halide)**Method:** SM 5320 B**QC Batch ID:** 12-0-256

									Acceptance Criteria	
<u>QC Type</u>		<u>Spike</u>	<u>Recovery</u>	<u>Unit</u>	<u>Yield</u>	<u>RPD</u>		<u>S&amp;H ID</u>	<u>MRL</u>	<u>Range</u> <u>RPD</u>
Matrix Spike	Matrix Spike	200	201	µg Cl-/L	100%			9811-467	25	
Matrix Spike (Dupl)	Matrix Spike	200	191	µg Cl-/L	95%			9811-467	25	
		<b>200</b>	<b>196</b>	<b>µg Cl-/L</b>	<b>98%</b>	<b>5.1 %</b>				
Standard - TCP Aqueous	Standard	25	24	µg Cl-/L	96%			9812-64	25	75-125%
Standard - TCP Aqueous	Standard	200	193	µg Cl-/L	96%			9812-63	25	85-115%
System Blank	Blank		ND*	µg Cl-/L				9812-65	25	

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Analysis: TOX-ICR (Total Organic Halide)

Method: SM 5320 B

QC Batch ID: 12-0-257

								Acceptance Criteria	
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range
Standard - TCP Aqueous	Standard	25	24	µg Cl-/L	96%		9812-82	25	75-125%
Standard - TCP Aqueous	Standard	200	198	µg Cl-/L	99%		9812-81	25	85-115%
System Blank	Blank		ND*	µg Cl-/L			9812-83	25	

Analysis: TOX-ICR (Total Organic Halide)

Method: SM 5320 B

QC Batch ID: 12-0-259

								Acceptance Criteria	
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range
Matrix Spike	Matrix Spike	200	197	µg Cl-/L	98%		9811-512	25	
Matrix Spike (Dupl)	Matrix Spike	200	201	µg Cl-/L	100%		9811-512	25	
		200	199	µg Cl-/L	100%	2.0 %			
Standard - TCP Aqueous	Standard	25	24	µg Cl-/L	96%		9812-105	25	75-125%
Standard - TCP Aqueous	Standard	200	190	µg Cl-/L	95%		9812-104	25	85-115%
System Blank	Blank		ND*	µg Cl-/L			9812-103	25	

Analysis: TOX-ICR (Total Organic Halide)

Method: SM 5320 B

QC Batch ID: 12-0-260

								Acceptance Criteria	
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range
Standard - TCP Aqueous	Standard	25	23	µg Cl-/L	92%		9812-113	25	75-125%
Standard - TCP Aqueous	Standard	200	195	µg Cl-/L	97%		9812-112	25	85-115%
System Blank	Blank		ND*	µg Cl-/L			9812-114	25	

Analysis: TOX-ICR (Total Organic Halide)

Method: SM 5320 B

QC Batch ID: 12-0-261

								Acceptance Criteria	
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range
Standard - TCP Aqueous	Standard	25	24	µg Cl-/L	96%		9812-123	25	75-125%
Standard - TCP Aqueous	Standard	200	191	µg Cl-/L	95%		9812-122	25	85-115%
System Blank	Blank		ND*	µg Cl-/L			9812-124	25	

Analysis: TOX-ICR (Total Organic Halide)

Method: SM 5320 B

QC Batch ID: 12-0-262

								Acceptance Criteria	
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range
Matrix Spike	Matrix Spike	200	197	µg Cl-/L	98%		9811-432	25	
Matrix Spike (Dupl)	Matrix Spike	200	194	µg Cl-/L	97%		9811-432	25	
		200	195	µg Cl-/L	97%	1.5 %			

ND: non-detect. \*Recovery is below 1/2 minimum reporting level (MRL). NA (not applicable): RPD calculation is not applicable.

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Standard - TCP Aqueous	Standard	25	21	µg Cl-/L	84%	9812-128	25	75-125%
Standard - TCP Aqueous	Standard	200	172	µg Cl-/L	86%	9812-127	25	85-115%
System Blank	Blank		ND*	µg Cl-/L		9812-129	25	

**Analysis:** TOX-ICR (Total Organic Halide)**Method:** SM 5320 B**QC Batch ID:** 12-0-263

<u>QC Type</u>		<u>Spike</u>	<u>Recovery</u>	<u>Unit</u>	<u>Yield</u>	<u>RPD</u>	<u>S&amp;H ID</u>	<u>MRL</u>	<u>Range</u>	<u>RPD</u>
Standard - TCP Aqueous	Standard	25	24	µg Cl-/L	96%		9812-142	25	75-125%	
Standard - TCP Aqueous	Standard	200	195	µg Cl-/L	97%		9812-141	25	85-115%	
System Blank	Blank		ND*	µg Cl-/L			9812-144	25		

Acceptance  
Criteria**Analysis:** TOX-ICR (Total Organic Halide)**Method:** SM 5320 B**QC Batch ID:** 12-0-264

<u>QC Type</u>		<u>Spike</u>	<u>Recovery</u>	<u>Unit</u>	<u>Yield</u>	<u>RPD</u>	<u>S&amp;H ID</u>	<u>MRL</u>	<u>Range</u>	<u>RPD</u>
Matrix Spike	Matrix Spike	200	205	µg Cl-/L	102%		9811-600	25		
Matrix Spike (Dupl)	Matrix Spike	200	202	µg Cl-/L	101%		9811-600	25		
		<b>200</b>	<b>204</b>	<b>µg Cl-/L</b>	<b>102%</b>	<b>2.0 %</b>				
Standard - TCP Aqueous	Standard	25	25	µg Cl-/L	100%		9812-148	25	75-125%	
Standard - TCP Aqueous	Standard	200	199	µg Cl-/L	100%		9812-147	25	85-115%	
System Blank	Blank		ND*	µg Cl-/L			9812-146	25		

Acceptance  
Criteria**Analysis:** TOX-ICR (Total Organic Halide)**Method:** SM 5320 B**QC Batch ID:** 12-0-265

<u>QC Type</u>		<u>Spike</u>	<u>Recovery</u>	<u>Unit</u>	<u>Yield</u>	<u>RPD</u>	<u>S&amp;H ID</u>	<u>MRL</u>	<u>Range</u>	<u>RPD</u>
Standard - TCP Aqueous	Standard	25	24	µg Cl-/L	96%		9812-149	25	75-125%	
Standard - TCP Aqueous	Standard	200	176	µg Cl-/L	88%		9812-150	25	85-115%	
System Blank	Blank		ND*	µg Cl-/L			9812-152	25		

Acceptance  
Criteria**Analysis:** TOX-ICR (Total Organic Halide)**Method:** SM 5320 B**QC Batch ID:** 12-0-266

<u>QC Type</u>		<u>Spike</u>	<u>Recovery</u>	<u>Unit</u>	<u>Yield</u>	<u>RPD</u>	<u>S&amp;H ID</u>	<u>MRL</u>	<u>Range</u>	<u>RPD</u>
Standard - TCP Aqueous	Standard	25	25	µg Cl-/L	100%		9812-156	25	75-125%	
Standard - TCP Aqueous	Standard	200	197	µg Cl-/L	98%		9812-155	25	85-115%	
System Blank	Blank		ND*	µg Cl-/L			9812-153	25		

Acceptance  
Criteria

**Quality Control Report**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

Analysis: TOX-ICR (Total Organic Halide)

Method: SM 5320 B

QC Batch ID: 12-0-267

								Acceptance Criteria		
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range	RPD
Matrix Spike	Matrix Spike	200	197	µg Cl-/L	98%		9811-581	25		
Matrix Spike (Dupl)	Matrix Spike	200	196	µg Cl-/L	98%		9811-581	25		
		200	196	µg Cl-/L	98%	0.5 %				
Standard - TCP Aqueous	Standard	25	23	µg Cl-/L	92%		9812-162	25	75-125%	
Standard - TCP Aqueous	Standard	200	198	µg Cl-/L	99%		9812-161	25	85-115%	
System Blank	Blank		ND*	µg Cl-/L			9812-163	25		

