ICR Treatment Study Summary Report

Mahoning Valley Sanitary District

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

Conducted during the period of 1/14/97 through 10/22/97

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Attachments: 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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°C	degree 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_{50}	bed volumes to 50 percent TOC breakthrough
C	concentration
$\overline{C}$	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
$CHBr_3$	bromoform
$CHCl_3$	chloroform
Cl^-	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
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
$_i$	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
MGD	million gallons per day
$_{min}$	minimum
min	minute
mL	milliliter
mm	millimeter
MRL	minimum reporting level
MtBE	methyl tert-butyl ether
$_n$	number of contactors
NA	not applicable
NA	not analyzed
NA_v	not available
NB	not backwashed
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
RSSCT	rapid small-scale column test
$_{SC}$	small column
SDS	simulated distribution system
sec	second
SF	scaling factor
SM	*Standard Methods*

SUVA	specific ultraviolet absorbance
t	time
$_T$	total
TBAA	tribromoacetic acid
TCAA	trichloroacetic acid
THM	trihalomethane
THM4	sum of four trihalomethanes: $CHCl_3$, BDCM, DBCM, and $CHBr_3$
TOC	total organic carbon
TOC_0	influent total organic carbon
TOX	total organic halide
TSUVA	total specific ultraviolet absorbance
UV	ultraviolet absorbance
UV_{254}	ultraviolet absorbance at 254 nm
ε	bed porosity
ν	kinematic viscosity
ρ	density

4 *Conclusions and Recommendations*

4 Conclusions and Recommendations

A treatment study was conducted by Summers & Hooper, Inc. to evaluate the removal of disinfection byproduct (DBP) precursors by granular activated carbon (GAC) for the Meander Creek Reservoir Works, operated by the Mahoning Valley Sanitary District. 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, GAC 1240 B4, manufactured by Norit Americas, Inc. was investigated. Four quarterly sessions were conducted to evaluate seasonal variability. During each session, two empty-bed contact times (EBCTs) were evaluated (10 and 20 minutes). DBP formation by disinfection with free chlorine was simulated by utilizing site-specific chlorination conditions designed to match the 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 as an attachment to this report. It contains: this report in portable document format (PDF) 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.

Based on complying with the placeholder for Stage 2 DBP maximum contaminant levels (MCLs), the formation of total trihalomethane (THM4) was the controlling parameter for GAC run time estimates. Run times, based on parallel and staggered operation of multiple contactors, ranged from 44 to 93 days for 10 minute EBCT contactors, and 102 to 223 days for 20 minute EBCT contactors. This study showed that with GAC adsorption, the system will comply with the placeholder for Stage 2 MCL for the sum of five haloacetic acids (HAA5). All run times given reflect meeting the Stage 2 THM4 or HAA5 MCL with a 20 percent safety factor, 32 and 24 µg/L, respectively. All chlorination was conducted at pH 9.0, a relatively high pH, which may have favored the base-catalyzed formation of THMs.

Based on an EPA cost model, the average cost for GAC to maintain formed THM4 levels below the placeholders for Stage 2 MCLs using concrete gravity contactors is 31 and 38 cents/1,000 gallons for 10 and 20 minute EBCT contactors, respectively, based on operation in parallel staggered mode. The average costs for steel pressure contactors is 38 and 58 cents/1,000 gallons for 10 and 20 minute EBCT contactors, respectively, based on operation in parallel staggered mode. These cost estimates include on on-site reactivation, and do not include the cost for pH adjustment (recarbonation) from the settled water pH (typically 10.7) to the GAC influent pH of 9.0.

A relative measure of GAC performance is the number of bed volumes to 50 percent total organic carbon (TOC) breakthrough, BV_{50}. This parameter can correlate 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 an average water, correlated to the influent TOC concentration, which is available in the literature. Based on the average influent TOC concentration during each quarterly session, the BV_{50} was predicted to average 5,200 bed volumes. During the four quarters of testing, the 10 minute EBCT contactor averaged a BV_{50} of 4,500 bed volumes. Therefore, GAC run times were about 13 percent shorter than predicted for the 10 minute EBCT contactor. For the 20 minute EBCT contactor, however, the average BV_{50} during all four quarters was 5,700 bed volumes, or about 10 percent longer than predicted. On a throughput basis, normalized for EBCT, the 20 minute EBCT contactor outperformed the 10 minute EBCT contactor. Thus, the carbon usage rate and O&M costs for a 20 minute EBCT contactor were lower than those for a 10 minute EBCT contactor. However, due to higher capital costs for a 20 minute EBCT contactor, the 10 minute EBCT contactor was more cost-effective in terms of total costs.

GAC influent TOC concentration varied from 3.2 to 3.9 mg/L during the four sessions evaluated, and bromide concentration varied from 36 to 42 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 and bromoform, formed concentrations in the were measured higher than that in the influent. 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.

A normalized breakthrough evaluation showed that TOC breakthrough served as a conservative indicator for the breakthrough of all DBP precursors, while UV_{254} breakthrough served as an excellent predictor of TOX precursor breakthrough.

In general, GAC performance can be improved by lowering the influent TOC concentration and the influent pH. Further optimization of the softening process could result in lower TOC concentrations. Although requiring higher chemical costs, GAC run times would be extended, lowering GAC O&M costs. Lowering the influent pH may increase treatment costs due to the costs of pH adjustment before (and possibly after) GAC adsorption. Prior to full-scale decisions, optimization of GAC performance by adjusting the influent pH prior to adsorption should be considered. Again, lowering the influent pH could increase GAC run times, decreasing GAC O&M costs.

As reported above, the total costs (capital and O&M) for GAC treatment to comply with the placeholders for Stage 2 DBP MCLs were lowest using 10 minute EBCT concrete gravity contactors. However, an evaluation of shorter EBCT contactors was not made. Depending on the trade off between higher O&M costs and lower capital costs, an EBCT shorter than 10 minutes may be more cost-effective.

5 *Background Information*

5 Background Information

5.1 Treatment Plant Description

The Mahoning Valley Sanitary District operates the Meander Reservoir Treatment Works, a lime softening plant that provides water for a population of 250,000 in the Youngstown, Ohio area. The state approved plant capacity is 60 MGD and the source water is the Meander Creek Reservoir, a surface water.

Figure 1 shows a simple schematic of Mahoning Valley Sanitary District's Meander Reservoir Treatment Works. Powdered activated carbon is added for taste and odor control at the plant influent, with doses ranging from 3 to 20 mg/L. Lime (CaOH) and sodium aluminate ($Na_2Al_2O_4$) are added during rapid mix, which is followed by flocculation and sedimentation. Chlorine is added prior to rapid sand filtration. After the clearwell, ammonia is added to the finished water. The sand filter washwater is sent to a backwash recycle station, and then recycled to the point of rapid mix. The finished water pH is typically about 10.5.

5.1.1 Treatment plant design information

Table 1 summarizes the Meander Reservoir Treatment Works plant design data. 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

The Mahoning Valley Sanitary District’s Meander Creek Reservoir Works faces several treatment challenges, including: meeting the placeholders for Stage 2 MCLs of the Disinfection Byproduct Rule (DBPR), particularly for THM4; continuing to comply with the Lead and Copper Rule if changes in plant operation are made to meet lower DBP levels; and continuing to mitigate taste and odor episodes, particularly in the winter months when cold water conditions prevail. The Meander Creek Reservoir Works is currently barely meeting Stage 1 DBP MCLs, with chlorine addition just prior to filtration, and maintaining a free chlorine residual through the filters and clearwells. Ammonia is added to the clearwell effluent to yield a combined chlorine residual in the distribution systems.

To lower the levels of DBPs formed in the distribution systems of Youngstown and Niles, Ohio, the Mahoning Valley Sanitary District is investigating: recarbonation to lower the filter effluent pH from 10.5 to 9.0, and post-filter GAC adsorption to remove DBP precursors; installation of additional ammonia addition points in a new, baffled clearwell; an increase in the capacity of PAC storage and feed facilities so that more than 20 mg/L of PAC can be added at the reservoir effluent or the rapid-mix units.

If the filtered water pH values are lowered to improve the efficiency of post-filter GAC adsorption units or to simply lower the levels for DBP formation, the plant is faced with making

changes to its corrosion-control program for continuing to comply with the Lead and Copper Rule. A revised desk-top study would be required to determine the appropriate pH, calcium, alkalinity and total dissolved solids (TDS) values based on the water temperatures experienced seasonally. The addition of a corrosion inhibitor may also be required, although it is unlikely that pH values of 9.0 or greater would be conducive to the its use.

The Meander Creek Reservoir Works periodically experiences taste and odor episodes, particularly in the winter months, which are associated with the occurrence of Synura algae in the reservoir. Mahoning Valley Sanitary District has investigated several means of mitigating these taste and odor episodes with existing chemical feed capabilities, including: adding higher levels of PAC to the reservoir effluent or the rapid-mix units, increasing the potassium permanganate dose, and increasing the pre-filtration chlorine dose. The use of alternate oxidants such as chlorine dioxide and ozone have been investigated.

The only two treatments that appear to warrant consideration for mitigating these periodic taste and odor episodes are increasing the PAC dose, and ozonation of the raw water. Both of these treatments should also lower DBP formation. Higher PAC doses would increase TOC removal prior to the addition of chorine and ammonia. Addition of ozone prior to filtration would likely improve the biological removal of TOC during the filtration process, and could potentially meet the disinfection credit criteria of the Surface Water Treatment Rule (SWTR) while allowing for the use of combined chlorine as residual disinfectant in the both the clearwell and distribution system.

Bench-scale studies have shown that ozone reduces raw water total organic nitrogen (TON) during taste and odor episodes to acceptable levels. If ozone is used to mitigate taste and odor episodes, the addition of peroxide during ozonation may need to be considered to potentially enhance the performance of the ozone. If ozone is added to the filter influent, at a pH value of about 10.5, strategies to control the formation of bromate will need to be investigated.

5.2 Tabular Summary of Source and Finished Water Quality

Tables 2 and 3 summarize average source and finished water quality, respectively, at the Meander Reservoir Treatment Works, based on data taken between July 1997 and December 1998. These data constitute preliminary ICR monitoring results and have not necessarily undergone EPA review. The source water is characterized by moderate TOC levels, averaging 5.2 mg/L. Bromide levels are low, averaging 35 µg/L. The Meander Creek Reservoir Works averaged 40 percent TOC removal, yielding an average treated water TOC concentration of 3.2 mg/L. UV_{254} removal averaged 51 percent. The source water specific UV absorbance (TSUVA, defined as UV_{254}/TOC) averaged 2.4 L/mg-m. This was reduced to an average of 2.0 L/mg-m after treatment. Distribution system DBP concentrations were not available. Finished water THM4 levels ranged from 32 to 147 µg/L. Finished water THM4 levels averaged 84 µg/L, exceeding Stage 1 and the placeholders for Stage 2 MCLs. Finished water HAA5 averaged 36 µg/L, exceeding the placeholders for Stage 2 MCLs for HAA5. Finished water HAA5 concentrations also showed a wide seasonal variability. This variability was not evident in TOC concentration, which yielded a standard deviation of only 0.2 mg/L. Seasonal temperature chages are likely a significant factor in causing the wide variability in DS-DBP concentrations.

Unit Process	Process Description
Washwater Return	Washwater Treated: No 24 Hour Average Water Flow Returned (MGD): 1.1
Rapid Mix	Type of Mixer: Mechanical Baffling Type: Average Liquid Volume (gal): 1,683 Short Circuiting Factor: NA_V Mean Velocity Gradient (sec^{-1}): 800 Coagulant Addition: Lime (CaOH) Coagulant Dose (mg/L): 65 Other Chemical Addition: Sodium aluminate ($Na_2Al_2O_4$) Other Chemical Dose (mg/L): 7.7
Flocculation	Type of Mixer: Mechanical Liquid Volume (gal): 769,842 Short Circuiting Factor: NA_v Baffling Type: Average Stage Sequence Number: 1 Stage Mean Velocity Gradient (sec^{-1}): 200 Stage Liquid Volume (gal): 192,460 Stage Sequence Number: 2 Stage Mean Velocity Gradient (sec^{-1}): 200 Stage Liquid Volume (gal): 192,460 Stage Sequence Number: 3 Stage Mean Velocity Gradient (sec^{-1}): 100 Stage Liquid Volume (gal): 192,460 Stage Sequence Number: 4 Stage Mean Velocity Gradient (sec^{-1}): 100 Stage Liquid Volume (gal): 192,460
Sedimentation	Surface Area (ft^2): 54,150 Liquid Volume (gal): 5,262,000 Baffling Type: Average Short Circuiting Factor: NA_V
Disinfection	Chemical Type: Chlorine gas Measured as: Cl_2 Dose Rate (mg/L): 4.0
Filtration	Surface Area (ft^2): 22,400 Liquid Volume (gal): 753,984 Total Media Depth (in): 33 Media Type: Sand Minimum Water Depth to Top of Media (ft): 3.0 Depth from Top of Media to Top of Backwash Trough (ft): 3.0
Clearwell	Surface Area (ft^2): 58,000 Liquid Volume (gal): 4,400,000 Minimum Liquid Volume (gal): 3,900,000 Baffling Type: Superior - Serpentine Short Circuiting Factor: NA_V Covered Contactor: Yes
Disinfection	Chemical Type: Ammonia Measured as: NH_3 Dose Rate (mg/L): 0.50

Na_V: not available

Table 1 Summary of treatment plant design data

Water quality parameter	Mean	Standard deviation	Minimum	Maximum	Count
Temperature (°C)	15	7	5	24	16
pH	7.56	0.20	7.22	7.88	16
Alkalinity (mg/L as $CaCO_3$)	74	6	65	86	16
Total hardness (mg/L as $CaCO_3$)	132	6	118	141	16
Calcium hardness (mg/L as $CaCO_3$)	91	4	83	97	16
TOC (mg/L)	5.2	03	4.8	5.7	15
UV_{254} (1/cm)	0.128	0.009	0.114	0.146	15
Bromide (µg/L)	35	7	22	42	14
TSUVA (L/mg-m)	2.4	0.2	2.2	2.8	15

Table 2 Summary of source water quality at the Meander Creek Reservoir Treatment Works between July 1997 and December 1998

Water quality parameter	Mean	Standard deviation	Minimum	Maximum	Count
Temperature (°C)	15	8	4	25	16
pH	10.5	0.1	10.3	10.6	16
Turbidity (ntu)	0.10	0.02	0.08	0.14	16
TOC (mg/L)	3.2	0.2	2.8	3.6	15
UV_{254} (1/cm)	0.062	0.004	0.058	0.071	15
TSUVA (L/mg-m)	2.0	0.2	1.6	2.4	15
THM4 (µg/L)	84	50	32	147	5
HAA5 (µg/L)	36	12	23	51	5
HAA6 (µg/L)	38	12	25	53	5

Note: DBP concentrations reported are averages of finished water sampling, not distribution system.

Table 3 Summary of finished water quality at the Meander Creek Reservoir Works between July 1997 and December 1998

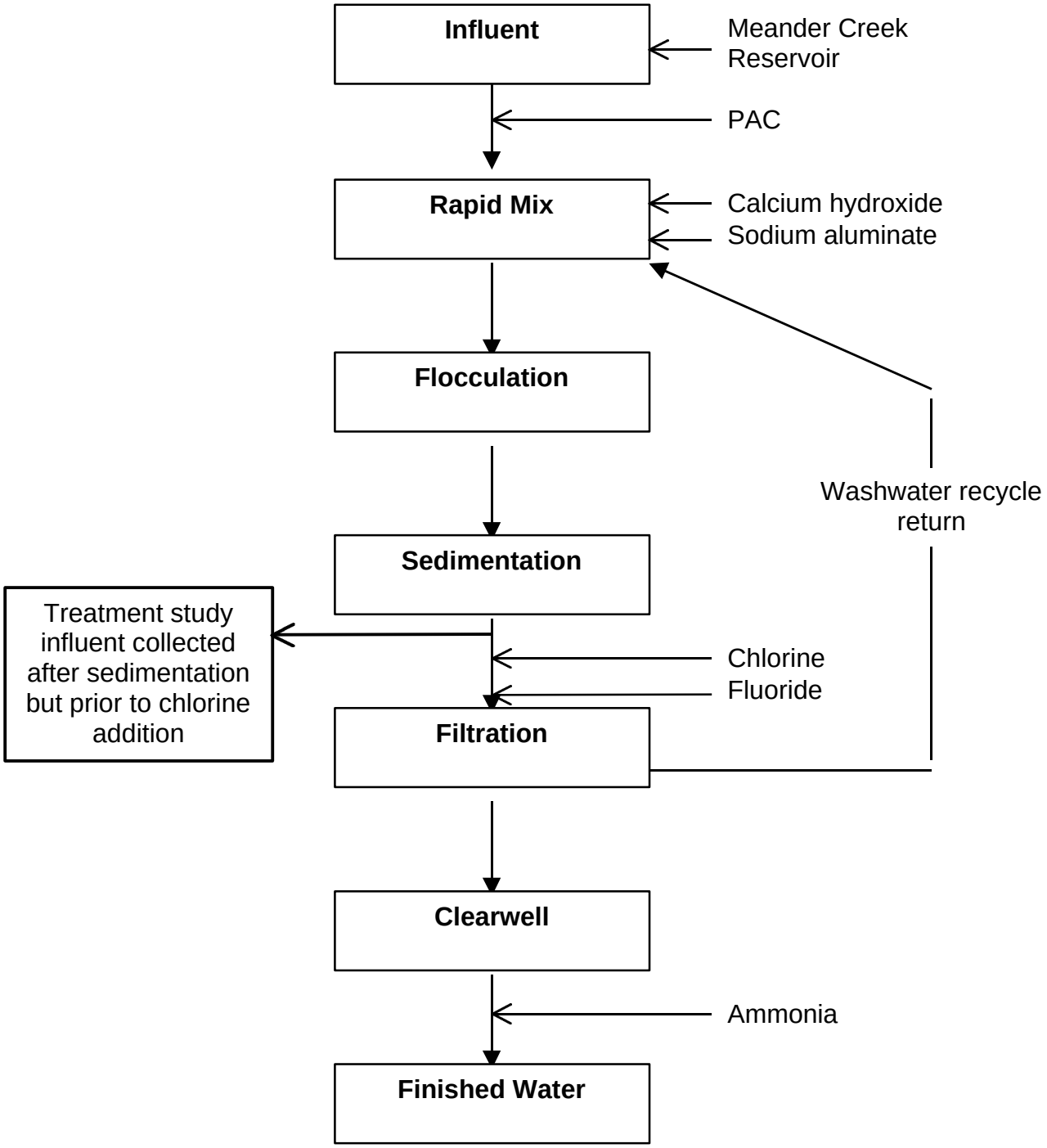


Figure 1 Meander Reservoir Treatment Works plant schematic

6 *Materials and Methods*

6 Materials and Methods

6.1 Treatment Study Influent Sampling Procedures

The treatment study influent water was sampled from the Meander Reservoir Treatment Works after full-scale sedimentation. Four quarterly samples were taken throughout the year to capture seasonal variability. The sample dates are summarized in Table 4. The four samples represent winter, spring, summer, and fall seasons.

The water was sampled 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 measurable (as TOC) leaching of organic compounds from the inside surface of the drums was occurring.

During each quarterly sampling event, at the time the treatment study influent water was sampled, an aliquot of the water was taken and analyzed to determine the representativeness of the sample. Water quality parameters analyzed included TOC, turbidity, pH, alkalinity, calcium hardness, and total hardness. These analyses were conducted off-site at S&H's laboratory facilities in Cincinnati, Ohio, and the treatment study influent water sample was not shipped until the representativeness of the sample was verified by comparison with historic data. Verification for each session was complete within 24 hours, and the data obtained are summarized in Table 5.

For all quarterly sessions the treatment study influent water was shipped the day after sampling. The travel time to S&H's laboratory facilities was one day for all quarterly sessions. The water was shipped at ambient temperature.

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 6.

An average 5.7 percent decrease in the settled water TOC concentration was observed after shipping, for all four quarters. It is possible that some biodegradation occurred during shipment. A lot of settled floc was observed in the drums on their arrival at S&H's laboratory facilities. It is possible that a part or all of the drop in TOC concentration observed was due to further settling of the floc after the drums were sampled. Attempts were made to shake the drums, to mix the settled floc, before sampling for TOC at S&H.

At the Meander Reservoir Treatment Works, chlorine is added at the filter influent, and the filter washwater is returned to the head of the plant. Since there existed the potential for the introduction of formed DBPs from the washwater return to the head of the plant, an aliquot of the treatment study influent water was sampled for THM4, HAA6, and TOX. The results of this sampling are summarized in Table 7.

Detectable levels of instantaneous THMs and HAAs occurred during the first three quarterly sessions. For THMs, chloroform was the only species present, and dichloroacetic acid (DCAA) was solely responsible for the measurable quantities of HAA6 present. Chloroform is strongly adsorbing, and may not have shown significant levels of breakthrough in the GAC effluent, as a formed compound. However, DCAA is not as strongly adsorbing, and may have shown some breakthrough. The RSSCT effluent was not sampled for instantaneous DBP breakthrough.

6.2 Pretreatment Processes to the Advanced Treatment Processes

The full-scale and bench-scale pretreatment processes in place prior to bench-scale GAC are described in Figure 2. The water was sampled after full-scale lime-softening and sedimentation. Bench-scale filtration through a 1.0-µm glass fiber cartridge filter simulated full-scale rapid sand filtration. The TOC data for the filtered water, Table 6, shows that there was some TOC removal due to filtration by a 1.0-µm glass fiber cartridge filter. The average percent decrease in TOC concentration after filtration was 6.1 percent. The plant finished water pH is typically 10.7. Since maintaining this relatively high pH through GAC would be unfavorable for GAC adsorption, the pH was reduced to 9.0 by the addition of sulfuric acid. During the operation of the RSSCT, the pH was maintained at 9.0 ± 0.1 by the addition of dilute solutions of sulfuric acid and sodium hydroxide.

Due to excessive headloss during the first quarterly RSSCT session (described in Section 7.2), a sand column was placed in line prior to the RSSCT during the second session (April). The design for the sand filter is summarized in Section 6.2.1. The sand used for the sand filter had not been previously biologically acclimated. TOC samples were taken before and after the sand filter during the run to check for significant changes in concentration, as summarized in Table 8 and Figure 3. The data show that there was not a measurable change in TOC concentration after sand filtration. The in-line sand column filtration was not utilized during the third or fourth sessions, because use of the sand filter did not significantly decrease excessive headloss problems.

6.2.1 Design data for each pretreatment process

Table 9 summarizes the design data for each pretreatment process prior to GAC adsorption. Bench-scale cartridge filtration and pH adjustment were employed during four quarterly sessions. In an attempt to mitigate excessive headloss buildup, during the second quarter only, a bench-scale sand filter was placed in line prior to each RSSCT.

6.3 Advanced Treatment Process Information

6.3.1 Schematics and descriptions of the process equipment used

Figures 4 through 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. During the first quarterly session only (January), variable area flow meters were used to help in monitoring the system flow rates. The wetted components were glass and stainless steel. The flow meters were not used in subsequent quarterly sessions.

During the remaining three sessions, the effluent flow rate was monitored constantly. The calibration of the effluent flow rate control system was checked by a manual measurement at least three times daily and adjusted as necessary to maintain it within 3 percent of the design flow rate.

During the April session, the 10 and 20 minute EBCT contactors were each preceded by a bench-scale sand filter, as shown in Figure 4. The system configuration for the 10 minute EBCT contactors during the January, July, and October sessions, and for the 20 minute EBCT contactor during the January session is shown in Figure 5. For these RSSCTs, the entire GAC bed was packed in a single column. During the July and October runs, the GAC in the 20 minute EBCT contactor was packed into two columns in series, as shown in Figure 6. This allowed for mixing of the top portion of the GAC bed, if necessary, without disturbing the remainder of the bed. 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 8 mm inner diameter columns required a stainless steel support system as shown in Figure 7 (a). When 9 and 10 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 quarter are summarized in Table 10. Each quarter, two RSSCTs were operated to simulate full-scale equivalent EBCTs of 10 and 20 minutes. Other than the EBCT, the design for the two RSSCTs operated during each quarterly session was identical. Over the course of the entire study, columns with inner diameters ranging from 8.0 to 10.0 mm were used, and Reynolds numbers in the RSSCTs used ranged from 0.33 to 0.50.

6.3.3 Procedures specific to the treatment study

6.3.3.1 GAC Preparation Procedures

A representative batch of GAC 1240 B4, a bituminous-coal based GAC, was obtained from the manufacturer, Norit Americas, Inc. The GAC is a 12x40 mesh size (d_p = 1.06 mm). Using a riffle splitter, a small (10 to 30 g) representative sample of the GAC was obtained. Using a

porcelain mortar and pestle, the GAC was ground to a 100x200 mesh size (d_p = 0.113 mm). Care was taken to frequently sieve the ground GAC, and the GAC was ground until the entire sample passed through the 100 mesh size sieve. Usually, a recovery of 25 to 30 percent was obtained, as defined by the amount of GAC retained between the 100 and 200 mesh size sieves 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 about 1 hour to displace the air within the pores.

6.3.3.2 RSSCT Column Setup

The GAC support for 9.0 and 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 usually 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

On arrival to S&H's laboratory facilities, the influent water was filtered through a 1.0-µm nominal pore size glass fiber cartridge filter. The cartridge filter was pre-rinsed with deionized water. The pH of the influent water sample was reduced to 9.0 by addition of sulfuric acid prior to use as influent to GAC. Dilute solutions of sulfuric acid and sodium hydroxide were used to maintain the influent pH at 9.0 ± 0.1 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 three times 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.

6.3.3.5 Headloss Buildup

To different extents, headloss buildup occurred during all four quarterly RSSCT runs. When a pressure greater than 60 psi was needed to maintain a constant flow rate through the RSSCT, one of three types of corrective actions (usually Type 1) were used to mitigate the headloss problem, as described below.

Type 1

The column is taken off line, and the top opened so that the GAC inside is accessible. A clean small rod (18 gauge galvanized steel wire) is inserted into the column. The top layer (0.2 - 1.0 cm) of GAC is carefully mixed to break apart the particles that are bound together. Once the top layer is sufficiently loosened, the column is placed on line, and the head pressure necessary to maintain the design flow rate is usually 20 to 40 percent of the pressure before mixing the top layer.

Type 2

Once the top layer is loosened as described in Type 1, the rod is pushed downward to a level 3 to 5 cm below the top of the GAC bed. By moving the rod in a circular motion, the bed is stirred.

Type 3

When headloss increased very rapidly after Type 2 mitigation, the entire column is backwashed. This procedure is performed only if absolutely necessary. The GAC in the column is removed into a clean beaker and stirred to break apart any clumps. The column is then repacked as a slurry using GAC effluent water (sampled just prior to the start of backwashing) to help rinse all the GAC from the beaker into the column.

Type 1 was the most commonly used method to mitigate headloss buildup in the RSSCT columns. All backwashing episodes are summarized in Section 7.2

6.4 Experimental Design

The treatment study was designed to evaluate GAC at two EBCTs and to evaluate the effects of seasonal variability by conducting four quarterly pairs of RSSCTs. The experimental design is summarized in Table 11.

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_{254}, 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, $UV_{254,}$ 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 an equivalent of one year full-scale operation

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. Typically 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.

Although the twelfth sample taken during the April session yielded a 69 percent TOC breakthrough, this value was based on all influent TOC samples taken. At the time of column run termination the calculated percent TOC breakthrough, based on the running average of the influent TOC concentration, was 70 percent. The thirteenth sample yielded 78 percent TOC breakthrough.

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 all quarterly sessions, a 24-hour holding time was used. The samples were buffered at pH 9.0 using a borate buffer, and the target free chlorine residual was 0.75 mg/L as Cl_2. The incubation temperature varied seasonally. For GAC influent water, during all four sessions, the average 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 column, and in Table 16 for the effluent samples taken from the 20 minute EBCT column.

6.7 Analytical Methods

A list of all analytical methods used during the study is shown in Table 17. The MRL reported for TOX was 50 or 25 µg/L as Cl^- during the first quarterly session (January), and 25 µg/L as Cl^- during the remaining three quarterly session. The MRLs reported for HAA species varied throughout the treatment study; Table 17 summarizes the MRLs used during each session. 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.

Influent sample		Post-sand filter sample		
Run time (d)	TOC concentration (mg/L)	Run time (d)	TOC concentration (mg/L)	
			10 minute EBCT	20 minute EBCT
11	3.14	12	3.06	3.13
67	3.21	41	2.97	3.04
151	3.37	84	3.26	3.33
		115	--	3.12
Avg:	3.24		3.10	3.16
SD:	0.12		0.l5	0.12

Table 8 Summary of TOC data before and after sand filtration during the second session

Unit Process	Process Description
Washwater Return (Full-Scale)	Washwater Treated: No 24 Hour Average Water Flow Returned (MGD): 1.1
Rapid Mix (Full-Scale)	Type of Mixer: Mechanical Baffling Type: Average Liquid Volume (gal): 1,683 Short Circuiting Factor: NA_V Mean Velocity Gradient (sec^{-1}): 800 Coagulant Addition: Lime (CaOH) Coagulant Dose (mg/L): 65 Other Chemical Addition: Sodium aluminate ($Na_2Al_2O_4$) Other Chemical Dose (mg/L): 7.7
Flocculation (Full-Scale)	Type of Mixer: Mechanical Liquid Volume (gal): 769,842 Short Circuiting Factor: NA_V Baffling Type: Average Stage Sequence Number: 1 Stage Mean Velocity Gradient (sec^{-1}): 200 Stage Liquid Volume (gal): 192,460 Stage Sequence Number: 2 Stage Mean Velocity Gradient (sec^{-1}): 200 Stage Liquid Volume (gal): 192,460 Stage Sequence Number: 3 Stage Mean Velocity Gradient (sec^{-1}): 100 Stage Liquid Volume (gal): 192,460 Stage Sequence Number: 4 Stage Mean Velocity Gradient (sec^{-1}): 100 Stage Liquid Volume (gal): 192,460
Sedimentation (Full-Scale)	Surface Area (ft^2): 54,150 Liquid Volume (gal): 5,262,000 Baffling Type: Average Short Circuiting Factor: NA_V
Cartridge Filtration (Bench-Scale)	Surface Area (ft^2): 5.0 Nominal Pore Size (µm): 1.0 Filter Material: Glass fiber Filter Life (gallons of processed water): 100 - 150
pH Adjustment (Bench-Scale)	Chemical Type: Sulfuric acid Adjusted pH: 9.0 Dose Rate: NA_V
Sand filtration (Bench-Scale, Quarter 2, April, only)	EBCT (min): 1.5 Column inner diameter (mm): 11 Volumetric flow rate (mL/min): 7.6 Superficial velocity (gpm/ft^2): 2.0

NA_V: Not available

Table 9 Summary of design data for each pretreatment process prior to GAC

Design parameter	Design value during session			
	1 January	2 April	3 June	4 October
GAC manufacturer	Norit Americas, Inc.	Norit Americas, Inc.	Norit Americas, Inc.	Norit Americas, Inc.
GAC brand name	GAC 1240 B4	GAC 1240 B4	GAC 1240 B4	GAC 1240 B4
GAC type	Bituminous	Bituminous	Bituminous	Bituminous
GAC mesh size	12x40	12x40	12x40	12x40
Average particle diameter, d_{LC} (mm)	1.063	1.063	1.063	1.063
General design parameters				
Minimum Reynold's number, $Re_{SC,\,min}$ (-)	0.33	0.38	0.41	0.50
Full-scale operating temperature (°C)	5	10	20	15
Kinematic viscosity, ν_{LC} (m^2/s)	1.52E-06	1.31E-06	1.00E-06	1.14E-06
Bed porosity, ε_{LC} (-)	0.45	0.45	0.45	0.45
Measured dry bed density, ρ_{SC} (g/cm^3)	0.500	0.496	0.498	0.498
RSSCT design parameters				
RSSCT mesh size	100x200	100x200	100x200	100x200
Particle diameter, d_{SC} (mm)	0.113	0.113	0.113	0.113
Scaling factor, SF	9.44	9.44	9.44	9.44
Hydraulic loading rate, v_{SC} (m/hr)	7.20	7.20	5.85	8.21
Column diameter, D_{SC} (mm)	10.0	9.0	8.0	9.0
Flow rate, Q_{SC} (mL/min)	9.4	7.6	4.9	8.7
Estimated run length				
RSSCT Influent TOC concentration (mg/L)	3.9	3.2	3.4	3.4
Bed volumes to 50% TOC breakthrough, BV_{50}	3,699	4,784	4,421	4,421
Estimated total run time, BV_T	11,097	14,351	13,264	13,264
RSSCT 1				
Full-scale empty-bed contact time, $EBCT_{LC}$ (min)	10	10	10	10
Estimated full-scale run time, t_{LC}^T (days)	77	100	92	92
Estimated RSSCT run time, t_{SC}^T (days)	8.2	10.6	9.8	9.8
Volume water required, V_{SC} (L)	111	116	69	122
Mass GAC required, m_{SC} (g)	4.99	4.01	2.59	4.59
RSSCT empty-bed contact time, $EBCT_{SC}$ (min)	1.06	1.06	1.06	1.06
Bed length, l_{SC} (cm)	12.7	12.7	10.3	14.5
RSSCT 2				
Full-scale empty-bed contact time, $EBCT_{LC}$ (min)	20	20	20	20
Estimated full-scale run time, t_{LC}^T (days)	154	199	184	184
Estimated RSSCT run time, t_{SC}^T (days)	16.3	21.1	19.5	19.5
Volume water required, V_{SC} (L)	221	232	138	244
Mass GAC required, m_{SC} (g)	9.98	8.02	5.17	9.18
RSSCT empty-bed contact time, $EBCT_{SC}$ (min)	2.12	2.12	2.12	2.12
Bed length, l_{SC} (cm)	25.4	25.4	20.7	29.0

Table 10 Summary of RSSCT design parameters

Season	Month sampled	Pretreatment	EBCT (min)
Winter	January	Lime softening / pH adjustment	10, 20
Spring	April	Lime softening / pH adjustment	10, 20
Summer	July	Lime softening / pH adjustment	10, 20
Autumn	October	Lime softening / pH adjustment	10, 20

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
January	1	54	79	1	138	74
April	1	66	69†	1	151	70
July	1	76	74	1	160	70
October	1	56	73	1	152	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
†This value based on all influent TOC samples taken. At time of column run termination the calculated percent TOC breakthrough, based on the running average of the influent TOC concentration, was 70 percent.

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

Parameter	Session 1 January		Session 2 April		Session 3 June		Session 4 October	
	Value	Tolerance	Value	Tolerance	Value	Tolerance	Value	Tolerance
Incubation time (hours)	24.0	1.0	24.0	1.0	24.0	1.0	24.0	1.0
Incubation temperature (°C)	5.0	2.0	10.0	2.0	20.0	2.0	15.0	2.0
pH	9.00	0.20	9.00	0.20	9.00	0.20	9.00	0.20
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 January		Session 2 April		Session 3 June		Session 4 October	
	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation
Incubation time (hours)	24.1	0.2	24.4	0.6	24.0	0.1	24.2	0.1
Incubation temperature (°C)	4.8	0.5	9.9	0.1	20.1	0.4	14.9	0.2
pH	9.06	0.09	8.96	0.04	9.01	0.04	9.06	0.02
Free chlorine residual (mg/L)	0.77	0.03	0.75	0.04	0.81	0.04	0.66	0.02

*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 January		Session 2 April		Session 3 June		Session 4 October	
	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation
Incubation time (hours)	24.2	0.2	24.1	0.2	24.0	0.1	24.2	0.1
Incubation temperature (°C)	4.9	0.3	10.0	0.1	20.3	0.3	14.9	0.2
pH	9.08	0.06	8.98	0.03	9.00	0.02	9.04	0.02
Free chlorine residual (mg/L)	0.76	0.08	0.80	0.09	0.70	0.05	0.69	0.07

*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 contactor

Parameter	Session 1 January		Session 2 April		Session 3 June		Session 4 October	
	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation
Incubation time (hours)	24.2	0.2	24.1	0.3	24.0	0.1	24.2	0.2
Incubation temperature (°C)	4.8	0.2	10.0	0.2	20.0	0.3	15.0	0.1
pH	9.01	0.08	8.97	0.04	8.99	0.03	9.04	0.03
Free chlorine residual (mg/L)	0.76	0.09	0.81	0.07	0.78	0.04	0.70	0.09

*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 contactor.

Analyte	Quarter	Method	Minimum reporting level (MRL)
Alkalinity	All	SM 2320 B	5 mg/L as $CaCO_3$
Ammonia-Nitrogen	All	EPA 350.1	0.05 mg/L as NH_3-N
Bromide	All	EPA 300.0 A	0.02 mg/L
Calcium hardness	All	SM 3500-Ca D	10 mg/L as $CaCO_3$
Chlorine dose (solution standardization)	All	SM 4500-Cl B	Not applicable
Chlorine residual	All	SM 4500-Cl F	0.2 mg/L as Cl_2
BCAA, DBAA, DCAA, MBAA, TCAA, BDCAA, CDBAA, TBAA	1	SM 6251 B	1.0 µg/L (each analyte)
MCAA	1	SM 6251 B	2.0 µg/L
BCAA, DBAA, DCAA, MBAA, TCAA, BDCAA, CDBAA	2	SM 6251 B	1.0 µg/L (each analyte)
MCAA	2	SM 6251 B	2.0 µg/L
TBAA	2	SM 6251 B	1.0 or 2.0 µg/L
BCAA, DBAA, DCAA, MBAA, TCAA, DCBAA	3-4	SM 6251 B	1.0 µg/L (each analyte)
MCAA, CDBAA	3-4	SM 6251 B	2.0 µg/L (each analyte)
TBAA	3-4	SM 6251 B	4.0 µg/L
pH	All	4500-H^+ B	Not applicable
Temperature	All	SM 2550 B	Not applicable
Total hardness	All	SM 2340 C	5 mg/L as $CaCO_3$
Total organic carbon (TOC)	All	SM 5310 C	0.50 mg/L
Total organic halide (TOX)	1	SM 5320 B	25 or 50 µg/L as Cl^-
Total organic halide (TOX)	2-4	SM 5320 B	25 µg/L as Cl^-
THM4 ($CHCl_3$, BDCM, DBCM, $CHBr_3$)	1-2	EPA 551	0.5 or 1.0 µg/L (each analyte)
THM4 ($CHCl_3$, BDCM, DBCM, $CHBr_3$)	3-4	EPA 551.1	1.0 µg/L (each analyte)
Turbidity	All	SM 2130 B	0.05 ntu
UV absorbance at 254 nm (UV_{254})	All	SM 5910 B	0.009 cm^{-1}

SM: *Standard Methods*

Table 17 Summary of analytical methods and MRLs

Analyses performed	Quarterly sessions of service	Laboratory
Alkalinity, calcium hardness, chlorine dose, chlorine residual, pH, temperature, total hardness, TOC, turbidity, UV_{254}	All	Summers & Hooper, Inc.
TOX	2 - 4	Summers & Hooper, Inc.
THM4 (EPA 551.1)	3 - 4	Summers & Hooper, Inc.
Ammonia, bromide, HAA9	All	Montgomery Watson Laboratories
TOX	1	Montgomery Watson Laboratories
THM4 (EPA 551)	1 -2	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

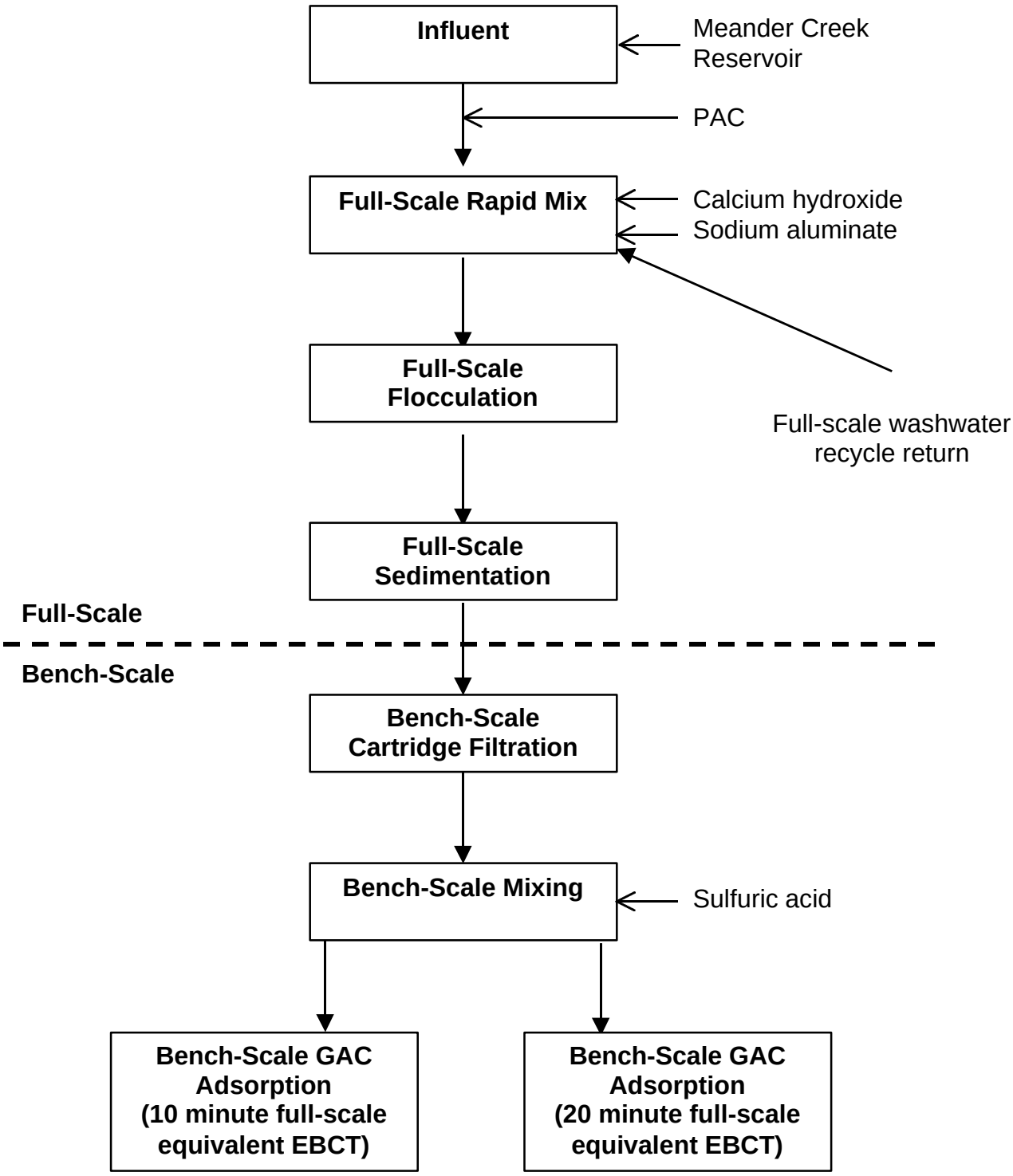


Figure 2 Schematic of pretreatment processes prior to GAC

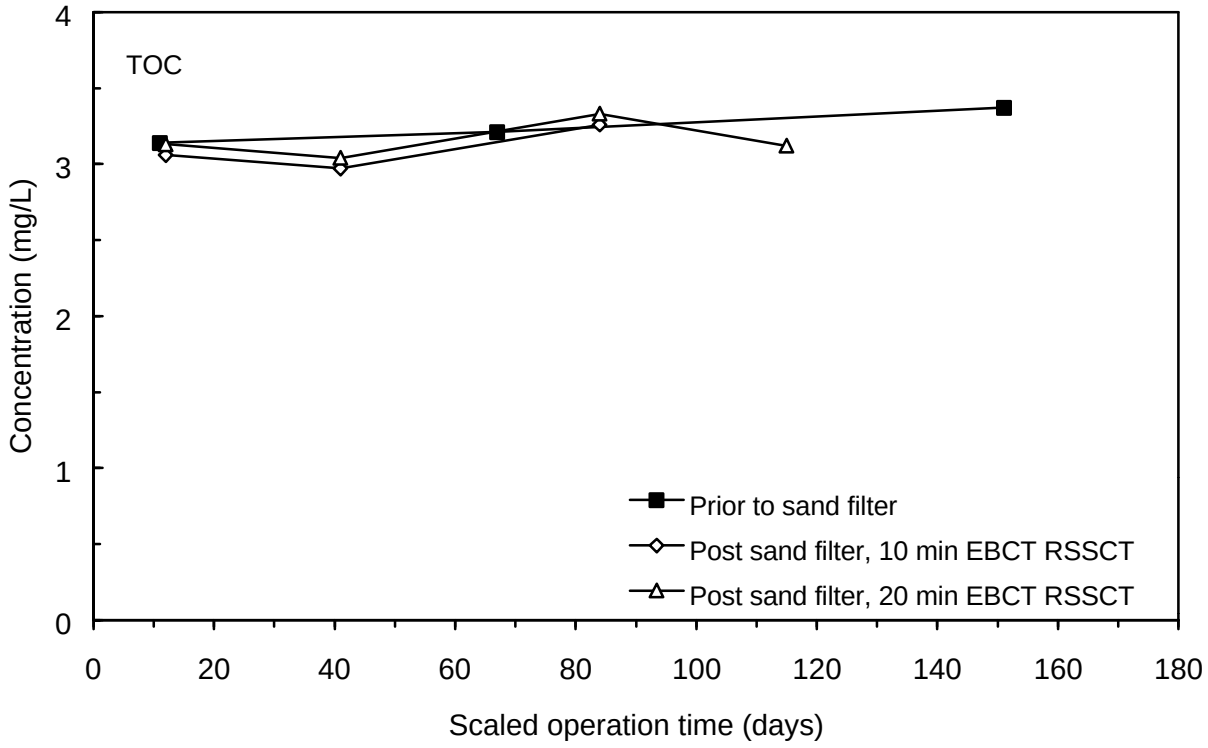


Figure 3 Effect of in-line sand filtration on TOC concentration during the second session

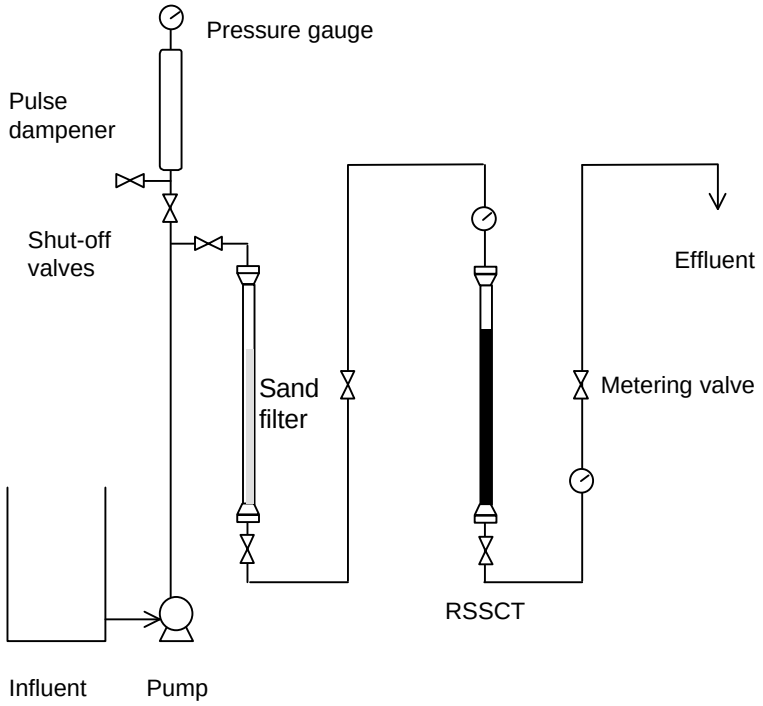


Figure 4 RSSCT system schematic for 10 and 20 minute EBCT full-scale equivalent contactors (April session)

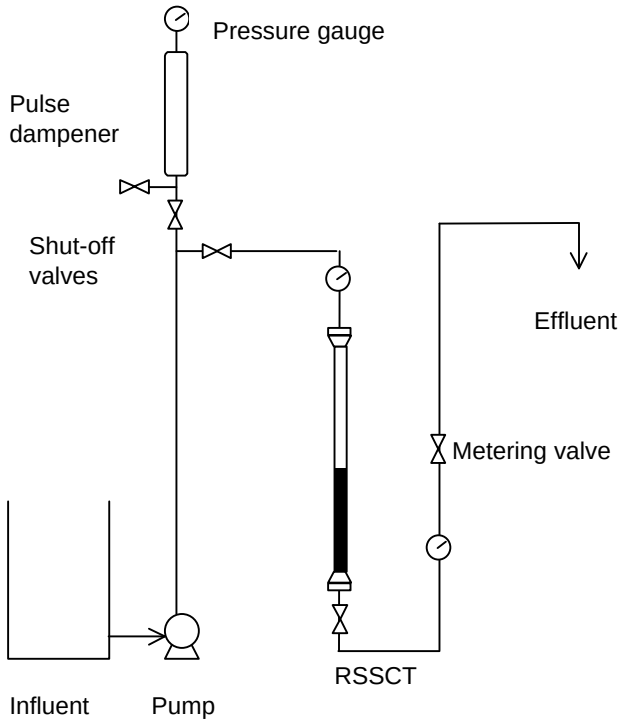


Figure 5 RSSCT system schematic for 10 minute EBCT full-scale equivalent contactor (January, July, October sessions) and for 20 minute EBCT full-scale equivalent contactor (January session)

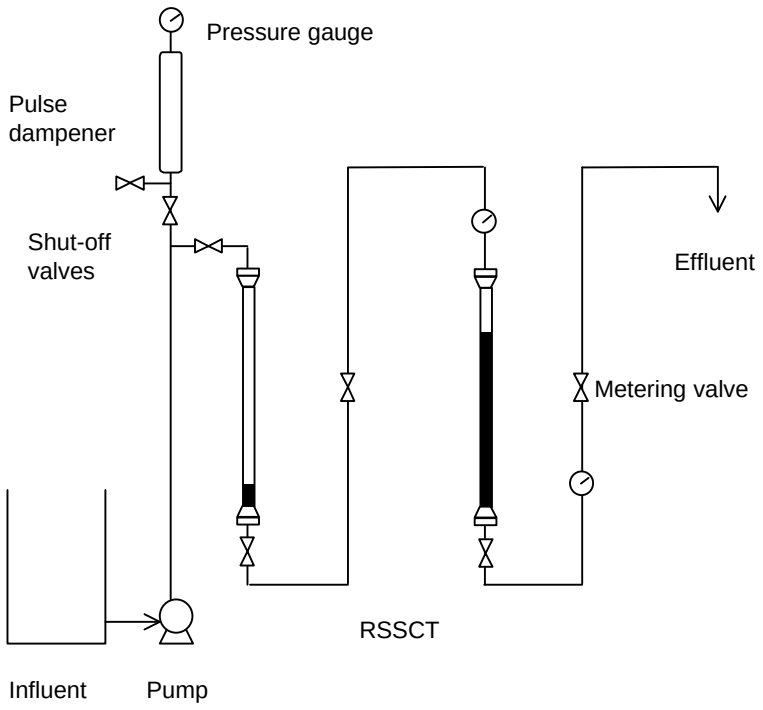
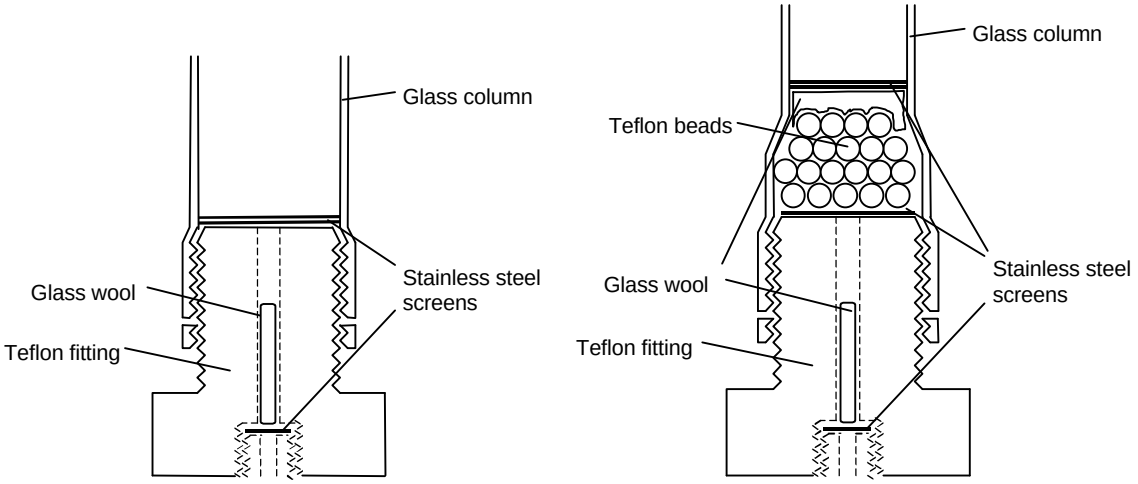


Figure 6 RSSCT system schematic for 20 minute EBCT full-scale equivalent contactor (July and October sessions)



(a) Standard 8 mm inner diameter column (b) 9 and 10 mm inner diameter column

Figure 7 RSSCT column GAC support system

7 *Results and Discussion Overview*

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. 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_{254} 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

Excessive headloss buildup caused operational difficulties during the first and third quarters of seasonal RSSCTs (January and June water samples). The 20 minute full-scale equivalent EBCT RSSCT was most affected, because it required longer run times to complete. Table 20 summarizes all the backwash episodes performed to mitigate headloss buildup.