Analysis: TOX-ICR (Total Organic Halide)

Method: SM 5320 B

QC Batch ID: 12-0-268

								Acceptance Criteria		
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range	RPD
Standard - TCP Aqueous	Standard	25	24	µg Cl-/L	96%		9812-200	25	75-125%	
Standard - TCP Aqueous	Standard	200	191	µg Cl-/L	95%		9812-199	25	85-115%	
System Blank	Blank		ND*	µg Cl-/L			9812-201	25		

Analysis: THM-ICR (Trihalomethanes (ICR))

Method: EPA 551.1

QC Batch ID: 0-279-0

								Acceptance Criteria		
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range	RPD
Bromodichloromethane	Duplicate	1.0	1.2	µg/L		18.2%	9811-492	1		
Bromodichloromethane	Matrix Spike	40.0	42.3	µg/L	106%		9811-505	1		
Bromodichloromethane	Method Blank		ND*	µg/L			9812-56	1		
Bromodichloromethane	Secondary Source Std	20.0	23.6	µg/L	118%		9812-57	1	70-130%	
Bromodichloromethane	Standard	20.0	21.8	µg/L	109%		9812-58	1	80-120%	
Bromodichloromethane	Standard	20.0	23.2	µg/L	116%		9812-58	1	80-120%	
Bromodichloromethane	Standard	40.0	39.8	µg/L	99%		9812-59	1	80-120%	
Bromoform	Duplicate	ND	ND	µg/L		NA	9811-492	1		
Bromoform	Matrix Spike	40.0	42.8	µg/L	107%		9811-505	1		
Bromoform	Method Blank		ND*	µg/L			9812-56	1		
Bromoform	Secondary Source Std	20.0	20.5	µg/L	102%		9812-57	1	70-130%	
Bromoform	Standard	20.0	20.0	µg/L	100%		9812-58	1	80-120%	
Bromoform	Standard	20.0	22.0	µg/L	110%		9812-58	1	80-120%	
Bromoform	Standard	40.0	41.3	µg/L	103%		9812-59	1	80-120%	
Chloroform	Duplicate	ND	ND	µg/L		NA	9811-492	1		

ND: non-detect. \*Recovery is below 1/2 minimum reporting level (MRL). NA (not applicable): RPD calculation is not applicable.

**Quality Control Report**Mr. Joel Mohr  
Iowa-American Water Company**Study#:** 185  
**Study Title:** ICR RSSCT #3,4

Chloroform	Matrix Spike	40.0	43.2 µg/L	108%	9811-505	1
Chloroform	Method Blank		ND* µg/L		9812-56	1
Chloroform	Secondary Source Std	20.0	22.8 µg/L	114%	9812-57	1 70-130%
Chloroform	Standard	20.0	21.2 µg/L	106%	9812-58	1 80-120%
Chloroform	Standard	20.0	23.1 µg/L	116%	9812-58	1 80-120%
Chloroform	Standard	40.0	40.4 µg/L	101%	9812-59	1 80-120%
Dibromochloromethane	Duplicate	1.2	1.2 µg/L	0.0%	9811-492	1
Dibromochloromethane	Matrix Spike	40.0	42.5 µg/L	106%	9811-505	1
Dibromochloromethane	Method Blank		ND* µg/L		9812-56	1
Dibromochloromethane	Secondary Source Std	20.0	22.7 µg/L	114%	9812-57	1 70-130%
Dibromochloromethane	Standard	20.0	22.2 µg/L	111%	9812-58	1 80-120%
Dibromochloromethane	Standard	20.0	23.7 µg/L	119%	9812-58	1 80-120%
Dibromochloromethane	Standard	40.0	40.3 µg/L	101%	9812-59	1 80-120%

**Analysis:** THM-ICR (Trihalomethanes (ICR))**Method:** EPA 551.1**QC Batch ID:** 0-284-0

										Acceptance Criteria
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range	RPD
Bromodichloromethane	Duplicate	2.8	2.8	µg/L		0.0%	9811-513	1		
Bromodichloromethane	Matrix Spike	40.0	41.3	µg/L	103%		9811-428	1		
Bromodichloromethane	Method Blank		ND*	µg/L			9812-97	1		
Bromodichloromethane	Secondary Source Std	20.0	21.5	µg/L	108%		9812-98	1	70-130%	
Bromodichloromethane	Standard	20.0	20.6	µg/L	103%		9812-99	1	80-120%	
Bromodichloromethane	Standard	20.0	21.1	µg/L	106%		9812-99	1	80-120%	
Bromodichloromethane	Standard	40.0	39.5	µg/L	99%		9812-100	1	80-120%	
Bromodichloromethane	Standard	40.0	40.3	µg/L	101%		9812-100	1	80-120%	
Bromoform	Duplicate	ND	ND	µg/L		NA	9811-513	1		
Bromoform	Matrix Spike	40.0	44.5	µg/L	111%		9811-428	1		
Bromoform	Method Blank		ND*	µg/L			9812-97	1		
Bromoform	Secondary Source Std	20.0	19.0	µg/L	95%		9812-98	1	70-130%	
Bromoform	Standard	20.0	20.7	µg/L	103%		9812-99	1	80-120%	
Bromoform	Standard	20.0	20.4	µg/L	102%		9812-99	1	80-120%	
Bromoform	Standard	40.0	38.4	µg/L	96%		9812-100	1	80-120%	
Bromoform	Standard	40.0	42.0	µg/L	105%		9812-100	1	80-120%	

ND: non-detect. \*Recovery is below 1/2 minimum reporting level (MRL). NA (not applicable): RPD calculation is not applicable.

**Quality Control Report**Mr. Joel Mohr  
Iowa-American Water Company**Study#:** 185  
**Study Title:** ICR RSSCT #3,4

Chloroform	Duplicate	1.8	1.8	µg/L	0.0%	9811-513	1
Chloroform	Matrix Spike	40.0	44.0	µg/L	110%	9811-428	1
Chloroform	Method Blank		ND*	µg/L		9812-97	1
Chloroform	Secondary Source Std	20.0	21.7	µg/L	109%	9812-98	1 70-130%
Chloroform	Standard	20.0	19.8	µg/L	99%	9812-99	1 80-120%
Chloroform	Standard	20.0	20.5	µg/L	102%	9812-99	1 80-120%
Chloroform	Standard	40.0	39.8	µg/L	99%	9812-100	1 80-120%
Chloroform	Standard	40.0	40.3	µg/L	101%	9812-100	1 80-120%
Dibromochloromethane	Duplicate	2.8	2.8	µg/L	0.0%	9811-513	1
Dibromochloromethane	Matrix Spike	40.0	40.7	µg/L	102%	9811-428	1
Dibromochloromethane	Method Blank		ND*	µg/L		9812-97	1
Dibromochloromethane	Secondary Source Std	20.0	21.1	µg/L	106%	9812-98	1 70-130%
Dibromochloromethane	Standard	20.0	20.9	µg/L	104%	9812-99	1 80-120%
Dibromochloromethane	Standard	20.0	21.1	µg/L	106%	9812-99	1 80-120%
Dibromochloromethane	Standard	40.0	39.8	µg/L	99%	9812-100	1 80-120%
Dibromochloromethane	Standard	40.0	40.6	µg/L	102%	9812-100	1 80-120%

**Analysis:** THM-ICR (Trihalomethanes (ICR))**Method:** EPA 551.1**QC Batch ID:** 0-288-0

									Acceptance Criteria	
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range	RPD
Bromodichloromethane	Duplicate	ND	ND	µg/L		NA	9811-552	1		
Bromodichloromethane	Matrix Spike	40.0	41.2	µg/L	103%		9811-603	1		
Bromodichloromethane	Method Blank		ND*	µg/L			9812-117	1		
Bromodichloromethane	Secondary Source Std	20.0	21.1	µg/L	106%		9812-118	1	70-130%	
Bromodichloromethane	Standard	20.0	18.9	µg/L	94%		9812-119	1	80-120%	
Bromodichloromethane	Standard	20.0	19.5	µg/L	97%		9812-119	1	80-120%	
Bromodichloromethane	Standard	40.0	43.0	µg/L	108%		9812-120	1	80-120%	
Bromoform	Duplicate	ND	ND	µg/L		NA	9811-552	1		
Bromoform	Matrix Spike	40.0	39.5	µg/L	99%		9811-603	1		
Bromoform	Method Blank		ND*	µg/L			9812-117	1		
Bromoform	Secondary Source Std	20.0	18.8	µg/L	94%		9812-118	1	70-130%	
Bromoform	Standard	20.0	18.6	µg/L	93%		9812-119	1	80-120%	
Bromoform	Standard	20.0	18.6	µg/L	93%		9812-119	1	80-120%	

ND: non-detect. \*Recovery is below 1/2 minimum reporting level (MRL). NA (not applicable): RPD calculation is not applicable.

**Quality Control Report**Mr. Joel Mohr  
Iowa-American Water Company**Study#:** 185  
**Study Title:** ICR RSSCT #3,4

Bromoform	Standard	40.0	40.9 µg/L	102%	9812-120	1	80-120%
Chloroform	Duplicate	ND	ND µg/L	NA	9811-552	1	
Chloroform	Matrix Spike	40.0	42.8 µg/L	107%	9811-603	1	
Chloroform	Method Blank		ND* µg/L		9812-117	1	
Chloroform	Secondary Source Std	20.0	21.3 µg/L	106%	9812-118	1	70-130%
Chloroform	Standard	20.0	18.1 µg/L	91%	9812-119	1	80-120%
Chloroform	Standard	20.0	19.5 µg/L	97%	9812-119	1	80-120%
Chloroform	Standard	40.0	44.3 µg/L	111%	9812-120	1	80-120%
Dibromochloromethane	Duplicate	ND	ND µg/L	NA	9811-552	1	
Dibromochloromethane	Matrix Spike	40.0	41.5 µg/L	104%	9811-603	1	
Dibromochloromethane	Method Blank		ND* µg/L		9812-117	1	
Dibromochloromethane	Secondary Source Std	20.0	20.2 µg/L	101%	9812-118	1	70-130%
Dibromochloromethane	Standard	20.0	19.0 µg/L	95%	9812-119	1	80-120%
Dibromochloromethane	Standard	20.0	19.4 µg/L	97%	9812-119	1	80-120%
Dibromochloromethane	Standard	40.0	42.6 µg/L	106%	9812-120	1	80-120%

**Analysis:** THM-ICR (Trihalomethanes (ICR))**Method:** EPA 551.1**QC Batch ID:** 0-290-0

								Acceptance Criteria	
<u>QC Type</u>		<u>Spike</u>	<u>Recovery</u>	<u>Unit</u>	<u>Yield</u>	<u>RPD</u>	<u>S&amp;H ID</u>	<u>MRL</u>	<u>Range</u>
Bromodichloromethane	Duplicate	11.1	11.4	µg/L		2.7%	9811-641	1	
Bromodichloromethane	Matrix Spike	40.0	35.8	µg/L	89%		9811-437	1	
Bromodichloromethane	Method Blank		ND*	µg/L			9812-137	1	
Bromodichloromethane	Secondary Source Std	20.0	23.6	µg/L	118%		9812-138	1	70-130%
Bromodichloromethane	Standard	20.0	18.8	µg/L	94%		9812-139	1	80-120%
Bromodichloromethane	Standard	20.0	19.1	µg/L	96%		9812-139	1	80-120%
Bromodichloromethane	Standard	20.0	19.5	µg/L	97%		9812-139	1	80-120%
Bromodichloromethane	Standard	40.0	41.4	µg/L	103%		9812-140	1	80-120%
Bromodichloromethane	Standard	40.0	41.5	µg/L	104%		9812-140	1	80-120%
Bromoform	Duplicate	ND	ND	µg/L		NA	9811-641	1	
Bromoform	Matrix Spike	40.0	42.7	µg/L	107%		9811-437	1	
Bromoform	Method Blank		ND*	µg/L			9812-137	1	
Bromoform	Secondary Source Std	20.0	22.6	µg/L	113%		9812-138	1	70-130%
Bromoform	Standard	20.0	18.2	µg/L	91%		9812-139	1	80-120%

ND: non-detect. \*Recovery is below 1/2 minimum reporting level (MRL). NA (not applicable); RPD calculation is not applicable.



**Quality Control Report**Mr. Joel Mohr  
Iowa-American Water Company**Study#:** 185  
**Study Title:** ICR RSSCT #3,4

Bromoform	Standard	20.0	18.2 µg/L	91%	9812-139	1	80-120%
Bromoform	Standard	20.0	20.1 µg/L	101%	9812-139	1	80-120%
Bromoform	Standard	40.0	41.8 µg/L	104%	9812-140	1	80-120%
Bromoform	Standard	40.0	42.9 µg/L	107%	9812-140	1	80-120%
Chloroform	Duplicate	25.2	25.8 µg/L	2.4%	9811-641	1	
Chloroform	Matrix Spike	40.0	37.8 µg/L	94%	9811-437	1	
Chloroform	Method Blank		ND* µg/L		9812-137	1	
Chloroform	Secondary Source Std	20.0	21.9 µg/L	110%	9812-138	1	70-130%
Chloroform	Standard	20.0	18.0 µg/L	90%	9812-139	1	80-120%
Chloroform	Standard	20.0	18.9 µg/L	94%	9812-139	1	80-120%
Chloroform	Standard	20.0	19.0 µg/L	95%	9812-139	1	80-120%
Chloroform	Standard	40.0	42.5 µg/L	106%	9812-140	1	80-120%
Chloroform	Standard	40.0	41.4 µg/L	103%	9812-140	1	80-120%
Dibromochloromethane	Duplicate	2.1	2.3 µg/L	9.1%	9811-641	1	
Dibromochloromethane	Matrix Spike	40.0	36.6 µg/L	92%	9811-437	1	
Dibromochloromethane	Method Blank		ND* µg/L		9812-137	1	
Dibromochloromethane	Secondary Source Std	20.0	23.7 µg/L	119%	9812-138	1	70-130%
Dibromochloromethane	Standard	20.0	19.1 µg/L	96%	9812-139	1	80-120%
Dibromochloromethane	Standard	20.0	19.1 µg/L	96%	9812-139	1	80-120%
Dibromochloromethane	Standard	20.0	19.0 µg/L	95%	9812-139	1	80-120%
Dibromochloromethane	Standard	40.0	41.5 µg/L	104%	9812-140	1	80-120%
Dibromochloromethane	Standard	40.0	42.1 µg/L	105%	9812-140	1	80-120%

**Analysis:** HAA-ICR (Haloacetic Acids)**Method:** EPA 552.2**QC Batch ID:** 0-280-0

C Batch ID: 0-280-0									Acceptance Criteria	
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range	RPD
Bromochloroacetic acid	Duplicate	ND	ND	µg/L		NA	9811-466	1		
Bromochloroacetic acid	Matrix Spike	40.0	42.7	µg/L	107%		9811-473	1		
Bromochloroacetic acid	Method Blank		ND*	µg/L			9812-76	1		
Bromochloroacetic acid	Secondary Source Std	20.0	21.5	µg/L	108%		9812-77	1	70-130%	
Bromochloroacetic acid	Standard	20.0	21.0	µg/L	105%		9812-78	1	80-120%	
Bromochloroacetic acid	Standard	20.0	21.3	µg/L	106%		9812-78	1	80-120%	
Bromochloroacetic acid	Standard	40.0	38.3	µg/L	96%		9812-79	1	80-120%	
Bromodichloroacetic acid	Duplicate	ND	ND	µg/L		NA	9811-466	1		

ND: non-detect. \*Recovery is below 1/2 minimum reporting level (MRL). NA (not applicable): RPD calculation is not applicable.