The summer sample for RSSCTs was taken on July 14, 1997. On July 18, both 10 and 20 minute EBCT columns were started. The influent TOC concentration on July 19 was 3.41 mg/L. The influent water was not sampled for TOC again until July 23, when it measured 4.05 mg/L, a 19 percent increase. On July 24, the influent TOC concentration was 4.45 mg/L, 30 percent increase. Due to the changes in influent TOC concentration, the run was stopped while the source of contamination was isolated.

The drum containing the influent water was stored in a walk-in cold room at 4°C for the duration of the study. However, the drum was not sealed, to allow for the direct pumping of the influent water to the system influent water container. While the TOC concentration in the open drum increased over 4 days, the TOC concentration in a second drum which had remained sealed had not changed significantly (3.42 mg/L).

The source of contamination was thought to be an algaecide agent that was diluted in a circulating water bath maintained in the walk-in cold room. The water temperature in the bath was 20°C, which may have led to the evaporation of some of the semi-volatile organic compounds used in the algaecide. Use of the algaecide in the circulating water bath was terminated. Furthermore, a small hole was drilled in the drum lid so that influent water could be pumped from the influent water drums while the lids remained sealed. After these corrective measures, no further contamination of the influent water drums was observed.

All data generated during the RSSCT run for both EBCTs was rejected, and the run was restarted using water from the sealed drum on July 30, 1997.

During the October session, multiple QC failures affected primarily the analysis of tribromoacetic acid (TBAA), one of the three additional HAAs included in HAA9. The QC failures affected all HAA samples analyzed during the October session. Due to the lack of TBAA, HAA9 data for the October session is not reportable.

7.3 Water Quality Data

The average pretreated influent to GAC water quality for each quarterly sample is summarized in Table 21. Other than ammonia, little variability was observed in the inorganic water quality parameters. Some variability was observed in TOC concentration and UV_{254}, but the specific UV absorbance, TSUVA, remained fairly constant throughout the four quarters.

SDS-DBP formation increased with increasing SDS chlorination incubation temperature. The SDS chlorination incubation temperature ranged from 5 to 20°C during the treatment study, and SDS-DBPs chlorinated at the highest temperature (June) exhibited the highest concentrations. SDS-THM4 levels increased by nearly a factor of two, between January and June. However, SDS-HAA9 levels only increased by 17 percent and SDS-TOX levels increased by 28 percent. These results were not altogether unexpected, as THM formation is more sensitive to temperature than HAA or TOX formation (Summers et al., 1996).

Session	10 minute EBCT		20 minute EBCT	
	Full-scale equivalent run time (d)	Backwash type	Full-scale equivalent run time (d)	Backwash type
1	47	1	45	1
			123	1
			130	1
			134	2
			138	1
			142	1
			144	3
			147	1
			149	1
			151	2
			153	2
2	NB	NB	78	1
3	NB	NB	126	1
			142	1
			148	1
			154	2
4	NB	NB	NB	NB

NB: not backwashed during entire run

Table 20 Summary of RSSCT backwashing episodes

Water Quality Parameter	Session 1 January		Session 2 April		Session 3 June		Session 4 October	
	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation
Temperature (°C)	21.7	1.1	17.9	0.9	18.5	0.9	16.6	2.4
pH	8.91	0.10	8.93	0.05	9.03	0.04	9.01	0.06
Turbidity (ntu)	0.10	0.00	0.13	0.03	0.10	0.05	0.10	0.00
Alkalinity (mg/L as $CaCO_3$)	19	6	22	4	21	3	25	3
Calcium hardness (mg/L as $CaCO_3$)	72	0	78	0	73	0	76	1
Total hardness (mg/L as $CaCO_3$)	98	6	94	1	91	1	97	2
Ammonia (mg/L)	0.025	0.035	0.040	0.057	0.065	0.007	0.200	0.000
Bromide (mg/L)	0.036	0.003	0.040	0.001	0.040	0.001	0.042	0.002
TOC (mg/L)	3.88	0.03	3.24	0.12	3.45	0.06	3.37	0.13
UV_{254} (1/cm)	0.079	0.001	0.066	0.001	0.066	0.001	0.063	0.000
Specific UV absorbance, TSUVA (L/mg-m)	2.0	--	2.0	--	1.9	--	1.9	--
SDS-THM4 (µg/L)	66	1	60	0	120	8	98	4
SDS-HAA5 (µg/L)	34	1	33	3	36	2	30	2
SDS-HAA6 (µg/L)	38	1	38	3	42	2	35	3
SDS-HAA9 (µg/L)	39	NA	38	NA	45	2	NR	NA
SDS-TOX (µg Cl^-/L)	212	25	225	4	271	11	232	4
SDS-chlorine demand (mg/L)	2.1	0.1	1.7	0.0	2.9	0.1	3.8	0.1

NA: not applicable
NR: not reported

Table 21 Summary of GAC influent water quality

8 *Impact of Seasonal Variability*

8 Impact of Seasonal Variability

During each of four quarterly sessions, both 10 and 20 minute full-scale equivalent EBCTs were evaluated using RSSCTs. Table 4 lists the sampling date for each quarterly session. Figure 8 shows the RSSCT effluent TOC breakthrough profiles for the 10 minute EBCT contactors during each quarter. The average influent TOC concentration during each quarterly session ranged from 3.2 to 3.9 mg/L. A range of effluent TOC concentration breakthrough behavior was observed, with run times to an effluent concentration of 2.0 mg/L ranging from 26 to 56 days. Run times to 70 percent TOC breakthrough ranged from 52 to 69 days.

Effluent UV_{254} breakthrough profiles are shown in Figure 9. The GAC effluent breakthrough profiles for SDS-DBPs are plotted in Figures 10 through 14. The June and October water samples yielded higher levels of GAC effluent THM4 formation than the January and April samples. This shift may be due to the higher SDS incubation temperatures used during June and October. The influent THM4 formation during June and October was 90 and 57 percent higher, respectively, than during January and June. SDS-HAA breakthrough (as measured by HAA5, HAA6, or HAA9) showed little variability with seasons. The influent SDS-HAA5, for example, varied by at most 20 percent between seasons. Some of the HAA species that make up the remaining three measured as HAA9 are not reported due to QC failures (See Appendix). In these cases, data for SDS-HAA9 is not shown in Figure 13. The SDS-TOX breakthrough showed only a small seasonal influence. The GAC effluent SDS chlorine demand (CLD), Figure 15, displayed a high immediate breakthrough which varied by season. This was likely caused by the variation in ammonia concentration and its nonadsorbability.

The RSSCT effluent TOC breakthrough profiles for the 20 minute EBCT contactors are shown in Figure 16. As was seen with the 10 minute EBCT contactors, a range in effluent TOC concentration breakthrough behavior was observed, and run times to an effluent concentration of 2.0 mg/L ranged from 80 to 126 days. Run times to 70 percent TOC breakthrough ranged from 139 to 153 days. Effluent UV_{254} breakthrough profiles are shown in Figure 17. The GAC effluent breakthrough profiles for SDS-DBP formation are plotted in Figures 18 through 22. The breakthrough trends for THMs, HAAs, and TOX described above were also evident in the 20 minute EBCT contactor breakthrough profiles. Again, some of the HAA species that make up the remaining three measured as HAA9 are not reported due to QC failures (See Appendix). In these cases, data for SDS-HAA9 is not shown in Figure 21. Figure 23 shows the measured GAC effluent SDS chlorine demand, which also had breakthrough trends similar to that of the 10 minute EBCT contactor.

In summary, a limited amount of seasonal variability in influent TOC concentration was observed: the influent TOC concentration ranged from 3.2 to 3.9 mg/L (mean = 3.5 ± 0.3 mg/L). Seasonal variability in temperature seemed to have the greatest impact of GAC performance, due to the impact of SDS temperature on DBP formation. As can be observed in Figures 10 and 18, SDS-THM4 effluent breakthrough curves showed higher rates of increasing concentration during the June and October samples (SDS chlorination temperatures of 20 and 15°C, respectively) than during the January and April samples (SDS chlorination temperatures of 5 and 10°C, respectively). The influent SDS-THM4 levels measured in June were almost double that observed in January or April, while the influent TOC concentration did not change substantially.

Conversely, HAA formation, as measured by HAA5, HAA6, or HAA9, remained relatively low throughout all four quarters, and showed little sensitivity to SDS chlorination temperature between 5 and 20°C. TOX formation showed a slight temperature-dependent behavior. The CLD breakthrough behavior was dominated by the influent ammonia concentration.

The effluent pH and temperature for each EBCT during each quarterly session was also monitored. The results are summarized in Tables 22 and 23. The variability of both effluent pH and temperature was very low during each run.

Table 24 summarizes run times to various GAC effluent criteria for the 10 minute EBCT contactors during all four seasons. The mean, standard deviation, and percent standard deviation of the run times are also tabulated. For the 20 minute EBCT contactors, a summary of the same information is given in Table 25. The SDS-DBP run time criteria chosen are based on Stage 1 and the placeholders for Stage 2 MCLs, with a 20 percent safety factor. The impact of using a 20 percent safety factor as THM4 breakthrough criterion can be seen in Figures 10 and 18 and Tables 24 and 25. The 80 µg/L MCL is only exceeded during one quarter (June) and only for the last sample point of both EBCT runs. For a visual comparison of the impact of seasonal variability on GAC run times, bar graph plots of the TOC, UV_{254}, THM4, and HAA5 data were generated. For a 10 minute EBCT, Figures 24 and 25 summarize run times to effluent TOC and UV_{254} 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 20 minute EBCT contactors. For both 10 and 20 minute EBCT contactors, the HAA5 criteria were never exceeded. The Stage 1 THM4 criterion, 64 µg/L, was exceeded only during the June and October sessions, while the Stage 2 criterion, 32 µg/L, was exceeded all four quarters. The TOC, UV_{254}, and TOX breakthrough criteria were chosen to represent a range of concentrations. A relative performance criterion, 50 percent breakthrough, c/c_0, was also chosen for TOC and UV_{254}.

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 quarter and each EBCT, these data are summarized in Tables 26 through 33. For example, Table 26 shows that when the placeholder for Stage 2 MCL for THM4 (with a 20 percent safety factor) was exceeded, the TOC concentration was 2.2 mg/L, the SDS-HAA5 concentration was 12 µg/L, and the SDS-TOX concentration was 93 µg Cl^-/L.

It is important to track the breakthrough behavior of specific DBP species, since some may be of potential health concern and a MCL could be set for a specific DBP species. 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, especially during the early part of the breakthrough. In some cases, effluent levels are higher than influent levels.

For both the 10 and 20 minute EBCT contactors and all four seasons, Figures 32, 33, 34 and 35 show the breakthrough behavior of formed chloroform ($CHCl_3$), bromodichloromethane (BDCM), dibromochloromethane (DBCM), and bromoform ($CHBr_3$), respectively. For most of the three brominated species, effluent concentrations at some time during the run exceeded those

measured when the GAC influent was chlorinated, due to the high bromide to TOC ratio in the GAC effluent. For BDCM this occurred during the June and October runs, and for DBCM it occurred during the January and April runs. 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 four 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). Because of the high bromide to TOC ratio in the GAC effluent, DBAA, DCBAA, CDBAA, and TBAA formed higher in the chlorinated effluent than in the chlorinated influent sometime during the run.

Effluent sample number	Effluent pH				Effluent temperature (°C)			
	January	April	June	October	January	April	June	October
1	8.8	8.9	8.8	8.6	22	23	22	25
2	7.8	8.7	8.3	8.4	21	21	22	22
3	7.4	9.2	8.5	8.4	21	21	21	21
4	8.1	8.5	8.4	8.3	23	21	22	21
5	8.5	8.5	8.4	8.3	24	22	22	22
6	8.5	8.1	8.4	8.4	24	23	21	21
7	8.4	8.7	8.4	8.4	24	23	22	21
8	8.2	8.5	8.6	8.3	24	23	21	21
9	8.3	8.7	8.4	8.3	22	22	21	21
10	8.2	8.6	8.3	8.3	22	22	22	21
11	8.3	8.6	8.4	8.2	21	22	22	22
12	8.0	8.6	8.5	8.2	21	22	22	22
13		8.4		8.2		22		21
Mean	8.2	8.6	8.5	8.3	22	22	22	22
Standard deviation	±0.4	±0.2	±0.1	±0.1	±1.3	±0.6	±0.3	±1.0
Relative percent error	4	3	2	1	6	3	2	5

Table 22 GAC effluent pH and temperature data for 10 minute EBCT contactors

Effluent sample number	Effluent pH				Effluent temperature (°C)			
	January	April	June	October	January	April	June	October
1	9.5	9.2	8.8	8.6	22	23	22	25
2	8.0	8.6	8.3	8.3	24	22	22	21
3	8.2	8.6	8.1	8.3	21	24	23	21
4	8.1	8.6	8.0	8.3	21	21	22	21
5	8.0	8.5	7.9	8.4	21	23	22	22
6	8.4	8.6	7.9	8.2	21	23	22	23
7	8.4	8.7	7.9	8.3	21	22	23	22
8	8.3	8.5	7.9	8.0	21	23	23	22
9	8.5	8.5	8.6	8.3	21	21	23	21
10	8.4	8.8	8.5	8.3	23	22	22	22
11	8.6	8.8	8.5	8.2	22	21	23	21
12	8.1	8.4		8.3	23	23		22
13		8.5	8.3	8.3		22	23	22
Mean	8.4	8.6	8.2	8.3	22	22	22	22
Standard deviation	±0.4	±0.2	±0.3	±0.1	±1.0	±0.9	±0.4	±0.9
Relative percent error	5	2	4	1	4	4	2	4

Table 23 GAC effluent pH and temperature data for 20 minute EBCT contactors

Parameter	Units	Value	Run time (days) Session 1 January	2 April	3 June	4 October	Mean	Standard deviation	Relative standard deviation (%)
TOC	(mg/L)	2.0	26	56	45	38	41	±13	30%
		1.0	16	24	21	18	20	±3	17%
		c/c_0 = 50%†	25	36	35	29	31	±5	16%
UV-254	(1/cm)	0.040	41	*	71	*	56	±21	38%
		0.020	21	28	30	25	26	±4	14%
		c/c_0 = 50%†	40	48	52	40	45	±6	13%
SDS-THM4	(µg/L)	80	*	*	73	*	73		
		64	*	*	47	51	49	±3	6%
		32	33	35	24	20	28	±7	26%
SDS-HAA5	(µg/L)	48	*	*	*	*			
		24	*	*	*	*			
SDS-HAA6	(µg/L)	48	*	*	*	*			
		24	*	63	61	*	62	±2	3%
SDS-HAA9	(µg/L)	48	*	*	*	NA			
		24	*	58	40	NA	49	±13	26%
SDS-TOX	(µg Cl^-/L)	120	50	66	45	39	50	±11	23%
		70	26	30	27	24	27	±3	10%
Study length	(days)	--	82	66	76	56	70	±11	16%

†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.
NA: not applicable; data not reported

Table 24 Run times to selected GAC effluent criteria (10 minute EBCT)

Parameter	Units	Value	Run time (days) Session 1 January	2 April	3 June	4 October	Mean	Standard deviation	Relative standard deviation (%)
TOC	(mg/L)	2.0	80	126	106	100	103	±19	18%
		1.0	42	55	49	39	46	±7	15%
		c/c_0 = 50%†	76	83	87	72	79	±7	9%
UV-254	(1/cm)	0.040	106	*	*	*	106		
		0.020	52	79	73	64	67	±12	17%
		c/c_0 = 50%†	104	123	132	114	118	±12	10%
SDS-THM4	(µg/L)	80	*	*	156	*	156		
		64	*	*	117	121	119	±2	2%
		32	*	105	56	47	70	±31	44%
SDS-HAA5	(µg/L)	48	*	*	*	*			
		24	*	*	*	*			
SDS-HAA6	(µg/L)	48	*	*	*	*			
		24	*	147	149	*	148	±1	1%
SDS-HAA9	(µg/L)	48	*	*	*	NA			
		24	*	*	106	NA	106		
SDS-TOX	(µg Cl^-/L)	120	126	151	105	113	124	±20	16%
		70	86	81	68	62	74	±11	15%
Study length	(days)	--	152	151	160	152	154	±4	3%

†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.
NA: not applicable; data not reported

Table 25 Run times to selected GAC effluent criteria (20 minute EBCT)

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_{254} (1/cm)	SDS-THM4 (µg/L)	SDS-HAA5 (µg/L)	SDS-HAA6 (µg/L)	SDS-HAA9 (µg/L)	SDS-TOX (µg Cl^-/L)
TOC	(mg/L)	3.9	2.0	26	3,800	2.0	0.026	28	12	15	17	72
			1.0	16	2,300	1.0	0.010	12	3	4	#N/A	14
			1.9†	25	3,660	1.9	0.025	27	12	15	17	68
UV_{254}	(1/cm)	0.079	0.040	41	5,950	2.5	0.040	39	13	17	21	105
			0.020	21	3,080	1.6	0.020	22	10	13	14	47
			0.039†	40	5,830	2.4	0.039	38	12	16	20	104
SDS-THM4	(µg/L)	66	80	*	*							
			64	*	*							
			32	33	4,820	2.2	0.032	32	12	16	19	93
SDS-HAA5	(µg/L)	34	48	*	*							
			24	*	*							
SDS-HAA6	(µg/L)	38	48	*	*							
			24	*	*							
SDS-HAA9	(µg/L)	39	48	*	*							
			24	*	*							
SDS-TOX	(µg Cl^-/L)	212	120	50	7,140	2.6	0.044	44	15	19	23	120
			70	26	3,720	2.0	0.025	27	12	15	17	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 (10 minute EBCT) during session 1, January

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_{254} (1/cm)	SDS-THM4 (µg/L)	SDS-HAA5 (µg/L)	SDS-HAA6 (µg/L)	SDS-HAA9 (µg/L)	SDS-TOX (µg Cl^-/L)
TOC	(mg/L)	3.9	2.0	80	5,750	2.0	0.028	28	10	14	#	61
			1.0	42	3,010	1.0	0.012	15	3	5	7	0
			1.9†	76	5,460	1.9	0.027	28	9	13	#	55
UV_{254}	(1/cm)	0.079	0.040	106	7,620	2.5	0.040	#	14	18	#	101
			0.020	52	3,750	1.5	0.020	22	6	9	11	13
			0.039†	104	7,510	2.4	0.039	#	14	18	#	98
SDS-THM4	(µg/L)	66	80	*	*							
			64	*	*							
			32	*	*							
SDS-HAA5	(µg/L)	34	48	*	*							
			24	*	*							
SDS-HAA6	(µg/L)	38	48	*	*							
			24	*	*							
SDS-HAA9	(µg/L)	39	48	*	*							
			24	*	*							
SDS-TOX	(µg Cl^-/L)	212	120	126	9,040	2.6	0.045	#	16	20	#	120
			70	86	6,180	2.1	0.031	30	11	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 (20 minute EBCT) during session 1, January

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_{254} (1/cm)	SDS-THM4 (µg/L)	SDS-HAA5 (µg/L)	SDS-HAA6 (µg/L)	SDS-HAA9 (µg/L)	SDS-TOX (µg Cl^-/L)
TOC	(mg/L)	3.2	2.0	56	8,110	2.0	0.035	37	17	21	23	108
			1.0	24	3,420	1.0	0.014	20	8	10	14	43
			1.6†	36	5,190	1.6	0.025	33	14	18	22	83
UV_{254}	(1/cm)	0.066	0.040	*	*							
			0.020	28	4,020	1.3	0.020	25	11	15	18	63
			0.033†	48	6,860	1.9	0.033	35	16	20	23	104
SDS-THM4	(µg/L)	60	80	*	*							
			64	*	*							
			32	35	5,110	1.6	0.025	32	14	18	22	82
SDS-HAA5	(µg/L)	33	48	*	*							
			24	*	*							
SDS-HAA6	(µg/L)	38	48	*	*							
			24	63	9,140	2.2	0.038	40	19	24	26	117
SDS-HAA9	(µg/L)	38	48	*	*							
			24	58	8,330	2.0	0.036	37	18	22	24	110
SDS-TOX	(µg Cl^-/L)	225	120	66	9,450	2.2	0.039	41	20	25	27	120
			70	30	4,300	1.4	0.022	26	12	16	19	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 (10 minute EBCT) during session 2, April

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_{254} (1/cm)	SDS-THM4 (µg/L)	SDS-HAA5 (µg/L)	SDS-HAA6 (µg/L)	SDS-HAA9 (µg/L)	SDS-TOX (µg Cl^-/L)
TOC	(mg/L)	3.2	2.0	126	9,080	2.0	0.033	36	16	20	22	105
			1.0	55	3,970	1.0	0.013	18	10	13	17	40
			1.6†	83	5,970	1.6	0.024	29	12	16	21	76
UV_{254}	(1/cm)	0.066	0.040	*	*							
			0.020	79	5,660	1.5	0.020	27	12	15	20	62
			0.033†	123	8,840	2.0	0.033	36	16	20	22	104
SDS-THM4	(µg/L)	60	80	*	*							
			64	*	*							
			32	105	7,560	1.9	0.030	32	14	18	22	97
SDS-HAA5	(µg/L)	33	48	*	*							
			24	*	*							
SDS-HAA6	(µg/L)	38	48	*	*							
			24	147	10,560	2.2	0.037	#	19	24	#VALUE!	117
SDS-HAA9	(µg/L)	38	48	*	*							
			24	*	*							
SDS-TOX	(µg Cl^-/L)	225	120	151	10,860	2.3	0.038	#	20	25	#VALUE!	120
			70	81	5,800	1.6	0.022	28	12	16	21	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 (20 minute EBCT) during session 2, April

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_{254} (1/cm)	SDS-THM4 (µg/L)	SDS-HAA5 (µg/L)	SDS-HAA6 (µg/L)	SDS-HAA9 (µg/L)	SDS-TOX (µg Cl^-/L)
TOC	(mg/L)	3.4	2.0	45	6,480	2.0	0.029	63	15	20	25	121
			1.0	21	2,970	1.0	0.011	26	5	8	10	43
			1.7†	35	5,000	1.7	0.024	49	14	19	22	99
UV_{254}	(1/cm)	0.066	0.040	71	10,280	2.5	0.040	79	21	27	30	160
			0.020	30	4,320	1.5	0.020	42	12	16	19	80
			0.033†	52	7,560	2.1	0.033	66	17	22	26	131
SDS-THM4	(µg/L)	120	80	73	10,510	2.5	0.040	80	21	27	30	161
			64	47	6,730	2.0	0.030	64	15	20	25	123
			32	24	3,400	1.2	0.014	32	8	11	13	51
SDS-HAA5	(µg/L)	36	48	*	*							
			24	*	*							
SDS-HAA6	(µg/L)	42	48	*	*							
			24	61	8,800	2.3	0.037	72	19	24	27	145
SDS-HAA9	(µg/L)	45	48	*	*							
			24	40	5,750	1.9	0.027	58	16	20	24	114
SDS-TOX	(µg Cl^-/L)	271	120	45	6,420	2.0	0.029	63	15	20	25	120
			70	27	3,880	1.4	0.017	38	12	16	18	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 (10 minute EBCT) during session 3, June

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_{254} (1/cm)	SDS-THM4 (µg/L)	SDS-HAA5 (µg/L)	SDS-HAA6 (µg/L)	SDS-HAA9 (µg/L)	SDS-TOX (µg Cl^-/L)
TOC	(mg/L)	3.4	2.0	106	7,630	2.0	0.030	59	15	21	24	121
			1.0	49	3,520	1.0	0.011	28	7	10	11	44
			1.7†	87	6,280	1.7	0.025	50	12	17	20	94
UV_{254}	(1/cm)	0.066	0.040	*	*							
			0.020	73	5,250	1.5	0.020	42	11	15	18	77
			0.033†	132	9,500	2.2	0.033	73	17	23	26	131
SDS-THM4	(µg/L)	120	80	156	11,220	2.4	0.038	80	19	24	27	148
			64	117	8,430	2.1	0.032	64	17	22	25	127
			32	56	4,070	1.1	0.014	32	7	10	12	61
SDS-HAA5	(µg/L)	36	48	*	*							
			24	*	*							
SDS-HAA6	(µg/L)	42	48	*	*							
			24	149	10,690	2.4	0.036	78	19	24	27	142
SDS-HAA9	(µg/L)	45	48	*	*							
			24	106	7,650	2.0	0.030	59	16	21	24	121
SDS-TOX	(µg Cl^-/L)	271	120	105	7,580	2.0	0.030	58	15	20	24	120
			70	68	4,860	1.4	0.018	39	10	14	16	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 31 Run times to selected GAC effluent criteria (20 minute EBCT) during session 3, June

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_{254} (1/cm)	SDS-THM4 (µg/L)	SDS-HAA5 (µg/L)	SDS-HAA6 (µg/L)	SDS-HAA9 (µg/L)	SDS-TOX (µg Cl^-/L)
TOC	(mg/L)	3.4	2.0	38	5,480	2.0	0.029	52	15	20	#VALUE!	116
			1.0	18	2,600	1.0	0.013	27	5	8	#VALUE!	44
			1.7†	29	4,200	1.7	0.023	42	11	16	#VALUE!	85
UV_{254}	(1/cm)	0.063	0.040	*	*							
			0.020	25	3,550	1.4	0.020	38	10	14	#VALUE!	75
			0.031†	40	5,820	2.2	0.031	55	17	22	#VALUE!	124
SDS-THM4	(µg/L)	98	80	*	*							
			64	51	7,290	2.4	0.034	64	18	23	#VALUE!	139
			32	20	2,940	1.2	0.016	32	7	10	#VALUE!	56
SDS-HAA5	(µg/L)	30	48	*	*							
			24	*	*							
SDS-HAA6	(µg/L)	35	48	*	*							
			24	*	*							
SDS-HAA9	(µg/L)	#DIV/0!	48	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
			24	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
SDS-TOX	(µg Cl^-/L)	232	120	39	5,650	2.1	0.030	53	16	21	#VALUE!	120
			70	24	3,420	1.3	0.019	37	10	13	#VALUE!	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 32 Run times to selected GAC effluent criteria (10 minute EBCT) during session 4, October

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_{254} (1/cm)	SDS-THM4 (µg/L)	SDS-HAA5 (µg/L)	SDS-HAA6 (µg/L)	SDS-HAA9 (µg/L)	SDS-TOX (µg Cl^-/L)
TOC	(mg/L)	3.4	2.0	100	7,200	2.0	0.028	57	15	20	#VALUE!	106
			1.0	39	2,830	1.0	0.011	24	4	7	#VALUE!	39
			1.7†	72	5,180	1.7	0.022	46	10	14	#VALUE!	80
UV_{254}	(1/cm)	0.063	0.040	*	*							
			0.020	64	4,570	1.6	0.020	42	9	13	#VALUE!	72
			0.031†	114	8,240	2.1	0.031	62	17	22	#VALUE!	121
SDS-THM4	(µg/L)	98	80	*	*							
			64	121	8,680	2.2	0.033	64	17	23	#VALUE!	128
			32	47	3,410	1.2	0.015	32	7	10	#VALUE!	57
SDS-HAA5	(µg/L)	30	48	*	*							
			24	*	*							
SDS-HAA6	(µg/L)	35	48	*	*							
			24	*	*							
SDS-HAA9	(µg/L)	#DIV/0!	48	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
			24	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
SDS-TOX	(µg Cl^-/L)	232	120	113	8,150	2.1	0.031	61	16	22	#VALUE!	120
			70	62	4,450	1.5	0.019	42	9	12	#VALUE!	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 33 Run times to selected GAC effluent criteria (20 minute EBCT) during session 4, October