**Quality Control Report**Mr. Joel Mohr  
Iowa-American Water Company**Study#:** 185  
**Study Title:** ICR RSSCT #3,4

Bromodichloroacetic acid	Matrix Spike	40.0	45.9 µg/L	115%	9811-473	1
Bromodichloroacetic acid	Method Blank		ND* µg/L		9812-76	1
Bromodichloroacetic acid	Secondary Source Std		ND µg/L		9812-77	1 70-130%
Bromodichloroacetic acid	Standard	20.0	23.0 µg/L	115%	9812-78	1 80-120%
Bromodichloroacetic acid	Standard	20.0	21.5 µg/L	108%	9812-78	1 80-120%
Bromodichloroacetic acid	Standard	40.0	41.4 µg/L	103%	9812-79	1 80-120%
Chlorodibromoacetic acid	Duplicate	ND	ND µg/L	NA	9811-466	2
Chlorodibromoacetic acid	Matrix Spike	40.0	45.1 µg/L	113%	9811-473	2
Chlorodibromoacetic acid	Method Blank		ND* µg/L		9812-76	2
Chlorodibromoacetic acid	Secondary Source Std		ND µg/L		9812-77	2 70-130%
Chlorodibromoacetic acid	Standard	20.0	23.6 µg/L	118%	9812-78	2 80-120%
Chlorodibromoacetic acid	Standard	20.0	22.3 µg/L	112%	9812-78	2 80-120%
Chlorodibromoacetic acid	Standard	40.0	42.9 µg/L	107%	9812-79	2 80-120%
Dibromoacetic acid	Duplicate	ND	ND µg/L	NA	9811-466	1
Dibromoacetic acid	Matrix Spike	40.0	43.6 µg/L	109%	9811-473	1
Dibromoacetic acid	Method Blank		ND* µg/L		9812-76	1
Dibromoacetic acid	Secondary Source Std	20.0	22.5 µg/L	113%	9812-77	1 70-130%
Dibromoacetic acid	Standard	20.0	22.2 µg/L	111%	9812-78	1 80-120%
Dibromoacetic acid	Standard	20.0	22.3 µg/L	112%	9812-78	1 80-120%
Dibromoacetic acid	Standard	40.0	39.1 µg/L	98%	9812-79	1 80-120%
Dichloroacetic acid	Duplicate	ND	ND µg/L	NA	9811-466	1
Dichloroacetic acid	Matrix Spike	40.0	40.1 µg/L	100%	9811-473	1
Dichloroacetic acid	Method Blank		ND* µg/L		9812-76	1
Dichloroacetic acid	Secondary Source Std	20.0	21.3 µg/L	106%	9812-77	1 70-130%
Dichloroacetic acid	Standard	20.0	20.1 µg/L	101%	9812-78	1 80-120%
Dichloroacetic acid	Standard	20.0	20.4 µg/L	102%	9812-78	1 80-120%
Dichloroacetic acid	Standard	40.0	37.6 µg/L	94%	9812-79	1 80-120%
Monobromoacetic acid	Duplicate	ND	ND µg/L	NA	9811-466	1
Monobromoacetic acid	Matrix Spike	40.0	37.7 µg/L	94%	9811-473	1
Monobromoacetic acid	Method Blank		ND* µg/L		9812-76	1
Monobromoacetic acid	Secondary Source Std	20.0	19.7 µg/L	98%	9812-77	1 70-130%
Monobromoacetic acid	Standard	20.0	19.9 µg/L	99%	9812-78	1 80-120%

ND: non-detect. \*Recovery is below 1/2 minimum reporting level (MRL). NA (not applicable): RPD calculation is not applicable.

**Quality Control Report**Mr. Joel Mohr  
Iowa-American Water Company**Study#:** 185  
**Study Title:** ICR RSSCT #3,4

Monobromoacetic acid	Standard	20.0	19.9	µg/L	99%	9812-78	1	80-120%
Monobromoacetic acid	Standard	40.0	38.0	µg/L	95%	9812-79	1	80-120%
Monochloroacetic acid	Duplicate	ND	ND	µg/L	NA	9811-466	2	
Monochloroacetic acid	Matrix Spike	40.0	39.3	µg/L	98%	9811-473	2	
Monochloroacetic acid	Method Blank		ND*	µg/L		9812-76	2	
Monochloroacetic acid	Secondary Source Std	20.0	20.2	µg/L	101%	9812-77	2	70-130%
Monochloroacetic acid	Standard	20.0	20.3	µg/L	102%	9812-78	2	80-120%
Monochloroacetic acid	Standard	20.0	21.2	µg/L	106%	9812-78	2	80-120%
Monochloroacetic acid	Standard	40.0	38.5	µg/L	96%	9812-79	2	80-120%
Tribromoacetic acid	Duplicate	ND	ND	µg/L	NA	9811-466	4	
Tribromoacetic acid	Matrix Spike	40.0	44.6	µg/L	112%	9811-473	4	
Tribromoacetic acid	Method Blank		ND*	µg/L		9812-76	4	
Tribromoacetic acid	Secondary Source Std		ND	µg/L		9812-77	4	70-130%
Tribromoacetic acid	Standard	20.0	22.3	µg/L	112%	9812-78	4	80-120%
Tribromoacetic acid	Standard	20.0	20.9	µg/L	104%	9812-78	4	80-120%
Tribromoacetic acid	Standard	40.0	42.4	µg/L	106%	9812-79	4	80-120%
Trichloroacetic acid	Duplicate	ND	ND	µg/L	NA	9811-466	1	
Trichloroacetic acid	Matrix Spike	40.0	45.1	µg/L	113%	9811-473	1	
Trichloroacetic acid	Method Blank		ND*	µg/L		9812-76	1	
Trichloroacetic acid	Secondary Source Std	20.0	21.9	µg/L	110%	9812-77	1	70-130%
Trichloroacetic acid	Standard	20.0	21.5	µg/L	108%	9812-78	1	80-120%
Trichloroacetic acid	Standard	20.0	21.8	µg/L	109%	9812-78	1	80-120%
Trichloroacetic acid	Standard	40.0	37.1	µg/L	93%	9812-79	1	80-120%

**Analysis:** HAA-ICR (Haloacetic Acids)**Method:** EPA 552.2**QC Batch ID:** 0-286-0

									Acceptance Criteria	
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Range	RPD
Bromochloroacetic acid	Duplicate	1.1	1.2	µg/L		8.7%	9811-512	1		
Bromochloroacetic acid	Matrix Spike	40.0	39.6	µg/L	99%		9811-411	1		
Bromochloroacetic acid	Method Blank		ND*	µg/L			9812-107	1		
Bromochloroacetic acid	Secondary Source Std	20.0	22.9	µg/L	115%		9812-108	1	70-130%	
Bromochloroacetic acid	Standard	20.0	20.3	µg/L	102%		9812-109	1	80-120%	
Bromochloroacetic acid	Standard	20.0	20.6	µg/L	103%		9812-109	1	80-120%	

ND: non-detect. \*Recovery is below 1/2 minimum reporting level (MRL). NA (not applicable): RPD calculation is not applicable.

**Quality Control Report**Mr. Joel Mohr  
Iowa-American Water Company**Study#:** 185  
**Study Title:** ICR RSSCT #3,4

Bromochloroacetic acid	Standard	40.0	40.7 µg/L	102%	9812-110	1 80-120%
Bromodichloroacetic acid	Duplicate	1.1	1.1 µg/L	0.0%	9811-512	1
Bromodichloroacetic acid	Matrix Spike	40.0	42.4 µg/L	106%	9811-411	1
Bromodichloroacetic acid	Method Blank		ND* µg/L		9812-107	1
Bromodichloroacetic acid	Secondary Source Std		ND µg/L		9812-108	1 70-130%
Bromodichloroacetic acid	Standard	20.0	20.4 µg/L	102%	9812-109	1 80-120%
Bromodichloroacetic acid	Standard	20.0	20.7 µg/L	103%	9812-109	1 80-120%
Bromodichloroacetic acid	Standard	40.0	39.3 µg/L	98%	9812-110	1 80-120%
Chlorodibromoacetic acid	Duplicate	ND	ND µg/L	NA	9811-512	2
Chlorodibromoacetic acid	Matrix Spike	40.0	42.3 µg/L	106%	9811-411	2
Chlorodibromoacetic acid	Method Blank		ND* µg/L		9812-107	2
Chlorodibromoacetic acid	Secondary Source Std		ND µg/L		9812-108	2 70-130%
Chlorodibromoacetic acid	Standard	20.0	20.4 µg/L	102%	9812-109	2 80-120%
Chlorodibromoacetic acid	Standard	20.0	20.3 µg/L	102%	9812-109	2 80-120%
Chlorodibromoacetic acid	Standard	40.0	39.3 µg/L	98%	9812-110	2 80-120%
Dibromoacetic acid	Duplicate	ND	ND µg/L	NA	9811-512	1
Dibromoacetic acid	Matrix Spike	40.0	40.4 µg/L	101%	9811-411	1
Dibromoacetic acid	Method Blank		ND* µg/L		9812-107	1
Dibromoacetic acid	Secondary Source Std	20.0	23.2 µg/L	116%	9812-108	1 70-130%
Dibromoacetic acid	Standard	20.0	20.5 µg/L	102%	9812-109	1 80-120%
Dibromoacetic acid	Standard	20.0	20.7 µg/L	103%	9812-109	1 80-120%
Dibromoacetic acid	Standard	40.0	40.1 µg/L	100%	9812-110	1 80-120%
Dichloroacetic acid	Duplicate	ND	ND µg/L	NA	9811-512	1
Dichloroacetic acid	Matrix Spike	40.0	38.3 µg/L	96%	9811-411	1
Dichloroacetic acid	Method Blank		ND* µg/L		9812-107	1
Dichloroacetic acid	Secondary Source Std	20.0	23.3 µg/L	117%	9812-108	1 70-130%
Dichloroacetic acid	Standard	20.0	19.8 µg/L	99%	9812-109	1 80-120%
Dichloroacetic acid	Standard	20.0	19.4 µg/L	97%	9812-109	1 80-120%
Dichloroacetic acid	Standard	40.0	39.8 µg/L	99%	9812-110	1 80-120%
Monobromoacetic acid	Duplicate	ND	ND µg/L	NA	9811-512	1
Monobromoacetic acid	Matrix Spike	40.0	36.5 µg/L	91%	9811-411	1
Monobromoacetic acid	Method Blank		ND* µg/L		9812-107	1

ND: non-detect. \*Recovery is below 1/2 minimum reporting level (MRL). NA (not applicable): RPD calculation is not applicable.

**Quality Control Report**Mr. Joel Mohr  
Iowa-American Water Company**Study#:** 185  
**Study Title:** ICR RSSCT #3,4

Monobromoacetic acid	Secondary Source Std	20.0	21.8 µg/L	109%	9812-108	1	70-130%
Monobromoacetic acid	Standard	20.0	18.3 µg/L	92%	9812-109	1	80-120%
Monobromoacetic acid	Standard	20.0	17.9 µg/L	89%	9812-109	1	80-120%
Monobromoacetic acid	Standard	40.0	42.7 µg/L	107%	9812-110	1	80-120%
Monochloroacetic acid	Duplicate	ND	ND µg/L	NA	9811-512	2	
Monochloroacetic acid	Matrix Spike	40.0	38.5 µg/L	96%	9811-411	2	
Monochloroacetic acid	Method Blank		ND* µg/L		9812-107	2	
Monochloroacetic acid	Secondary Source Std	20.0	21.1 µg/L	106%	9812-108	2	70-130%
Monochloroacetic acid	Standard	20.0	18.4 µg/L	92%	9812-109	2	80-120%
Monochloroacetic acid	Standard	20.0	17.4 µg/L	87%	9812-109	2	80-120%
Monochloroacetic acid	Standard	40.0	41.7 µg/L	104%	9812-110	2	80-120%
Tribromoacetic acid	Duplicate	ND	ND µg/L	NA	9811-512	4	
Tribromoacetic acid	Matrix Spike	40.0	41.1 µg/L	103%	9811-411	4	
Tribromoacetic acid	Method Blank		ND* µg/L		9812-107	4	
Tribromoacetic acid	Secondary Source Std		ND µg/L		9812-108	4	70-130%
Tribromoacetic acid	Standard	20.0	20.4 µg/L	102%	9812-109	4	80-120%
Tribromoacetic acid	Standard	20.0	20.3 µg/L	102%	9812-109	4	80-120%
Tribromoacetic acid	Standard	40.0	38.4 µg/L	96%	9812-110	4	80-120%
Trichloroacetic acid	Duplicate	ND	ND µg/L	NA	9811-512	1	
Trichloroacetic acid	Matrix Spike	40.0	40.2 µg/L	101%	9811-411	1	
Trichloroacetic acid	Method Blank		ND* µg/L		9812-107	1	
Trichloroacetic acid	Secondary Source Std	20.0	23.0 µg/L	115%	9812-108	1	70-130%
Trichloroacetic acid	Standard	20.0	20.7 µg/L	103%	9812-109	1	80-120%
Trichloroacetic acid	Standard	20.0	20.5 µg/L	102%	9812-109	1	80-120%
Trichloroacetic acid	Standard	40.0	39.5 µg/L	99%	9812-110	1	80-120%

**Analysis:** HAA-ICR (Haloacetic Acids)**Method:** EPA 552.2**QC Batch ID:** 0-289-0

								Acceptance Criteria	
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL Range	RPD
Bromochloroacetic acid	Duplicate	ND	ND	µg/L		NA	9811-551	1	
Bromochloroacetic acid	Matrix Spike	40.0	44.7	µg/L	112%		9811-602	1	
Bromochloroacetic acid	Method Blank		ND*	µg/L			9812-130	1	
Bromochloroacetic acid	Secondary Source Std	20.0	20.9	µg/L	104%		9812-131	1	70-130%

ND: non-detect. \*Recovery is below 1/2 minimum reporting level (MRL). NA (not applicable): RPD calculation is not applicable.