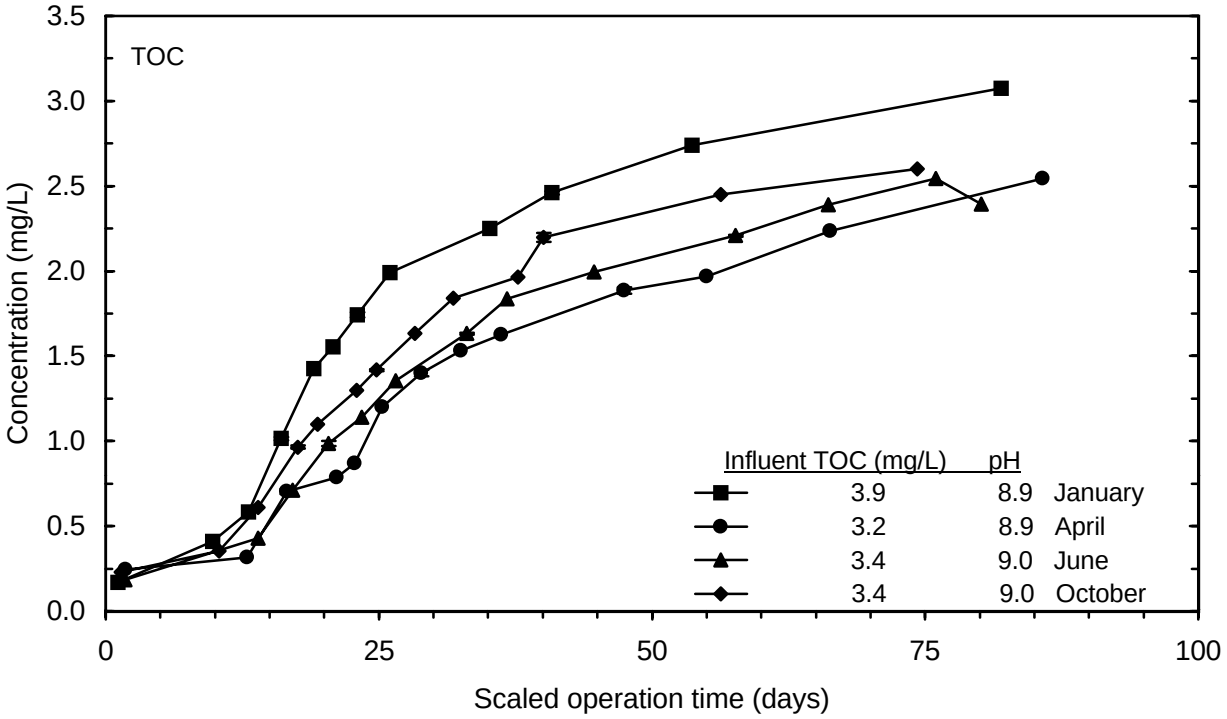


Figure 8 TOC breakthrough for 10 minute EBCT contactors for each session

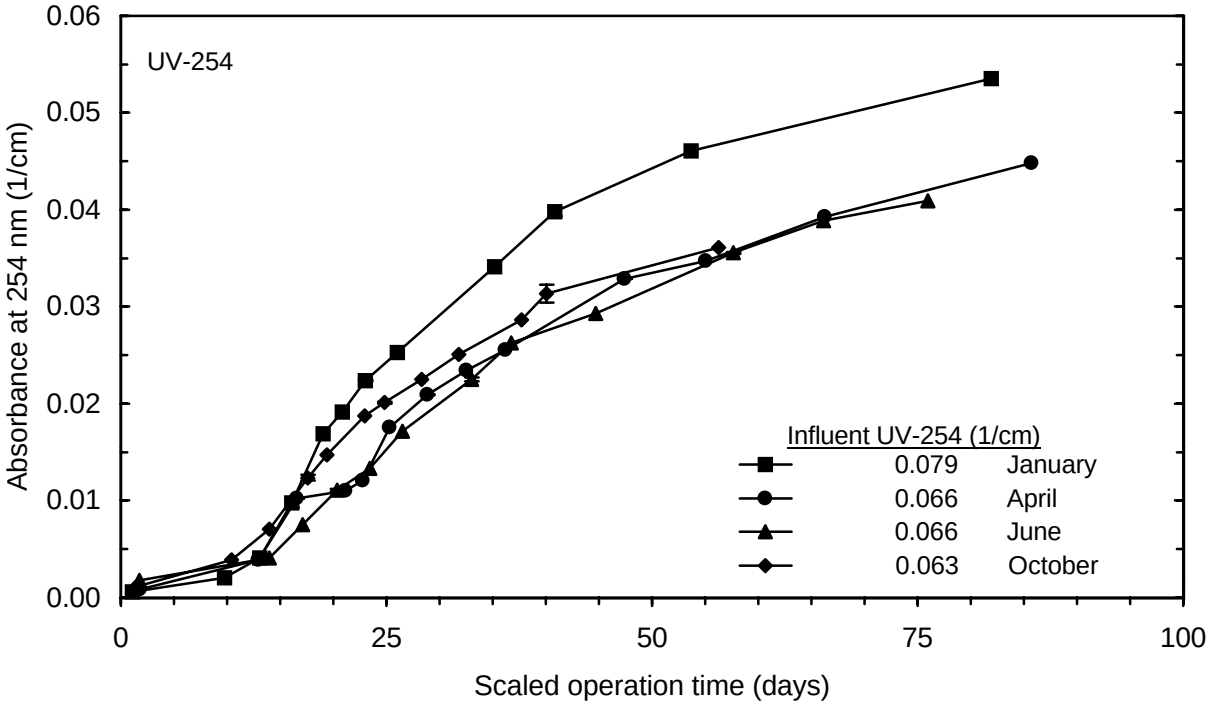


Figure 9 UV-254 breakthrough for 10 minute EBCT contactors for each session

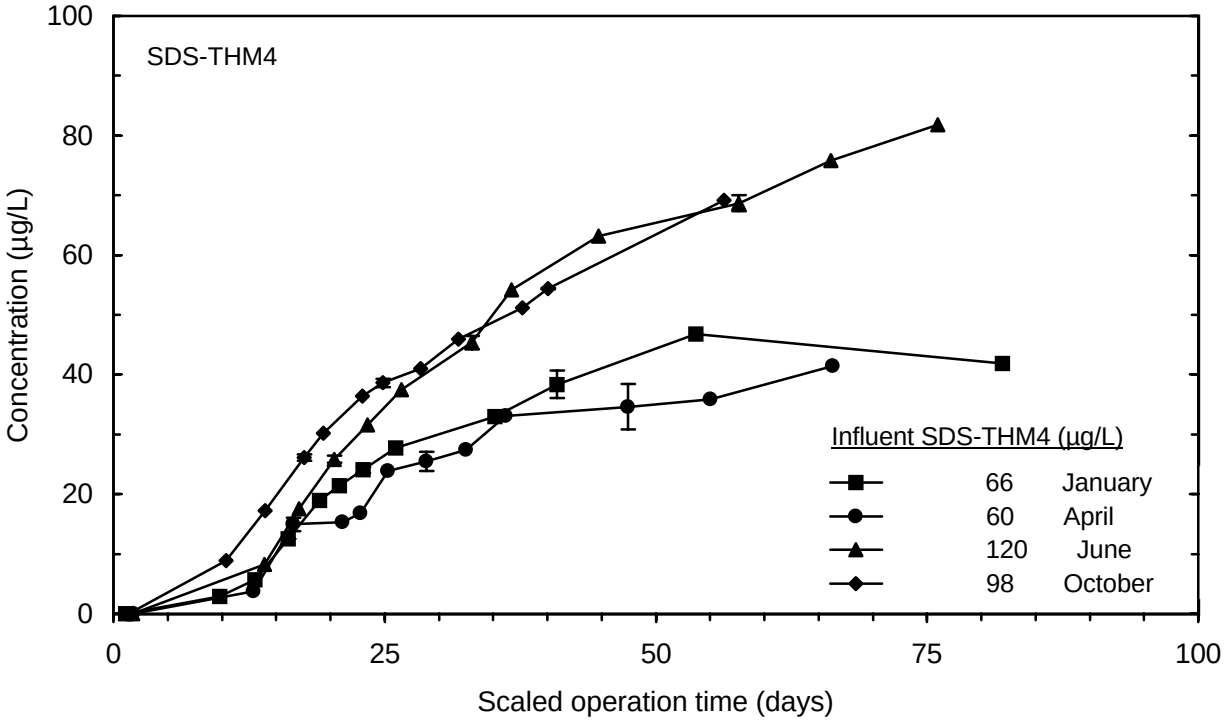


Figure 10 SDS-THM4 breakthrough for 10 minute EBCT contactors for each session

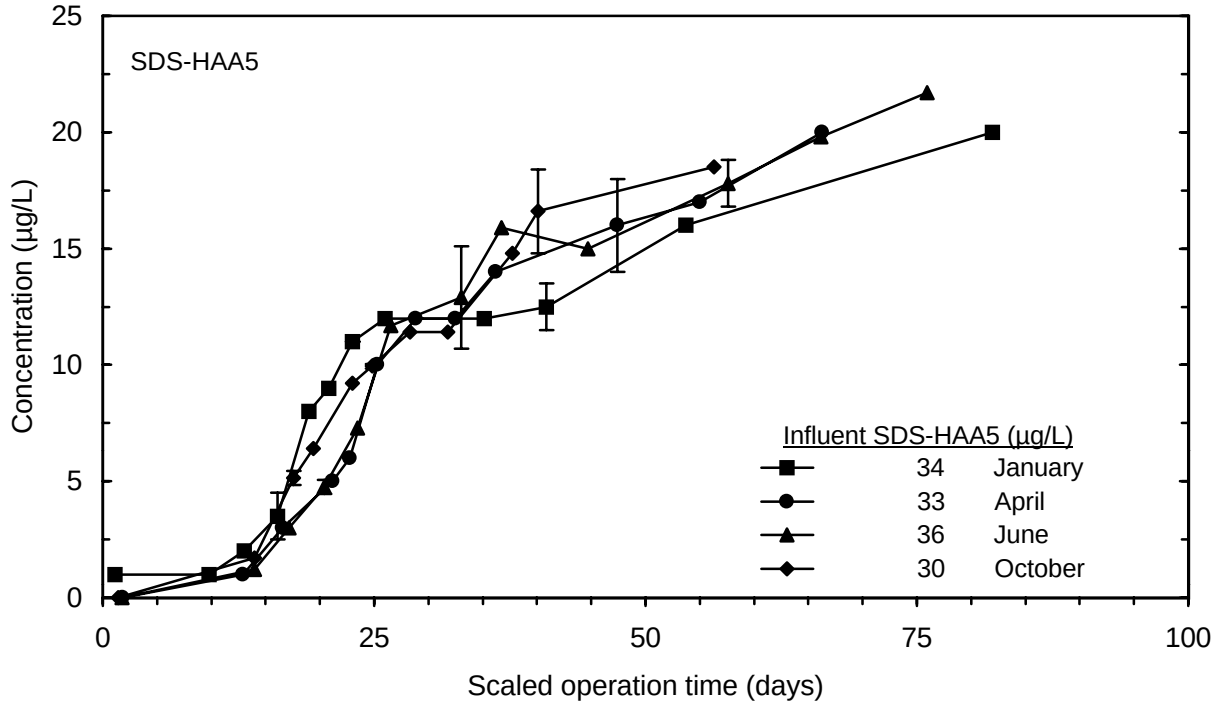


Figure 11 SDS-HAA5 breakthrough for 10 minute EBCT contactors for each session

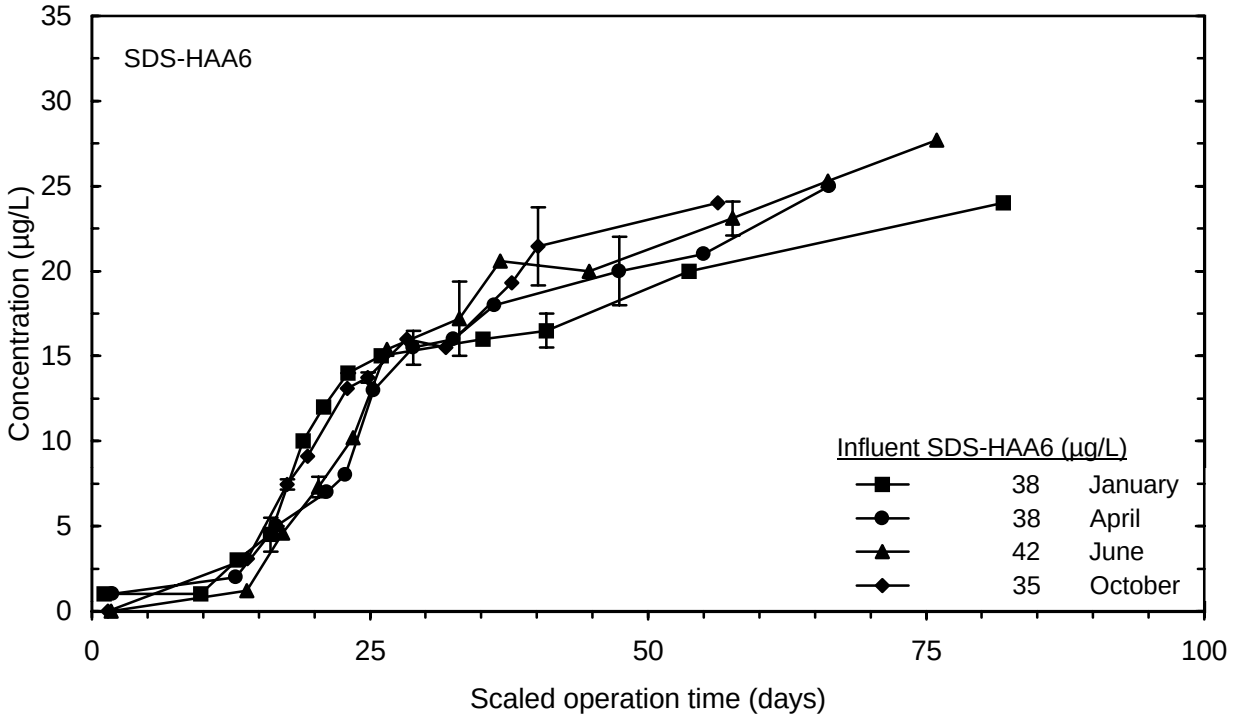


Figure 12 SDS-HAA6 breakthrough for 10 minute EBCT contactors for each session

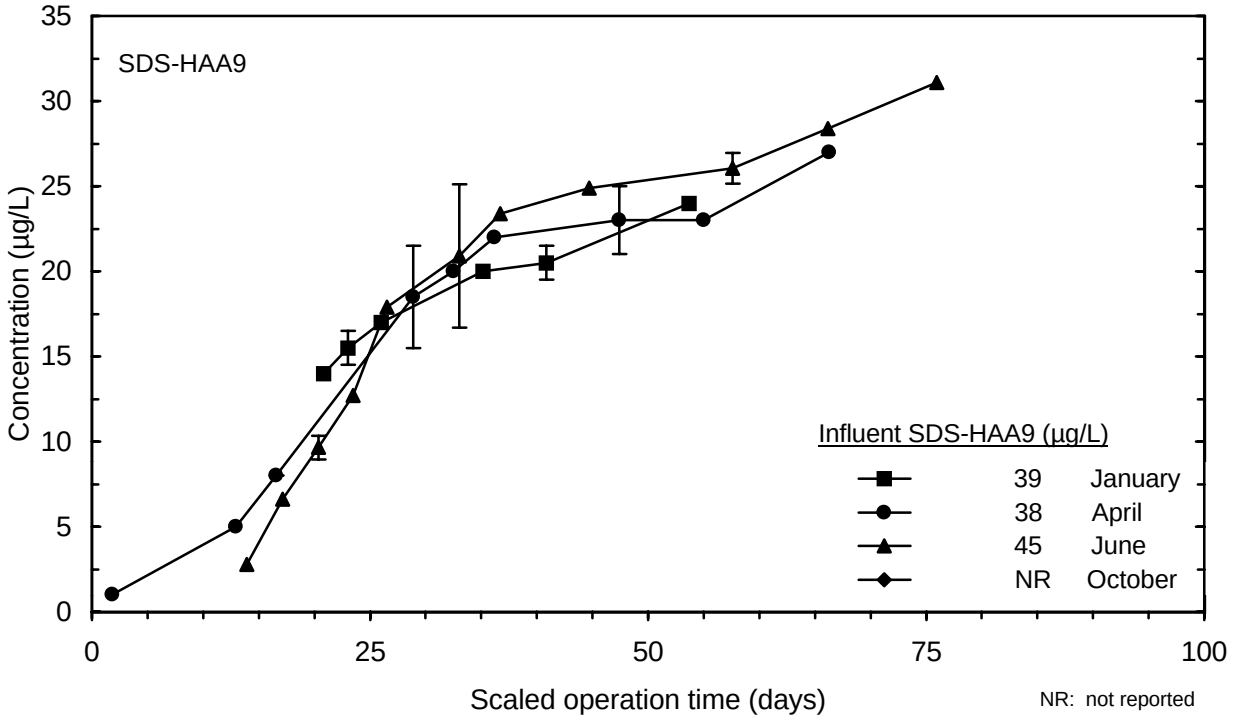


Figure 13 SDS-HAA9 breakthrough for 10 minute EBCT contactors for each session

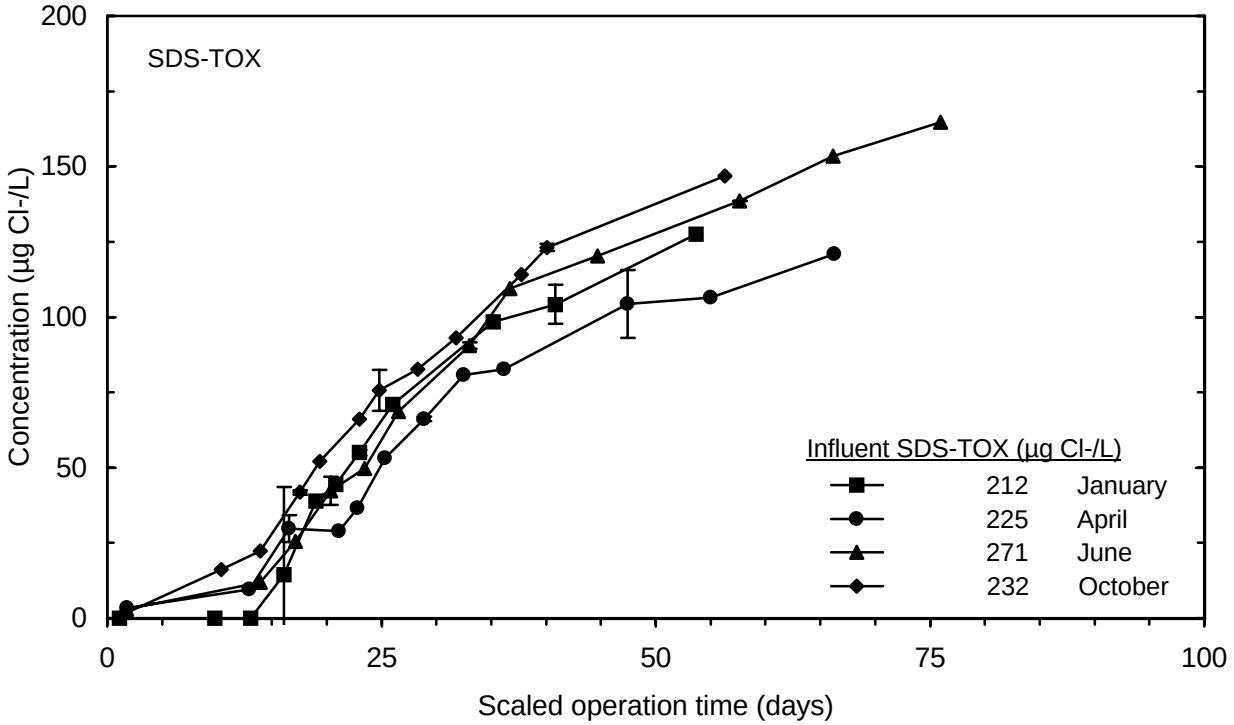


Figure 14 SDS-TOX breakthrough for 10 minute EBCT contactors for each session

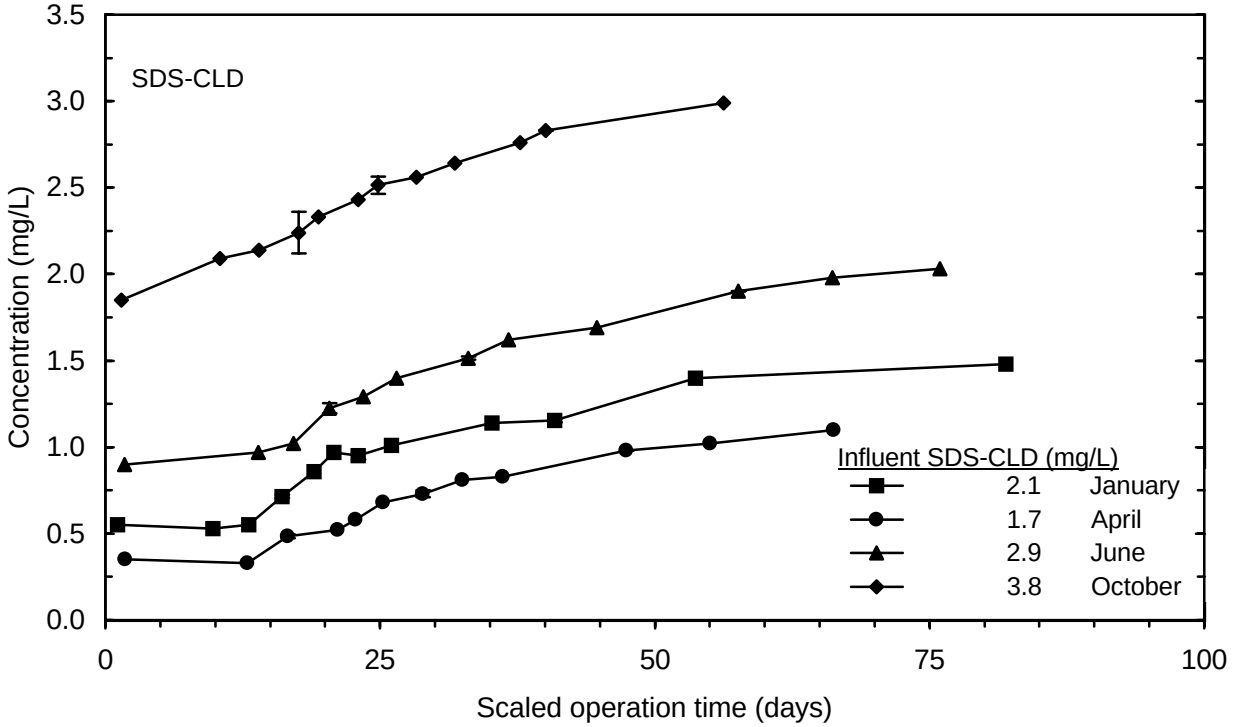


Figure 15 SDS-CLD breakthrough for 10 minute EBCT contactors for each session

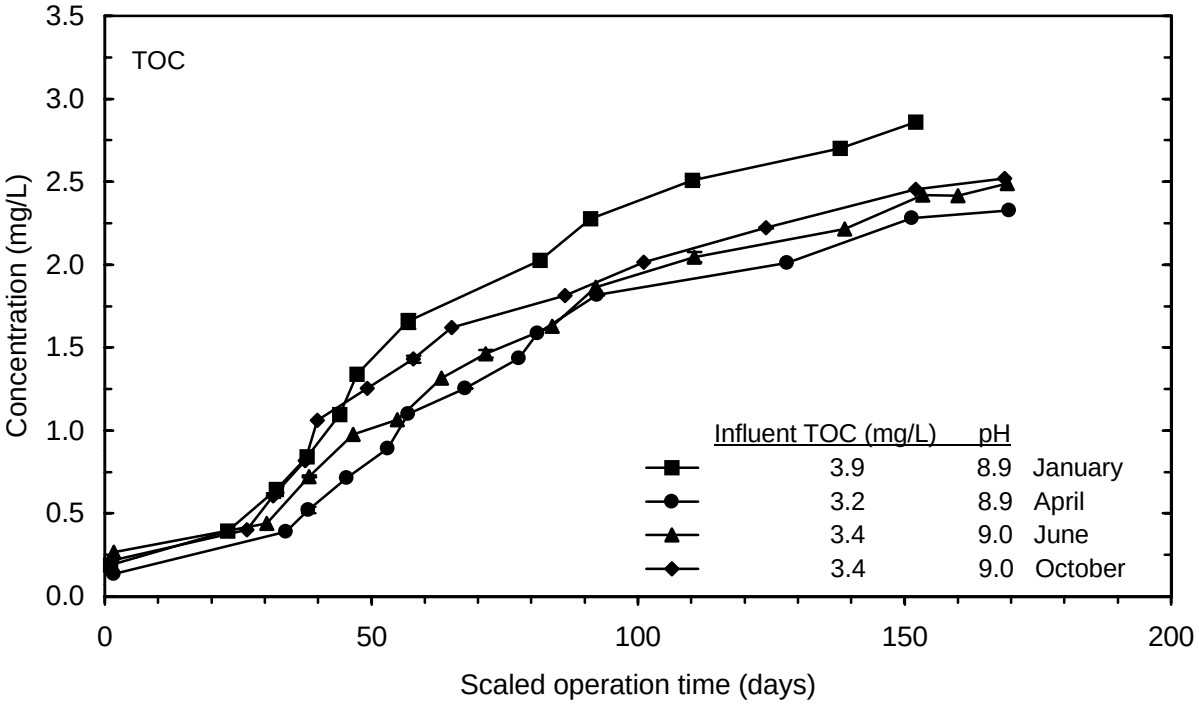


Figure 16 TOC breakthrough for 20 minute EBCT contactors for each session

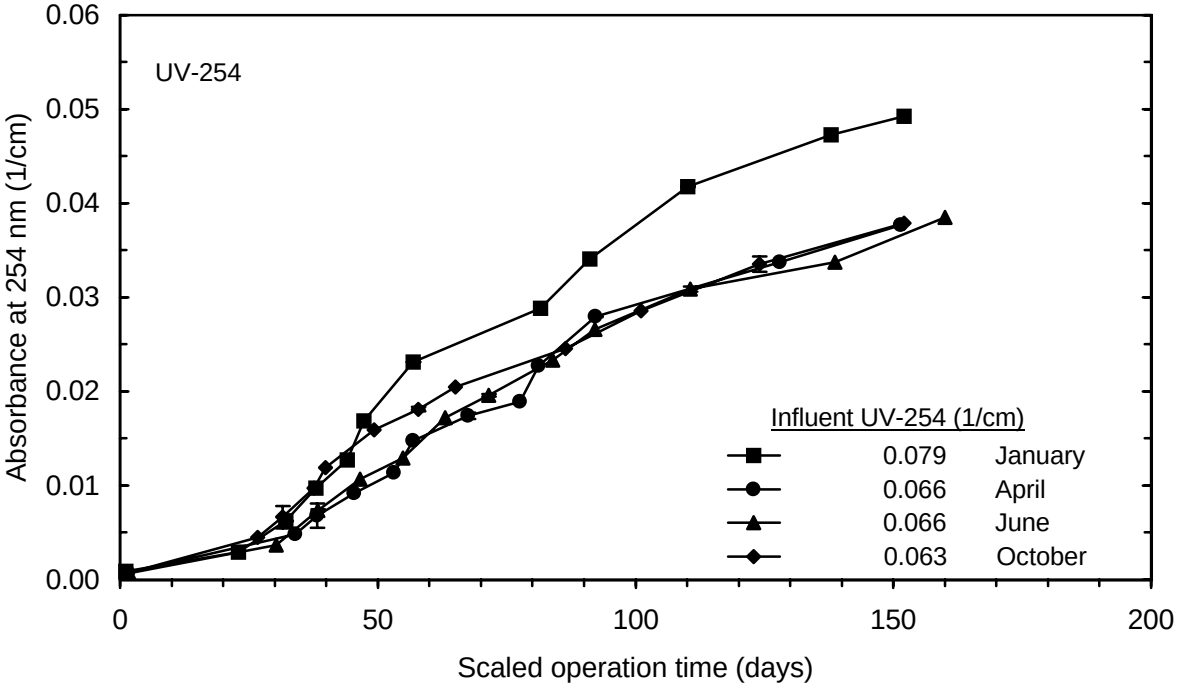


Figure 17 UV-254 breakthrough for 20 minute EBCT contactors for each session

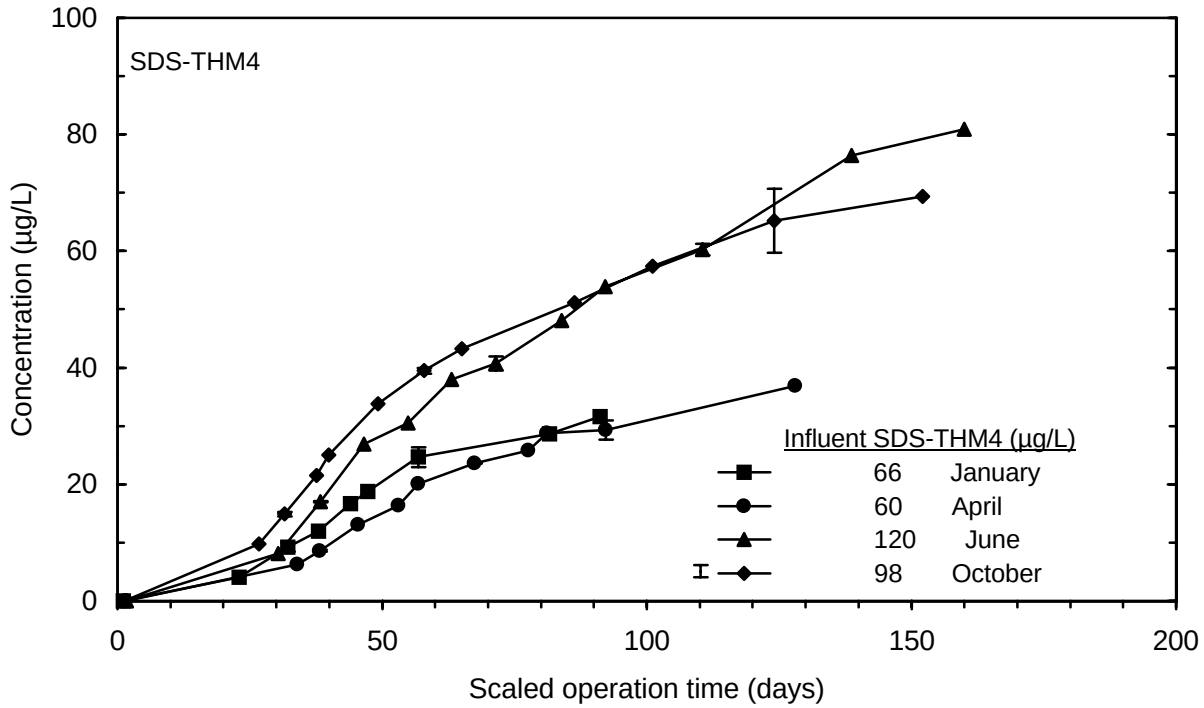


Figure 18 SDS-THM4 breakthrough for 20 minute EBCT contactors for each session

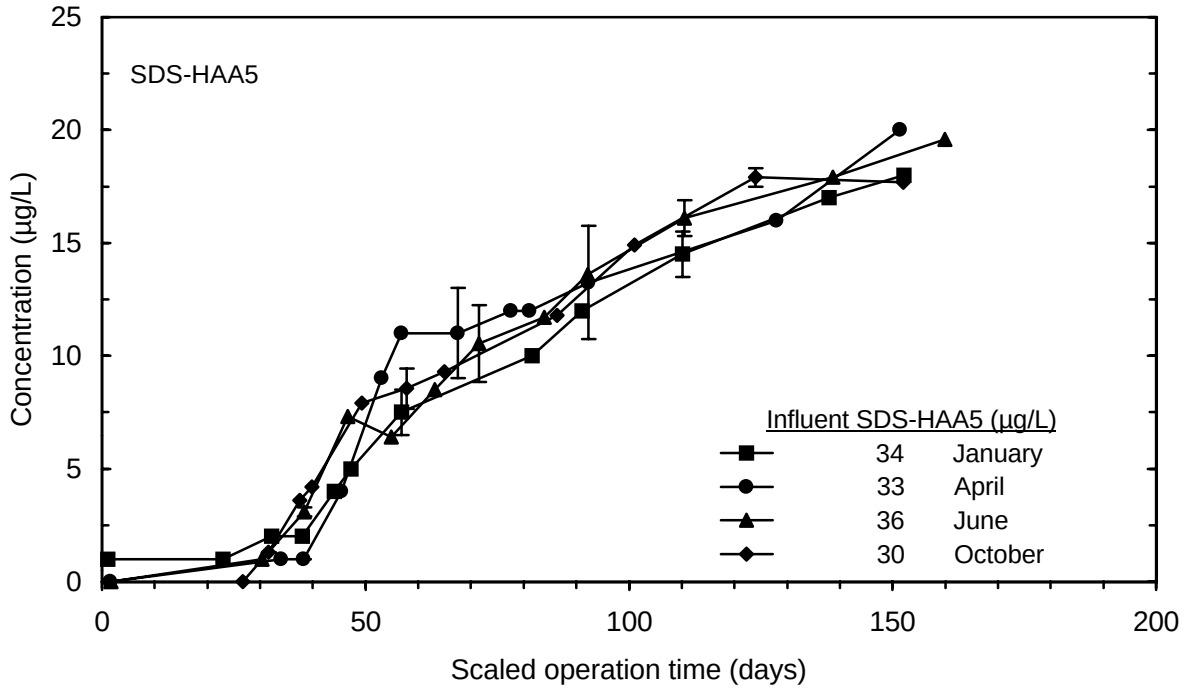


Figure 19 SDS-HAA5 breakthrough for 20 minute EBCT contactors for each session

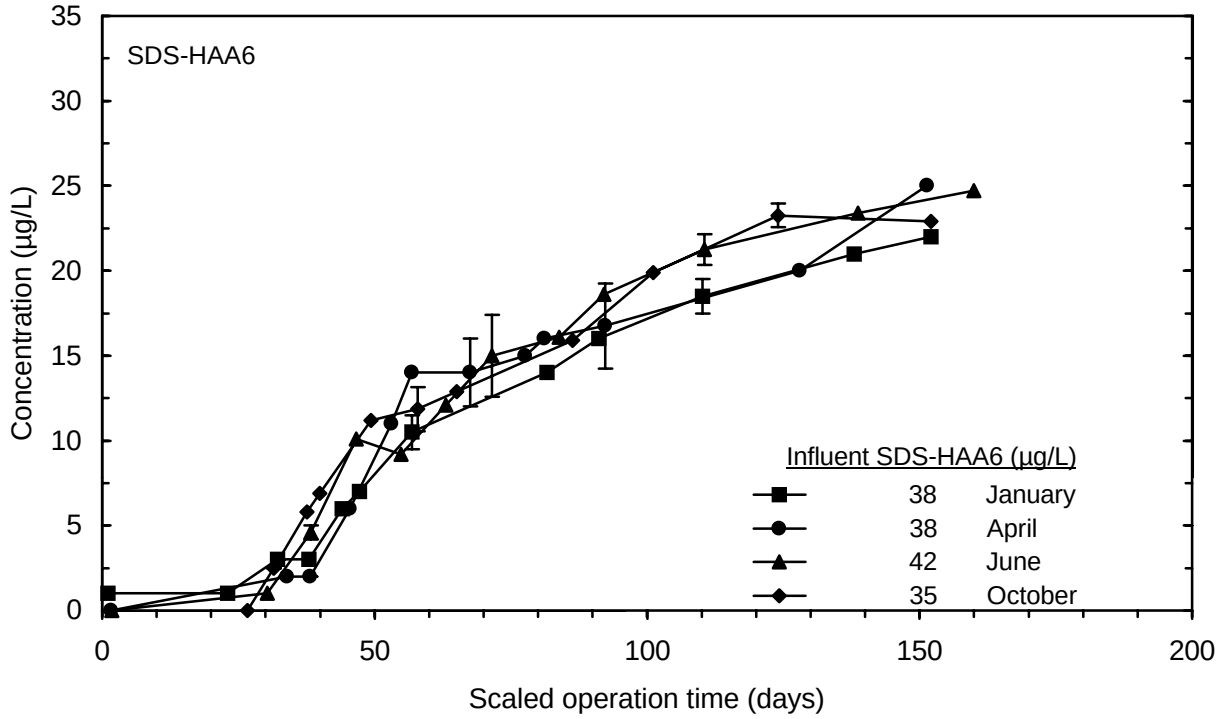


Figure 20 SDS-HAA6 breakthrough for 20 minute EBCT contactors for each session

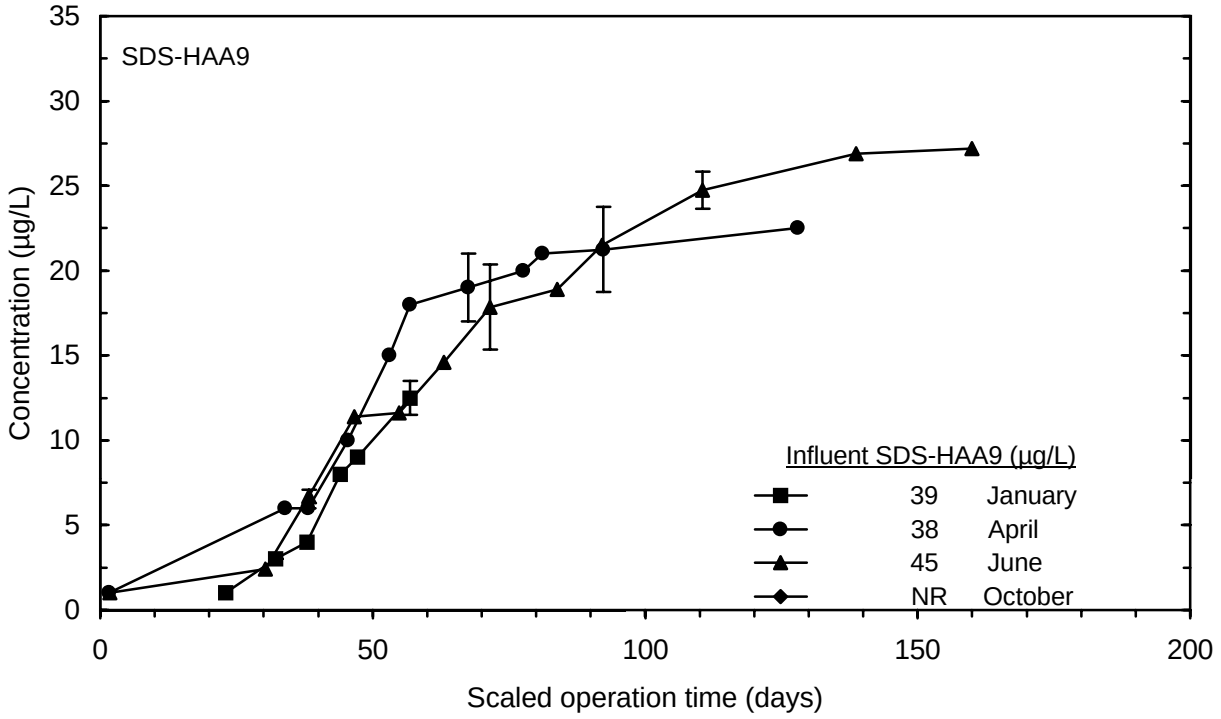


Figure 21 SDS-HAA9 breakthrough for 20 minute EBCT contactors for each session

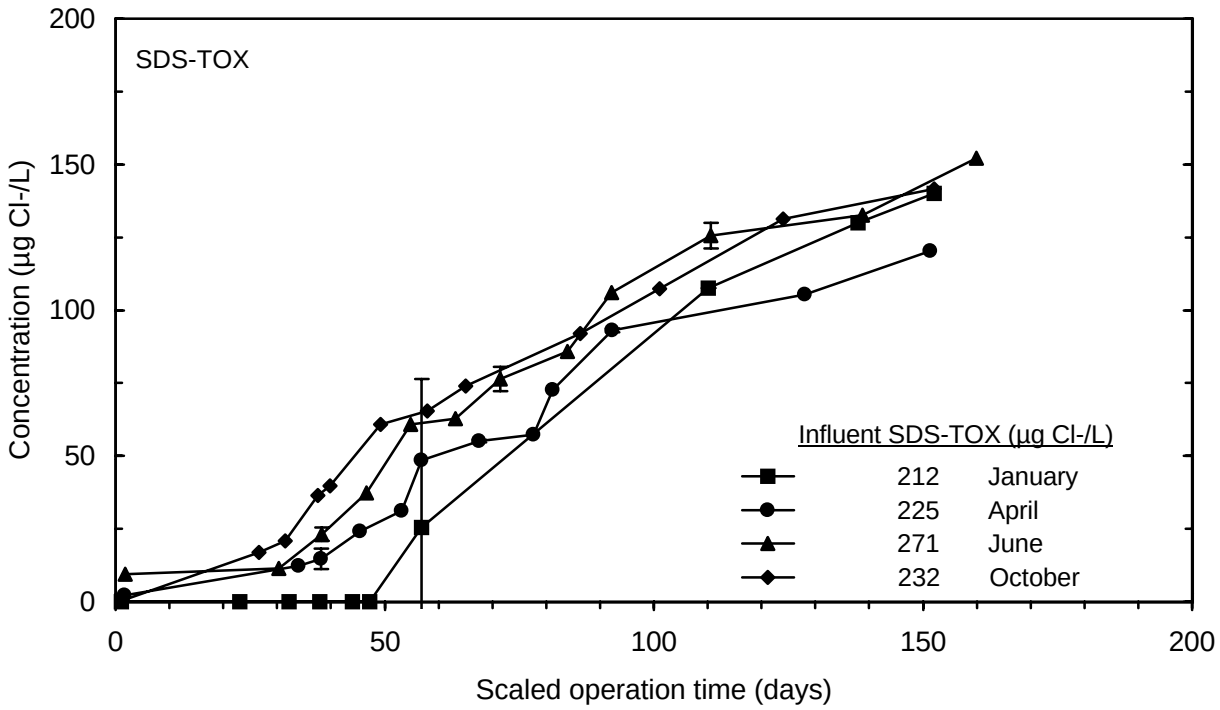


Figure 22 SDS-TOX breakthrough for 20 minute EBCT contactors for each session

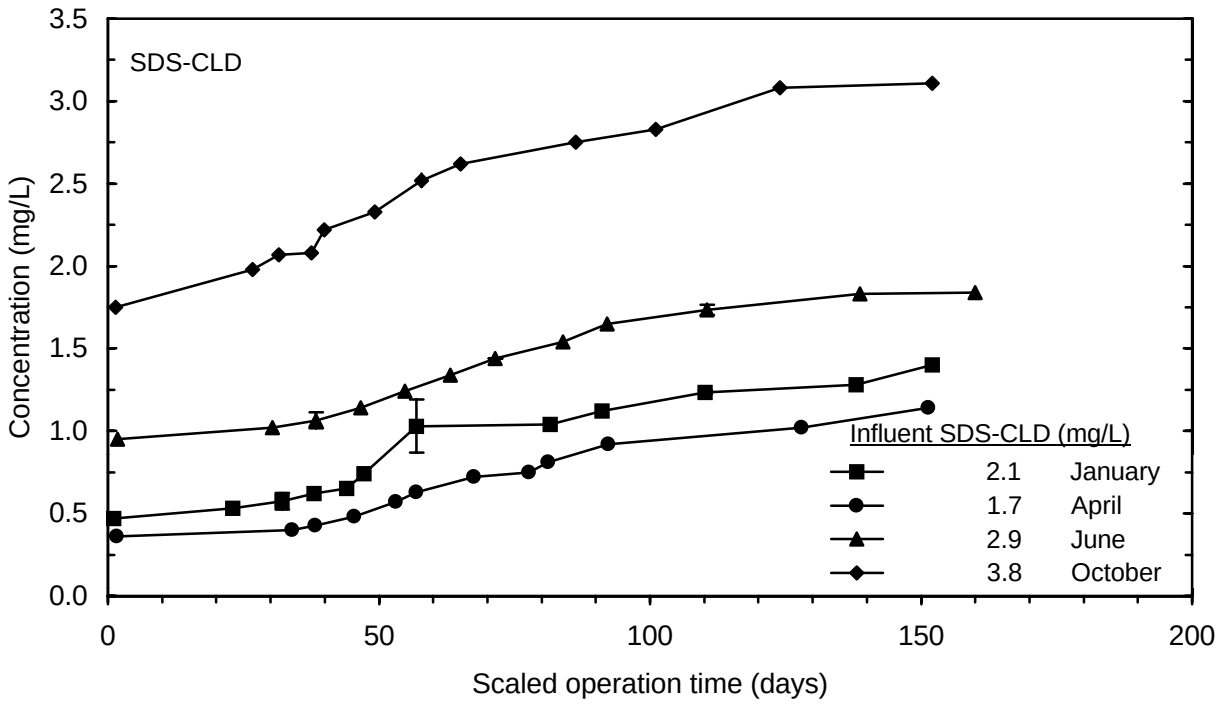


Figure 23 SDS-CLD breakthrough for 20 minute EBCT contactors for each session

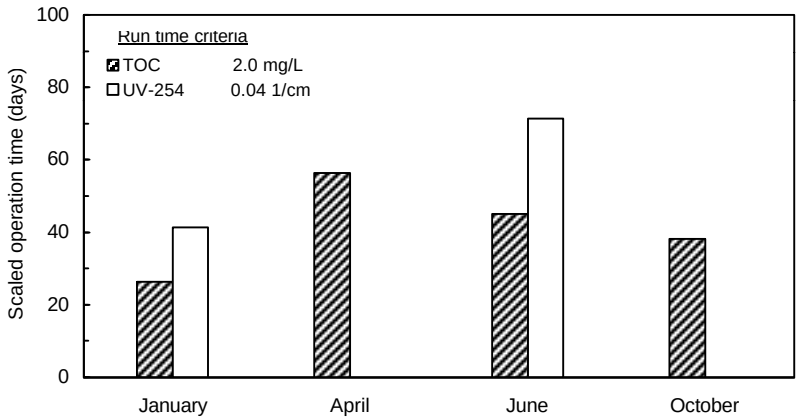


Figure 24 GAC run times based on single contactor breakthrough curves for TOC and UV-254 effluent criteria (high) for each session (10 minute EBCT)

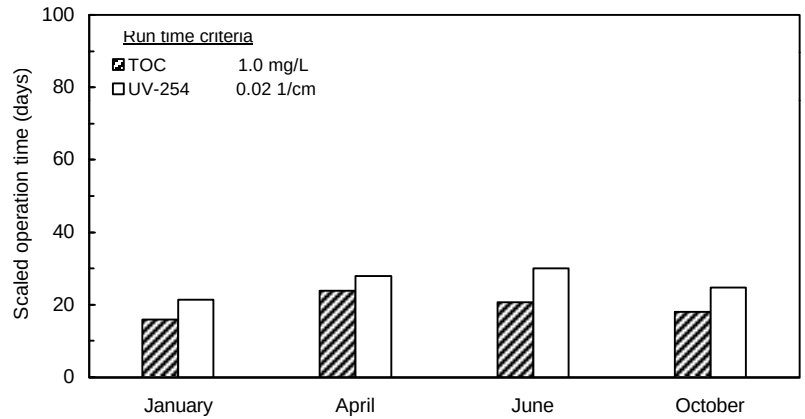


Figure 25 GAC run times based on single contactor breakthrough curves for TOC and UV-254 effluent criteria (low) for each session (10 minute EBCT)

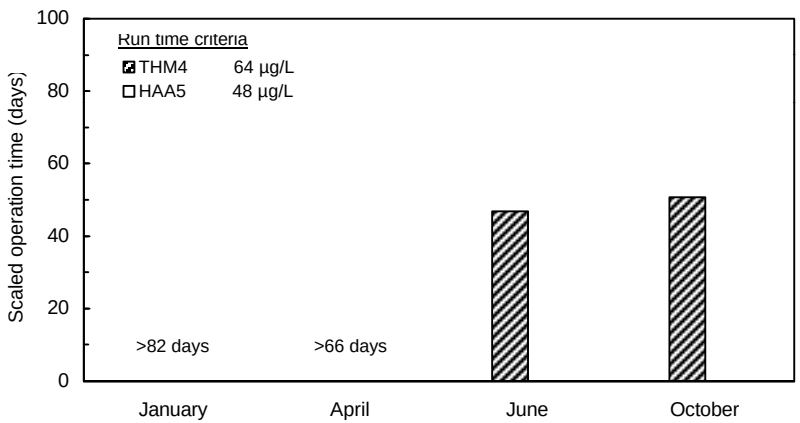


Figure 26 GAC run times based on single contactor breakthrough curves for Stage 1 THM4 and HAA5 effluent criteria for each session (10 minute EBCT)

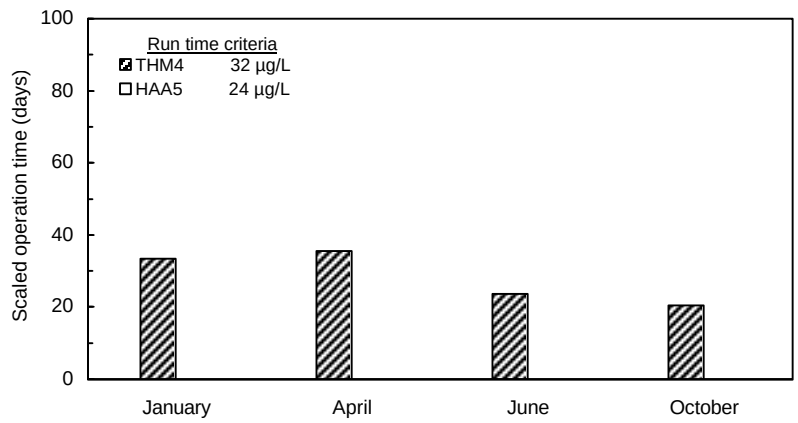


Figure 27 GAC run times based on single contactor breakthrough curves for Stage 2 THM4 and HAA5 effluent criteria for each session (10 minute EBCT)

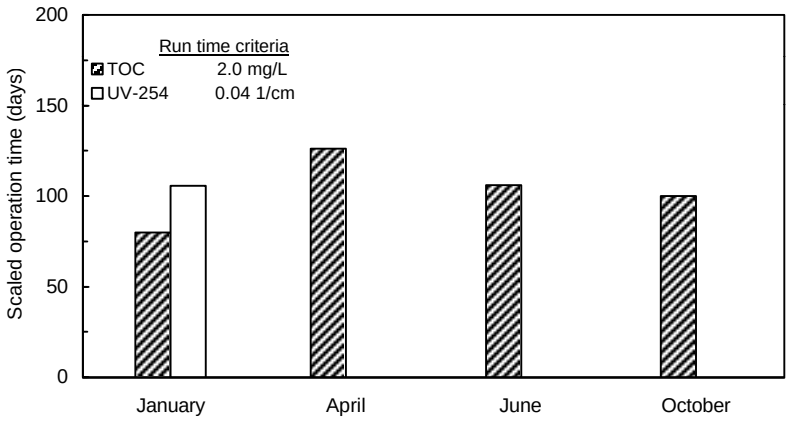


Figure 28 GAC run times based on single breakthrough curves for TOC and UV-254 effluent criteria for each session (20 minute EBCT)

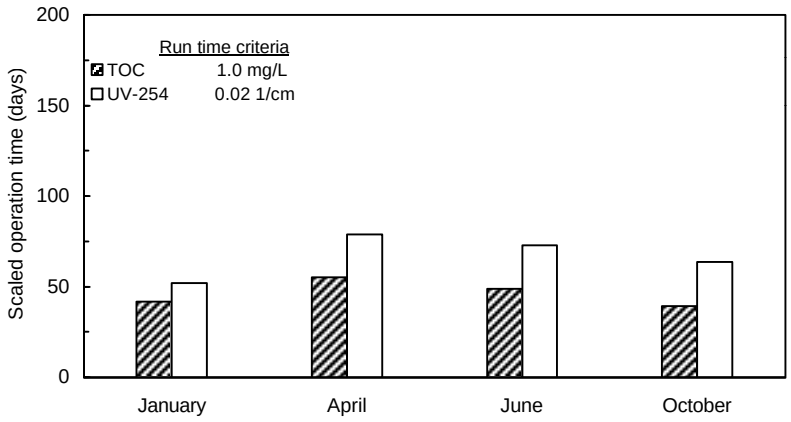


Figure 29 GAC run times based on single breakthrough curves for TOC and UV-254 effluent criteria for each session (20 minute EBCT)

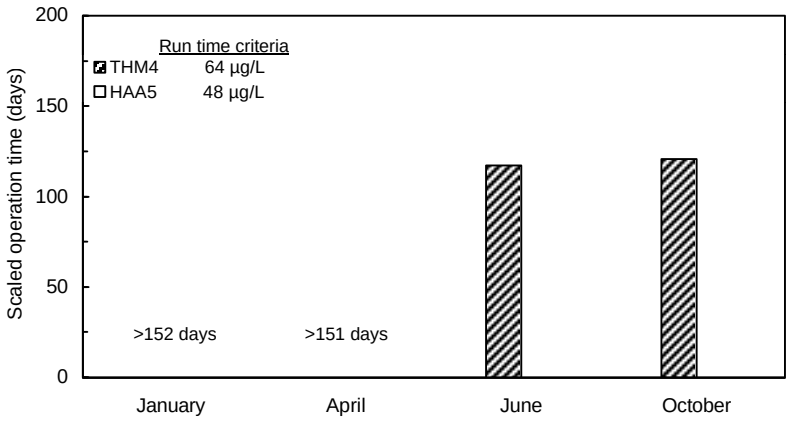


Figure 30 GAC run times based on single breakthrough curves for Stage 1 THM4 and HAA5 effluent criteria for each session (20 minute EBCT)

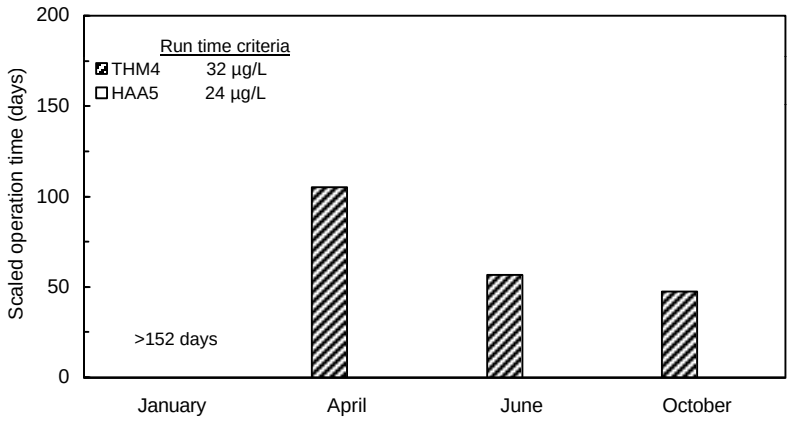


Figure 31 GAC run times based on single breakthrough curves for Stage 2 THM4 and HAA5 effluent criteria for each session (20 minute EBCT

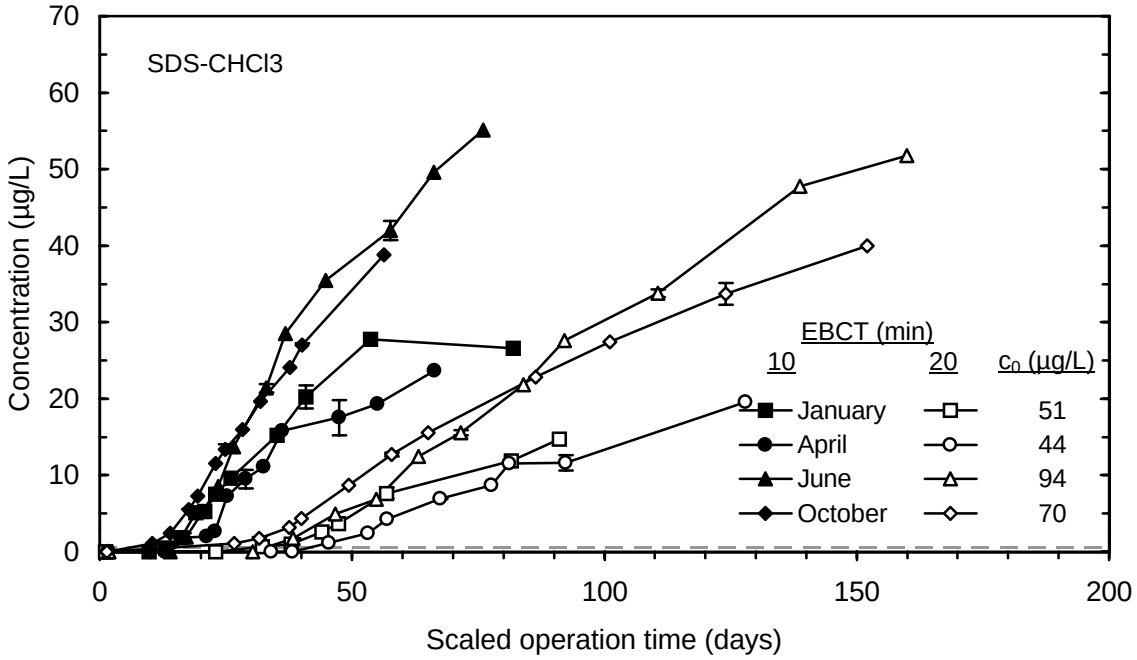


Figure 32 SDS-CHCl3 breakthrough for 10 and 20 minute EBCT contactors for each session

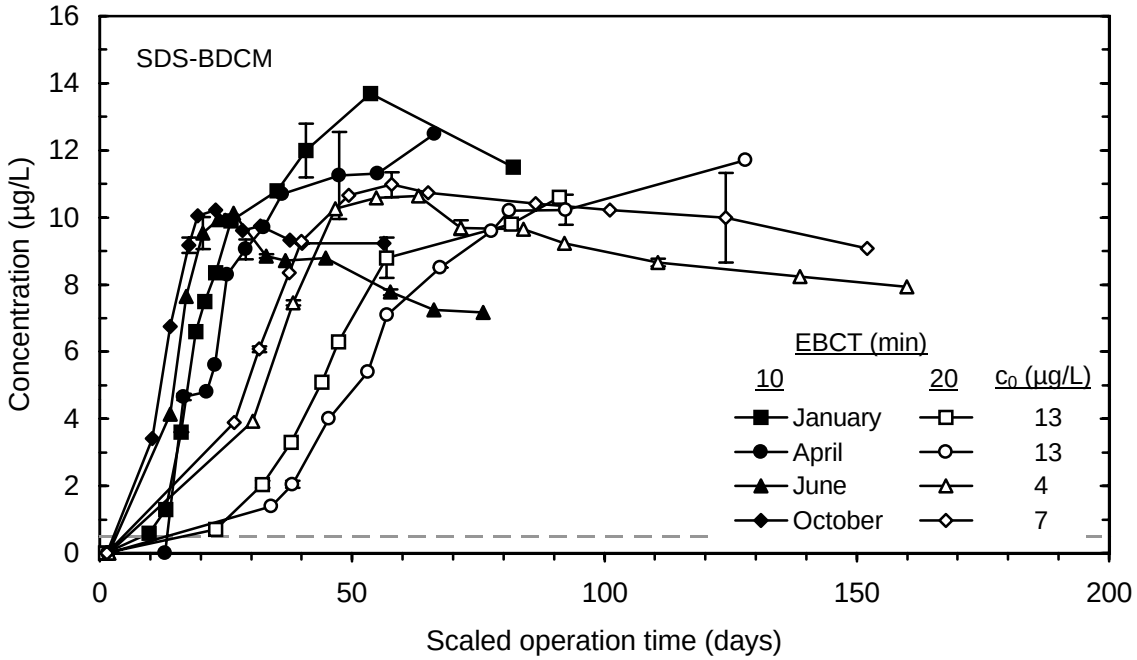


Figure 33 SDS-BDCM breakthrough for 10 and 20 minute EBCT contactors for each session

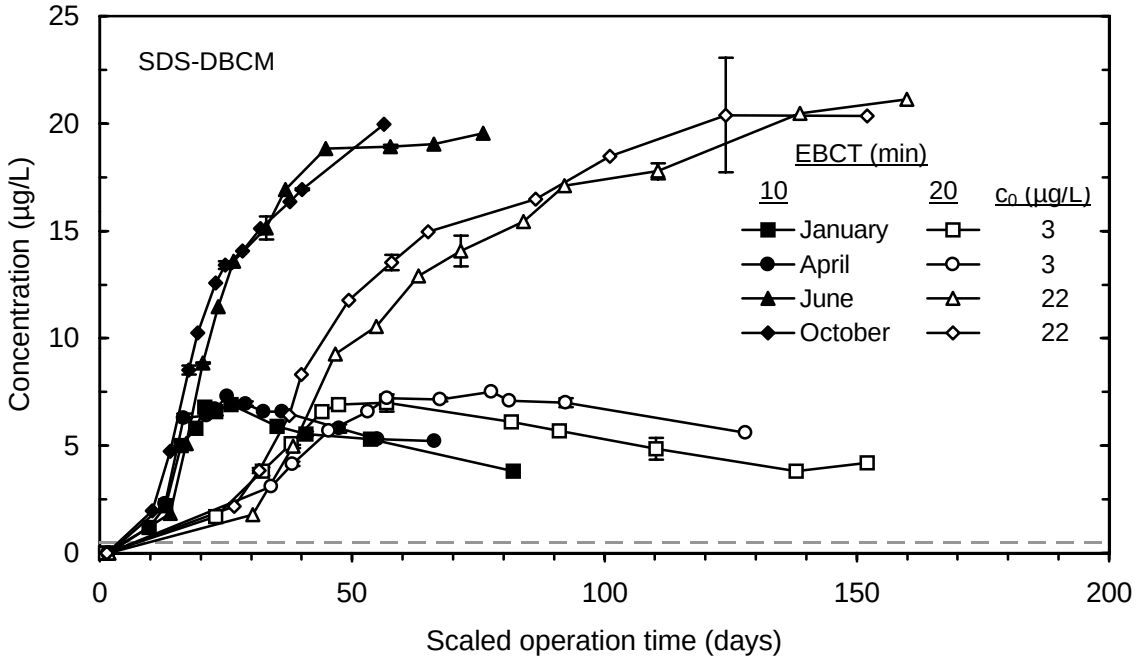


Figure 34 SDS-DBCM breakthrough for 10 and 20 minute EBCT contactors for each session

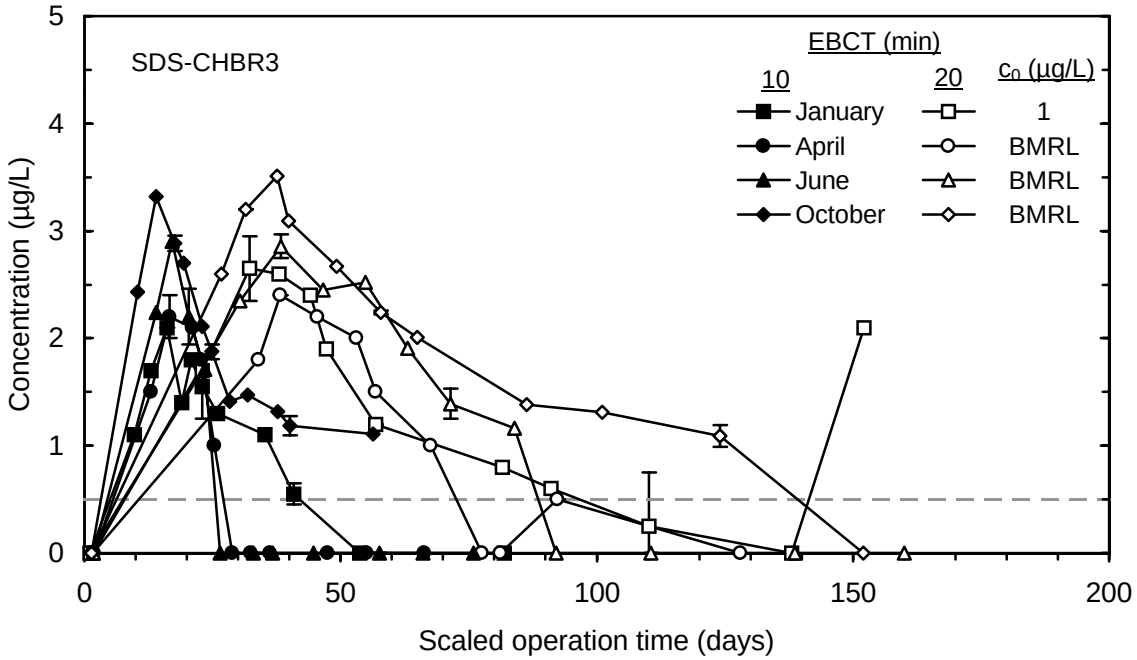


Figure 35 SDS-CHBR3 breakthrough for 10 and 20 minute EBCT contactors for each session

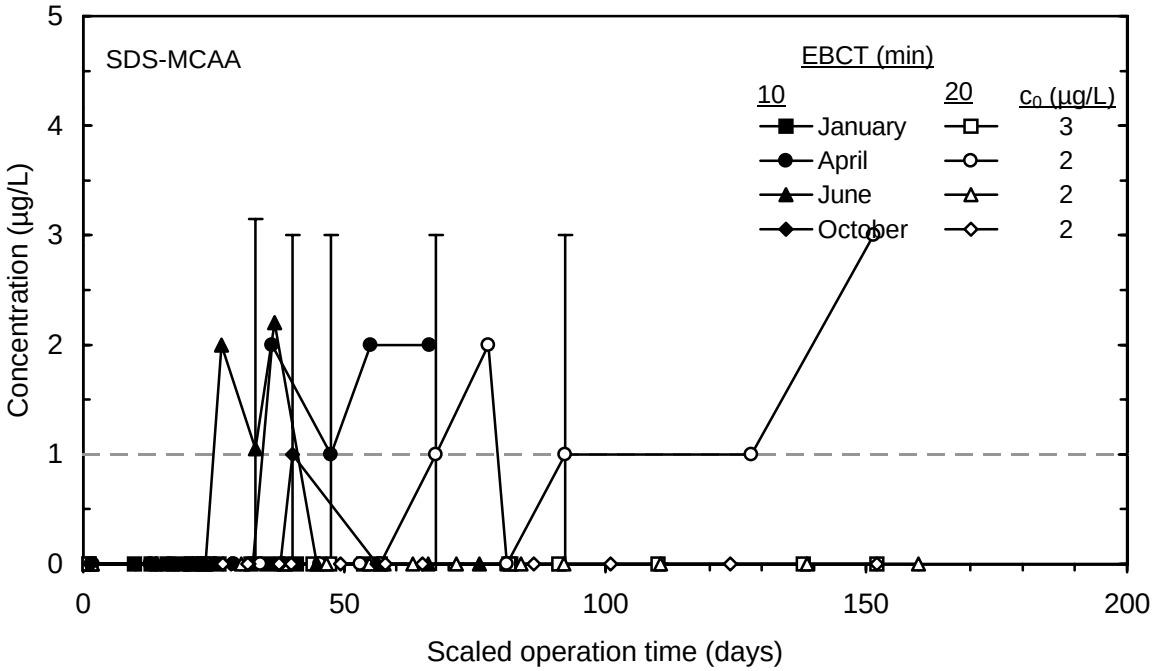


Figure 36 SDS-MCAA breakthrough for 10 and 20 minute EBCT contactors for each session

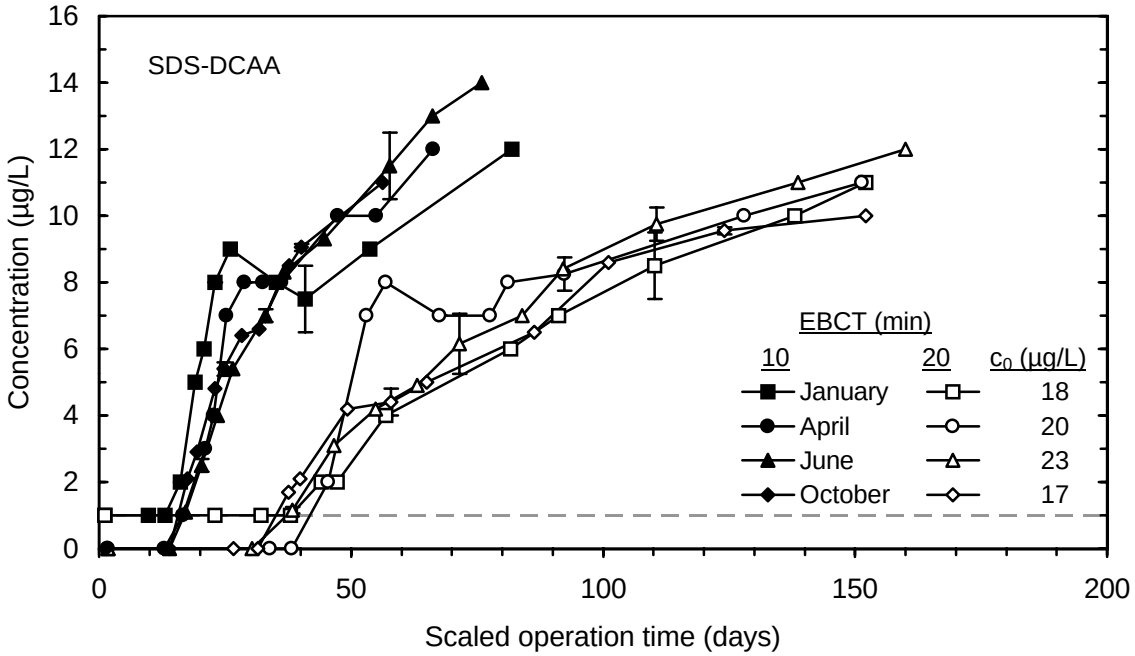


Figure 37 SDS-DCAA breakthrough for 10 and 20 minute EBCT contactors for each session

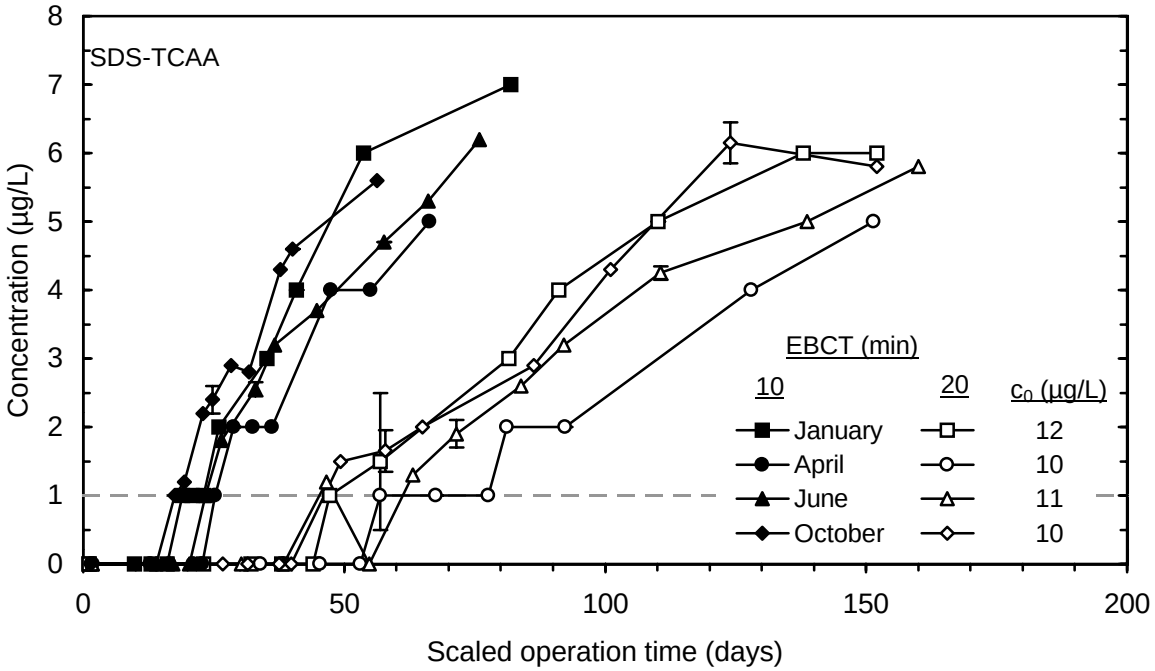


Figure 38 SDS-TCAA breakthrough for 10 and 20 minute EBCT contactors for each session

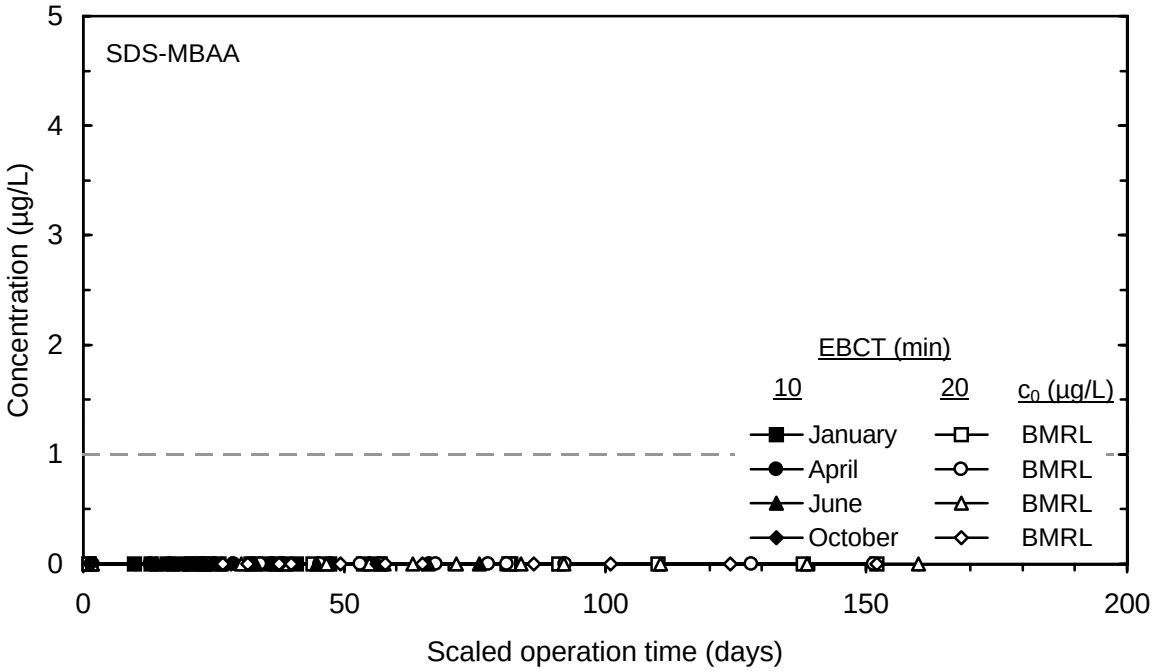


Figure 39 SDS-MBAA breakthrough for 10 and 20 minute EBCT contactors for each session

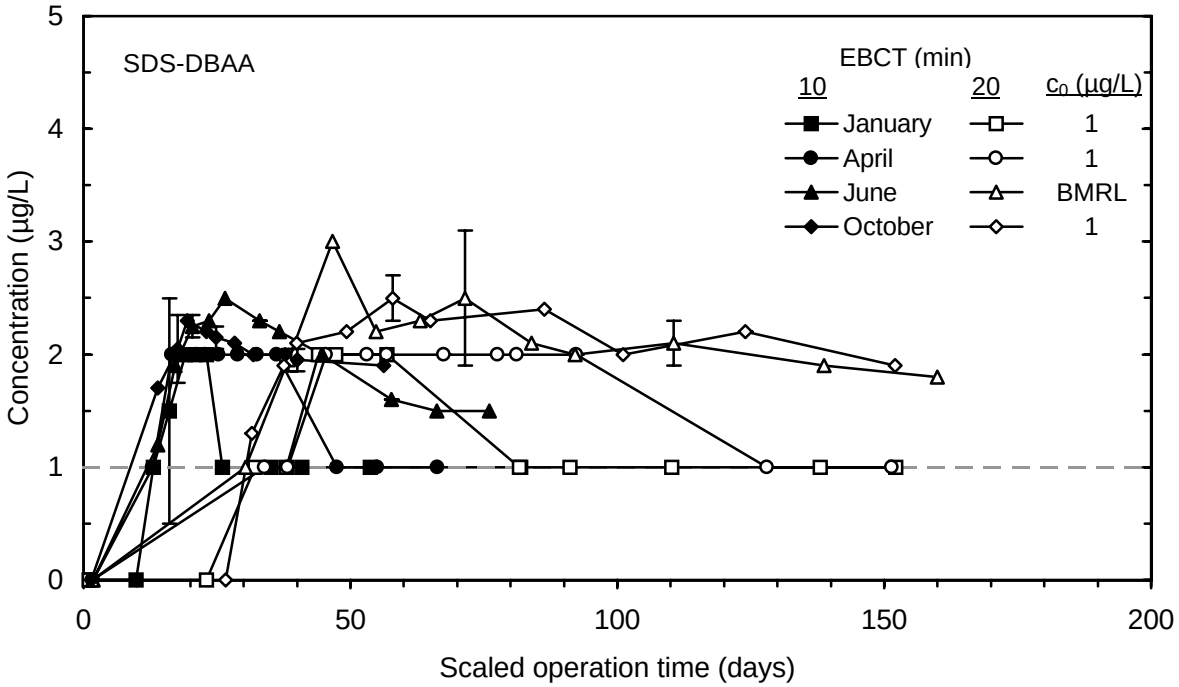


Figure 40 SDS-DBAA breakthrough for 10 and 20 minute EBCT contactors for each session

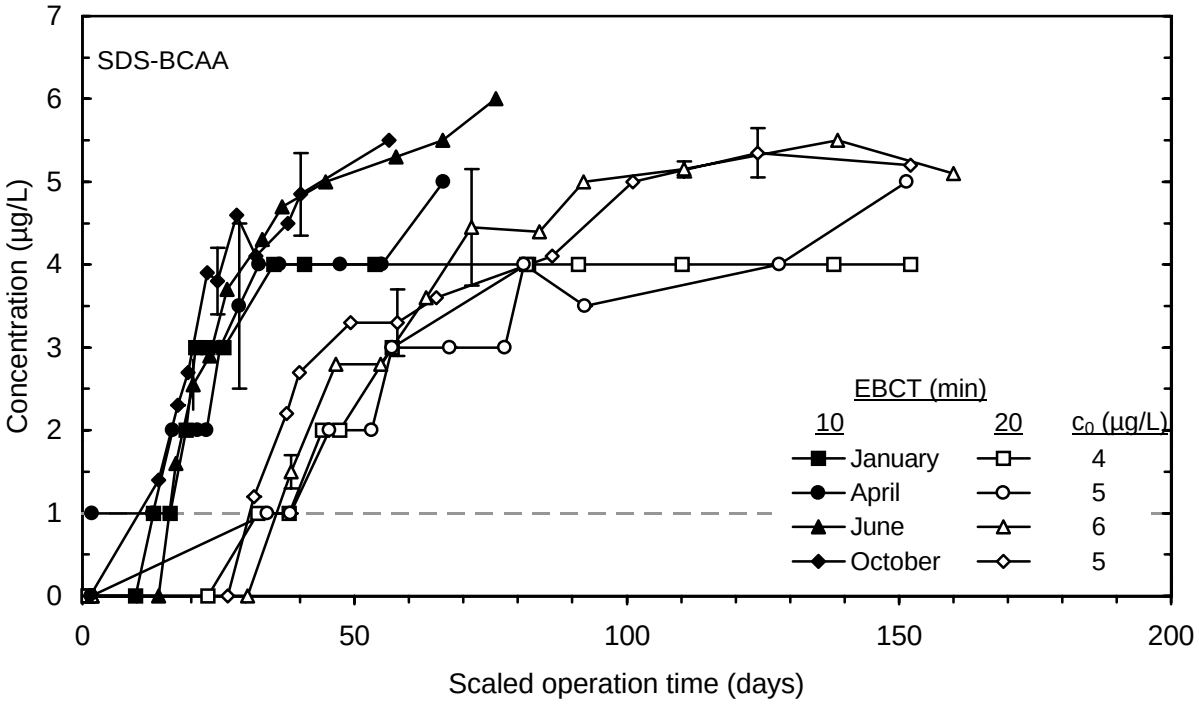


Figure 41 SDS-BCAA breakthrough for 10 and 20 minute EBCT contactors for each session

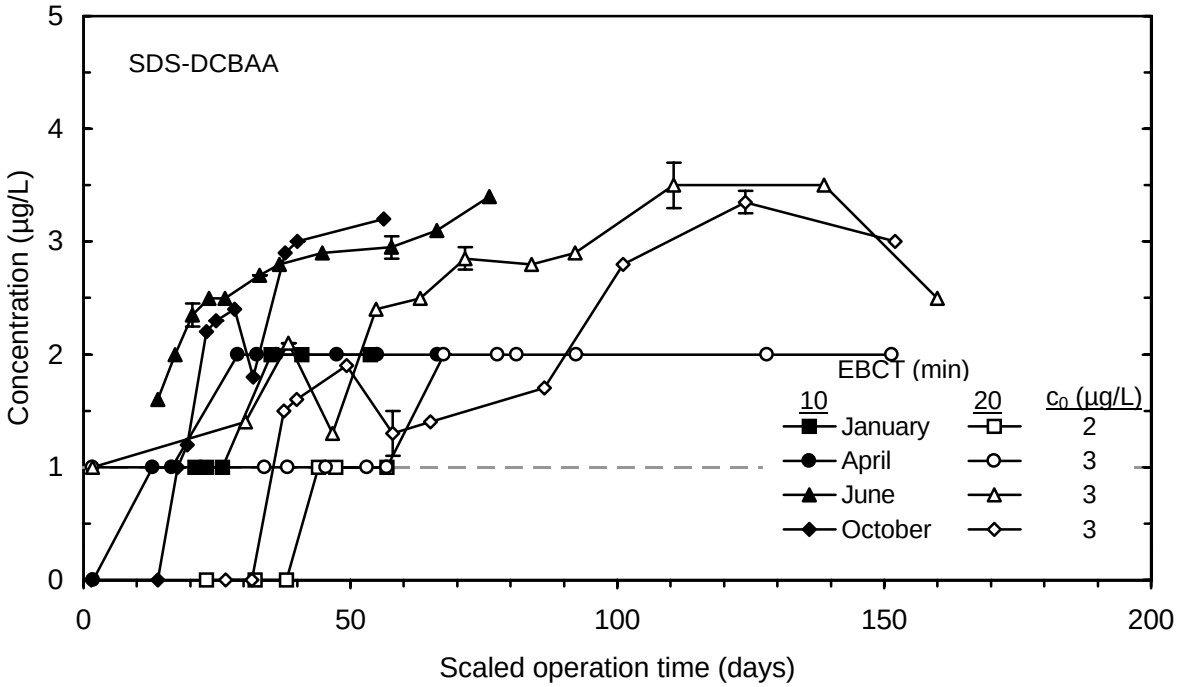


Figure 42 SDS-DCBAA breakthrough for 10 and 20 minute EBCT contactors for each session

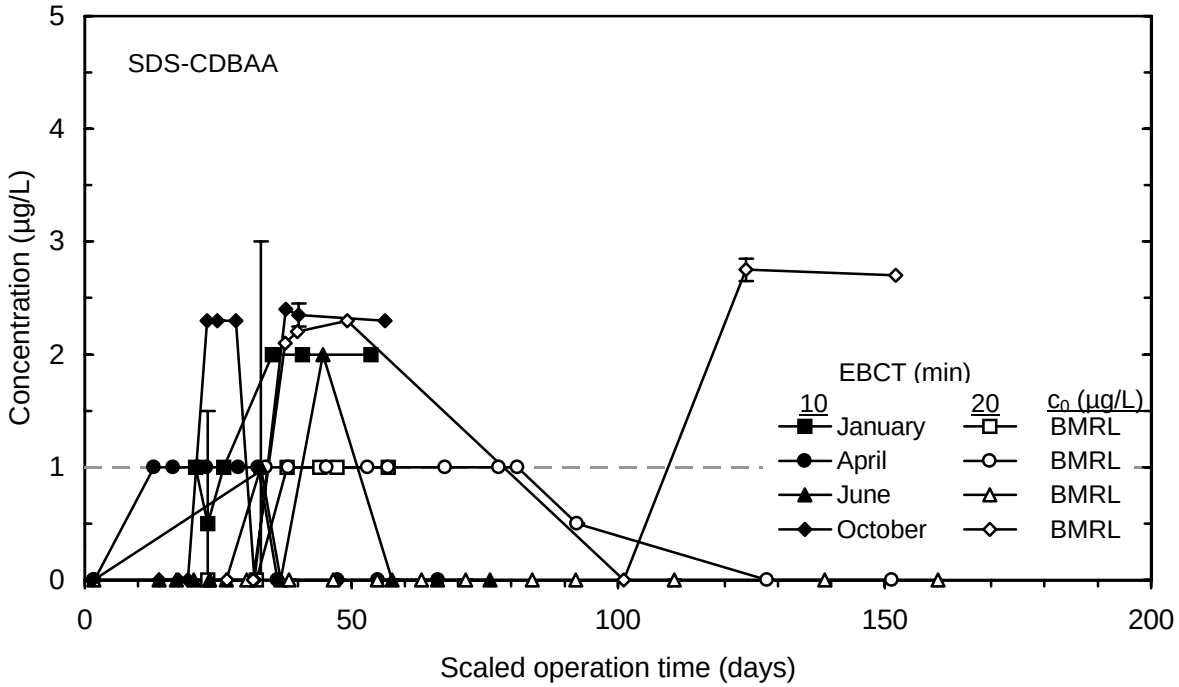


Figure 43 SDS-CDBAA breakthrough for 10 and 20 minute EBCT contactors for each session

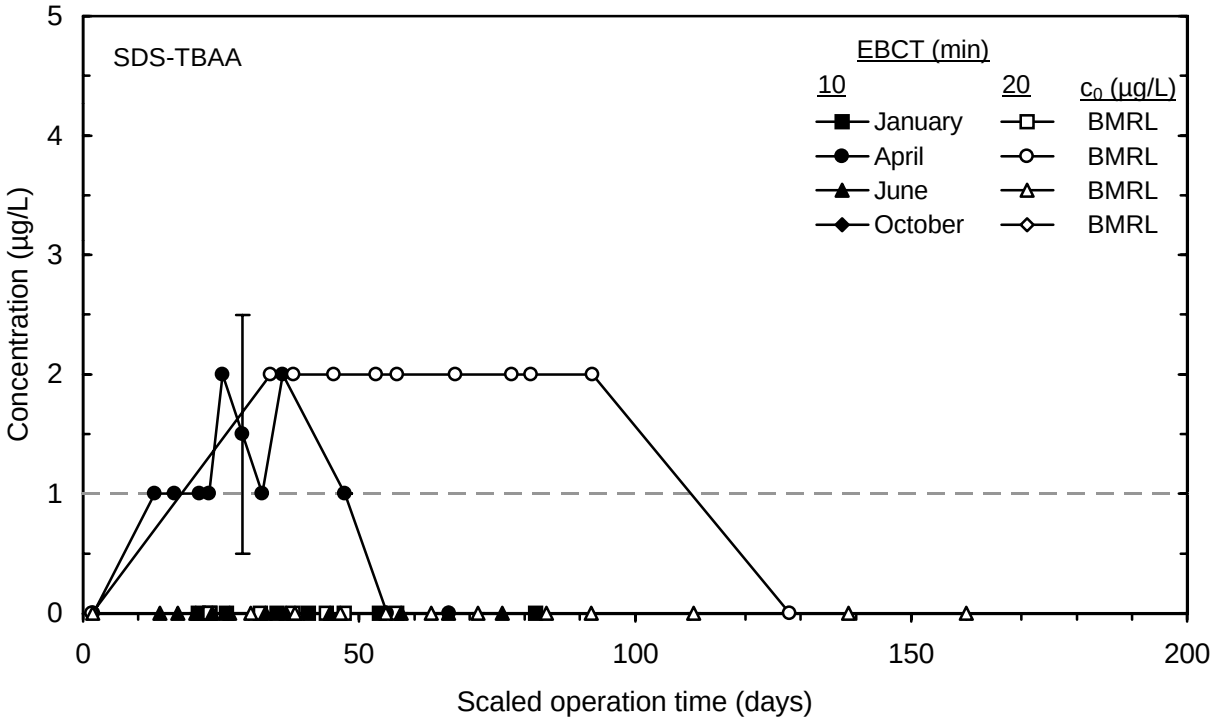


Figure 44 SDS-TBAA breakthrough for 10 and 20 minute EBCT contactors for each session

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

9 Impact of Empty-Bed Contact Time (EBCT)

During each of the four quarterly 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:

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

For the January quarter sample, Figures 45 through 52 compare the 10 minute and 20 minute EBCT contactor performance for the breakthrough of TOC, UV_{254}, SDS-THM4, SDS-HAA5, SDS-HAA6, SDS-HAA9, SDS-TOX, and SDS-CLD. The same data are presented for the April, June, and October samples in Figures 53 through 75. In general, all quarters 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. Furthermore, the difference between the two curves increased over run time.

For all parameters analyzed, the throughput in bed volumes for both EBCTs to various run time criteria are summarized in Tables 34 through 37.

The throughput comparison data are summarized in graphical format in Figures 76 through 79 for the January sample. 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 April, June, and October samples in Figures 80 through 91.

Parameter	Units	Influent concen-tration	Value	Throughput (BV) at given EBCT (min)				Throughput change from 10 to 20 min EBCT (%)	
				10		20			
				Contactor configuration					
				Single	Multiple	Single	Multiple	Single contactor	Multiple contactors
TOC	(mg/L)	3.9	2.0	3,800	10,460	5,750	13,030	51	25
			1.0	2,300	4,220	3,010	5,560	31	32
			1.9†	3,660	9,700	5,460	12,400	49	28
UV-254	(1/cm)	0.079	0.040	5,950	13,840	7,620	17,650	28	28
			0.020	3,080	6,240	3,750	8,100	22	30
			0.039†	5,830	13,480	7,510	17,240	29	28
SDS-THM4	(µg/L)	66	80	*	*	*	*		
			64	*	*	*	*		
			32	4,820	10,400	*	13,340		28
SDS-HAA5	(µg/L)	34	48	*	*	*	*		
			24	*	*	*	*		
SDS-HAA6	(µg/L)	38	48	*	*	*	*		
			24	*	28,890	*	*		
SDS-HAA9	(µg/L)	39	48	*	*	*	*		
			24	*	19,600	*	*		
SDS-TOX	(µg Cl^-/L)	212	120	7,140	18,400	9,040	23,210	27	26
			70	3,720	8,180	6,180	11,400	66	39

†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 34 Summary of throughput to selected GAC effluent criteria during session 1, January

Parameter	Units	Influent concen-tration	Value	Throughput (BV) at given EBCT (min)				Throughput change from 10 to 20 min EBCT (%)	
				10		20			
				Contactor configuration				Single contactor	Multiple contactors
				Single	Multiple	Single	Multiple		
TOC	(mg/L)	3.2	2.0	8,110	18,430	9,080	21,710	12	18
			1.0	3,420	6,570	3,970	7,960	16	21
			1.6†	5,190	12,230	5,970	14,230	15	16
UV-254	(1/cm)	0.066	0.040	*	23,470	*	*		
			0.020	4,020	8,650	5,660	10,900	41	26
			0.033†	6,860	15,680	8,840	19,250	29	23
SDS-THM4	(µg/L)	60	80	*	*	*	*		
			64	*	*	*	*		
			32	5,110	13,440	7,560	16,120	48	20
SDS-HAA5	(µg/L)	33	48	*	*	*	*		
			24	*	*	*	*		
SDS-HAA6	(µg/L)	38	48	*	*	*	*		
			24	9,140	22,970	10,560	*	16	
SDS-HAA9	(µg/L)	41	48	*	*	*	*		
			24	8,330	16,960	9,780	19,680	17	16
SDS-TOX	(µg Cl^-/L)	225	120	9,450	19,650	10,860	23,420	15	19
			70	4,300	9,750	5,800	12,070	35	24

†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 35 Summary of throughput to selected GAC effluent criteria during session 2, April

Parameter	Units	Influent concen-tration	Value	Throughput (BV) at given EBCT (min)				Throughput change from 10 to 20 min EBCT (%)	
				10		20			
				Contactor configuration				Single contactor	Multiple contactors
				Single	Multiple	Single	Multiple		
TOC	(mg/L)	3.4	2.0	6,480	16,310	7,630	18,960	18	16
			1.0	2,970	5,990	3,520	7,090	19	18
			1.7†	5,000	12,220	6,280	14,450	26	18
UV-254	(1/cm)	0.066	0.040	10,280	24,810	*	*		
			0.020	4,320	8,960	5,250	10,990	22	23
			0.033†	7,560	16,860	9,500	19,850	26	18
SDS-THM4	(µg/L)	120	80	10,510	*	11,220	*	7	
			64	6,730	16,340	8,430	18,290	25	12
			32	3,400	6,820	4,070	8,160	20	20
SDS-HAA5	(µg/L)	36	48	*	*	*	*		
			24	*	*	*	*		
SDS-HAA6	(µg/L)	42	48	*	*	*	*		
			24	8,800	20,040	10,690	23,840	21	19
SDS-HAA9	(µg/L)	45	48	*	*	*	*		
			24	5,750	15,110	7,650	18,560	33	23
SDS-TOX	(µg Cl^-/L)	271	120	6,420	14,630	7,580	17,360	18	19
			70	3,880	7,850	4,860	9,700	25	24

†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 36 Summary of throughput to selected GAC effluent criteria during session 3, June

Parameter	Units	Influent concen-tration	Value	Throughput (BV) at given EBCT (min)				Throughput change from 10 to 20 min EBCT (%)	
				10		20			
				Contactor configuration					
				Single	Multiple	Single	Multiple	Single contactor	Multiple contactors
TOC	(mg/L)	3.4	2.0	5,480	12,940	7,200	17,200	31	33
			1.0	2,600	5,180	2,830	6,040	9	17
			1.7†	4,200	10,180	5,180	12,340	23	21
UV-254	(1/cm)	0.063	0.040	*	*	*	*		
			0.020	3,550	7,870	4,570	9,980	29	27
			0.031†	5,820	13,180	8,240	17,800	42	35
SDS-THM4	(µg/L)	98	80	*	*	*	*		
			64	7,290	19,200	8,680	23,670	19	23
			32	2,940	6,390	3,410	7,330	16	15
SDS-HAA5	(µg/L)	30	48	*	*	*	*		
			24	*	*	*	*		
SDS-HAA6	(µg/L)	35	48	*	*	*	*		
			24	*	*	*	*		
SDS-HAA9	(µg/L)	#DIV/0!	48	#N/A	*	#N/A	*	#N/A	
			24	#N/A	14,030	#N/A	19,230	#N/A	37
SDS-TOX	(µg Cl^-/L)	232	120	5,650	12,910	8,150	18,300	44	42
			70	3,420	7,060	4,450	9,260	30	31

†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 37 Summary of throughput to selected GAC effluent criteria during session 4, October

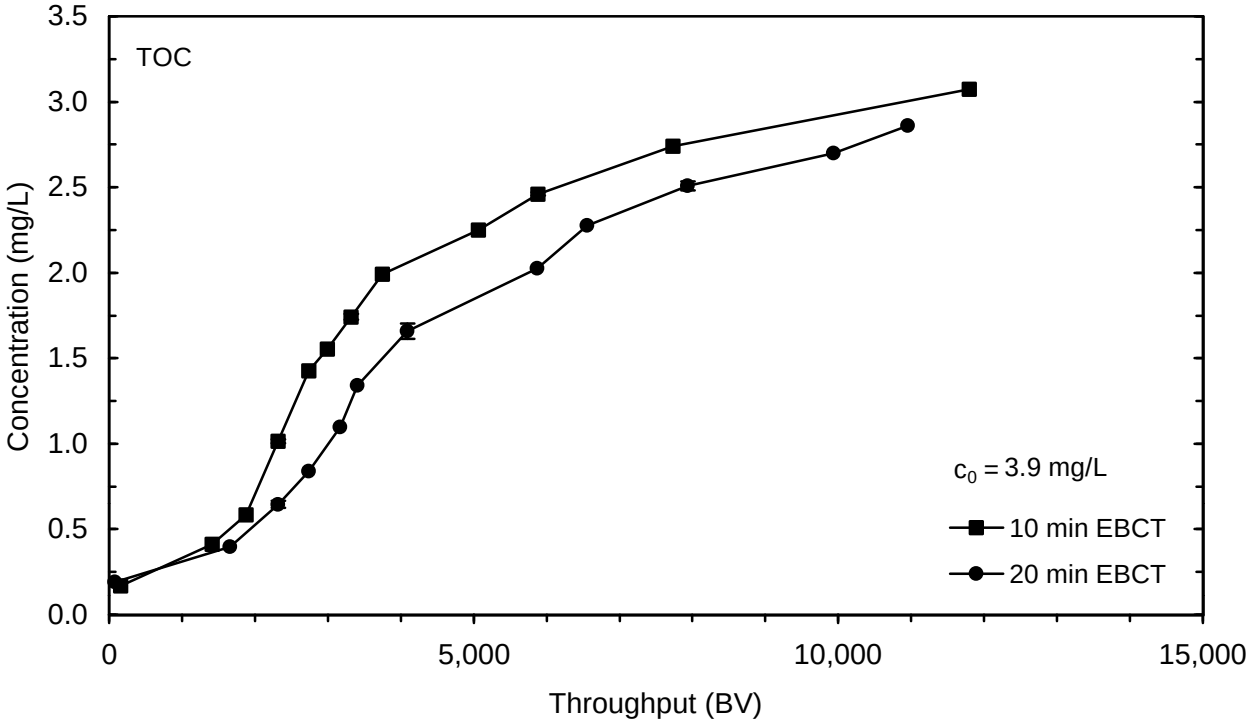


Figure 45 TOC breakthrough for 10 and 20 minute EBCT contactors during session 1 (January), plotted as throughput in bed volumes treated

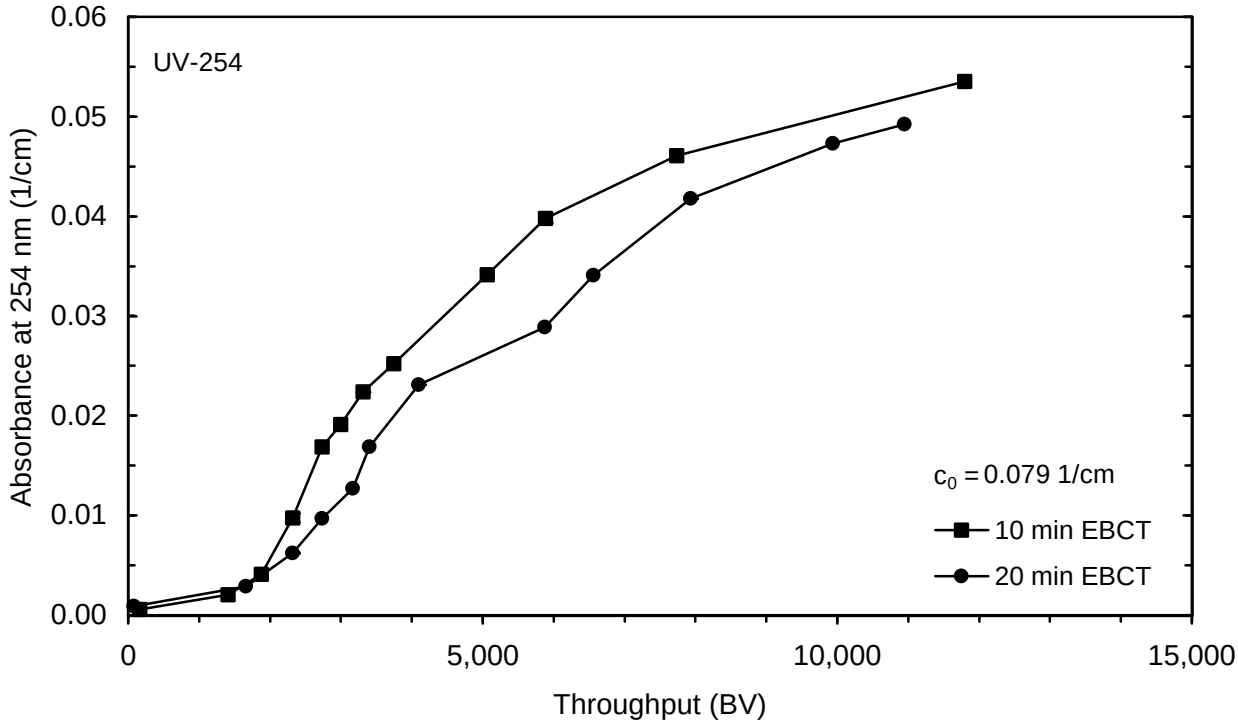


Figure 46 UV-254 breakthrough for 10 and 20 minute EBCT contactors during session 1 (January), plotted as throughput in bed volumes treated

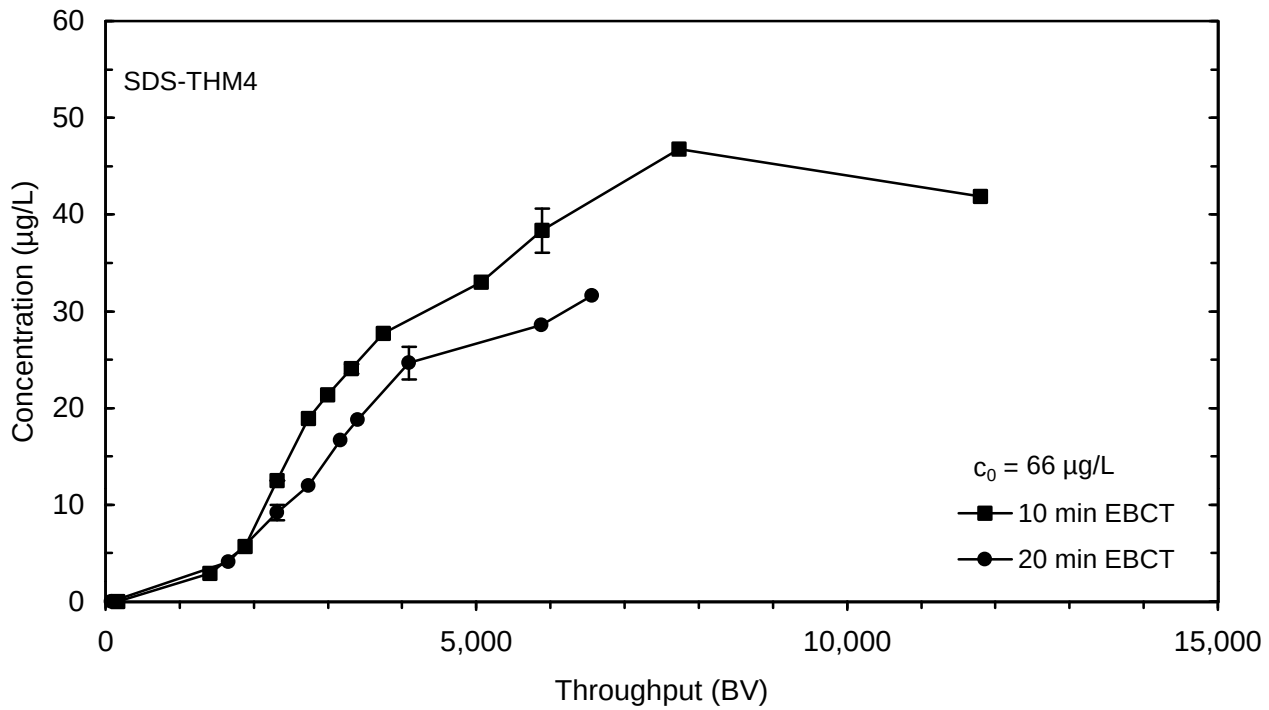


Figure 47 SDS-THM4 breakthrough for 10 and 20 minute EBCT contactors during session 1 (January), plotted as throughput in bed volumes treated

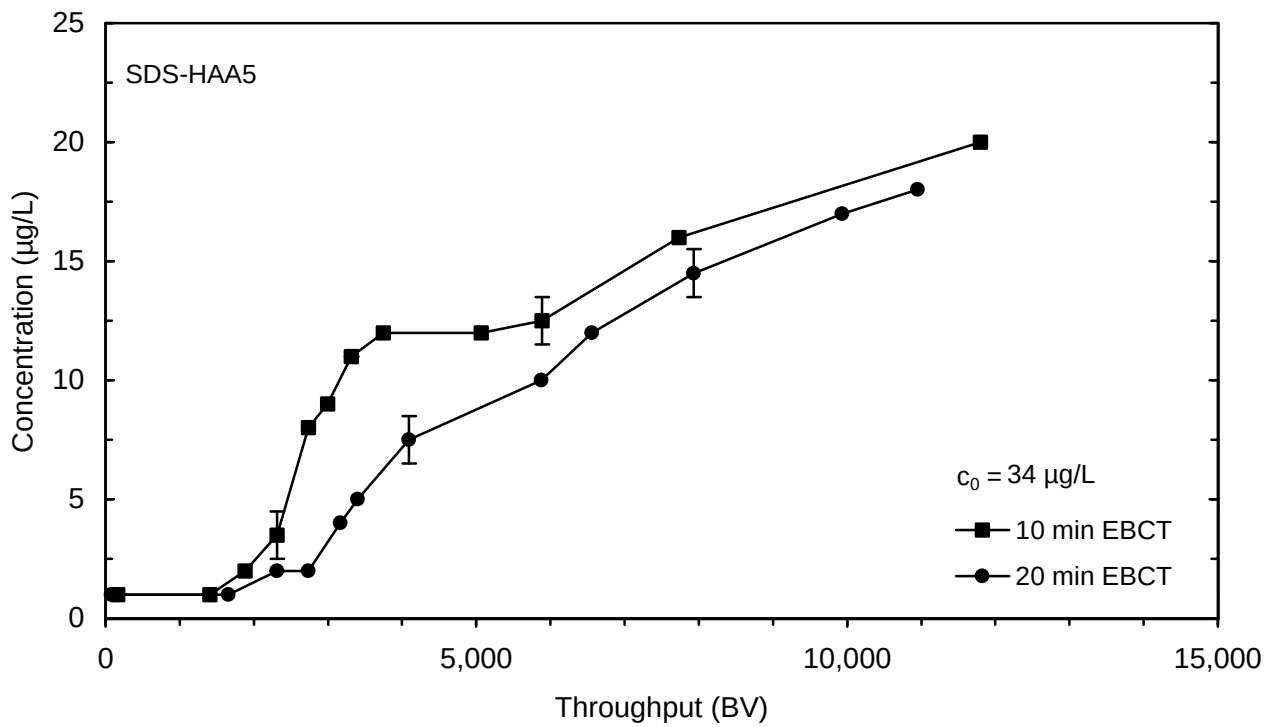


Figure 48 SDS-HAA5 breakthrough for 10 and 20 minute EBCT contactors during session 1 (January), plotted as throughput in bed volumes treated