**Quality Control Report**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

Bromochloroacetic acid	Standard	20.0	18.8 µg/L	94%	9812-132	1 80-120%
Bromochloroacetic acid	Standard	20.0	19.0 µg/L	95%	9812-132	1 80-120%
Bromochloroacetic acid	Standard	40.0	41.5 µg/L	104%	9812-133	1 80-120%
Bromodichloroacetic acid	Duplicate	ND	ND µg/L	NA	9811-551	1
Bromodichloroacetic acid	Matrix Spike	40.0	44.2 µg/L	111%	9811-602	1
Bromodichloroacetic acid	Method Blank		ND* µg/L		9812-130	1
Bromodichloroacetic acid	Secondary Source Std		ND µg/L		9812-131	1 70-130%
Bromodichloroacetic acid	Standard	20.0	17.8 µg/L	89%	9812-132	1 80-120%
Bromodichloroacetic acid	Standard	20.0	17.7 µg/L	89%	9812-132	1 80-120%
Bromodichloroacetic acid	Standard	40.0	43.4 µg/L	109%	9812-133	1 80-120%
Chlorodibromoacetic acid	Duplicate	ND	ND µg/L	NA	9811-551	2
Chlorodibromoacetic acid	Matrix Spike	40.0	47.0 µg/L	118%	9811-602	2
Chlorodibromoacetic acid	Method Blank		ND* µg/L		9812-130	2
Chlorodibromoacetic acid	Secondary Source Std		ND µg/L		9812-131	2 70-130%
Chlorodibromoacetic acid	Standard	20.0	17.7 µg/L	89%	9812-132	2 80-120%
Chlorodibromoacetic acid	Standard	20.0	17.6 µg/L	88%	9812-132	2 80-120%
Chlorodibromoacetic acid	Standard	40.0	44.0 µg/L	110%	9812-133	2 80-120%
Dibromoacetic acid	Duplicate	ND	ND µg/L	NA	9811-551	1
Dibromoacetic acid	Matrix Spike	40.0	46.1 µg/L	115%	9811-602	1
Dibromoacetic acid	Method Blank		ND* µg/L		9812-130	1
Dibromoacetic acid	Secondary Source Std	20.0	21.0 µg/L	105%	9812-131	1 70-130%
Dibromoacetic acid	Standard	20.0	18.5 µg/L	93%	9812-132	1 80-120%
Dibromoacetic acid	Standard	20.0	18.6 µg/L	93%	9812-132	1 80-120%
Dibromoacetic acid	Standard	40.0	42.1 µg/L	105%	9812-133	1 80-120%
Dichloroacetic acid	Duplicate	ND	ND µg/L	NA	9811-551	1
Dichloroacetic acid	Matrix Spike	40.0	40.0 µg/L	100%	9811-602	1
Dichloroacetic acid	Method Blank		ND* µg/L		9812-130	1
Dichloroacetic acid	Secondary Source Std	20.0	22.2 µg/L	111%	9812-131	1 70-130%
Dichloroacetic acid	Standard	20.0	19.1 µg/L	96%	9812-132	1 80-120%
Dichloroacetic acid	Standard	20.0	18.7 µg/L	93%	9812-132	1 80-120%
Dichloroacetic acid	Standard	40.0	40.6 µg/L	102%	9812-133	1 80-120%
Monobromoacetic acid	Duplicate	ND	ND µg/L	NA	9811-551	1
Monobromoacetic acid	Matrix Spike	40.0	37.9 µg/L	95%	9811-602	1

ND: non-detect. \*Recovery is below 1/2 minimum reporting level (MRL). NA (not applicable): RPD calculation is not applicable.

**Quality Control Report**Mr. Joel Mohr  
Iowa-American Water Company**Study#:** 185  
**Study Title:** ICR RSSCT #3,4

Monobromoacetic acid	Method Blank		ND*	µg/L		9812-130	1
Monobromoacetic acid	Secondary Source Std	20.0	23.1	µg/L	116%	9812-131	1 70-130%
Monobromoacetic acid	Standard	20.0	19.1	µg/L	96%	9812-132	1 80-120%
Monobromoacetic acid	Standard	20.0	19.1	µg/L	96%	9812-132	1 80-120%
Monobromoacetic acid	Standard	40.0	40.7	µg/L	102%	9812-133	1 80-120%
Monochloroacetic acid	Duplicate	ND	ND	µg/L	NA	9811-551	2
Monochloroacetic acid	Matrix Spike	40.0	38.6	µg/L	97%	9811-602	2
Monochloroacetic acid	Method Blank		ND*	µg/L		9812-130	2
Monochloroacetic acid	Secondary Source Std	20.0	22.8	µg/L	114%	9812-131	2 70-130%
Monochloroacetic acid	Standard	20.0	19.5	µg/L	97%	9812-132	2 80-120%
Monochloroacetic acid	Standard	20.0	19.3	µg/L	97%	9812-132	2 80-120%
Monochloroacetic acid	Standard	40.0	40.9	µg/L	102%	9812-133	2 80-120%
Tribromoacetic acid	Duplicate	ND	ND	µg/L	NA	9811-551	4
Tribromoacetic acid	Matrix Spike	40.0	44.1	µg/L	110%	9811-602	4
Tribromoacetic acid	Method Blank		ND*	µg/L		9812-130	4
Tribromoacetic acid	Secondary Source Std		ND	µg/L		9812-131	4 70-130%
Tribromoacetic acid	Standard	20.0	18.6	µg/L	93%	9812-132	4 80-120%
Tribromoacetic acid	Standard	20.0	18.0	µg/L	90%	9812-132	4 80-120%
Tribromoacetic acid	Standard	40.0	44.0	µg/L	110%	9812-133	4 80-120%
Trichloroacetic acid	Duplicate	ND	ND	µg/L	NA	9811-551	1
Trichloroacetic acid	Matrix Spike	40.0	47.2	µg/L	118%	9811-602	1
Trichloroacetic acid	Method Blank		ND*	µg/L		9812-130	1
Trichloroacetic acid	Secondary Source Std	20.0	20.4	µg/L	102%	9812-131	1 70-130%
Trichloroacetic acid	Standard	20.0	18.0	µg/L	90%	9812-132	1 80-120%
Trichloroacetic acid	Standard	20.0	17.9	µg/L	89%	9812-132	1 80-120%
Trichloroacetic acid	Standard	40.0	42.1	µg/L	105%	9812-133	1 80-120%

**Analysis:** HAA-ICR (Haloacetic Acids)**Method:** EPA 552.2**QC Batch ID:** 0-291-0

							Acceptance Criteria		
QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL Range	RPD
Bromochloroacetic acid	Duplicate	2.8	2.9	µg/L		3.5%	9811-630	1	
Bromochloroacetic acid	Matrix Spike	40.0	34.9	µg/L	87%		9811-583	1	
Bromochloroacetic acid	Method Blank		ND*	µg/L			9812-195	1	

ND: non-detect. \*Recovery is below 1/2 minimum reporting level (MRL). NA (not applicable): RPD calculation is not applicable.