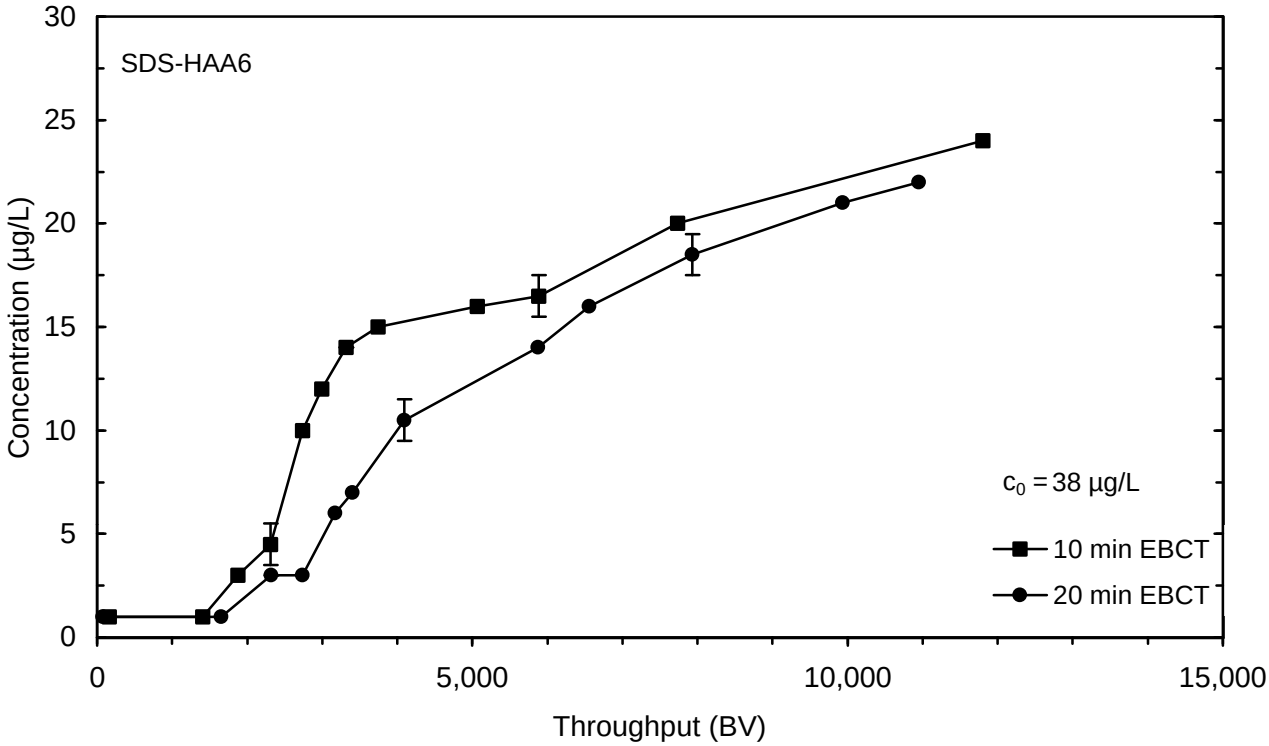


Figure 49 SDS-HAA6 breakthrough for 10 and 20 minute EBCT contactors during session 1 (January), plotted as throughput in bed volumes treated

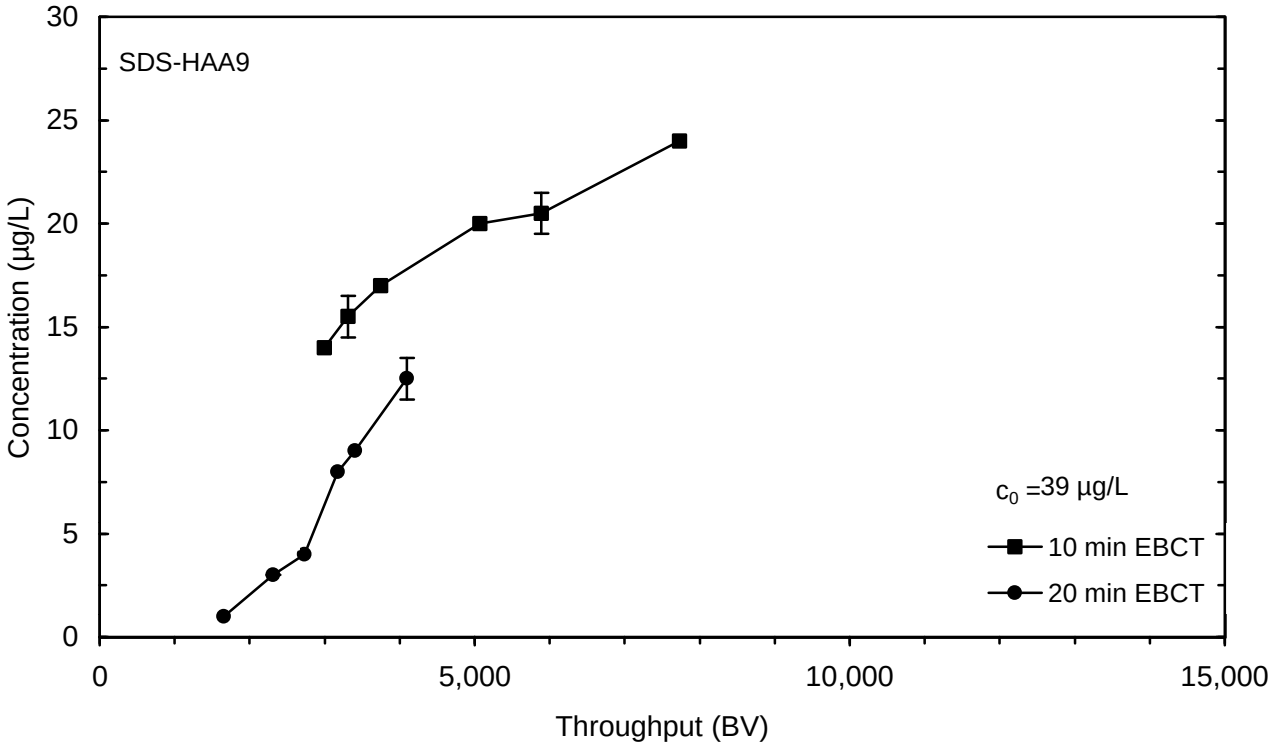


Figure 50 SDS-HAA9 breakthrough for 10 and 20 minute EBCT contactors during session 1 (January), plotted as throughput in bed volumes treated

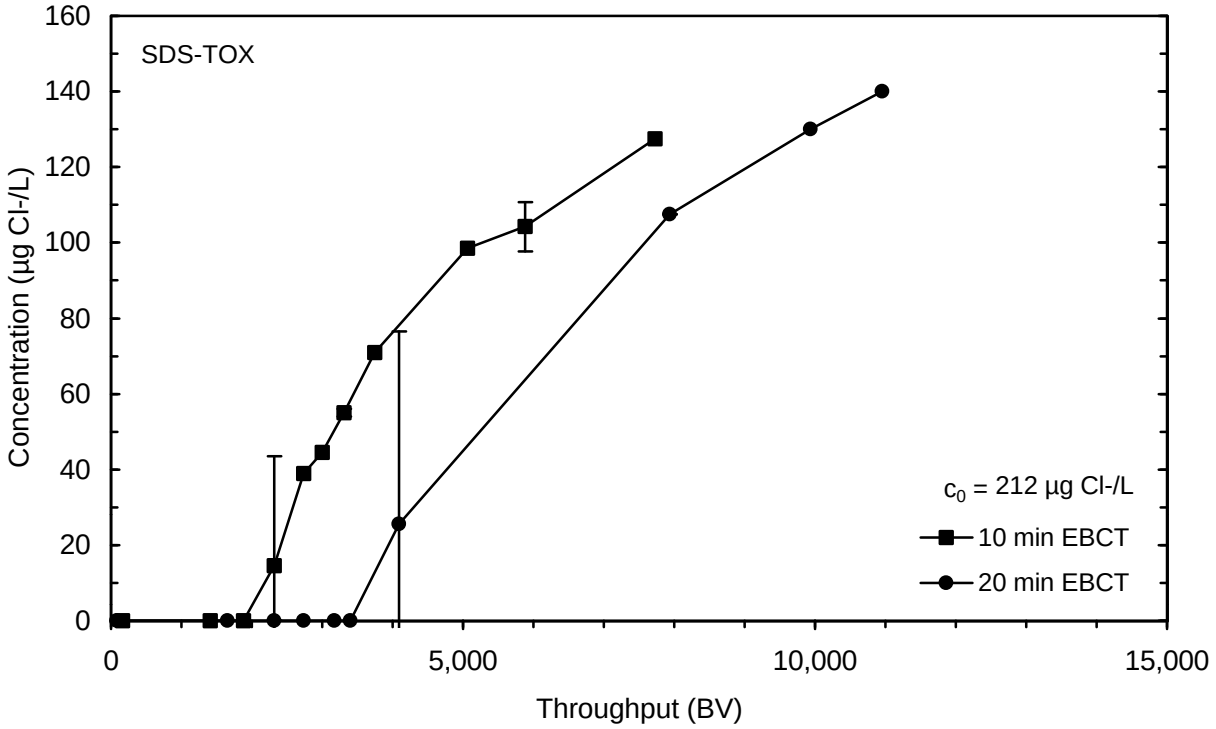


Figure 51 SDS-TOX breakthrough for 10 and 20 minute EBCT contactors during session 1 (January), plotted as throughput in bed volumes treated

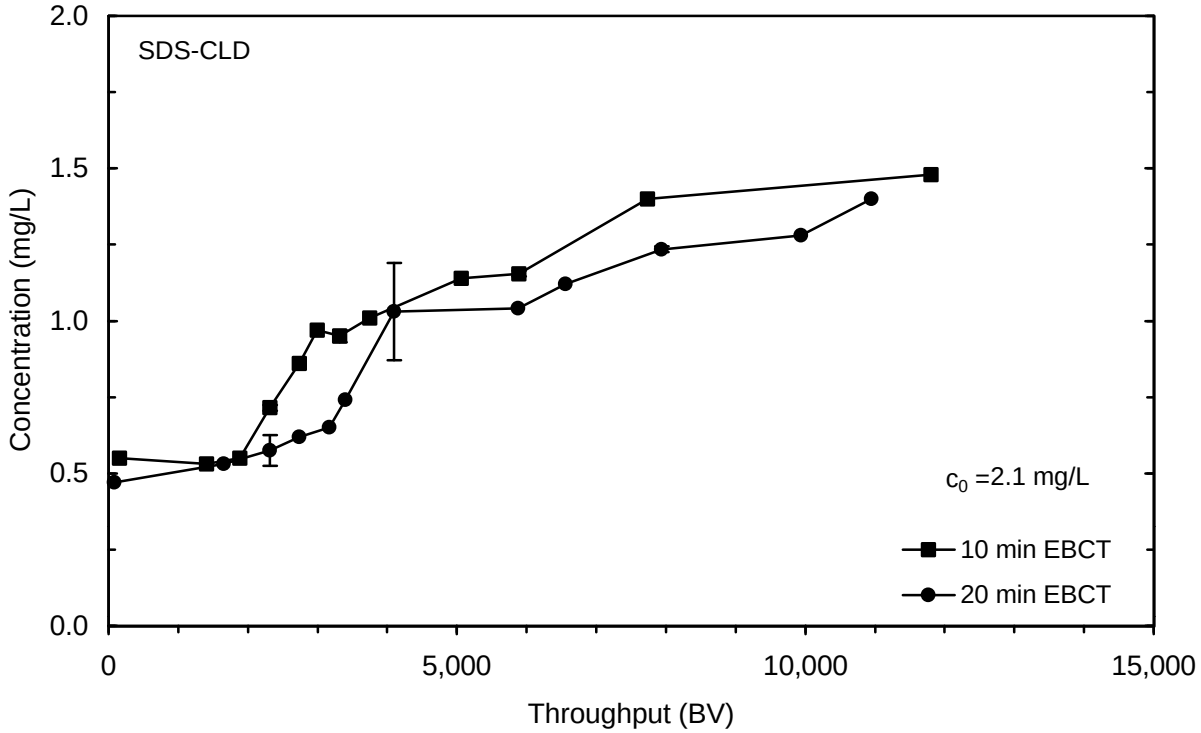


Figure 52 SDS-CLD breakthrough for 10 and 20 minute EBCT contactors during session 1 (January), plotted as throughput in bed volumes treated

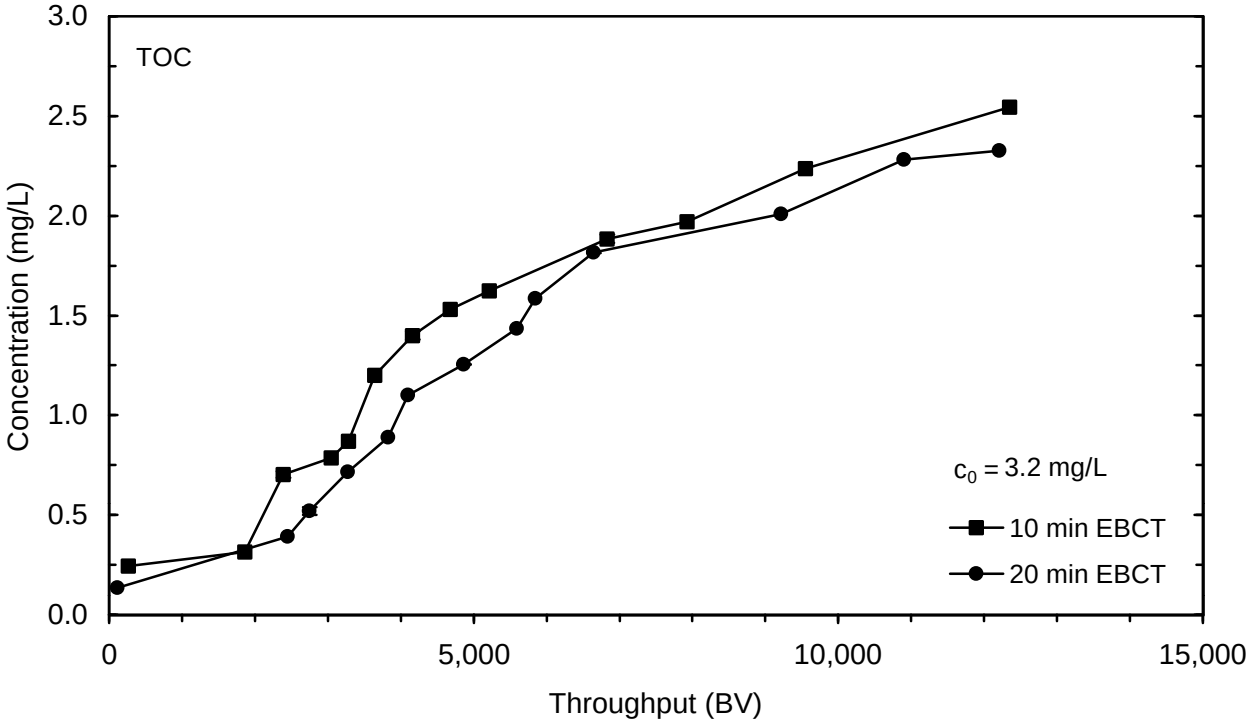


Figure 53 TOC breakthrough for 10 and 20 minute EBCT contactors during session 2 (April), plotted as throughput in bed volumes treated

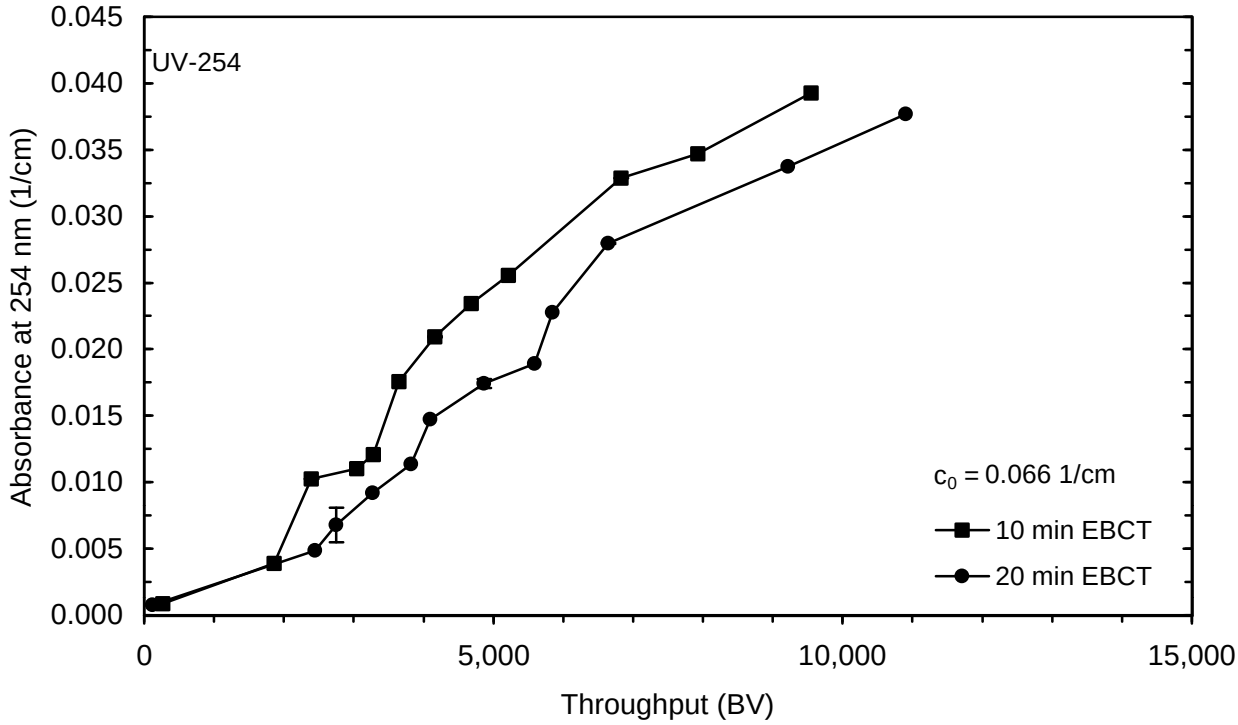


Figure 54 UV-254 breakthrough for 10 and 20 minute EBCT contactors during session 2 (April), plotted as throughput in bed volumes treated

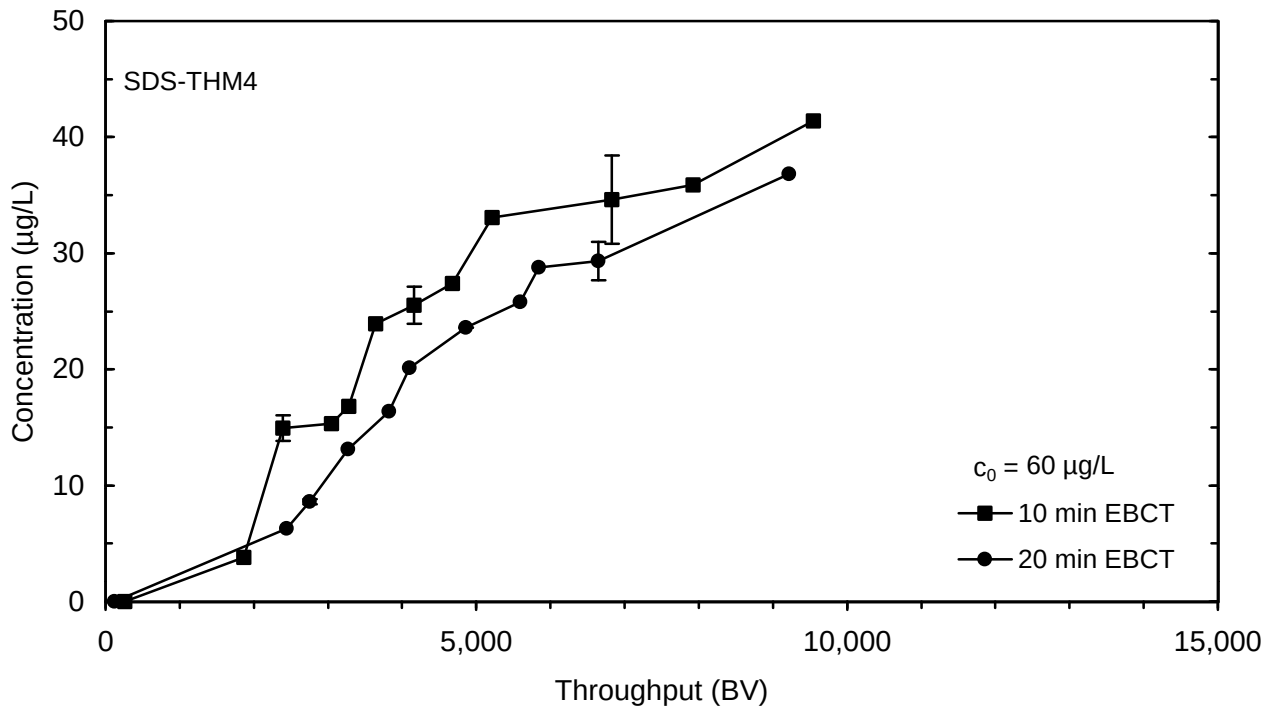


Figure 55 SDS-THM4 breakthrough for 10 and 20 minute EBCT contactors during session 2 (April), plotted as throughput in bed volumes treated

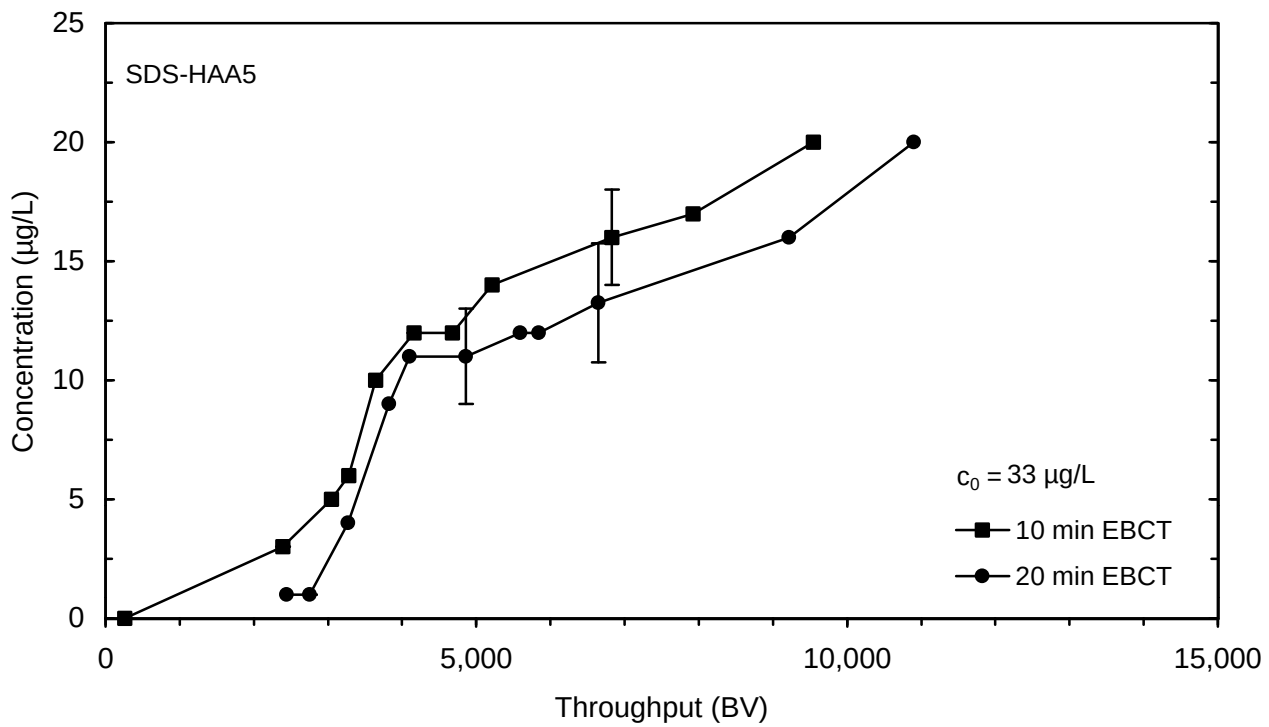


Figure 56 SDS-HAA5 breakthrough for 10 and 20 minute EBCT contactors during session 2 (April), plotted as throughput in bed volumes treated

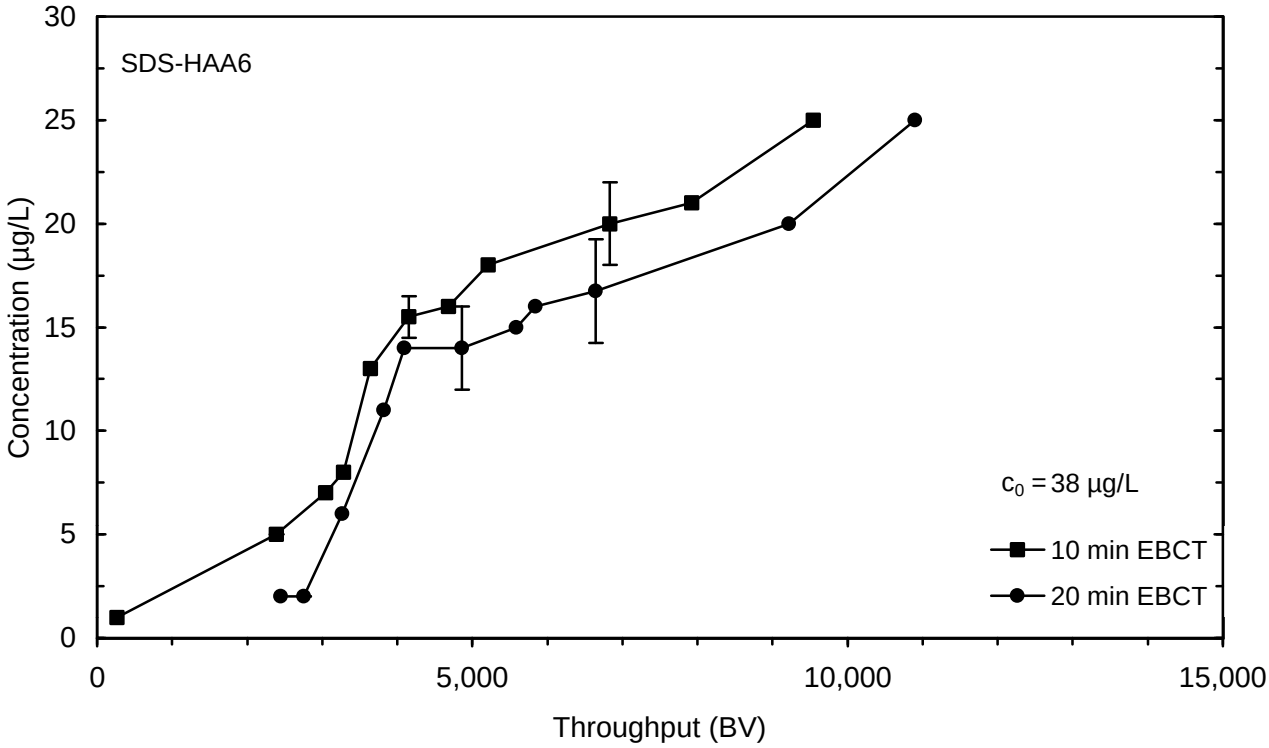


Figure 57 SDS-HAA6 breakthrough for 10 and 20 minute EBCT contactors during session 2 (April), plotted as throughput in bed volumes treated

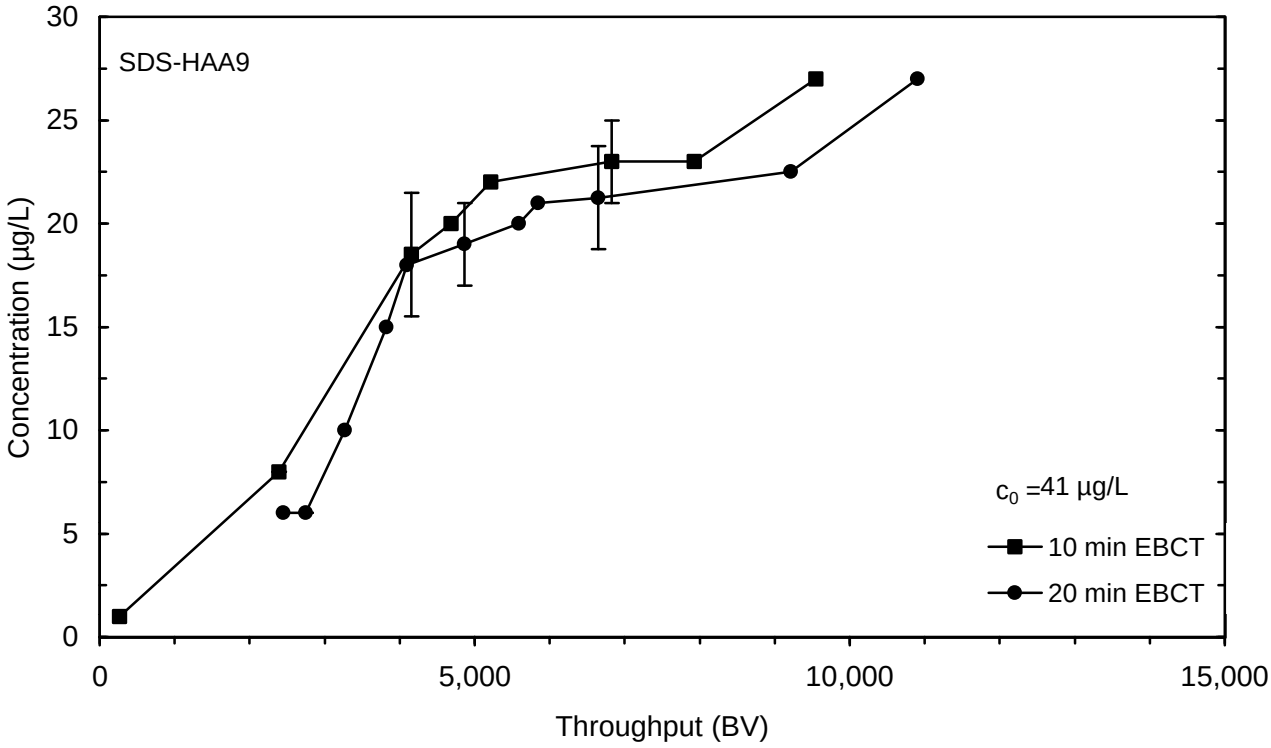


Figure 58 SDS-HAA9 breakthrough for 10 and 20 minute EBCT contactors during session 2 (April), plotted as throughput in bed volumes treated

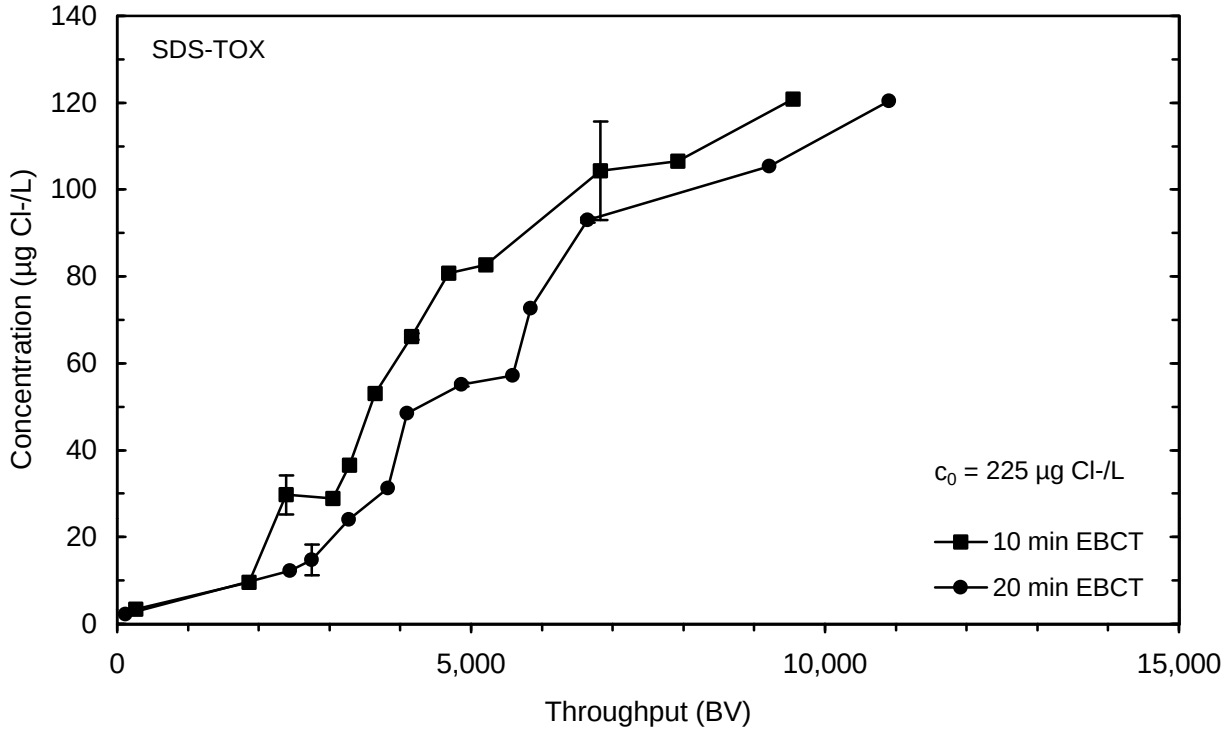


Figure 59 SDS-TOX breakthrough for 10 and 20 minute EBCT contactors during session 2 (April), plotted as throughput in bed volumes treated

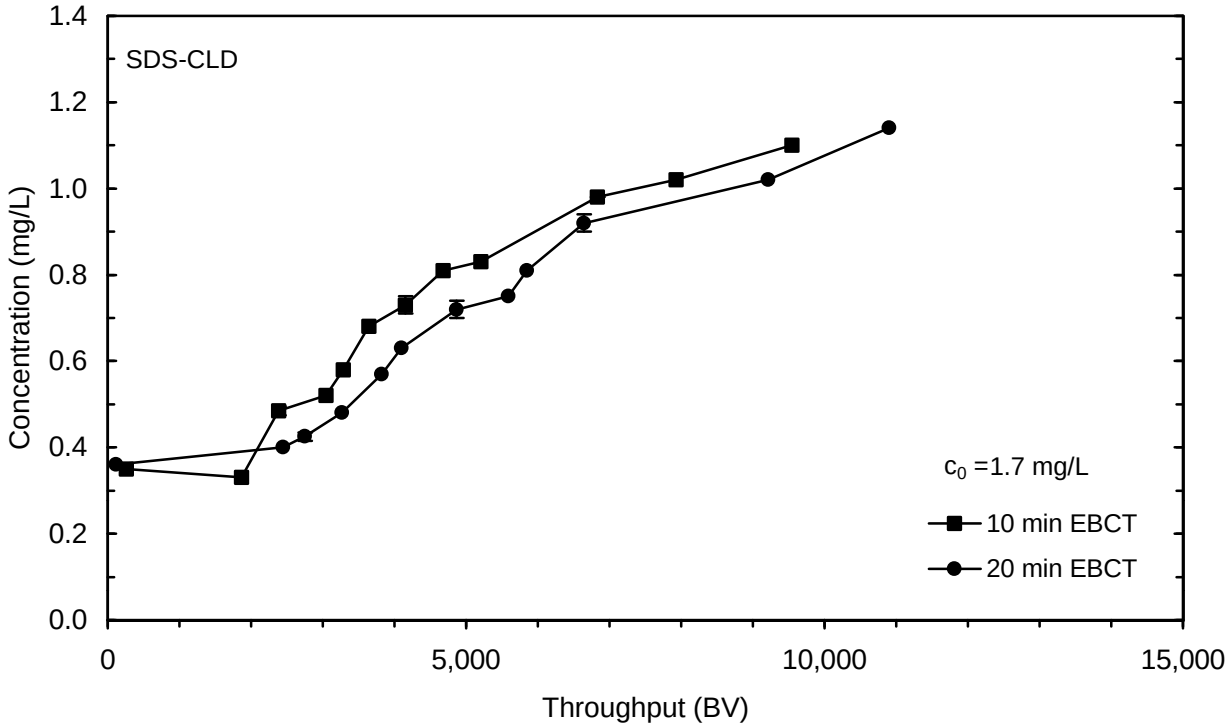


Figure 60 SDS-CLD breakthrough for 10 and 20 minute EBCT contactors during session 2 (April), plotted as throughput in bed volumes treated

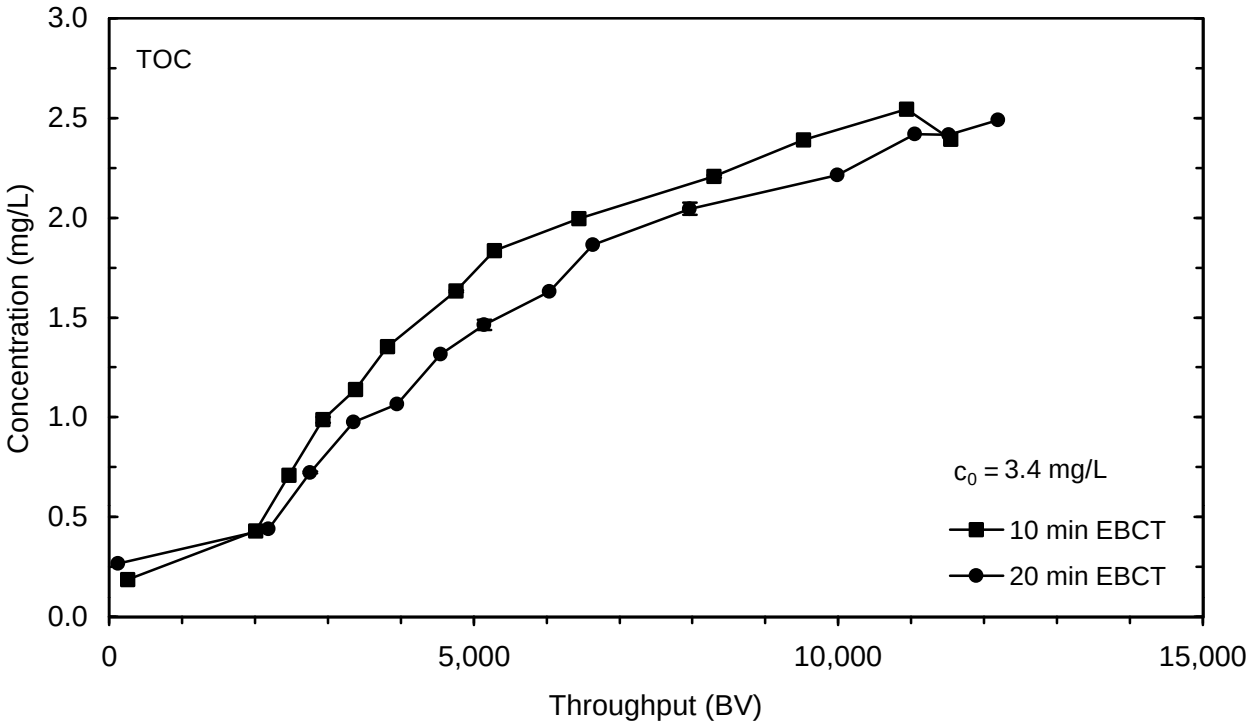


Figure 61 TOC breakthrough for 10 and 20 minute EBCT contactors during session 3 (June), plotted as throughput in bed volumes treated

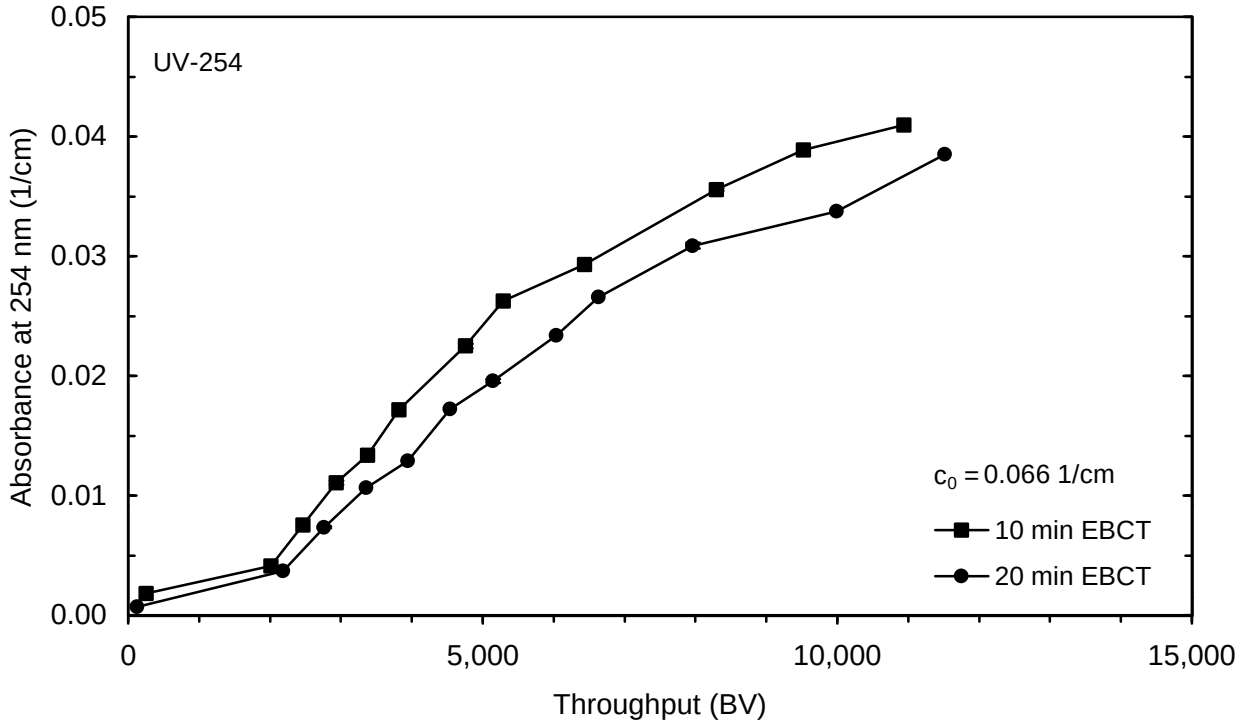


Figure 62 UV-254 breakthrough for 10 and 20 minute EBCT contactors during session 3 (June), plotted as throughput in bed volumes treated

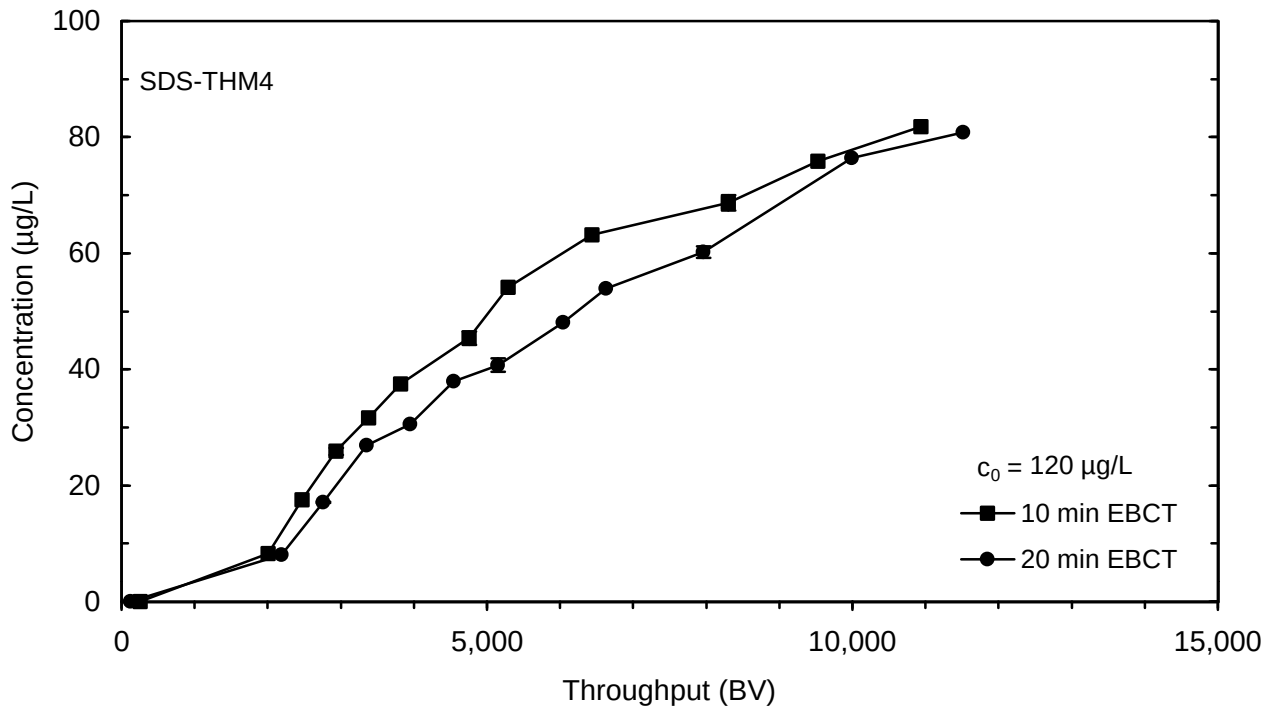


Figure 63 SDS-THM4 breakthrough for 10 and 20 minute EBCT contactors during session 3 (June), plotted as throughput in bed volumes treated

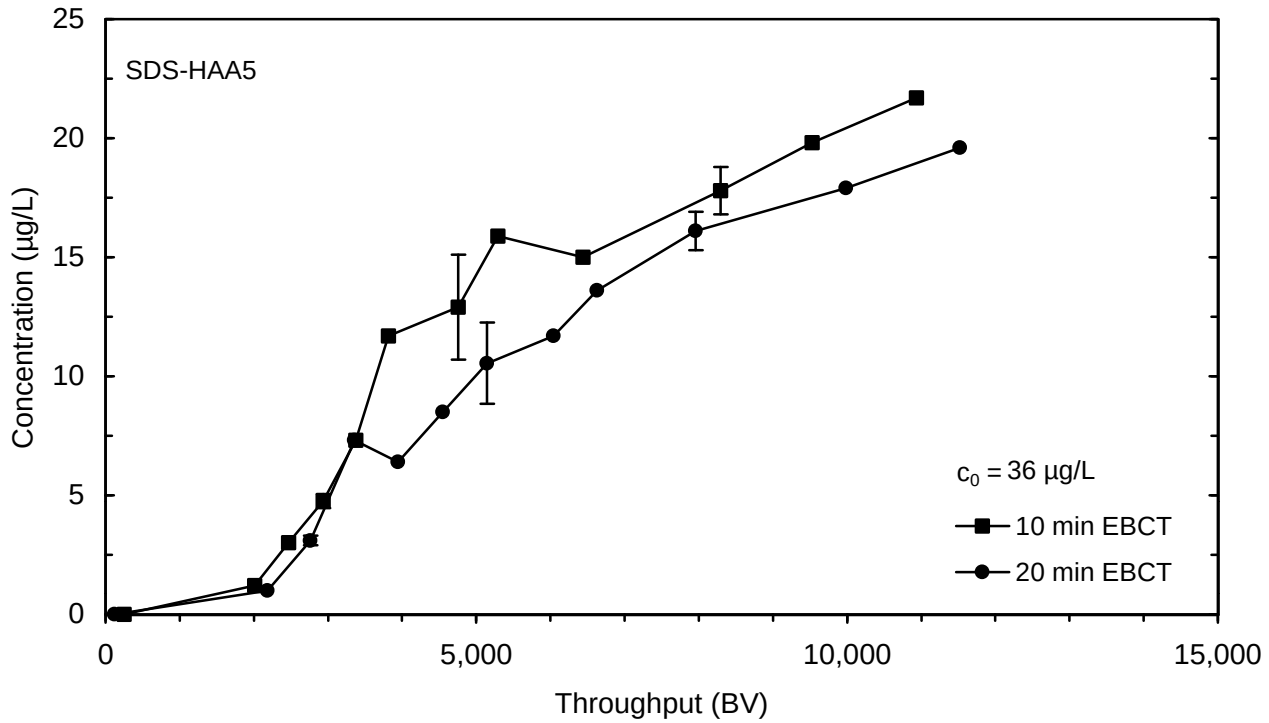


Figure 64 SDS-HAA5 breakthrough for 10 and 20 minute EBCT contactors during session 3 (June), plotted as throughput in bed volumes treated

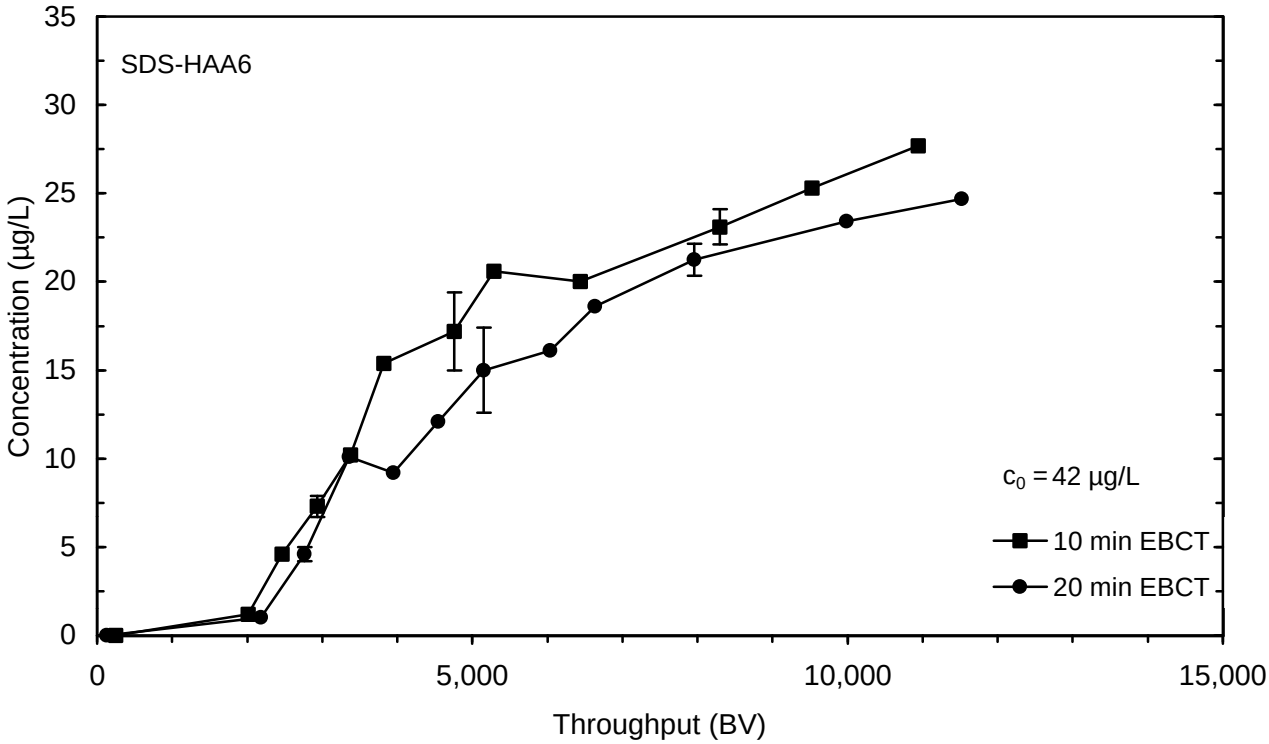


Figure 65 SDS-HAA6 breakthrough for 10 and 20 minute EBCT contactors during session 3 (June), plotted as throughput in bed volumes treated

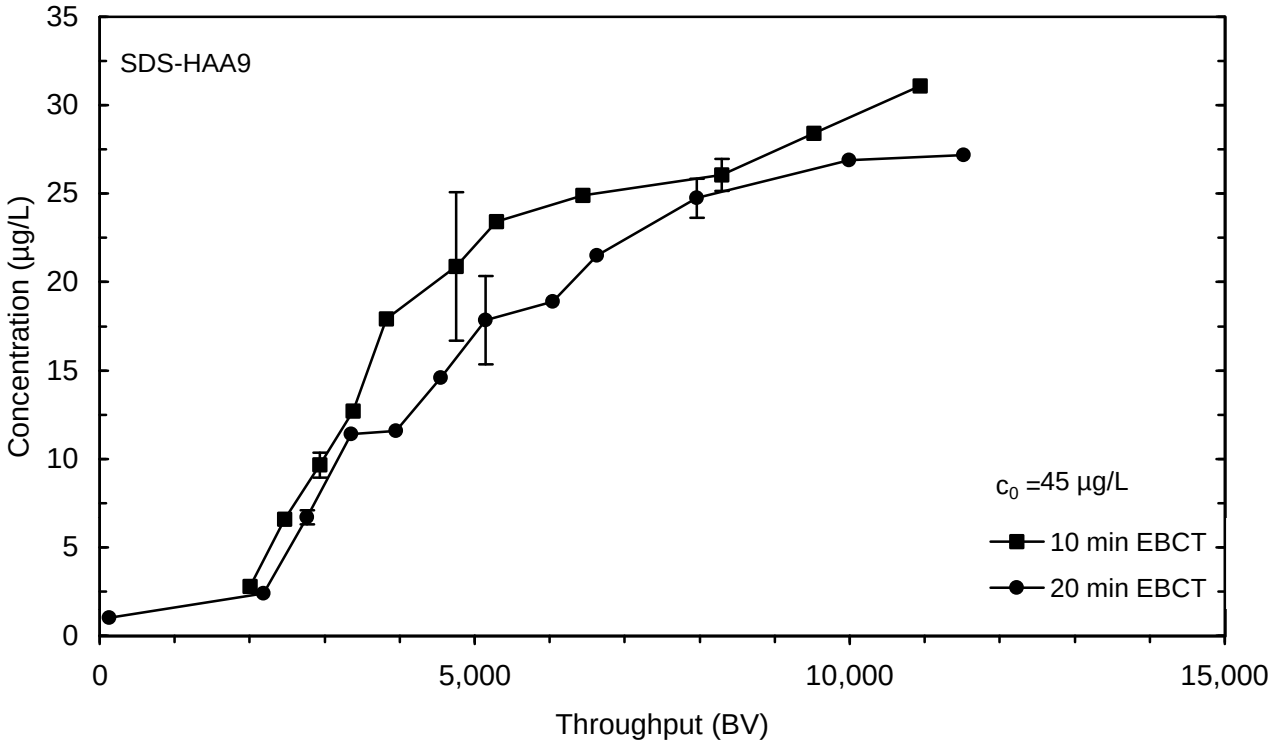


Figure 66 SDS-HAA9 breakthrough for 10 and 20 minute EBCT contactors during session 3 (June), plotted as throughput in bed volumes treated

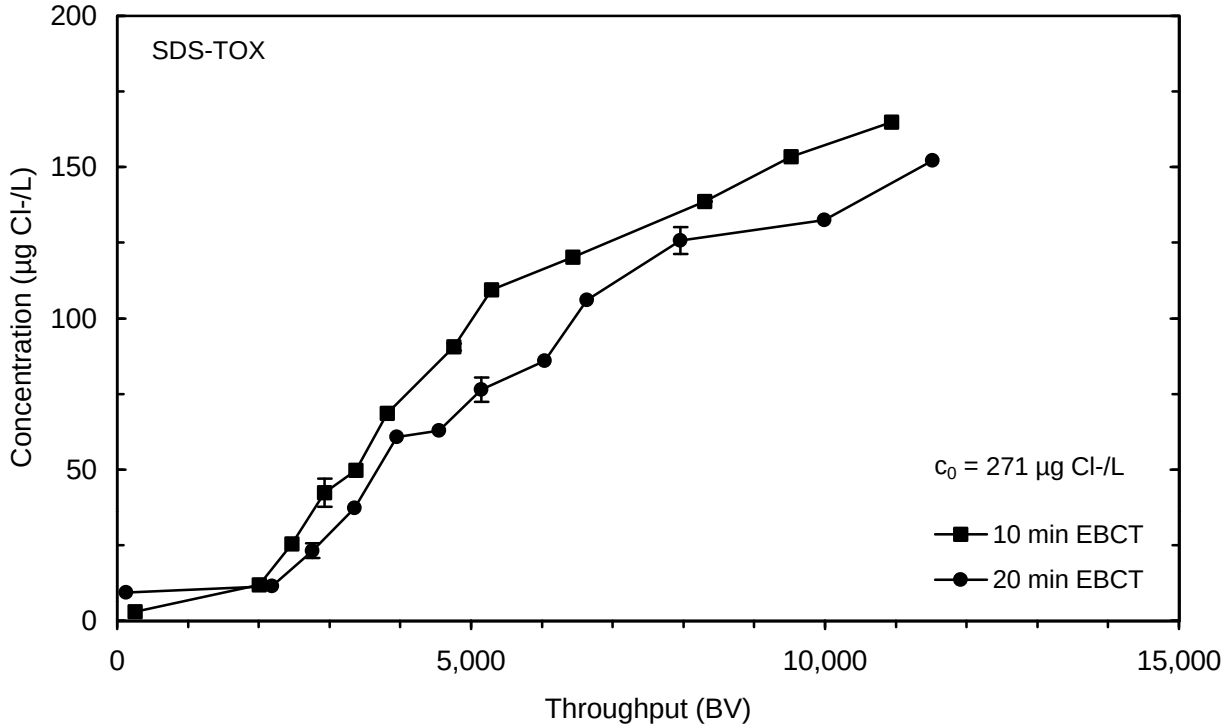


Figure 67 SDS-TOX breakthrough for 10 and 20 minute EBCT contactors during session 3 (June), plotted as throughput in bed volumes treated

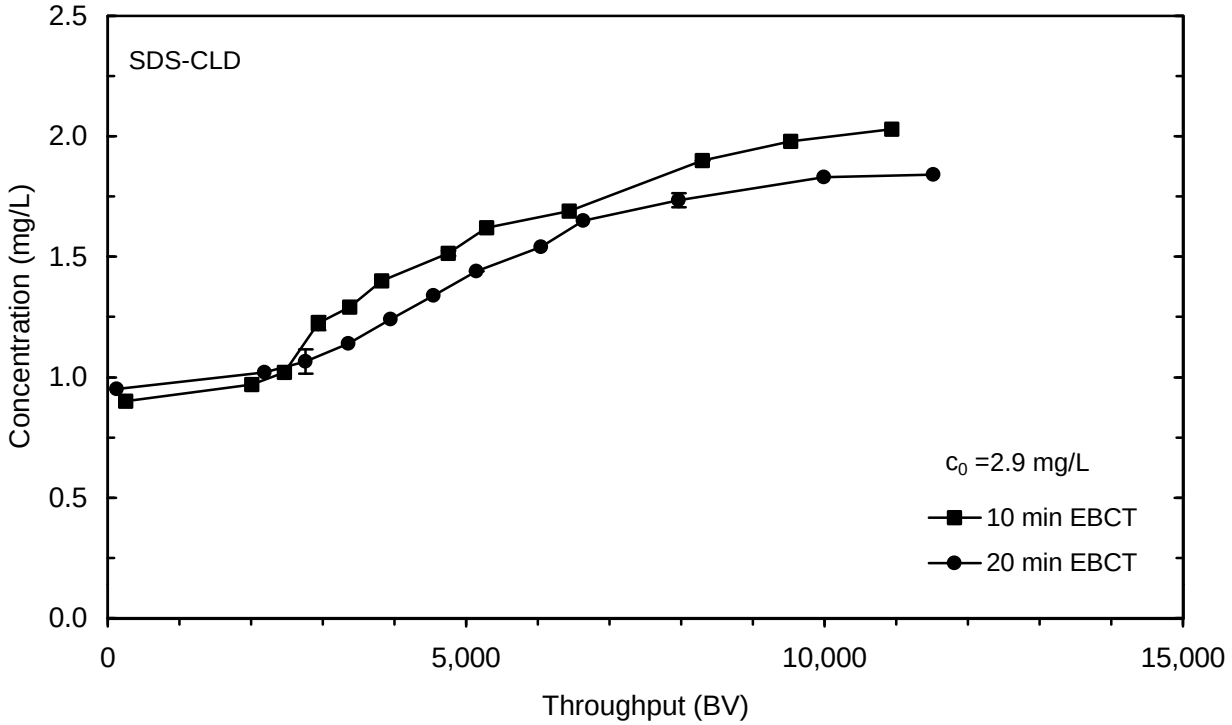


Figure 68 SDS-CLD breakthrough for 10 and 20 minute EBCT contactors during session 3 (June), plotted as throughput in bed volumes treated

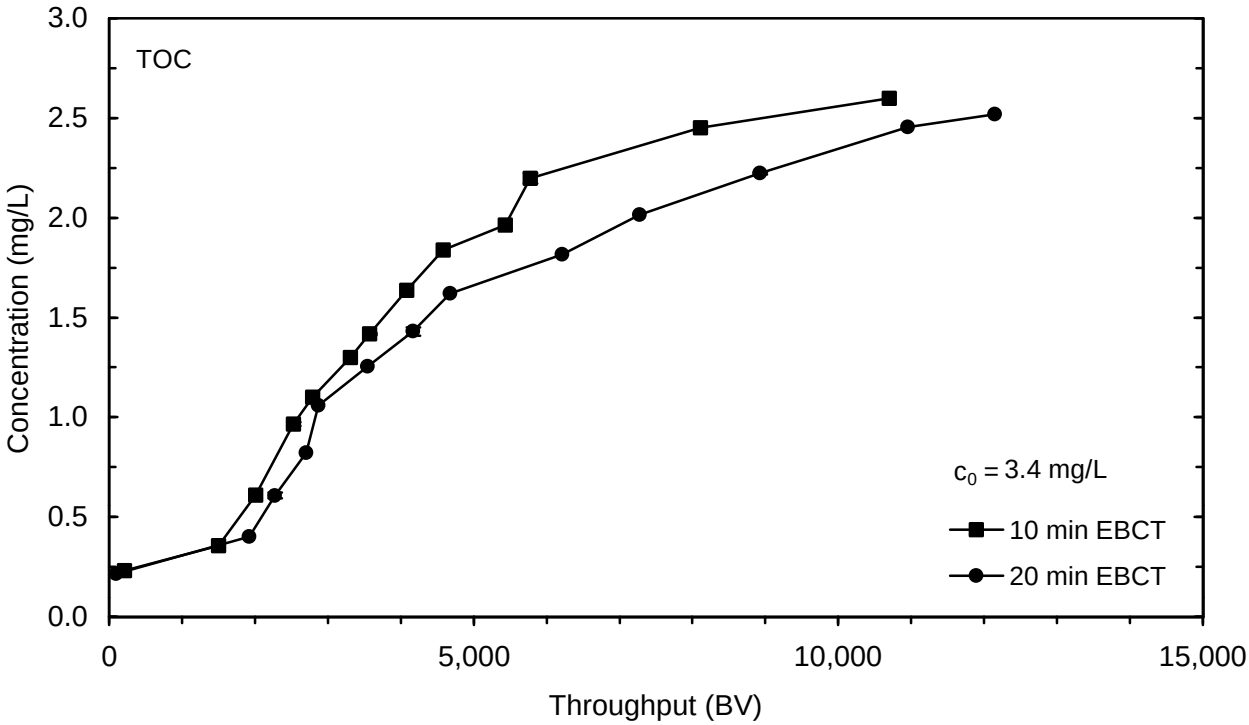


Figure 69 TOC breakthrough for 10 and 20 minute EBCT contactors during session 4 (October), plotted as throughput in bed volumes treated

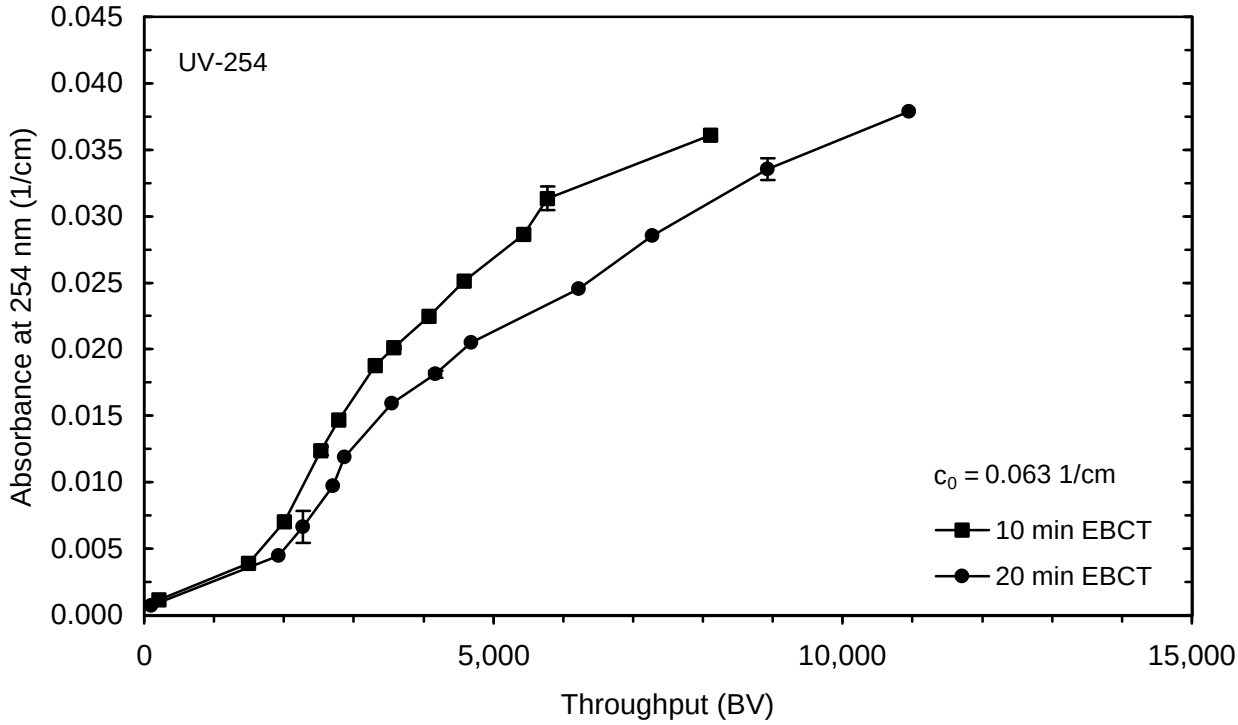


Figure 70 UV-254 breakthrough for 10 and 20 minute EBCT contactors during session 4 (October), plotted as throughput in bed volumes treated

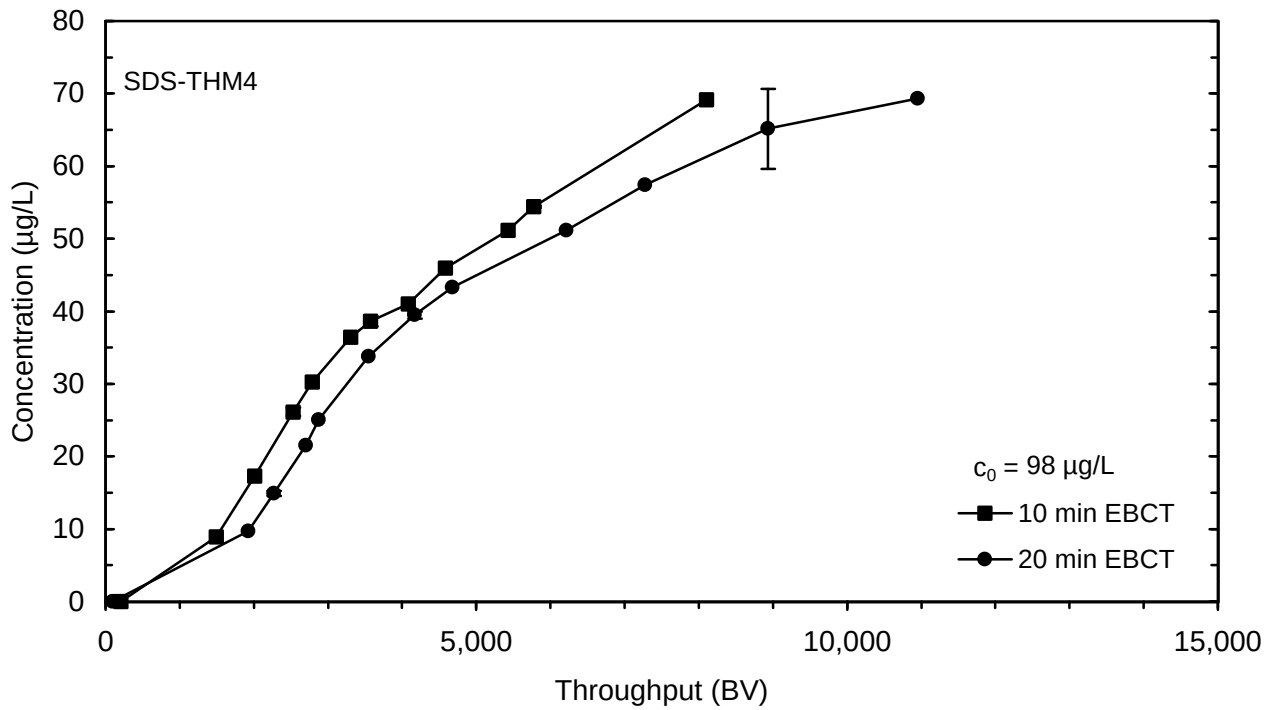


Figure 71 SDS-THM4 breakthrough for 10 and 20 minute EBCT contactors during session 4 (October), plotted as throughput in bed volumes treated

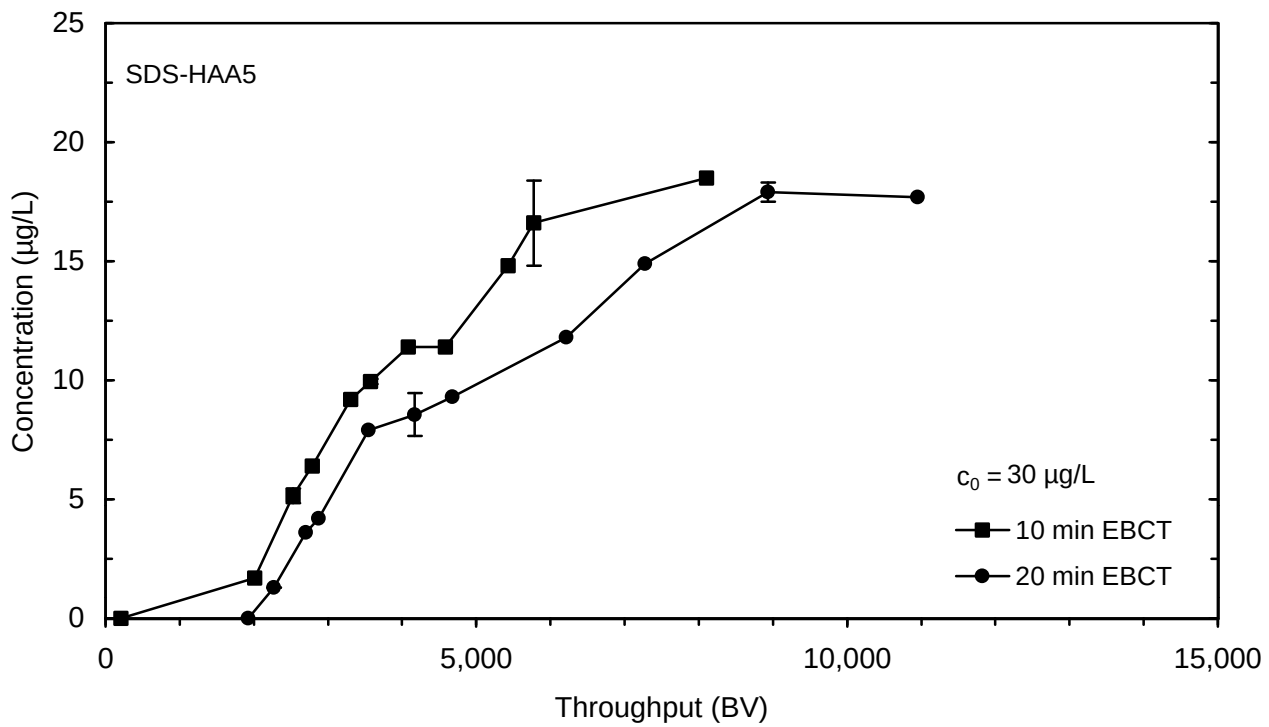


Figure 72 SDS-HAA5 breakthrough for 10 and 20 minute EBCT contactors during session 4 (October), plotted as throughput in bed volumes treated

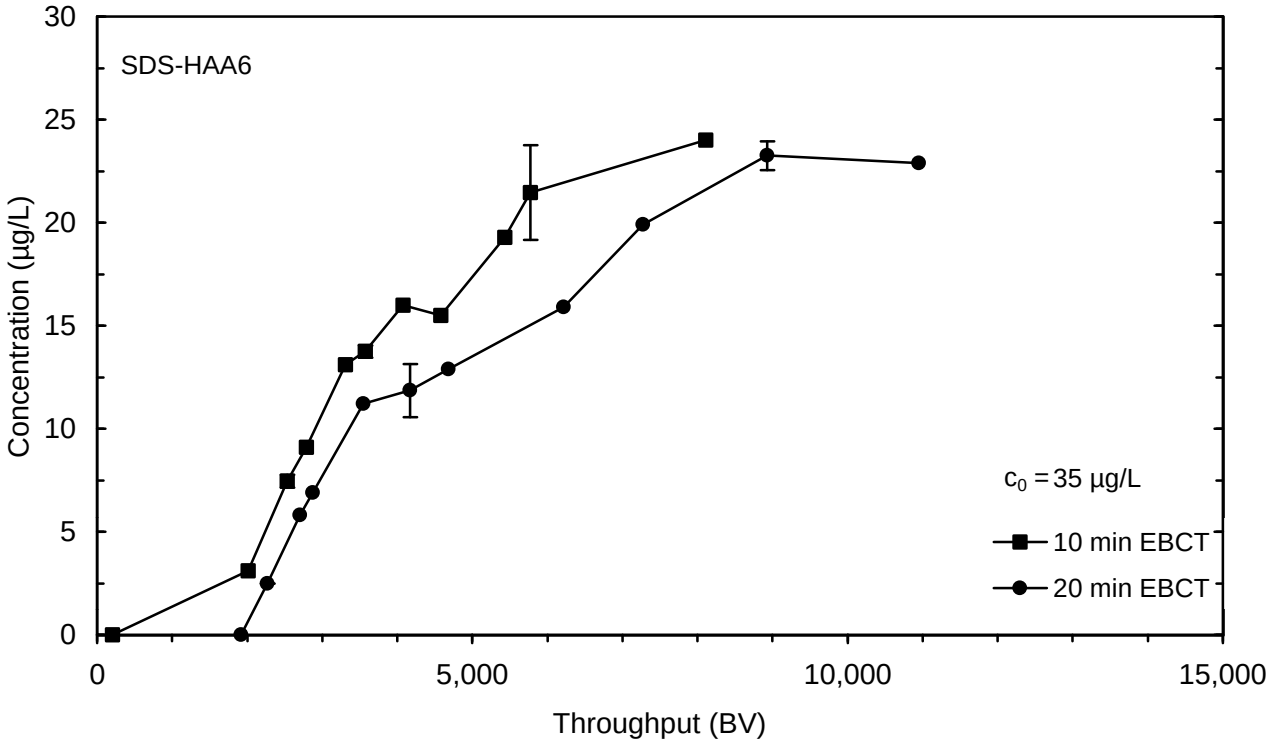


Figure 73 SDS-HAA6 breakthrough for 10 and 20 minute EBCT contactors during session 4 (October), plotted as throughput in bed volumes treated

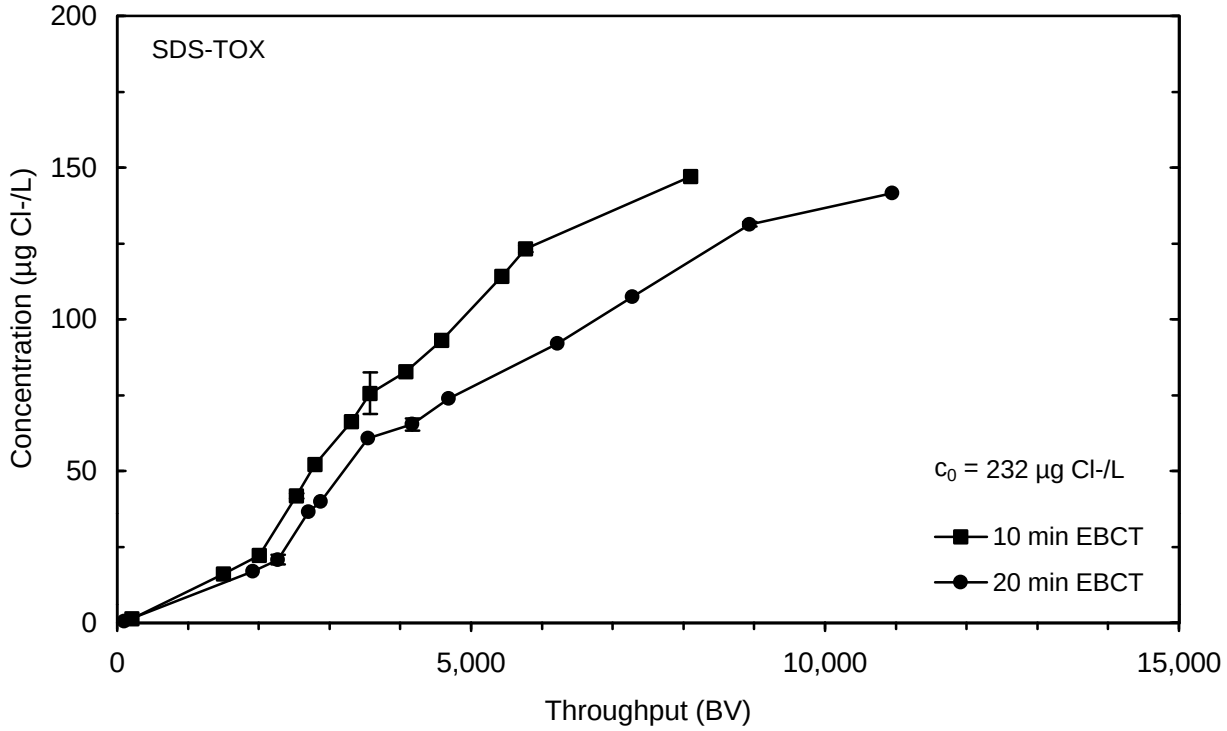


Figure 74 SDS-TOX breakthrough for 10 and 20 minute EBCT contactors during session 4 (October), plotted as throughput in bed volumes treated

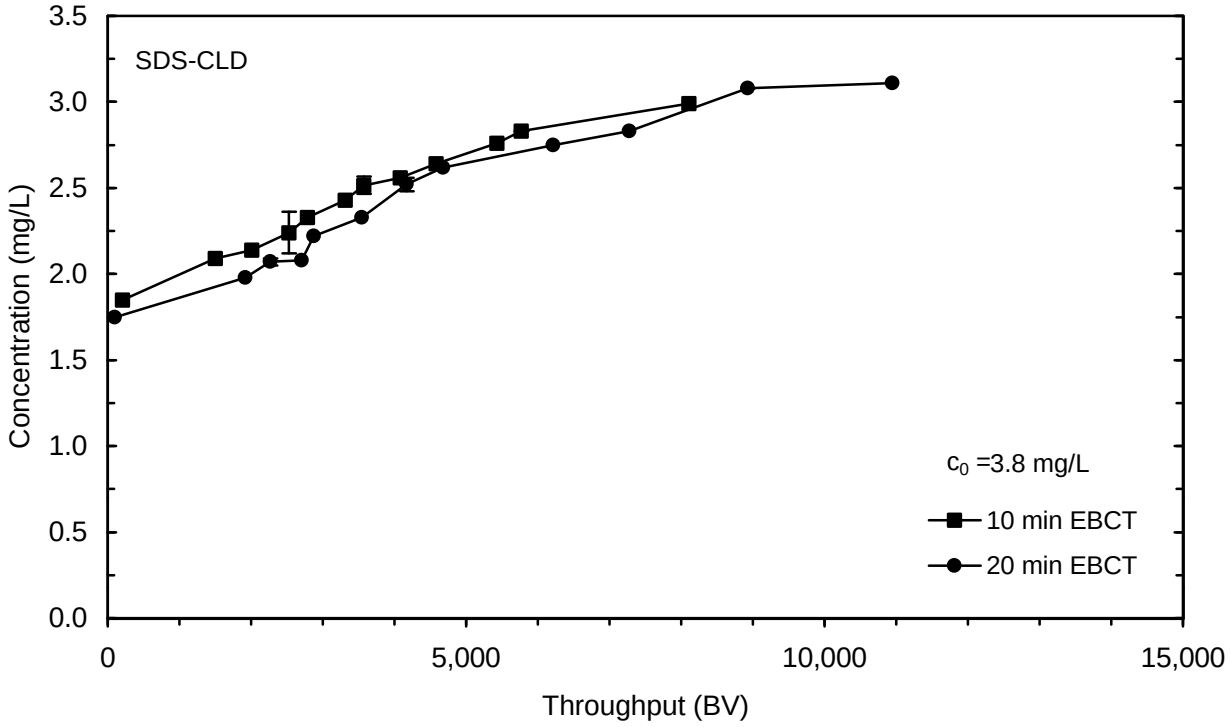


Figure 75 SDS-CLD breakthrough for 10 and 20 minute EBCT contactors during session 4 (October), plotted as throughput in bed volumes treated

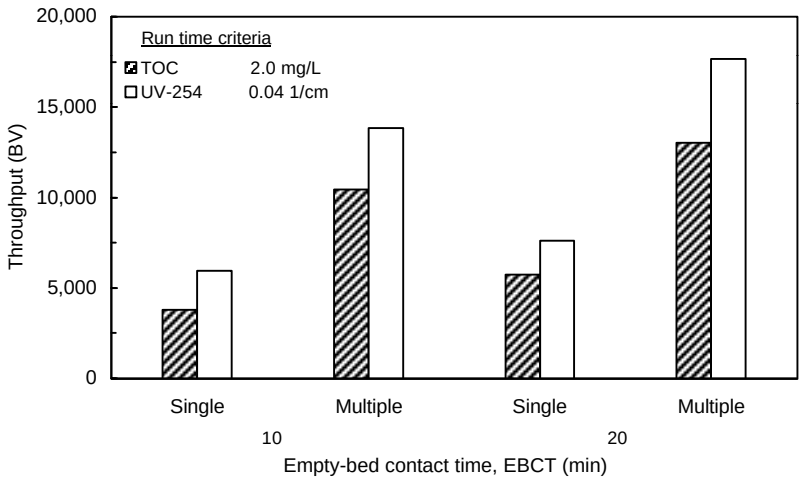


Figure 76 Throughput based on single contactor breakthrough and effluent blending for TOC and UV-254 effluent criteria (high) during session 1 (January)

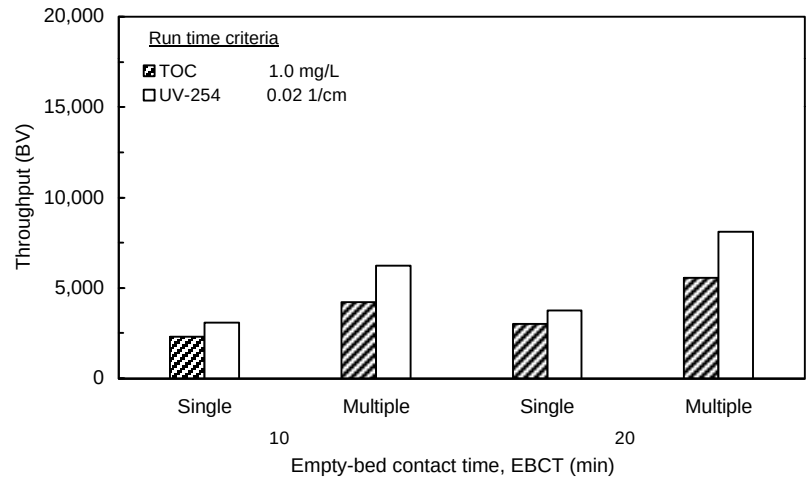


Figure 77 Throughput based on single contactor breakthrough and effluent blending for TOC and UV-254 effluent criteria (low) during session 1 (January)

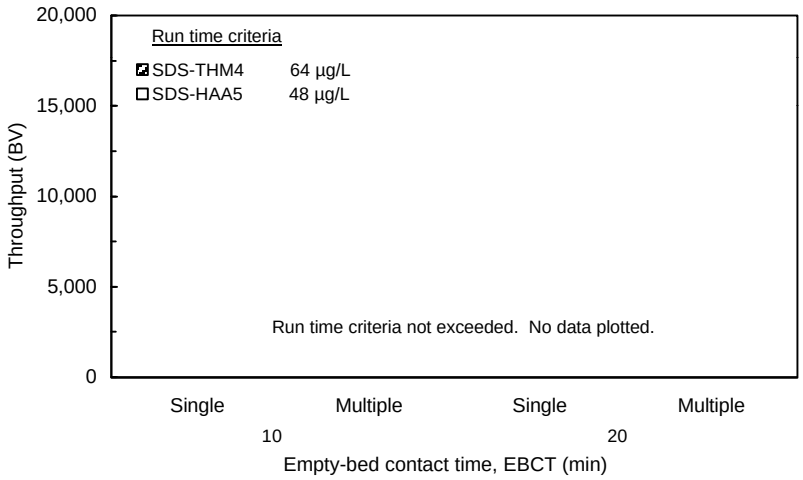


Figure 78 Throughput based on single contactor breakthrough and effluent blending for Stage 1 SDS-THM4 and SDS-HAA5 effluent criteria during session 1 (January)

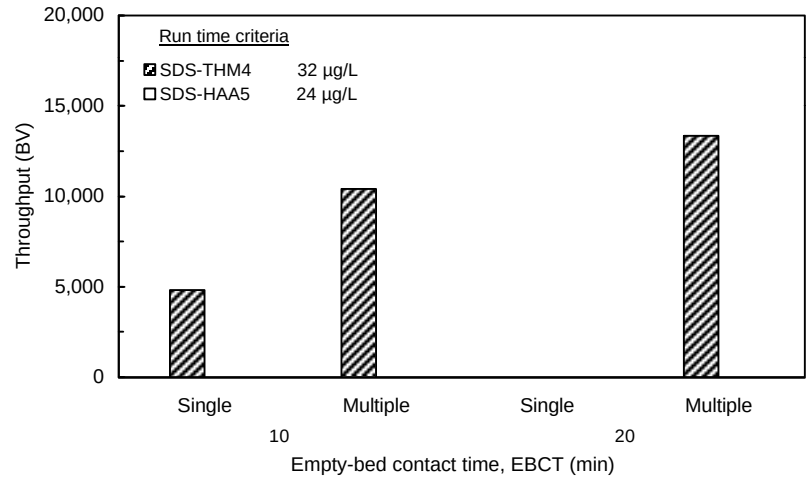


Figure 79 Throughput based on single contactor breakthrough and effluent blending for Stage 2 SDS-THM4 and SDS-HAA5 effluent criteria during session 1 (January)

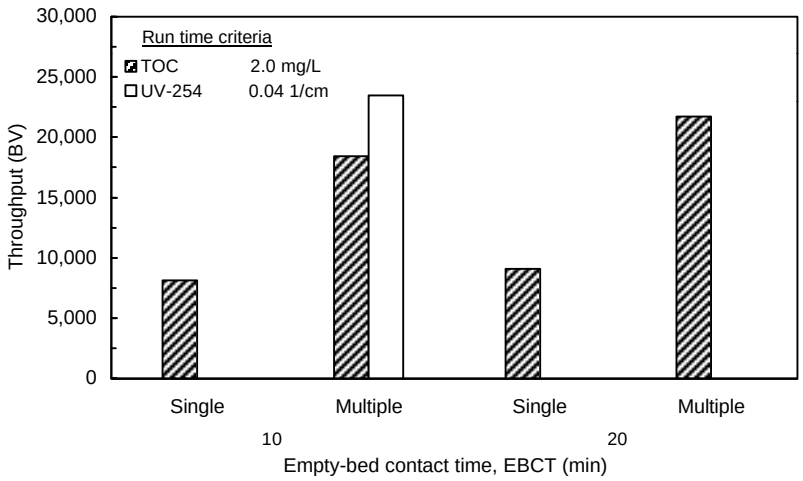


Figure 80 Throughput based on single contactor breakthrough and effluent blending for TOC and UV-254 effluent criteria (high) during session 2 (April)

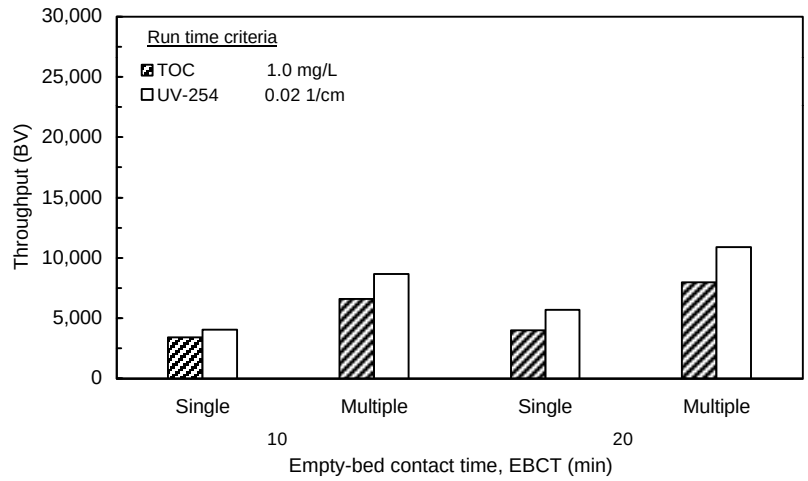


Figure 81 Throughput based on single contactor breakthrough and effluent blending for TOC and UV-254 effluent criteria (low) during session 2 (April)

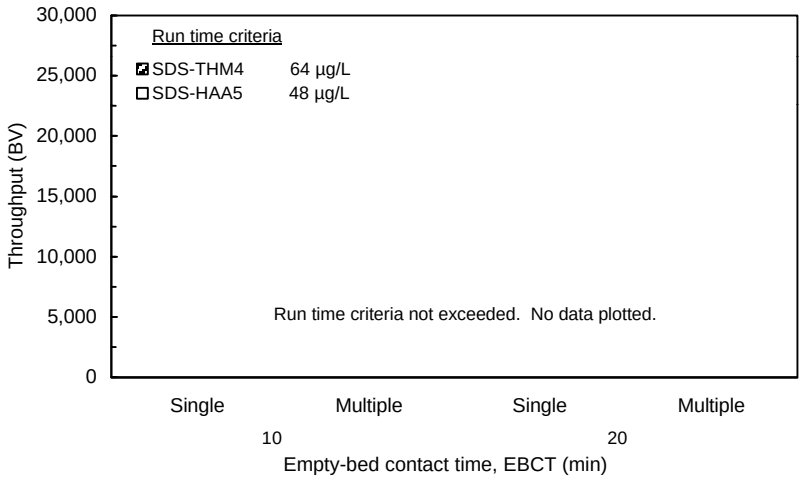


Figure 82 Throughput based on single contactor breakthrough and effluent blending for Stage 1 SDS-THM4 and SDS-HAA5 effluent criteria during session 2 (April)

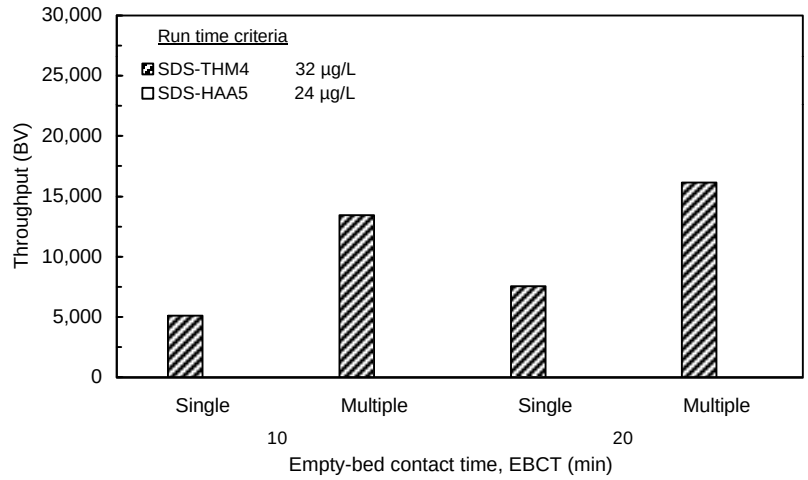


Figure 83 Throughput based on single contactor breakthrough and effluent blending for Stage 2 SDS-THM4 and SDS-HAA5 effluent criteria during session 2 (April)

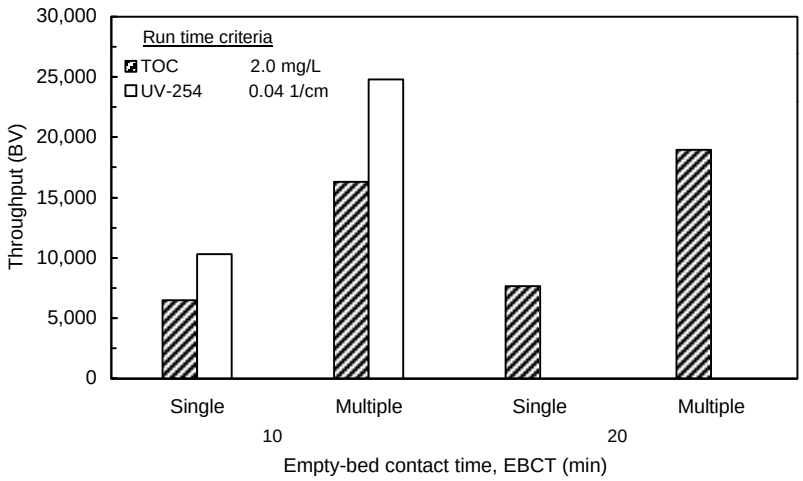


Figure 84 Throughput based on single contactor breakthrough and effluent blending for TOC and UV-254 effluent criteria (high) during session 3 (June)

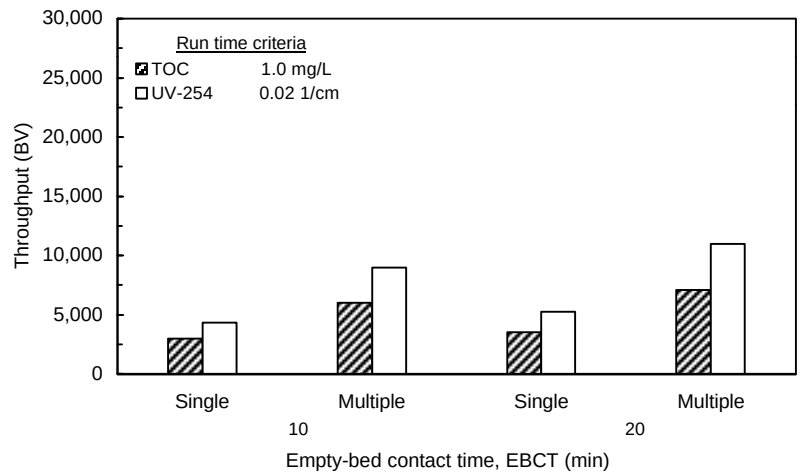


Figure 85 Throughput based on single contactor breakthrough and effluent blending for TOC and UV-254 effluent criteria (low) during session 3 (June)