**Quality Control Report**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

Bromochloroacetic acid	Secondary Source Std	20.0	20.1 µg/L	101%	9812-196	1 70-130%
Bromochloroacetic acid	Standard	20.0	19.3 µg/L	97%	9812-197	1 80-120%
Bromochloroacetic acid	Standard	20.0	19.6 µg/L	98%	9812-197	1 80-120%
Bromochloroacetic acid	Standard	40.0	41.0 µg/L	102%	9812-198	1 80-120%
Bromodichloroacetic acid	Duplicate	2.8	2.7 µg/L	3.6%	9811-630	1
Bromodichloroacetic acid	Matrix Spike	40.0	36.6 µg/L	92%	9811-583	1
Bromodichloroacetic acid	Method Blank		ND* µg/L		9812-195	1
Bromodichloroacetic acid	Secondary Source Std		ND µg/L		9812-196	1 70-130%
Bromodichloroacetic acid	Standard	20.0	18.9 µg/L	94%	9812-197	1 80-120%
Bromodichloroacetic acid	Standard	20.0	20.8 µg/L	104%	9812-197	1 80-120%
Bromodichloroacetic acid	Standard	40.0	42.4 µg/L	106%	9812-198	1 80-120%
Chlorodibromoacetic acid	Duplicate	ND	ND µg/L	NA	9811-630	2
Chlorodibromoacetic acid	Matrix Spike	40.0	36.1 µg/L	90%	9811-583	2
Chlorodibromoacetic acid	Method Blank		ND* µg/L		9812-195	2
Chlorodibromoacetic acid	Secondary Source Std		ND µg/L		9812-196	2 70-130%
Chlorodibromoacetic acid	Standard	20.0	18.8 µg/L	94%	9812-197	2 80-120%
Chlorodibromoacetic acid	Standard	20.0	21.3 µg/L	106%	9812-197	2 80-120%
Chlorodibromoacetic acid	Standard	40.0	44.7 µg/L	112%	9812-198	2 80-120%
Dibromoacetic acid	Duplicate	1.0	1.0 µg/L	0.0%	9811-630	1
Dibromoacetic acid	Matrix Spike	40.0	33.8 µg/L	84%	9811-583	1
Dibromoacetic acid	Method Blank		ND* µg/L		9812-195	1
Dibromoacetic acid	Secondary Source Std	20.0	19.5 µg/L	97%	9812-196	1 70-130%
Dibromoacetic acid	Standard	20.0	19.1 µg/L	96%	9812-197	1 80-120%
Dibromoacetic acid	Standard	20.0	19.4 µg/L	97%	9812-197	1 80-120%
Dibromoacetic acid	Standard	40.0	41.4 µg/L	103%	9812-198	1 80-120%
Dichloroacetic acid	Duplicate	5.2	5.3 µg/L	1.9%	9811-630	1
Dichloroacetic acid	Matrix Spike	40.0	36.4 µg/L	91%	9811-583	1
Dichloroacetic acid	Method Blank		ND* µg/L		9812-195	1
Dichloroacetic acid	Secondary Source Std	20.0	22.8 µg/L	114%	9812-196	1 70-130%
Dichloroacetic acid	Standard	20.0	19.7 µg/L	98%	9812-197	1 80-120%
Dichloroacetic acid	Standard	20.0	19.3 µg/L	97%	9812-197	1 80-120%
Dichloroacetic acid	Standard	40.0	39.7 µg/L	99%	9812-198	1 80-120%

ND: non-detect. \*Recovery is below 1/2 minimum reporting level (MRL). NA (not applicable): RPD calculation is not applicable.



**Quality Control Report**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

Monobromoacetic acid	Duplicate	ND	ND	µg/L	NA	9811-630	1
Monobromoacetic acid	Matrix Spike	40.0	38.5	µg/L	96%	9811-583	1
Monobromoacetic acid	Method Blank		ND*	µg/L		9812-195	1
Monobromoacetic acid	Secondary Source Std	20.0	22.3	µg/L	112%	9812-196	1 70-130%
Monobromoacetic acid	Standard	20.0	19.2	µg/L	96%	9812-197	1 80-120%
Monobromoacetic acid	Standard	20.0	18.9	µg/L	94%	9812-197	1 80-120%
Monobromoacetic acid	Standard	40.0	41.0	µg/L	102%	9812-198	1 80-120%
Monochloroacetic acid	Duplicate	ND	ND	µg/L	NA	9811-630	2
Monochloroacetic acid	Matrix Spike	40.0	39.4	µg/L	98%	9811-583	2
Monochloroacetic acid	Method Blank		ND*	µg/L		9812-195	2
Monochloroacetic acid	Secondary Source Std	20.0	21.9	µg/L	110%	9812-196	2 70-130%
Monochloroacetic acid	Standard	20.0	19.6	µg/L	98%	9812-197	2 80-120%
Monochloroacetic acid	Standard	20.0	19.2	µg/L	96%	9812-197	2 80-120%
Monochloroacetic acid	Standard	40.0	40.2	µg/L	101%	9812-198	2 80-120%
Tribromoacetic acid	Duplicate	ND	ND	µg/L	NA	9811-630	4
Tribromoacetic acid	Matrix Spike	40.0	36.6	µg/L	92%	9811-583	4
Tribromoacetic acid	Method Blank		ND*	µg/L		9812-195	4
Tribromoacetic acid	Secondary Source Std		ND	µg/L		9812-196	4 70-130%
Tribromoacetic acid	Standard	20.0	18.7	µg/L	93%	9812-197	4 80-120%
Tribromoacetic acid	Standard	20.0	21.8	µg/L	109%	9812-197	4 80-120%
Tribromoacetic acid	Standard	40.0	44.4	µg/L	111%	9812-198	4 80-120%
Trichloroacetic acid	Duplicate	5.2	5.1	µg/L	1.9%	9811-630	1
Trichloroacetic acid	Matrix Spike	40.0	33.3	µg/L	83%	9811-583	1
Trichloroacetic acid	Method Blank		ND*	µg/L		9812-195	1
Trichloroacetic acid	Secondary Source Std	20.0	18.7	µg/L	93%	9812-196	1 70-130%
Trichloroacetic acid	Standard	20.0	18.8	µg/L	94%	9812-197	1 80-120%
Trichloroacetic acid	Standard	20.0	19.2	µg/L	96%	9812-197	1 80-120%
Trichloroacetic acid	Standard	40.0	41.7	µg/L	104%	9812-198	1 80-120%

**End of quality control report**

## QC Results from Montgomery Watson Laboratories

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Mr. Joel Mohr  
Iowa-American Water Company  
230 East 2nd Street  
P.O. Box 979  
Davenport, IA 52805

Study#: 185  
Study Title: ICR RSSCT #3,4

Phone: 319-322-0161 Fax: 319-322-2190

QC Batch ID: 88138 Report #: 49666  
49667

Analysis: BR Method: ML/EPA 300

QC	Analyte	Spike	Recovery	Yield	RPD	Acceptance Criteria Range
LCS1	Bromide	0.02	0.021	105.0%		(50 - 150)
LCS2	Bromide	0.1	0.1	100.0%		(90 - 110)
MBLK	Bromide	ND	ND			(70 - 130)
MS	Bromide	0.1	0.098	98.0%		(80 - 120)
MSD	Bromide	0.1	0.099	99.0%		(80 - 120)

QC Batch ID: 88148 Report #: 49666  
49667

Analysis: CA Method: EPA/ML 200.7

QC	Analyte	Spike	Recovery	Yield	RPD	Acceptance Criteria Range
LCS1	Calcium, Total, ICAP	50	47.8	96.0%		(85 - 115)
LCS2	Calcium, Total, ICAP	50	48	96.0%		(85 - 115)
MBLK	Calcium, Total, ICAP	ND	ND			
MS	Calcium, Total, ICAP	50	52.4	105.0%		(70 - 130)

QC Batch ID: 88153 Report #: 49666  
49667

Analysis: MG Method: ML/EPA 200.7

QC	Analyte	Spike	Recovery	Yield	RPD	Acceptance Criteria Range
LCS1	Magnesium, Total, ICAP	20	20.2	101.0%		(85 - 115)
LCS2	Magnesium, Total, ICAP	20	20.1	100.0%		(85 - 115)
MBLK	Magnesium, Total, ICAP	ND	ND			
MS	Magnesium, Total, ICAP	20	20.7	104.0%		(70 - 130)

QC Batch ID: 88171 Report #: 49666  
49667

Analysis: NH3 Method: ML/EPA 350.1

QC	Analyte	Spike	Recovery	Yield	RPD	Acceptance Criteria Range
LCS1	Ammonia Nitrogen	1	0.908	91.0%		(80 - 120)
LCS2	Ammonia Nitrogen	1	0.82	82.0%		(80 - 120)
MBLK	Ammonia Nitrogen	ND	ND			

ND (non-detect): Result is below 1/2 minimum reporting level (MRL).