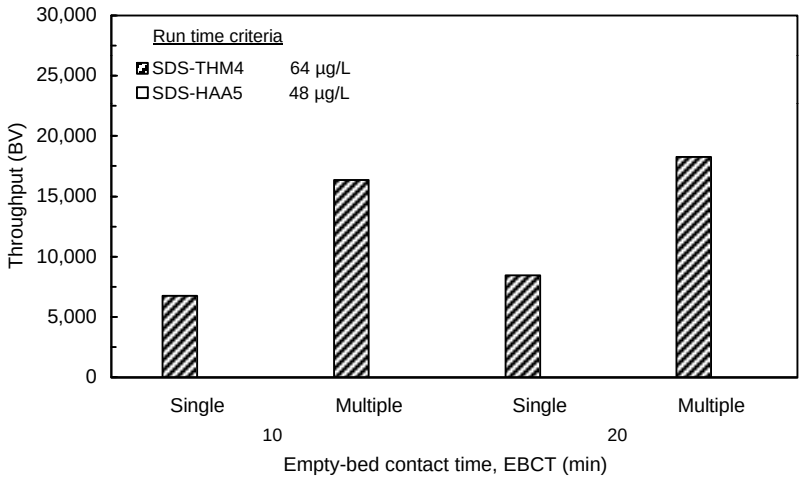


Figure 86 Throughput based on single contactor breakthrough and effluent blending for Stage 1 SDS-THM4 and SDS-HAA5 effluent criteria during session 3 (June)

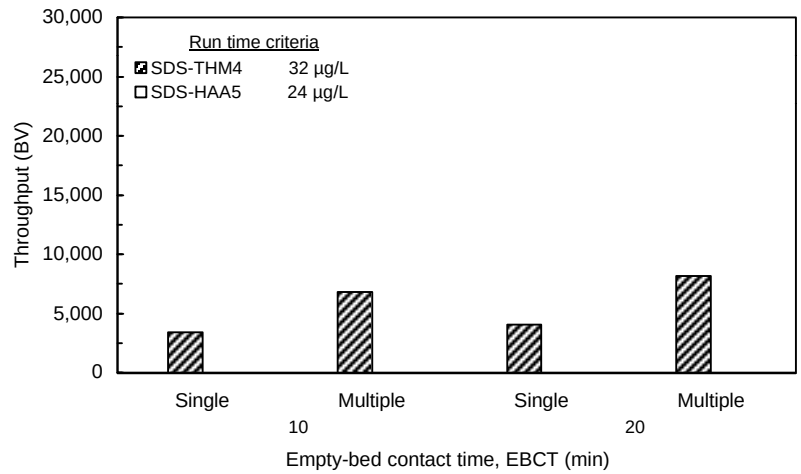


Figure 87 Throughput based on single contactor breakthrough and effluent blending for Stag SDS-THM4 and SDS-HAA5 effluent criteria during session 3 (June)

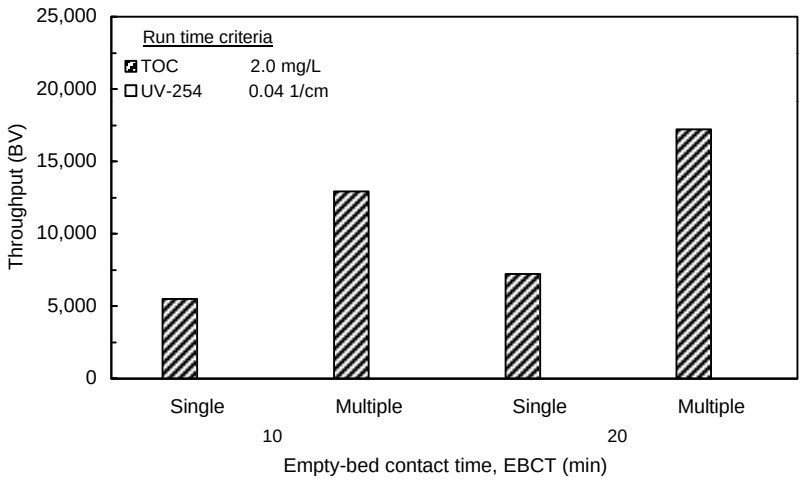


Figure 88 Throughput based on single contactor breakthrough and effluent blending for TOC and UV-254 effluent criteria (high) during session 4 (October)

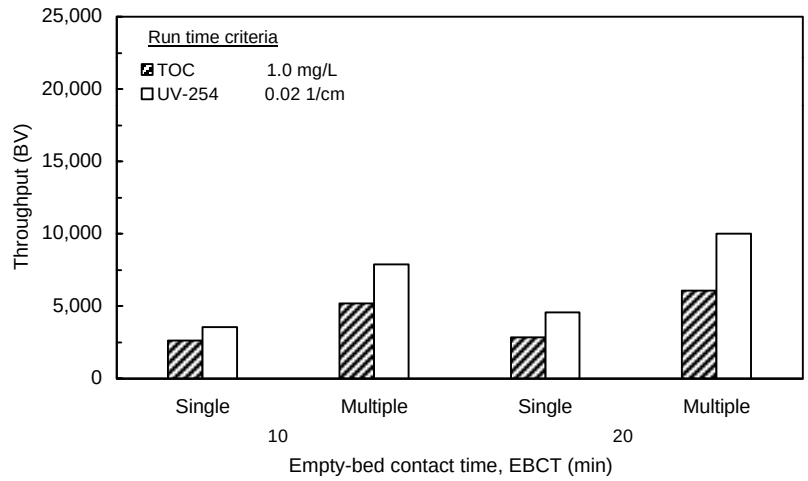


Figure 89 Throughput based on single contactor breakthrough and effluent blending for TOC and UV-254 effluent criteria (low) during session 4 (October)

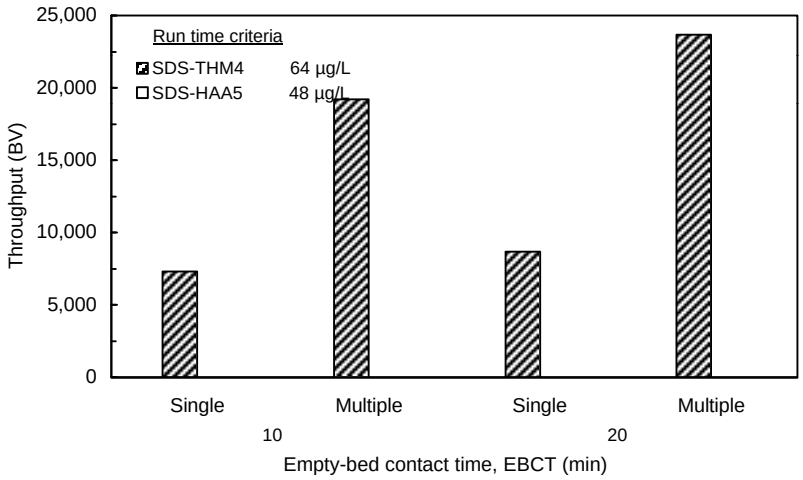


Figure 90 Throughput based on single contactor breakthrough and effluent blending for Stage 1 SDS-THM4 and SDS-HAA5 effluent criteria during session 4 (October)

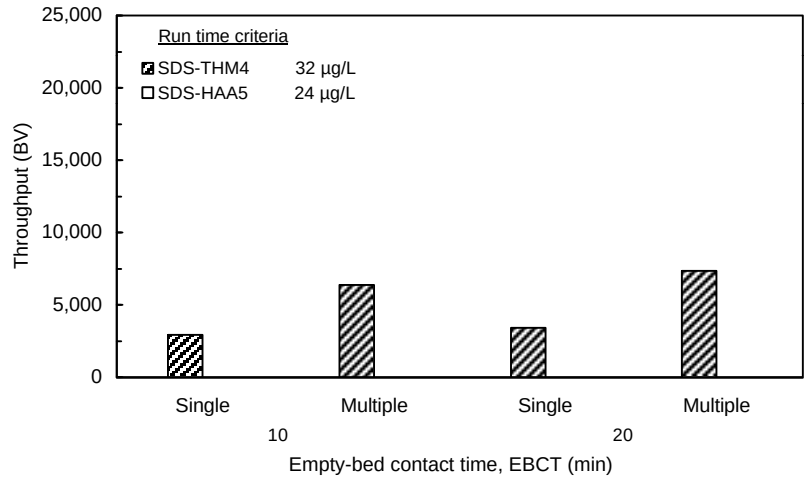


Figure 91 Throughput based on single contactor breakthrough and effluent blending for Stage 2 SDS-THM4 and SDS-HAA5 effluent criteria during session 4 (October)

10 *Blended Effluent Simulation and Breakthrough Curve Extrapolation*

10 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:

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

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:

$$\overline{C}(t) = \frac{1}{t}\int_0^t C(t)dt \qquad (3)$$

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:

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

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 data sets is given in Table 38. As can be seen by the high r^2, >0.89, the model well fit the data.

For the January quarter sample, Figures 92 through 99 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 instance, the 20 minute EBCT contactor TOC breakthrough curve plotted in Figure 92 reaches an effluent concentration of 1.0 mg/L after 42 days. However, the multiple contactor blended effluent breakthrough curve does not reach an effluent TOC concentration of 1.0 mg/L until after 77 days of single contactor operation time. Furthermore, after 79 days, each single contactor will have reached an effluent TOC concentration of almost 2.0 mg/L. Thus, for multiple GAC contactors operated in staggered mode, each individual contactor can be operated until an effluent TOC concentration of about 2.0 mg/L is reached in order to maintain a blend TOC concentration no greater than 1.0 mg/L. The actual contactor operation time (based on this effluent TOC concentration criterion) is 85 percent longer. A similar analysis can be made for SDS-THM4 and SDS-HAA5.

The single contactor and blended effluent (multiple contactors) comparisons are presented for the April, June, and October samples for all parameters in Figures 100 through 122.

Table 39 summarizes the run time for a 10 minute EBCT contactor, assuming a blended effluent, for the January sample. For each parameter and criterion, the value of other parameters is given when the run time criterion is met. Table 38 also includes, when applicable, run time calculations based on effluent blending of extrapolated breakthrough curves (described below). Tables 39 through 41 summarize the same information for the April, June, and October samples. Tables 42 through 45 summarize the same information for the 20 minute EBCT contactor for all four quarters.

For single and multiple contactor configurations, Tables 46 through 49 summarize the percent increase in run times observed between a 10 and 20 minute EBCT contactor, for each of the four quarterly 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 quarters was 156 percent and 145 percent for single and multiple contactor configurations, respectively.

By accounting for multiple contactor configurations, the estimated 10 minute EBCT contactor run time increased by an average of 129 percent over all quarters, as compared to single contactor performance. Thus, when 10 or more contactors are operated in staggered mode, the run time of each contactor is 129 percent longer than that of a single GAC contactor. For 20 minute EBCT contactors, the run time increase gained by effluent blending was similar: 116 percent.

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:

$$\mathrm{CUR} = \frac{\mathrm{EBCT} * r}{\mathrm{RT}} \qquad (5)$$

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 53 summarize the percent decrease in CUR observed between 10

and 20 minute EBCT contactors for both single and multiple contactor configurations for all four quarterly sessions. On average over all four quarters, the CUR for 20 minute EBCT contactors was 21 percent lower than the CUR for 10 minute EBCT contactors, based on single contactor breakthrough data. The difference was similar, 18 percent, based on multiple contactor effluent blending. For a 10 minute EBCT contactor, the CUR based on effluent blending was on average 56 percent lower than the CUR based on single contactor data, for all four quarters. The same difference was 53 percent for 20 minute EBCT contactors.

A seasonal comparison of multiple contactor simulation run times is summarized in Table 54, for a 10 minute EBCT, and in Table 55, for a 20 minute EBCT. The mean, standard deviation, and percent standard deviation of run times over all four quarters are listed in each table, providing a measure of the degree of seasonal variability evident in GAC performance.

Bar graph summaries of run times to effluent criteria for single and multiple contactor configurations and for 10 and 20 minute EBCTs for the January sample are shown in Figures 123 through 126. The same data are shown for the April, June, and October samples in Figures 127 through 138.

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 all four quarters in Figures 139 through 154.

For many breakthrough curves, 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_{max}), based on the following set of equations:

Point	Run time	Concentration	
A	$1.5t_{max}$	$C(t_{max}) + 0.5[C_{inf} - C(t_{max})]$	(6)
B	$2.0t_{max}$	$C(t_{max}) + 0.6[C_{inf} - C(t_{max})]$	(7)
C	$2.5t_{max}$	$C(t_{max}) + 0.7[C_{inf} - C(t_{max})]$	(8)

where C_{inf} is the influent concentration for each parameter, and $C(t_{max})$ is the effluent concentration of the parameter at t_{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 and CUR data contained in the figures and

tables presented earlier in this section include the estimates derived by the extrapolation procedure, when necessary. No breakthrough curves were extrapolated beyond 250 percent of the maximum run time. Figures 155 through 208 contain the extrapolated breakthrough curves for all parameters, EBCTs, and quarters. Table 57 summarizes the best fit parameter values and r^2 values for all curve fits.

Parameter	Coefficient	10 minute EBCT				20 minute EBCT			
		January	April	June	October	January	April	June	October
TOC	A_o	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	A_f	2.79	2.34	2.41	2.53	2.75	2.27	2.47	2.41
	B	16.7	11.2	12.6	12.5	12.5	17.3	9.5	9.4
	D	0.140	0.089	0.100	0.110	0.047	0.045	0.036	0.043
	r^2	0.974	0.969	0.988	0.990	0.986	0.991	0.992	0.976
UV_{254}	A_o	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	A_f	0.050	0.038	0.040	0.035	0.049	0.038	0.037	0.037
	B	22.8	20.0	20.0	20.0	20.0	20.0	20.0	12.4
	D	0.116	0.105	0.097	0.129	0.043	0.041	0.043	0.040
	r^2	0.976	0.986	0.991	0.987	0.982	0.990	0.991	0.977
SDS-THM4	A_o	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	A_f	42.2	38.1	76.6	64.7	30.7	35.8	81.9	65.6
	B	30.6	23.8	20.0	12.6	51.9	24.4	14.5	15.2
	D	0.157	0.135	0.106	0.113	0.094	0.056	0.037	0.052
	r^2	0.973	0.965	0.984	0.970	0.996	0.985	0.980	0.980
SDS-HAA5	A_o	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	A_f	15.4	17.9	19.2	18.3	18.3	17.4	19.2	17.7
	B	84.6	60.9	50.2	27.3	23.4	37.3	21.9	27.1
	D	0.223	0.157	0.145	0.133	0.042	0.059	0.044	0.052
	r^2	0.898	0.966	0.960	0.973	0.986	0.885	0.975	0.957
SDS-HAA6	A_o	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	A_f	19.3	22.3	24.6	23.1	21.6	21.8	24.0	22.7
	B	110.2	45.8	50.1	24.6	23.3	32.7	23.7	23.3
	D	0.240	0.151	0.150	0.138	0.048	0.059	0.049	0.053
	r^2	0.931	0.966	0.965	0.972	0.984	0.899	0.972	0.950
SDS-HAA9	A_o	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	A_f	23.1	24.9	28.0	27.8	20.4	23.5	27.1	30.0
	B	121.0	31.3	42.5	34.0	77.6	43.5	19.1	12.7
	D	0.234	0.147	0.151	0.157	0.085	0.079	0.049	0.038
	r^2	0.959	0.979	0.972	0.941	0.986	0.943	0.982	0.894
SDS-TOX	A_o	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	A_f	122	114	155	147	129	118	148	141
	B	89.5	37.7	29.1	21.1	759.0	37.3	21.7	14.1
	D	0.182	0.133	0.112	0.118	0.086	0.050	0.043	0.041
	r^2	0.977	0.983	0.986	0.989	0.985	0.979	0.982	0.978
SDS-CLD	A_o	0.27	0.27	0.71	1.87	0.33	0.28	0.89	1.41
	A_f	1.47	1.07	2.03	2.96	1.36	1.13	1.85	3.15
	B	5.3	20.3	9.0	19.8	9.7	20.0	24.3	4.7
	D	0.078	0.112	0.079	0.129	0.040	0.043	0.048	0.034
	r^2	0.946	0.980	0.984	0.982	0.956	0.985	0.998	0.987

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

Parameter	Units	Influent concen-tration	Breakthrough criterion	Value of listed parameter when breakthrough criterion is met (blended effluent)								
				Run time (days)	Throughput (bed volumes)	TOC (mg/L)	UV_{254} (1/cm)	SDS-THM4 (µg/L)	SDS-HAA5 (µg/L)	SDS-HAA6 (µg/L)	SDS-HAA9 (µg/L)	SDS-TOX (µg Cl^-/L)
TOC	(mg/L)	3.9	2.0	73	10,460	2.0	0.031	29	11	14	17	81
			1.0	29	4,220	1.0	0.012	13	5	7	12	27
			1.9†	67	9,700	1.9	0.030	28	11	14	16	77
UV_{254}	(1/cm)	0.079	0.040	96#	13,840	2.4	0.040	37	14	18	21	106
			0.020	43	6,240	1.5	0.020	21	8	11	15	52
			0.039†	94#	13,480	2.4	0.039	37	14	18	21	105
SDS-THM4	(µg/L)	66	80	*	*							
			64	*	*							
			32	72#	10,400	2.1	0.033	32	12	15	18	88
SDS-HAA5	(µg/L)	34	48	*	*							
			24	*	*							
SDS-HAA6	(µg/L)	38	48	*	*							
			24	201#	28,890	2.9	0.053	45	20	24	26	135
SDS-HAA9	(µg/L)	39	48	*	*							
			24	136#	19,600	2.7	0.047	42	18	21	24	123
SDS-TOX	(µg Cl^-/L)	212	120	128#	18,400	2.6	0.046	41	17	21	24	120
			70	57#	8,180	1.8	0.026	27	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 (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, January

Parameter	Units	Influent concen-tration	Breakthrough criterion	Value of listed parameter when breakthrough criterion is met (blended effluent)								
				Run time (days)	Throughput (bed volumes)	TOC (mg/L)	UV_{254} (1/cm)	SDS-THM4 (µg/L)	SDS-HAA5 (µg/L)	SDS-HAA6 (µg/L)	SDS-HAA9 (µg/L)	SDS-TOX (µg Cl^-/L)
TOC	(mg/L)	3.2	2.0	128#	18,430	2.0	0.036	37	18	22	25	116
			1.0	46	6,570	1.0	0.015	18	8	10	12	47
			1.6†	85#	12,230	1.6	0.028	30	14	18	20	87
UV_{254}	(1/cm)	0.066	0.040	163#	23,470	2.2	0.040	39	20	24	27	130
			0.020	60	8,650	1.3	0.020	23	10	13	15	62
			0.033†	109#	15,680	1.9	0.033	34	17	20	23	105
SDS-THM4	(µg/L)	60	80	*	*							
			64	*	*							
			32	93#	13,440	1.7	0.030	32	15	19	22	94
SDS-HAA5	(µg/L)	33	48	*	*							
			24	*	*							
SDS-HAA6	(µg/L)	38	48	*	*							
			24	160#	22,970	2.2	0.040	39	20	24	27	129
SDS-HAA9	(µg/L)	38	48	*	*							
			24	118#	16,960	1.9	0.034	36	17	21	24	111
SDS-TOX	(µg Cl^-/L)	225	120	136#	19,650	2.0	0.037	37	19	23	25	120
			70	68#	9,750	1.4	0.022	26	12	15	18	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, April

Parameter	Units	Influent concen-tration	Breakthrough criterion	Value of listed parameter when breakthrough criterion is met (blended effluent)								
				Run time (days)	Throughput (bed volumes)	TOC (mg/L)	UV_{254} (1/cm)	SDS-THM4 (µg/L)	SDS-HAA5 (µg/L)	SDS-HAA6 (µg/L)	SDS-HAA9 (µg/L)	SDS-TOX (µg Cl^-/L)
TOC	(mg/L)	3.4	2.0	113#	16,310	2.0	0.032	64	17	22	25	130
			1.0	42	5,990	1.0	0.013	27	7	9	12	50
			1.7†	85#	12,220	1.7	0.026	53	14	18	21	104
UV_{254}	(1/cm)	0.066	0.040	172#	24,810	2.3	0.040	76	21	26	29	161
			0.020	62	8,960	1.4	0.020	41	11	14	17	80
			0.033†	117#	16,860	2.0	0.033	65	17	22	25	132
SDS-THM4	(µg/L)	120	80	*	*							
			64	113#	16,340	2.0	0.032	64	17	22	25	130
			32	47	6,820	1.1	0.015	32	8	11	13	59
SDS-HAA5	(µg/L)	36	48	*	*							
			24	*	*							
SDS-HAA6	(µg/L)	42	48	*	*							
			24	139#	20,040	2.2	0.036	71	19	24	27	146
SDS-HAA9	(µg/L)	45	48	*	*							
			24	105#	15,110	1.9	0.031	61	16	21	24	123
SDS-TOX	(µg Cl^-/L)	271	120	102#	14,630	1.9	0.030	60	16	21	24	120
			70	55	7,850	1.3	0.018	37	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 (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, June

Parameter	Units	Influent concen-tration	Breakthrough criterion	Value of listed parameter when breakthrough criterion is met (blended effluent)								
				Run time (days)	Throughput (bed volumes)	TOC (mg/L)	UV_{254} (1/cm)	SDS-THM4 (µg/L)	SDS-HAA5 (µg/L)	SDS-HAA6 (µg/L)	SDS-HAA9 (µg/L)	SDS-TOX (µg Cl^-/L)
TOC	(mg/L)	3.4	2.0	90#	12,940	2.0	0.031	55	15	20	23	120
			1.0	36	5,180	1.0	0.013	26	6	9	11	49
			1.7†	71	10,180	1.7	0.025	45	12	16	20	95
UV_{254}	(1/cm)	0.063	0.040	*	*							
			0.020	55	7,870	1.4	0.020	38	10	13	16	77
			0.031†	91#	13,180	2.0	0.031	55	16	20	23	121
SDS-THM4	(µg/L)	98	80	*	*							
			64	133#	19,200	2.3	0.038	64	18	23	26	144
			32	44	6,390	1.2	0.017	32	8	11	14	63
SDS-HAA5	(µg/L)	30	48	*	*							
			24	*	*							
SDS-HAA6	(µg/L)	35	48	*	*							
			24	*	*							
SDS-HAA9	(µg/L)	#DIV/0!	48	*	*							
			24	97#	14,030	2.1	0.033	57	16	20	24	126
SDS-TOX	(µg Cl^-/L)	232	120	90#	12,910	2.0	0.031	55	15	20	23	120
			70	49	7,060	1.3	0.018	35	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 (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 (10 minute EBCT) during session 4, October

Parameter	Units	Influent concen-tration	Breakthrough criterion	Value of listed parameter when breakthrough criterion is met (blended effluent)								
				Run time (days)	Throughput (bed volumes)	TOC (mg/L)	UV_{254} (1/cm)	SDS-THM4 (µg/L)	SDS-HAA5 (µg/L)	SDS-HAA6 (µg/L)	SDS-HAA9 (µg/L)	SDS-TOX (µg Cl^-/L)
TOC	(mg/L)	3.9	2.0	181#	13,030	2.0	0.032	31	11	14	16	82
			1.0	77	5,560	1.0	0.012	14	4	6	7	9
			1.9†	172#	12,400	1.9	0.030	30	11	14	15	77
UV_{254}	(1/cm)	0.079	0.040	245#	17,650	2.3	0.040	*	15	18	19	104
			0.020	113	8,100	1.4	0.020	22	7	9	11	31
			0.039†	239#	17,240	2.3	0.039	*	15	18	19	103
SDS-THM4	(µg/L)	66	80	*	*							
			64	*	*							
			32	185#	13,340	2.0	0.032	32	11	15	16	84
SDS-HAA5	(µg/L)	34	48	*	*							
			24	*	*							
SDS-HAA6	(µg/L)	38	48	*	*							
			24	*	*							
SDS-HAA9	(µg/L)	39	48	*	*							
			24	*	*							
SDS-TOX	(µg Cl^-/L)	212	120	322#	23,210	2.6	0.046	*	18	21	22	120
			70	158#	11,400	1.8	0.028	29	10	13	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 43 Run times to selected GAC effluent criteria based on effluent blending (20 minute EBCT) during session 1, January

Parameter	Units	Influent concen-tration	Breakthrough criterion	Value of listed parameter when breakthrough criterion is met (blended effluent)								
				Run time (days)	Throughput (bed volumes)	TOC (mg/L)	UV_{254} (1/cm)	SDS-THM4 (µg/L)	SDS-HAA5 (µg/L)	SDS-HAA6 (µg/L)	SDS-HAA9 (µg/L)	SDS-TOX (µg Cl^-/L)
TOC	(mg/L)	3.2	2.0	302#	21,710	2.0	0.035	36	18	22	25	115
			1.0	111	7,960	1.0	0.014	17	8	10	13	44
			1.6†	198#	14,230	1.6	0.026	30	14	17	21	83
UV_{254}	(1/cm)	0.066	0.040	*	*							
			0.020	151#	10,900	1.3	0.020	24	11	14	18	62
			0.033†	267#	19,250	1.9	0.033	35	17	21	24	107
SDS-THM4	(µg/L)	60	80	*	*							
			64	*	*							
			32	224#	16,120	1.7	0.029	32	15	19	22	93
SDS-HAA5	(µg/L)	33	48	*	*							
			24	*	*							
SDS-HAA6	(µg/L)	38	48	*	*							
			24	*	*							
SDS-HAA9	(µg/L)	38	48	*	*							
			24	273#	19,680	1.9	0.033	35	17	21	24	108
SDS-TOX	(µg Cl^-/L)	225	120	325#	23,420	2.1	0.037	*	19	23	25	120
			70	168#	12,070	1.4	0.022	27	12	15	19	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 2, April

Parameter	Units	Influent concen-tration	Breakthrough criterion	Value of listed parameter when breakthrough criterion is met (blended effluent)								
				Run time (days)	Throughput (bed volumes)	TOC (mg/L)	UV_{254} (1/cm)	SDS-THM4 (µg/L)	SDS-HAA5 (µg/L)	SDS-HAA6 (µg/L)	SDS-HAA9 (µg/L)	SDS-TOX (µg Cl^-/L)
TOC	(mg/L)	3.4	2.0	263#	18,960	2.0	0.032	65	17	21	24	128
			1.0	98	7,090	1.0	0.013	27	6	9	11	49
			1.7†	201#	14,450	1.7	0.026	55	14	18	21	103
UV_{254}	(1/cm)	0.066	0.040	*	*							
			0.020	153	10,990	1.4	0.020	43	10	14	16	78
			0.033†	276#	19,850	2.0	0.033	67	17	22	25	132
SDS-THM4	(µg/L)	120	80	*	*							
			64	254#	18,290	2.0	0.031	64	16	21	24	125
			32	113	8,160	1.1	0.015	32	8	11	13	58
SDS-HAA5	(µg/L)	36	48	*	*							
			24	*	*							
SDS-HAA6	(µg/L)	42	48	*	*							
			24	331#	23,840	2.2	0.037	73	19	24	27	147
SDS-HAA9	(µg/L)	45	48	*	*							
			24	258#	18,560	2.0	0.032	65	17	21	24	126
SDS-TOX	(µg Cl^-/L)	271	120	241#	17,360	1.9	0.030	62	16	20	23	120
			70	135	9,700	1.3	0.018	38	9	13	15	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 (20 minute EBCT) during session 3, June

Parameter	Units	Influent concen-tration	Breakthrough criterion	Value of listed parameter when breakthrough criterion is met (blended effluent)								
				Run time (days)	Throughput (bed volumes)	TOC (mg/L)	UV_{254} (1/cm)	SDS-THM4 (µg/L)	SDS-HAA5 (µg/L)	SDS-HAA6 (µg/L)	SDS-HAA9 (µg/L)	SDS-TOX (µg Cl^-/L)
TOC	(mg/L)	3.4	2.0	239#	17,200	2.0	0.031	57	15	19	23	116
			1.0	84	6,040	1.0	0.012	26	5	8	9	45
			1.7†	171#	12,340	1.7	0.024	48	12	16	19	90
UV_{254}	(1/cm)	0.063	0.040	*	*							
			0.020	139	9,980	1.5	0.020	40	10	13	16	75
			0.031†	247#	17,800	2.0	0.031	58	15	20	23	118
SDS-THM4	(µg/L)	98	80	*	*							
			64	329#	23,670	2.2	0.037	64	18	22	26	137
			32	102	7,330	1.2	0.015	32	7	10	12	56
SDS-HAA5	(µg/L)	30	48	*	*							
			24	*	*							
SDS-HAA6	(µg/L)	35	48	*	*							
			24	*	*							
SDS-HAA9	(µg/L)	#DIV/0!	48	*	*							
			24	267#	19,230	2.1	0.033	60	16	20	24	123
SDS-TOX	(µg Cl^-/L)	232	120	254#	18,300	2.1	0.032	59	16	20	23	120
			70	129	9,260	1.4	0.019	39	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 (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 (20 minute EBCT) during session 4, October

Parameter	Units	Influent concen-tration	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				Contactor configuration			
				Single	Multiple	Single	Multiple	Single	Multiple	10	20
TOC	(mg/L)	3.9	2.0	26	73	80	181	203	149	175	126
			1.0	16	29	42	77	162	164	83	85
			1.9†	25	67	76	172	198	156	165	127
UV-254	(1/cm)	0.079	0.040	41	96	106	245	156	155	133	132
			0.020	21	43	52	113	143	160	103	116
			0.039†	40	94	104	239	158	156	131	130
SDS-THM4	(µg/L)	66	80	*	*	*	*				
			64	*	*	*	*				
			32	33	72	*	185		157	116	
SDS-HAA5	(µg/L)	34	48	*	*	*	*				
			24	*	*	*	*				
SDS-HAA6	(µg/L)	38	48	*	*	*	*				
			24	*	201	*	*				
SDS-HAA9	(µg/L)	39	48	*	*	*	*				
			24	*	136	*	*				
SDS-TOX	(µg Cl^-/L)	212	120	50	128	126	322	154	152	158	157
			70	26	57	86	158	232	179	120	85

†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, January

Parameter	Units	Influent concen-tration	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				Contactor configuration			
				Single	Multiple	Single	Multiple	Single	Multiple	10	20
TOC	(mg/L)	3.2	2.0	56	128	126	302	124	136	127	139
			1.0	24	46	55	111	132	142	92	101
			1.6†	36	85	83	198	130	133	136	138
UV-254	(1/cm)	0.066	0.040	*	163	*	*				
			0.020	28	60	79	151	182	152	116	93
			0.033†	48	109	123	267	158	145	129	118
SDS-THM4	(µg/L)	60	80	*	*	*	*				
			64	*	*	*	*				
			32	35	93	105	224	196	140	163	113
SDS-HAA5	(µg/L)	33	48	*	*	*	*				
			24	*	*	*	*				
SDS-HAA6	(µg/L)	38	48	*	*	*	*				
			24	63	160	147	*	131		151	
SDS-HAA9	(µg/L)	38	48	*	*	*	*				
			24	58	118	*	273		132	104	
SDS-TOX	(µg Cl^-/L)	225	120	66	136	151	325	130	138	108	116
			70	30	68	81	168	170	148	127	108

†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, April

Parameter	Units	Influent concen-tration	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				Contactor configuration			
				Single	Multiple	Single	Multiple	Single	Multiple	10	20
TOC	(mg/L)	3.4	2.0	45	113	106	263	135	133	152	149
			1.0	21	42	49	98	137	137	102	101
			1.7†	35	85	87	201	151	136	145	130
UV-254	(1/cm)	0.066	0.040	71	172	*	*			141	
			0.020	30	62	73	153	143	145	108	109
			0.033†	52	117	132	276	151	135	123	109
SDS-THM4	(µg/L)	120	80	73	*	156	*	113			
			64	47	113	117	254	150	124	143	117
			32	24	47	56	113	139	139	100	101
SDS-HAA5	(µg/L)	36	48	*	*	*	*				
			24	*	*	*	*				
SDS-HAA6	(µg/L)	42	48	*	*	*	*				
			24	61	139	149	331	143	138	128	123
SDS-HAA9	(µg/L)	45	48	*	*	*	*				
			24	40	105	106	258	166	146	163	142
SDS-TOX	(µg Cl^-/L)	271	120	45	102	105	241	136	137	128	129
			70	27	55	68	135	151	147	103	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, June

Parameter	Units	Influent concen-tration	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				Contactor configuration			
				Single	Multiple	Single	Multiple	Single	Multiple	10	20
TOC	(mg/L)	3.4	2.0	38	90	100	239	163	166	136	139
			1.0	18	36	39	84	118	133	99	113
			1.7†	29	71	72	171	147	142	143	138
UV-254	(1/cm)	0.063	0.040	*	*	*	*				
			0.020	25	55	64	139	157	154	122	118
			0.031†	40	91	114	247	183	170	126	116
SDS-THM4	(µg/L)	98	80	*	*	*	*				
			64	51	133	121	329	138	147	163	173
			32	20	44	47	102	132	129	117	115
SDS-HAA5	(µg/L)	30	48	*	*	*	*				
			24	*	*	*	*				
SDS-HAA6	(µg/L)	35	48	*	*	*	*				
			24	*	*	*	*				
SDS-HAA9	(µg/L)	#DIV/0!	48	#N/A	*	#N/A	*	#N/A		#N/A	#N/A
			24	#N/A	97	#N/A	267	#N/A	174	#N/A	#N/A
SDS-TOX	(µg Cl^-/L)	232	120	39	90	113	254	188	183	128	125
			70	24	49	62	129	160	162	107	108

†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 50 Summary of GAC run times to selected GAC effluent criteria during session 4, October

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 EBCT (min)	
				Contactor configuration				Contactor configuration			
				Single	Multiple	Single	Multiple	Single	Multiple	10	20
TOC	(mg/L)	3.9	2.0	1,090	400	720	320	34	20	63	56
			1.0	1,800	980	1,380	750	23	23	46	46
			1.9†	1,130	430	760	330	33	23	62	57
UV-254	(1/cm)	0.079	0.040	700	300	540	230	23	23	57	57
			0.020	1,350	660	1,110	510	18	23	51	54
			0.039†	710	310	550	240	23	23	56	56
SDS-THM4	(µg/L)	66	80	*	*	*	*				
			64	*	*	*	*				
			32	860	400	*	310		23	53	
SDS-HAA5	(µg/L)	34	48	*	*	*	*				
			24	*	*	*	*				
SDS-HAA6	(µg/L)	38	48	*	*	*	*				
			24	*	140	*	*				
SDS-HAA9	(µg/L)	39	48	*	*	*	*				
			24	*	210	*	*				
SDS-TOX	(µg Cl^-/L)	212	120	580	230	460	180	21	22	60	61
			70	1,110	510	670	360	40	29	54	46

†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 1, January

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 EBCT (min)	
				Contactor configuration				Contactor configuration			
				Single	Multiple	Single	Multiple	Single	Multiple	10	20
TOC	(mg/L)	3.2	2.0	510	220	460	190	10	14	57	59
			1.0	1,210	630	1,040	520	14	17	48	50
			1.6†	800	340	690	290	14	15	58	58
UV-254	(1/cm)	0.066	0.040	*	180	*	*				
			0.020	1,030	480	730	380	29	21	53	48
			0.033†	600	260	470	220	22	15	57	53
SDS-THM4	(µg/L)	60	80	*	*	*	*				
			64	*	*	*	*				
			32	810	310	550	260	32	16	62	53
SDS-HAA5	(µg/L)	33	48	*	*	*	*				
			24	*	*	*	*				
SDS-HAA6	(µg/L)	38	48	*	*	*	*				
			24	450	180	390	*	13		60	
SDS-HAA9	(µg/L)	38	48	*	*	*	*				
			24	500	240	*	210		13	52	
SDS-TOX	(µg Cl^-/L)	225	120	440	210	380	180	14	14	52	53
			70	960	420	710	340	26	19	56	52

†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 2, April

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 EBCT (min)	
				Contactor configuration				Contactor configuration			
				Single	Multiple	Single	Multiple	Single	Multiple	10	20
TOC	(mg/L)	3.4	2.0	640	250	540	220	16	12	61	59
			1.0	1,400	690	1,180	580	16	16	51	51
			1.7†	830	340	660	290	20	15	59	56
UV-254	(1/cm)	0.066	0.040	400	170	*	*			58	
			0.020	960	460	790	380	18	17	52	52
			0.033†	550	250	440	210	20	16	55	52
SDS-THM4	(µg/L)	120	80	390	*	370	*	5			
			64	620	250	490	230	21	8	60	53
			32	1,220	610	1,020	510	16	16	50	50
SDS-HAA5	(µg/L)	36	48	*	*	*	*				
			24	*	*	*	*				
SDS-HAA6	(µg/L)	42	48	*	*	*	*				
			24	470	210	390	170	17	19	55	56
SDS-HAA9	(µg/L)	45	48	*	*	*	*				
			24	720	270	540	220	25	19	63	59
SDS-TOX	(µg Cl^-/L)	271	120	650	280	550	240	15	14	57	56
			70	1,070	530	850	430	21	19	50	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 53 Summary of carbon usage rates to selected GAC effluent criteria during session 3, June

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 EBCT (min)	
				Contactor configuration				Contactor configuration			
				Single	Multiple	Single	Multiple	Single	Multiple	10	20
TOC	(mg/L)	3.4	2.0	760	320	580	240	24	25	58	59
			1.0	1,600	800	1,460	690	9	14	50	53
			1.7†	990	410	800	340	19	17	59	58
UV-254	(1/cm)	0.063	0.040	*	*	*	*				
			0.020	1,170	530	910	420	22	21	55	54
			0.031†	710	310	500	230	30	26	56	54
SDS-THM4	(µg/L)	98	80	*	*	*	*				
			64	570	220	480	180	16	18	61	63
			32	1,410	650	1,210	570	14	12	54	53
SDS-HAA5	(µg/L)	30	48	*	*	*	*				
			24	*	*	*	*				
SDS-HAA6	(µg/L)	35	48	*	*	*	*				
			24	*	*	*	*				
SDS-HAA9	(µg/L)	#DIV/0!	48	#N/A	*	#N/A	*	#N/A		#N/A	#N/A
			24	#N/A	300	#N/A	220	#N/A	27	#N/A	#N/A
SDS-TOX	(µg Cl^-/L)	232	120	730	320	510	230	30	28	56	55
			70	1,210	590	930	450	23	24	51	52

†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 54 Summary of carbon usage rates to selected GAC effluent criteria during session 4, October

Parameter	Units	Value	Run time (days) Session 1 January	2 April	3 June	4 October	Mean	Standard deviation	Relative standard deviation (%)
TOC	(mg/L)	2.0	73	128#	113#	90#	101	±25	24%
		1.0	29	46	42	36	38	±7	19%
		c/c_0 = 50%†	67	85#	85#	71	77	±9	12%
UV-254	(1/cm)	0.040	96#	163#	172#	*	144	±42	29%
		0.020	43	60	62	55	55	±8	15%
		c/c_0 = 50%†	94#	109#	117#	91#	103	±12	12%
SDS-THM4	(µg/L)	80	*	*	*	*			
		64	*	*	113#	133#	123	±14	11%
		32	72#	93#	47	44	64	±23	36%
SDS-HAA5	(µg/L)	48	*	*	*	*			
		24	*	*	*	*			
SDS-HAA6	(µg/L)	48	*	*	*	*			
		24	201#	160#	139#	*	166	±31	19%
SDS-HAA9	(µg/L)	48	*	*	*	*			
		24	136#	118#	105#	97#	114	±17	15%
SDS-TOX	(µg Cl^-/L)	120	128#	136#	102#	90#	114	±22	19%
		70	57#	68#	55	49	57	±8	14%
Extrapolated run time (days)		--	205	166	190	141	175	±28	16%

†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 55 Run times to selected GAC effluent criteria based on effluent blending (10 minute EBCT)

Parameter	Units	Value	Run time (days) Session 1 January	2 April	3 June	4 October	Mean	Standard deviation	Relative standard deviation (%)
TOC	(mg/L)	2.0	181#	302#	263#	239#	246	±51	21%
		1.0	77	111	98	84	93	±15	16%
		c/c_0 = 50%†	172#	198#	201#	171#	185	±16	9%
UV-254	(1/cm)	0.040	245#	*	*	*	245		
		0.020	113	151#	153	139	139	±19	13%
		c/c_0 = 50%†	239#	267#	276#	247#	257	±17	7%
SDS-THM4	(µg/L)	80	*	*	*	*			
		64	*	*	254#	329#	291	±53	18%
		32	185#	224#	113	102	156	±58	37%
SDS-HAA5	(µg/L)	48	*	*	*	*			
		24	*	*	*	*			
SDS-HAA6	(µg/L)	48	*	*	*	*			
		24	*	*	331#	*	331		
SDS-HAA9	(µg/L)	48	*	*	*	*			
		24	*	273#	258#	267#	266	±8	3%
SDS-TOX	(µg Cl^-/L)	120	322#	325#	241#	254#	286	±44	16%
		70	158#	168#	135	129	147	±19	13%
Extrapolated run time (days)		--	380	379	400	380	385	±10	3%

†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 56 Run times to selected GAC effluent criteria based on effluent blending (20 minute EBCT)

Parameter	Coefficient	10 minute EBCT				20 minute EBCT			
		January	April	June	October	January	April	June	October
TOC	A_o	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	A_f	3.27	2.80	2.89	2.90	3.33	2.75	2.98	2.88
	B	9.1	7.2	6.7	9.5	8.1	9.2	6.3	6.3
	D	0.090	0.057	0.058	0.084	0.030	0.028	0.023	0.027
	r^2	0.950	0.946	0.949	0.972	0.960	0.956	0.967	0.949
UV_{254}	A_o	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	A_f	0.064	0.055	0.055	0.051	0.067	0.055	0.055	0.053
	B	13.5	10.5	10.0	10.2	12.6	12.6	10.7	9.3
	D	0.074	0.056	0.051	0.067	0.026	0.024	0.022	0.023
	r^2	0.936	0.937	0.945	0.928	0.954	0.946	0.939	0.943
SDS-THM4	A_o	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	A_f	52.4	49.2	100.3	83.4	54.5	49.5	103.1	82.6
	B	14.1	8.8	9.3	9.3	11.8	12.2	10.7	8.7
	D	0.096	0.069	0.057	0.075	0.033	0.033	0.025	0.031
	r^2	0.931	0.904	0.939	0.948	0.905	0.939	0.960	0.946
SDS-HAA5	A_o	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	A_f	26.3	27.2	29.0	24.7	28.3	27.2	29.4	24.5
	B	7.1	9.5	9.5	13.5	14.9	9.8	11.0	13.2
	D	0.046	0.055	0.050	0.079	0.023	0.023	0.022	0.028
	r^2	0.820	0.892	0.871	0.927	0.947	0.806	0.914	0.904
SDS-HAA6	A_o	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	A_f	29.3	31.7	33.8	29.6	31.5	31.6	34.2	29.3
	B	7.6	8.3	9.6	12.6	12.4	9.3	10.0	11.9
	D	0.059	0.057	0.059	0.087	0.025	0.025	0.024	0.031
	r^2	0.834	0.901	0.886	0.937	0.935	0.830	0.904	0.908
SDS-HAA9	A_o	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	A_f	30.5	34.0	37.1	33.1	31.0	33.5	37.2	34.2
	B	12.4	5.8	7.4	16.8	9.4	5.4	8.6	10.8
	D	0.089	0.055	0.057	0.108	0.025	0.024	0.025	0.031
	r^2	0.896	0.877	0.873	0.923	0.866	0.799	0.914	0.885
SDS-TOX	A_o	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	A_f	162	183	223	194	169	184	224	194
	B	23.3	10.6	10.6	13.6	71.3	14.0	11.0	10.3
	D	0.096	0.052	0.051	0.078	0.046	0.024	0.022	0.025
	r^2	0.923	0.898	0.924	0.957	0.945	0.915	0.928	0.946

Table 57 Summary of logistic function curve fit parameters and r2 values for curve fits after breakthrough curve extrapolation

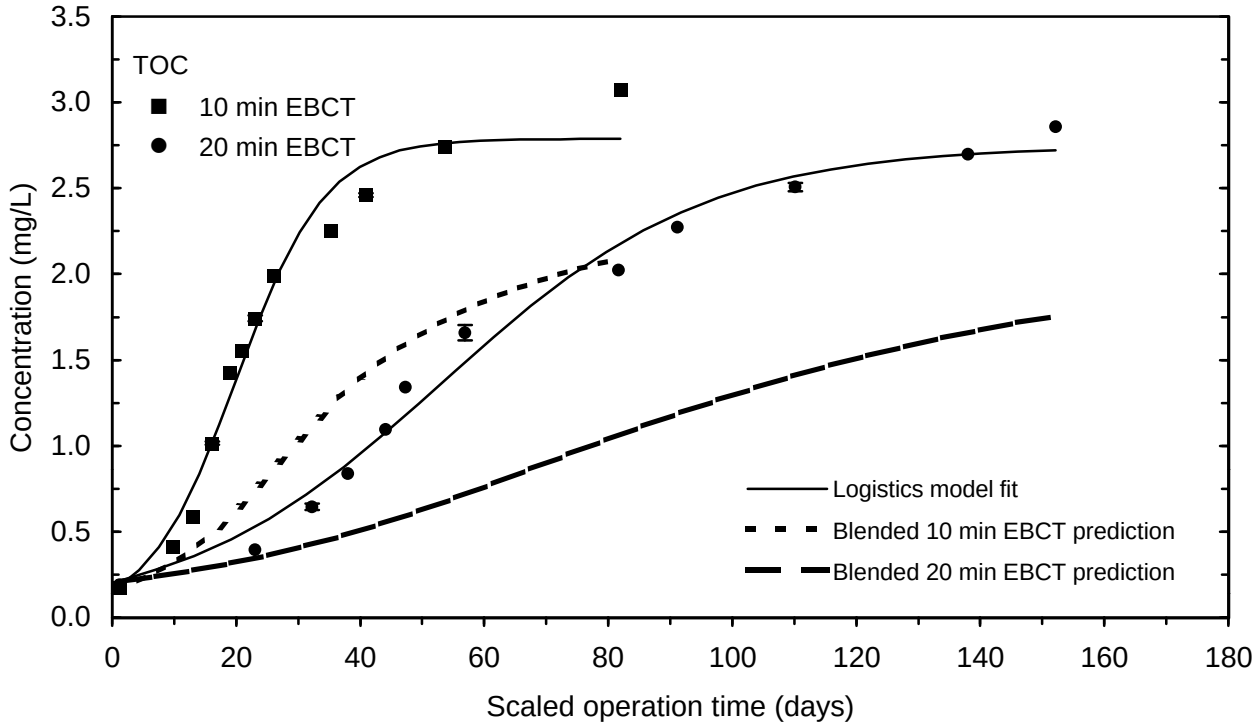


Figure 92 TOC breakthrough and effluent blending for 10 and 20 minute EBCT contactors during session 1 (January)