**QC Results from Montgomery Watson Laboratories**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

MS	Ammonia Nitrogen	1	0.941	94.0%	(80 - 120)
MSD	Ammonia Nitrogen	1	0.942	94.0%	(80 - 120)

QC Batch ID: 88377 Report #: 49829

Analysis: CA Method: EPA/ML 200.7

QC	Analyte	Spike	Recovery	Yield	RPD	Acceptance Criteria Range
LCS1	Calcium, Total, ICAP	50	48.6	97.0%		(85 - 115)
LCS2	Calcium, Total, ICAP	50	48.8	98.0%		(85 - 115)
MBLK	Calcium, Total, ICAP	ND	ND			
MS	Calcium, Total, ICAP	50	54.3	109.0%		(70 - 130)

QC Batch ID: 88380 Report #: 49829

Analysis: MG Method: ML/EPA 200.7

QC	Analyte	Spike	Recovery	Yield	RPD	Acceptance Criteria Range
LCS1	Magnesium, Total, ICAP	20	20	100.0%		(85 - 115)
LCS2	Magnesium, Total, ICAP	20	20	100.0%		(85 - 115)
MBLK	Magnesium, Total, ICAP	ND	ND			
MS	Magnesium, Total, ICAP	20	21.9	110.0%		(70 - 130)

QC Batch ID: 88404 Report #: 49829

Analysis: BR Method: ML/EPA 300

QC	Analyte	Spike	Recovery	Yield	RPD	Acceptance Criteria Range
LCS1	Bromide	0.02	0.021	105.0%		(50 - 150)
LCS2	Bromide	0.1	0.101	101.0%		(90 - 110)
MBLK	Bromide	ND	ND			(70 - 130)
MS	Bromide	0.1	0.096	96.0%		(80 - 120)
MSD	Bromide	0.1	0.097	97.0%		(80 - 120)

QC Batch ID: 88492 Report #: 49829  
49830

Analysis: BR Method: ML/EPA 300

QC	Analyte	Spike	Recovery	Yield	RPD	Acceptance Criteria Range
LCS1	Bromide	0.02	0.02	100.0%		(50 - 150)
LCS2	Bromide	0.1	0.101	101.0%		(90 - 110)
MBLK	Bromide	ND	ND			(70 - 130)
MS	Bromide	0.1	0.1	100.0%		(80 - 120)
MSD	Bromide	0.1	0.101	101.0%		(80 - 120)

ND (non-detect): Result is below 1/2 minimum reporting level (MRL).

**QC Results from Montgomery Watson Laboratories**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4QC Batch ID: 88543      Report #: 49829  
49830

Analysis: CA		Method: EPA/ML 200.7					Acceptance Criteria
QC	Analyte	Spike	Recovery	Yield	RPD	Range	
LCS1	Calcium, Total, ICAP	50	48.7	97.0%		(85 - 115)	
LCS2	Calcium, Total, ICAP	50	48.4	97.0%		(85 - 115)	
MBLK	Calcium, Total, ICAP	ND	ND				
MS	Calcium, Total, ICAP	50	50.2	100.0%		(70 - 130)	

QC Batch ID: 88546      Report #: 49829  
49830

Analysis: MG		Method: ML/EPA 200.7					Acceptance Criteria
QC	Analyte	Spike	Recovery	Yield	RPD	Range	
LCS1	Magnesium, Total, ICAP	20	19.9	100.0%		(85 - 115)	
LCS2	Magnesium, Total, ICAP	20	19.6	98.0%		(85 - 115)	
MBLK	Magnesium, Total, ICAP	ND	ND				
MS	Magnesium, Total, ICAP	20	19.7	98.0%		(70 - 130)	

QC Batch ID: 88718      Report #: 49829  
49830

Analysis: NH3		Method: ML/EPA 350.1					Acceptance Criteria
QC	Analyte	Spike	Recovery	Yield	RPD	Range	
LCS1	Ammonia Nitrogen	1	1.01	101.0%		(80 - 120)	
LCS2	Ammonia Nitrogen	1	0.997	100.0%		(80 - 120)	
MBLK	Ammonia Nitrogen	ND	ND				
MS	Ammonia Nitrogen	0.5	0.458	92.0%		(80 - 120)	
MSD	Ammonia Nitrogen	0.5	0.461	92.0%		(80 - 120)	

QC Batch ID: 88721      Report #: 50063

Analysis: NH3		Method: ML/EPA 350.1					Acceptance Criteria
QC	Analyte	Spike	Recovery	Yield	RPD	Range	
LCS1	Ammonia Nitrogen	1	1	100.0%		(80 - 120)	
LCS2	Ammonia Nitrogen	1	0.998	100.0%		(80 - 120)	
MBLK	Ammonia Nitrogen	ND	ND				
MS	Ammonia Nitrogen	0.5	0.543	109.0%		(80 - 120)	
MSD	Ammonia Nitrogen	0.5	0.544	109.0%		(80 - 120)	

ND (non-detect): Result is below 1/2 minimum reporting level (MRL).

**QC Results from Montgomery Watson Laboratories**Mr. Joel Mohr  
Iowa-American Water CompanyStudy#: 185  
Study Title: ICR RSSCT #3,4

QC Batch ID: 88787

Report #: 50063

Analysis: CA

Method: ML/EPA 200.7

QC	Analyte	Spike	Recovery	Yield	RPD	Acceptance Criteria Range
LCS1	Calcium, Total, ICAP	50	47.3	95.0%		(85 - 115)
LCS2	Calcium, Total, ICAP	50	48.1	96.0%		(85 - 115)
MBLK	Calcium, Total, ICAP	ND	ND			
MS	Calcium, Total, ICAP	50	48	96.0%		(70 - 130)

QC Batch ID: 88799

Report #: 50063

Analysis: MG

Method: ML/EPA 200.7

QC	Analyte	Spike	Recovery	Yield	RPD	Acceptance Criteria Range
LCS1	Magnesium, Total, ICAP	20	20	100.0%		(85 - 115)
LCS2	Magnesium, Total, ICAP	20	20	100.0%		(85 - 115)
MBLK	Magnesium, Total, ICAP	ND	ND			
MS	Magnesium, Total, ICAP	20	19.2	96.0%		(70 - 130)

QC Batch ID: 89070

Report #: 50063

Analysis: BR

Method: ML/EPA 300

QC	Analyte	Spike	Recovery	Yield	RPD	Acceptance Criteria Range
LCS1	Bromide	0.02	0.021	105.0%		(50 - 150)
LCS2	Bromide	0.1	0.098	98.0%		(90 - 110)
MBLK	Bromide	ND	ND			(70 - 130)
MS	Bromide	0.1	0.092	92.0%		(80 - 120)
MSD	Bromide	0.1	0.092	92.0%		(80 - 120)

**End of MW QC report**

**Comments**Page 1 of 1  
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**Study#:** 185  
**Study Title:** ICR RSSCT #3,4

**Analysis comments****Analysis:** Turbidity**Method:** SM 2130 B

Reported turbidity data has been rounded following the requirements of SM 2130 B, reproduced in the table below (Standard Methods, 1995). Note that the reported digits are not necessarily significant.

<b>Turbidity Range</b>	<b>Report to Nearest</b>
0-1.0	0.05
1-10	0.1
10-40	1
40-100	5
100-400	10
400-1000	50
> 1000	100

**End of comments**