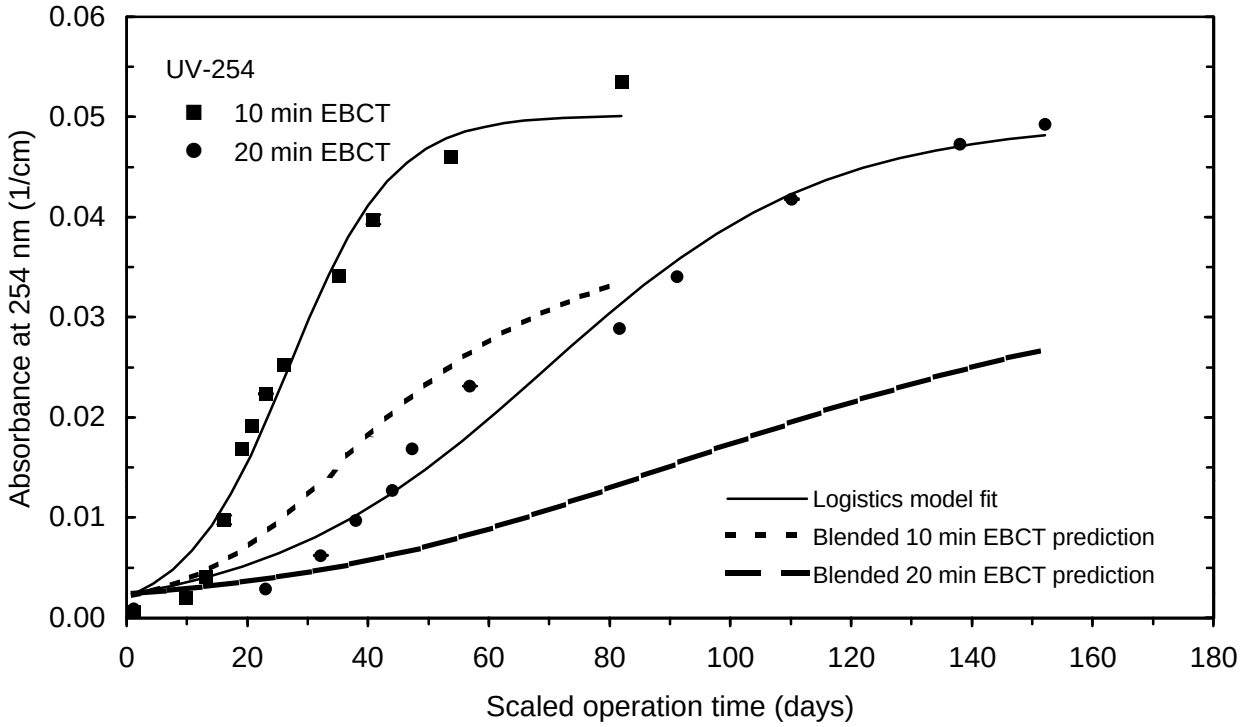


Figure 93 UV-254 breakthrough and effluent blending for 10 and 20 minute EBCT contactors during session 1 (January)

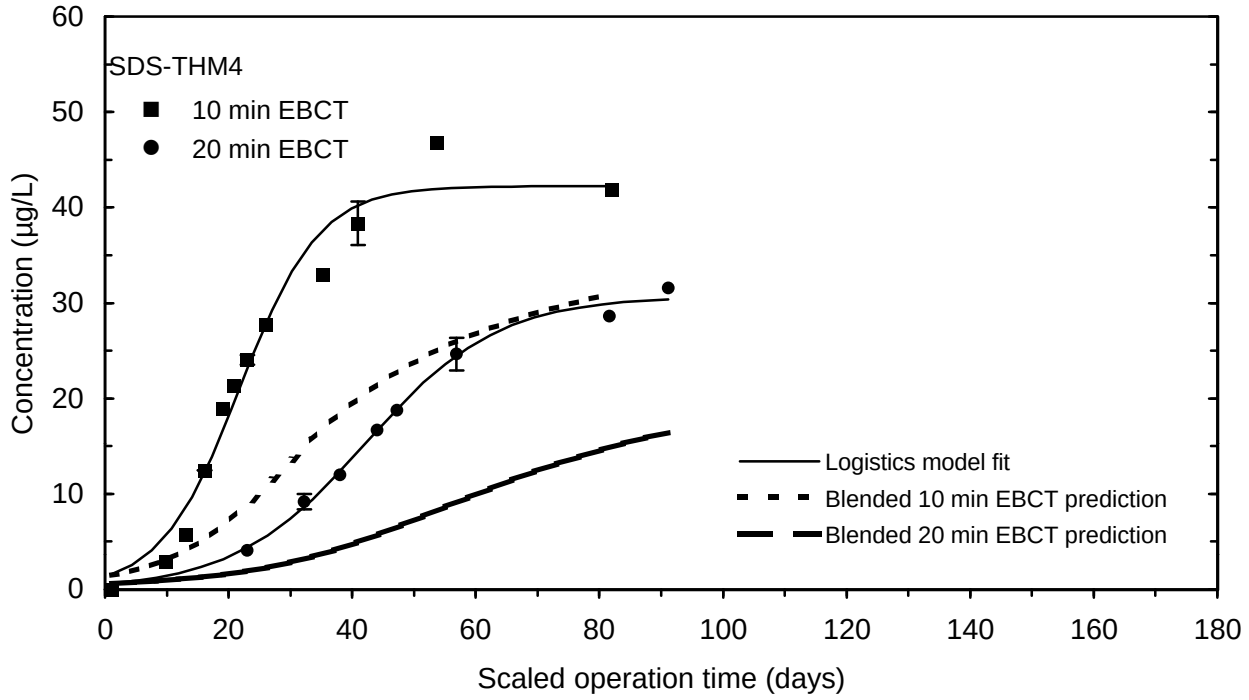


Figure 94 SDS-THM4 breakthrough and effluent blending for 10 and 20 minute EBCT contactors during session 1 (January)

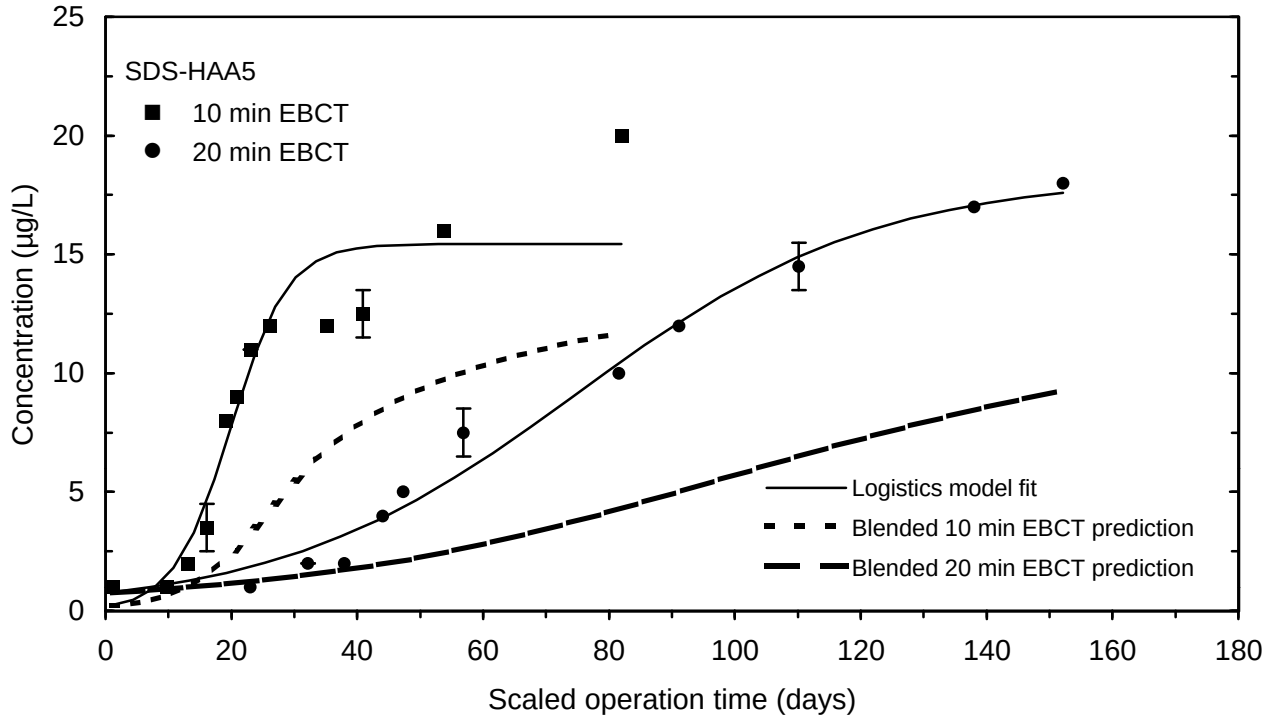


Figure 95 SDS-HAA5 breakthrough and effluent blending for 10 and 20 minute EBCT contactors during session 1 (January)

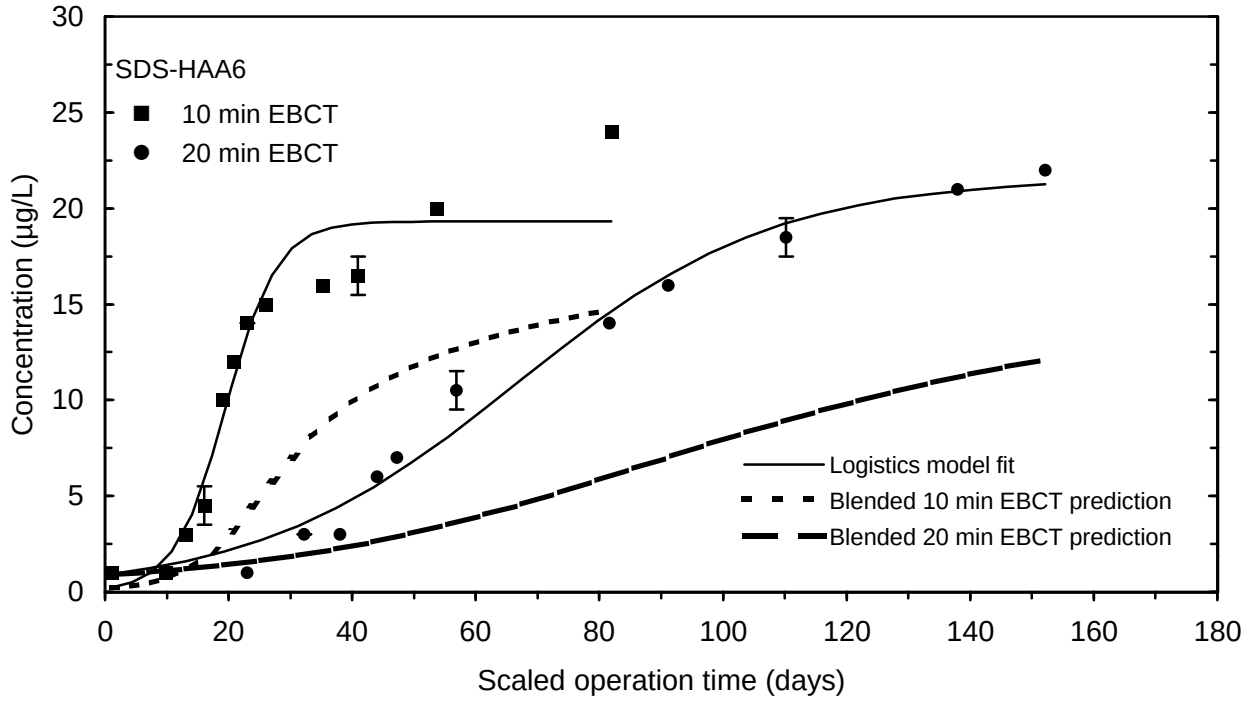


Figure 96 SDS-HAA6 breakthrough and effluent blending for 10 and 20 minute EBCT contactors during session 1 (January)

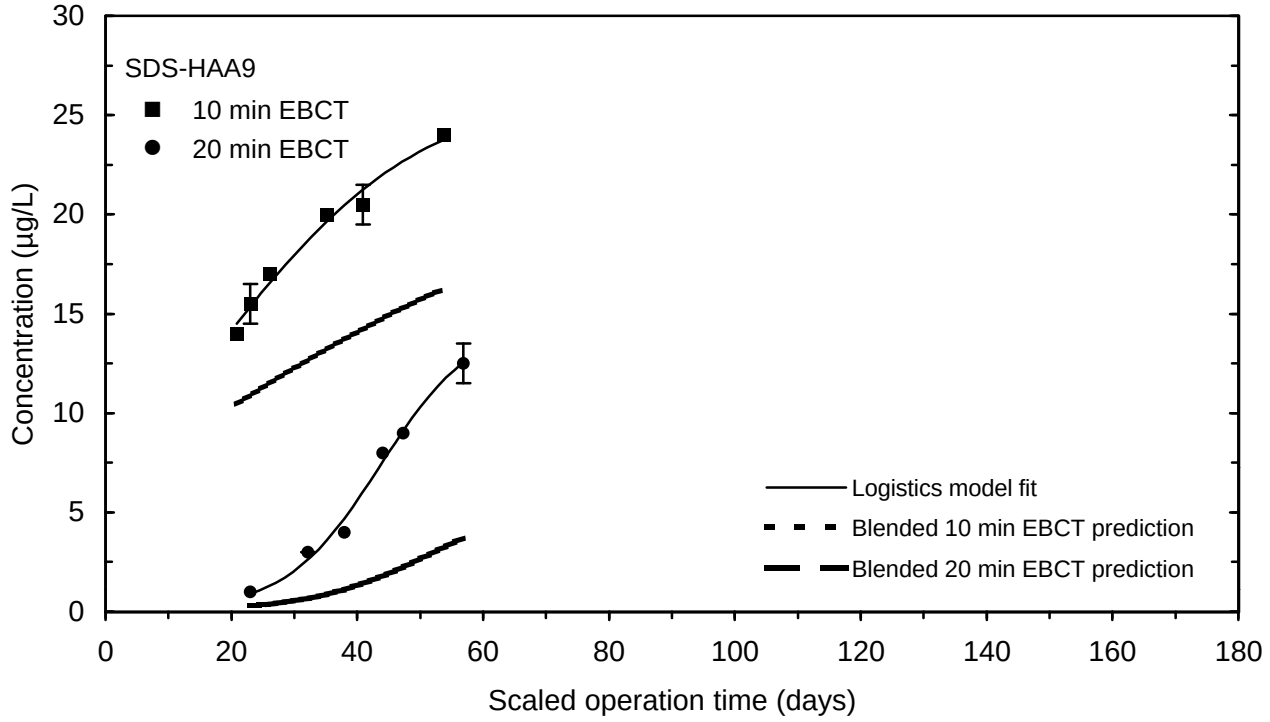


Figure 97 SDS-HAA9 breakthrough and effluent blending for 10 and 20 minute EBCT contactors during session 1 (January)

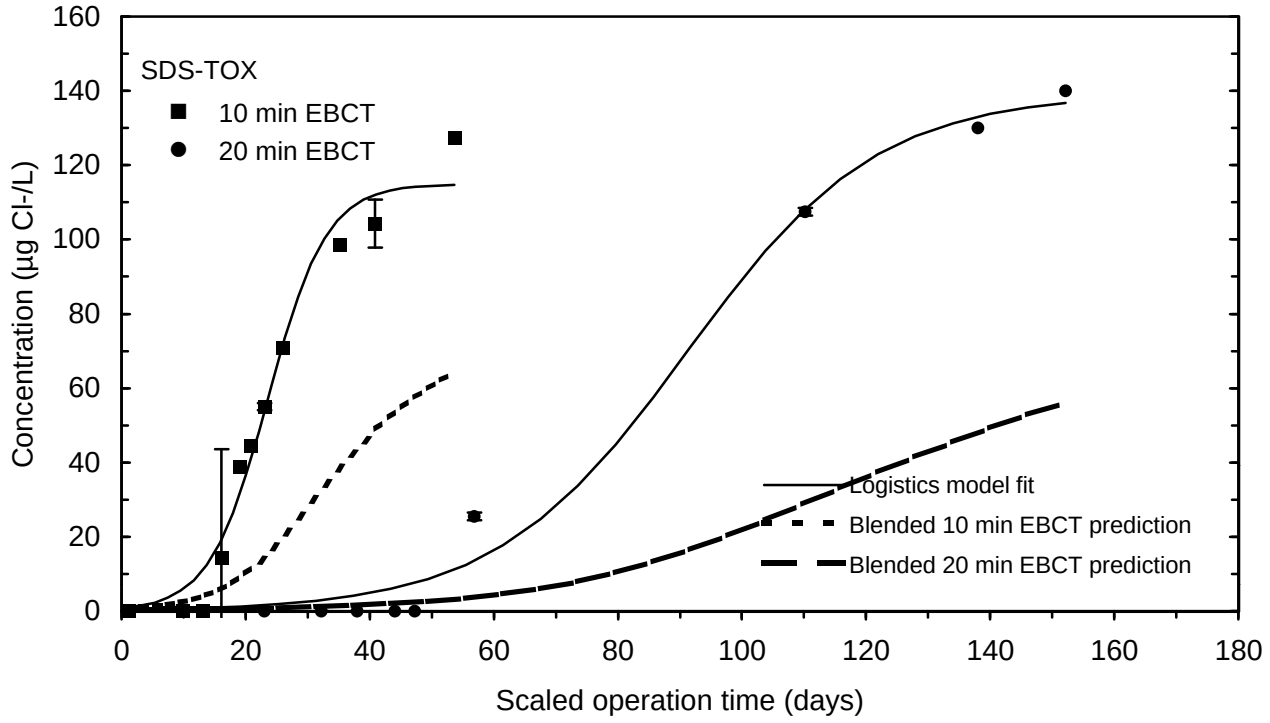


Figure 98 SDS-TOX breakthrough and effluent blending for 10 and 20 minute EBCT contactors during session 1 (January)

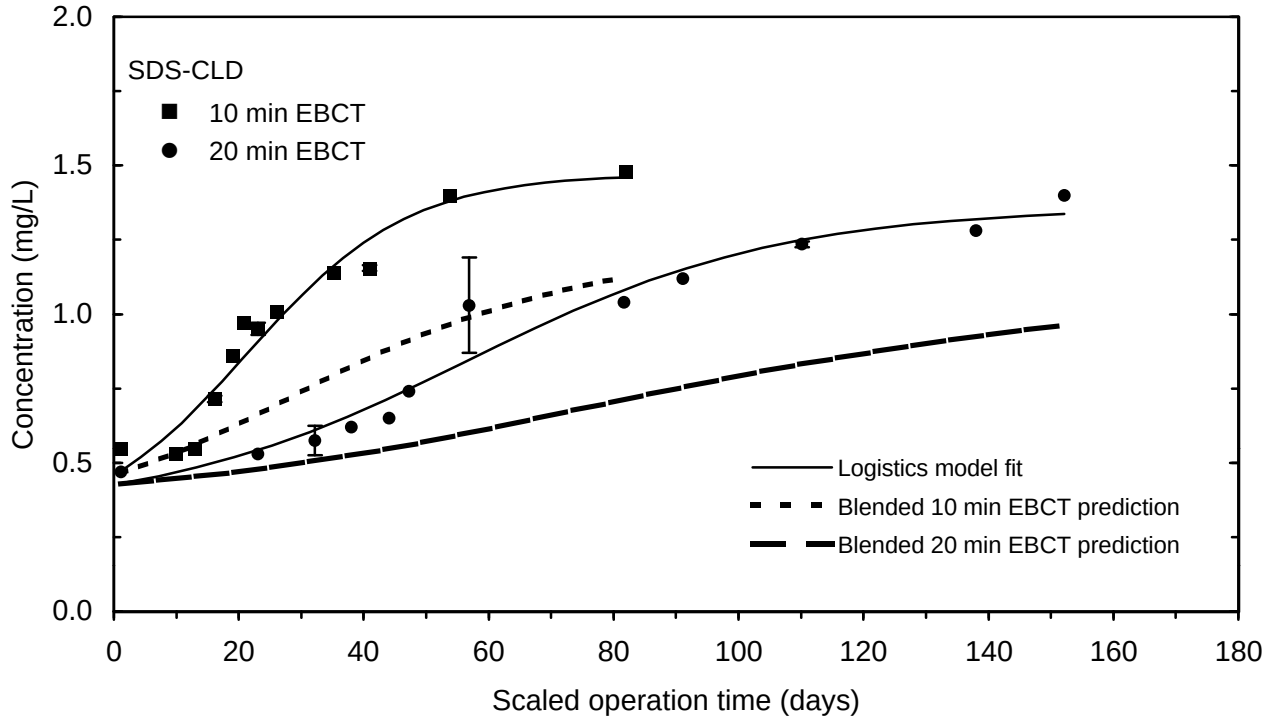


Figure 99 SDS-CLD breakthrough and effluent blending for 10 and 20 minute EBCT contactors during session 1 (January)

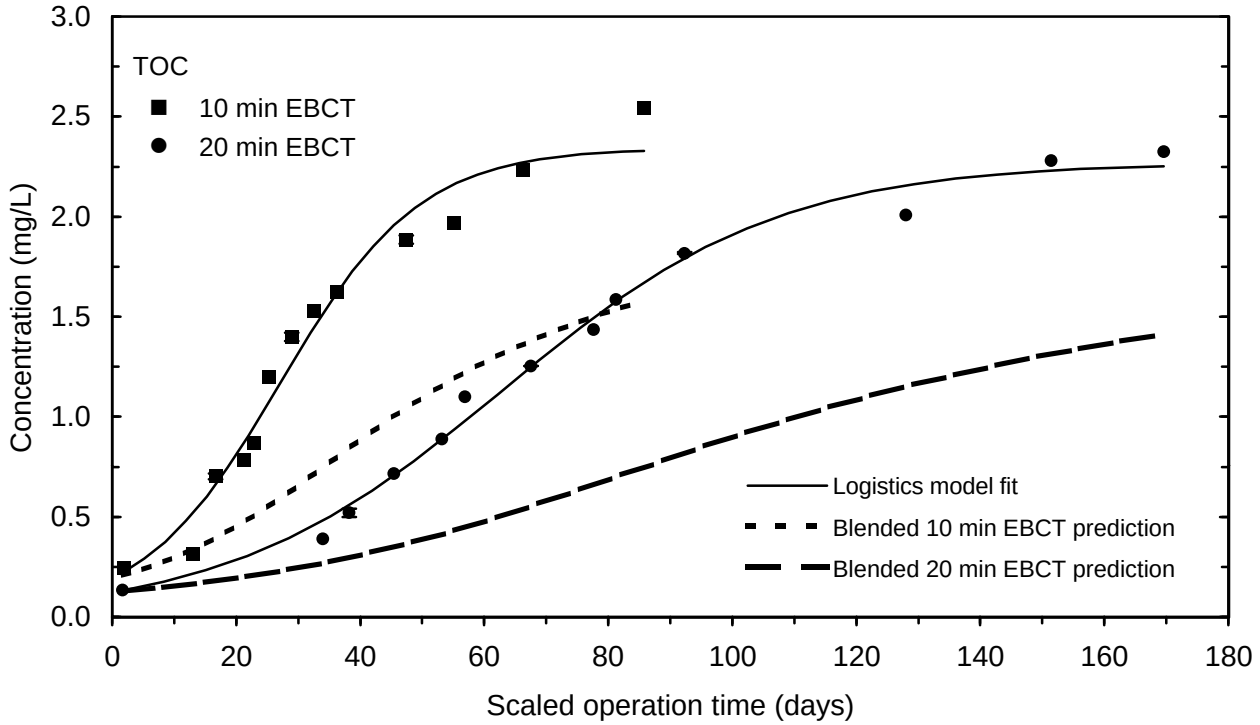


Figure 100 TOC breakthrough and effluent blending for 10 and 20 minute EBCT contactors during session 2 (April)

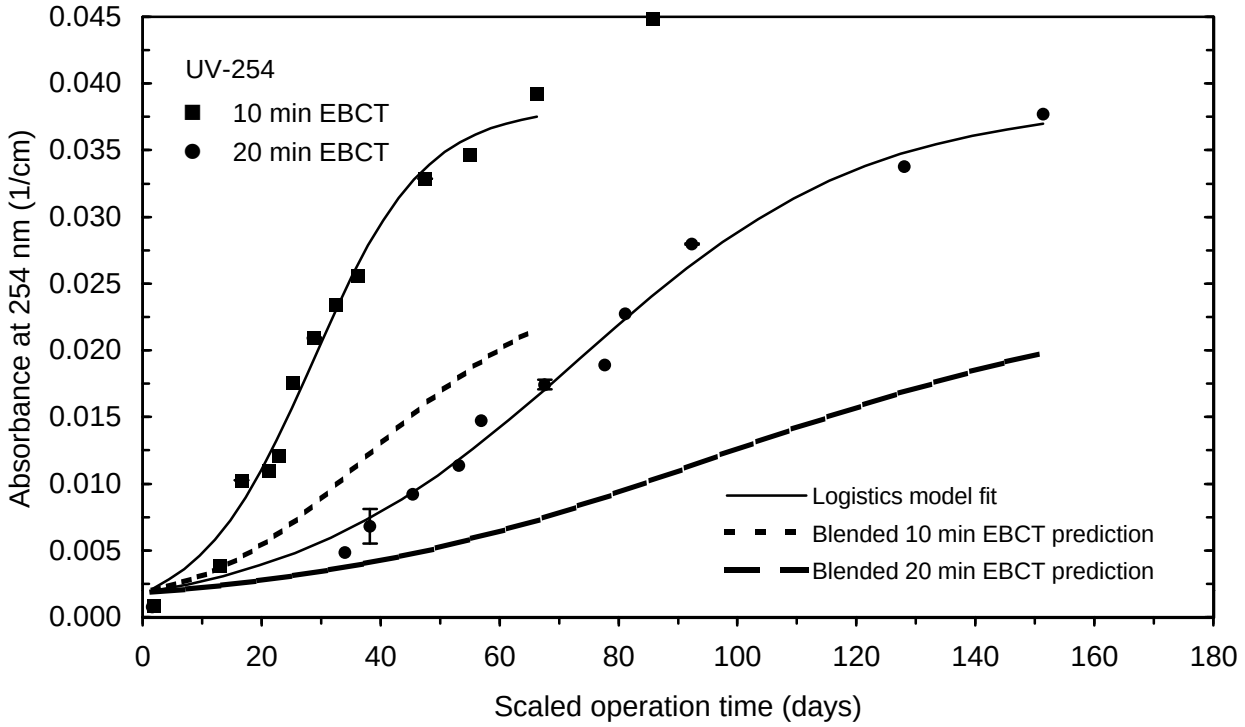


Figure 101 UV-254 breakthrough and effluent blending for 10 and 20 minute EBCT contactors during session 2 (April)

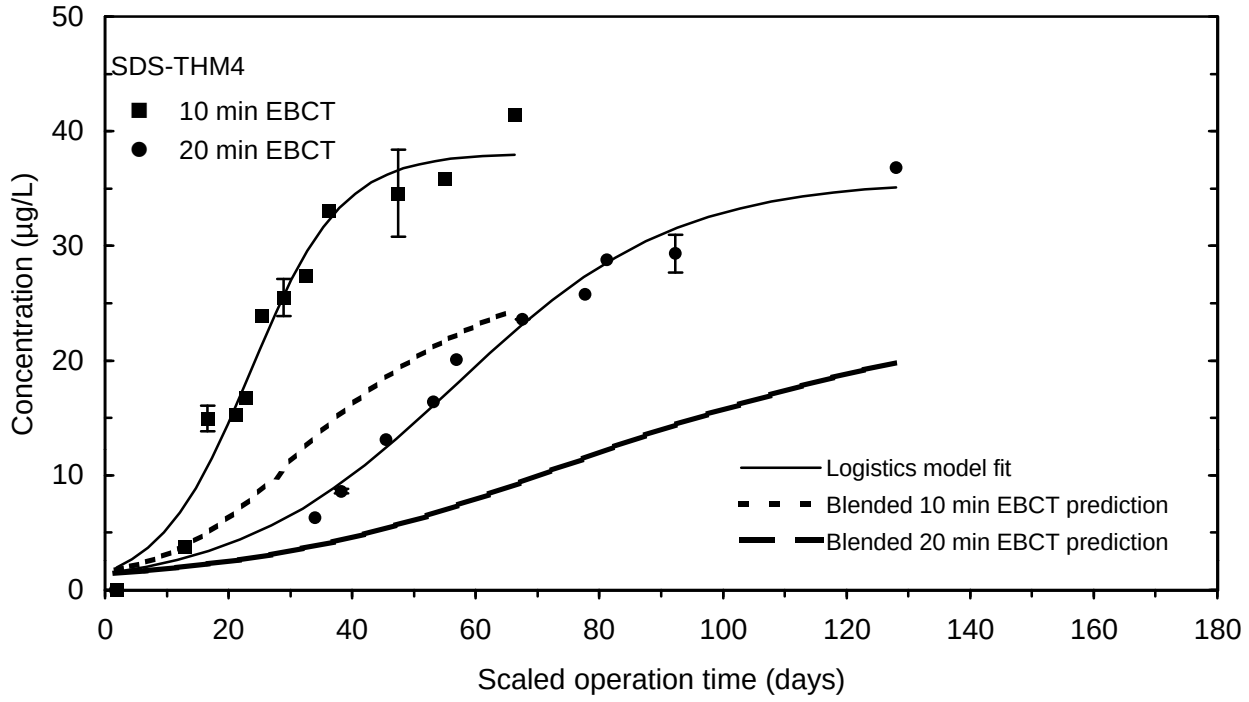


Figure 102 SDS-THM4 breakthrough and effluent blending for 10 and 20 minute EBCT contactors during session 2 (April)

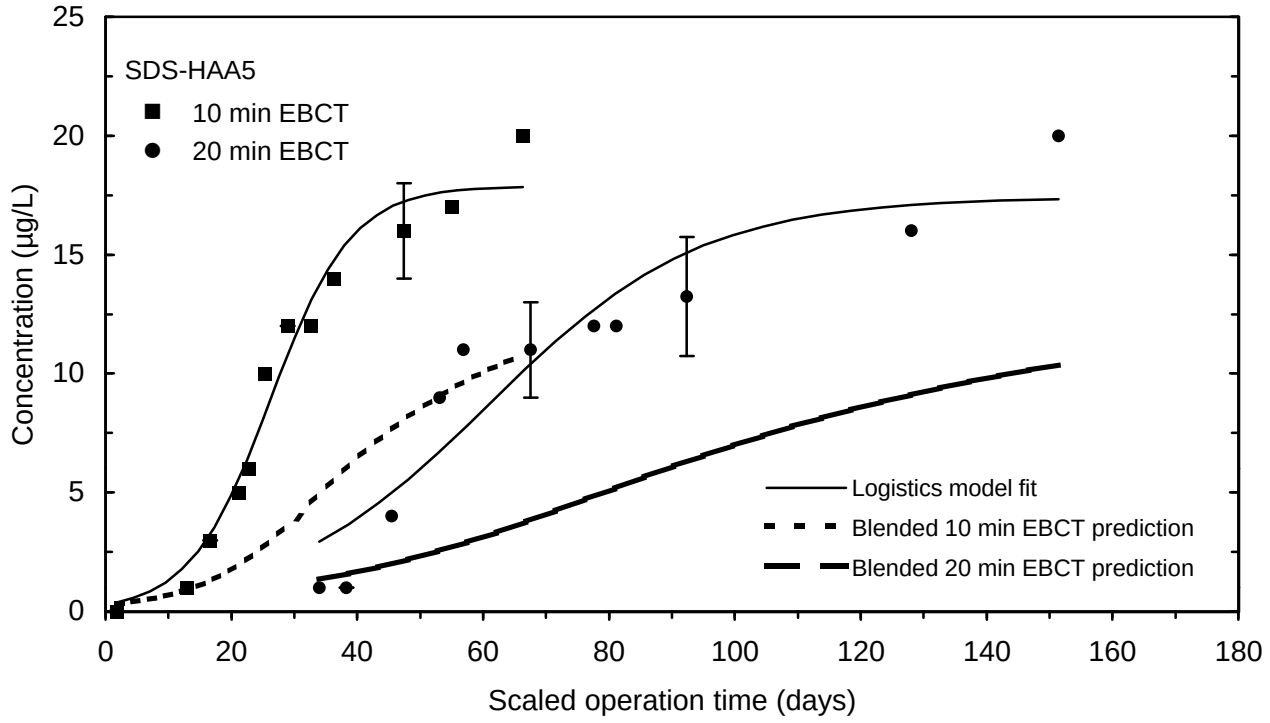


Figure 103 SDS-HAA5 breakthrough and effluent blending for 10 and 20 minute EBCT contactors during session 2 (April)

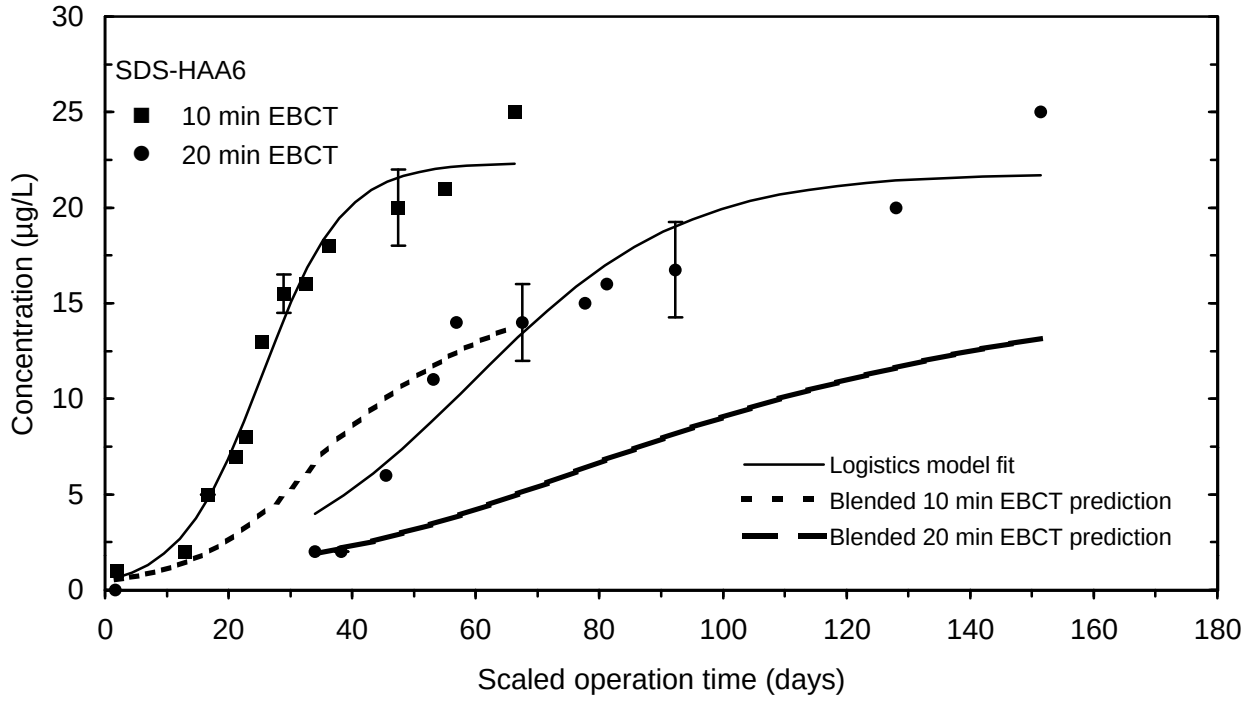


Figure 104 SDS-HAA6 breakthrough and effluent blending for 10 and 20 minute EBCT contactors during session 2 (April)

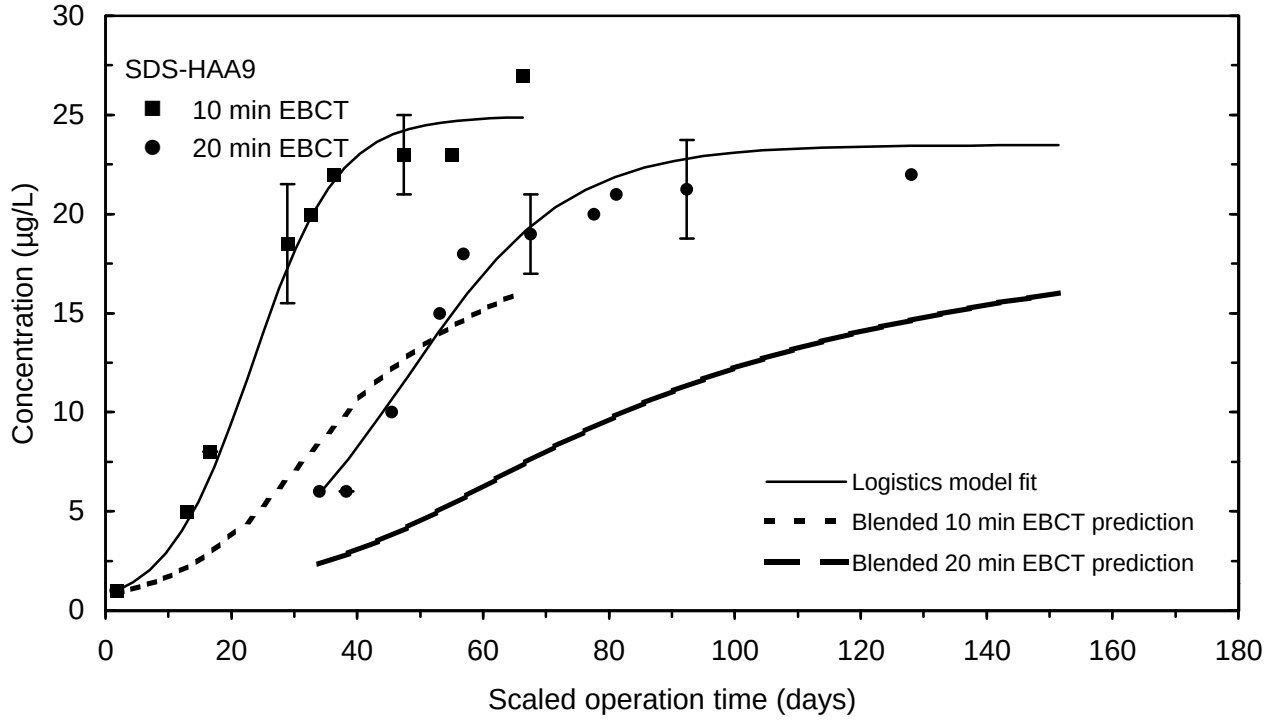


Figure 105 SDS-HAA9 breakthrough and effluent blending for 10 and 20 minute EBCT contactors during session 2 (April)

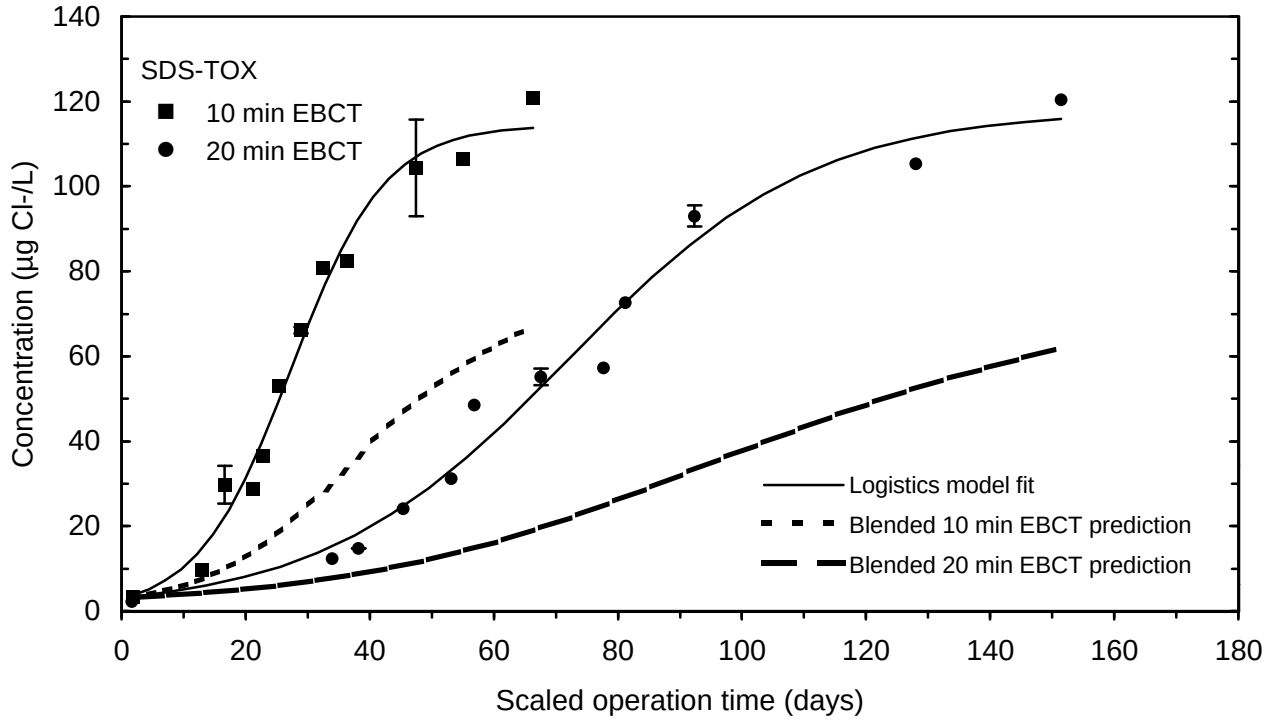


Figure 106 SDS-TOX breakthrough and effluent blending for 10 and 20 minute EBCT contactors during session 2 (April)

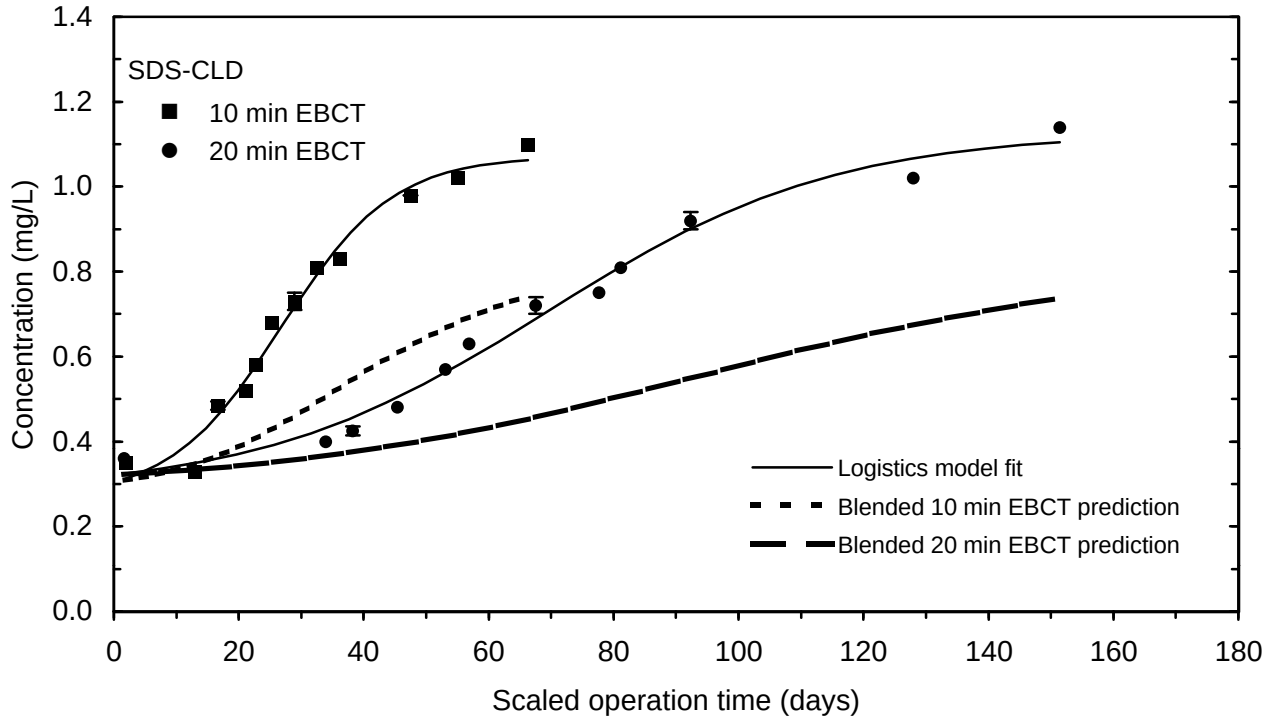


Figure 107 SDS-CLD breakthrough and effluent blending for 10 and 20 minute EBCT contactors during session 2 (April)

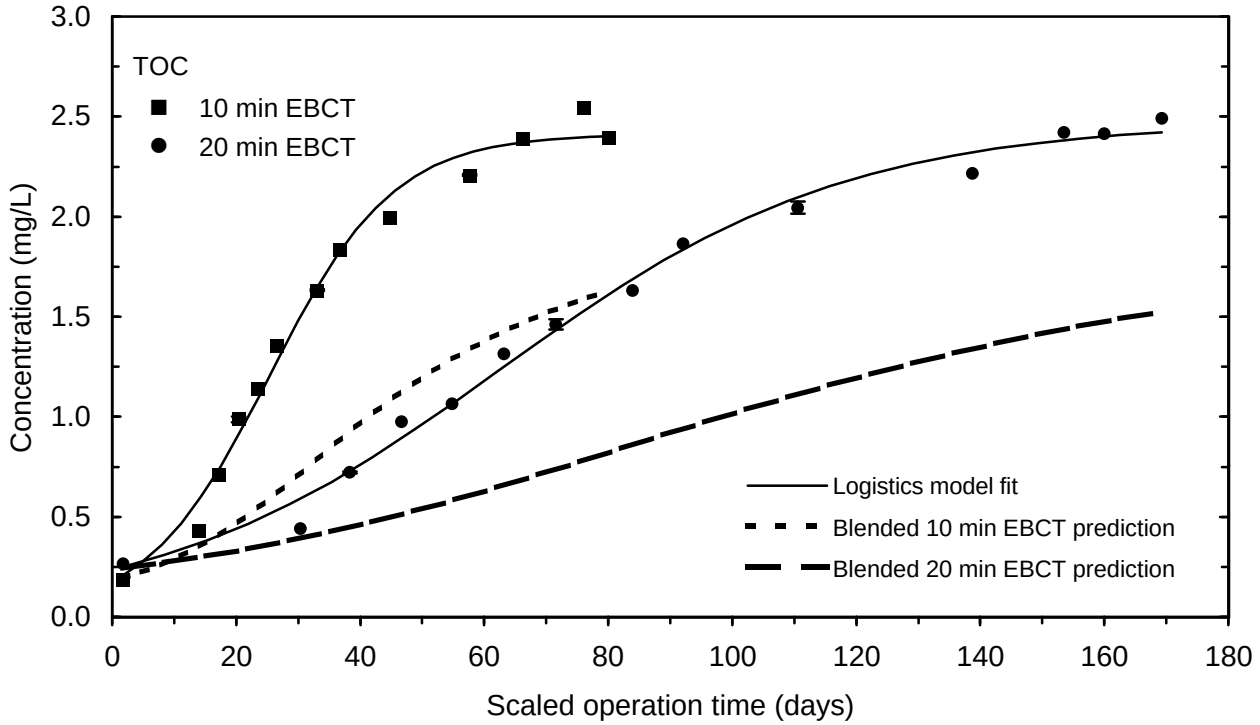


Figure 108 TOC breakthrough and effluent blending for 10 and 20 minute EBCT contactors during session 3 (June)

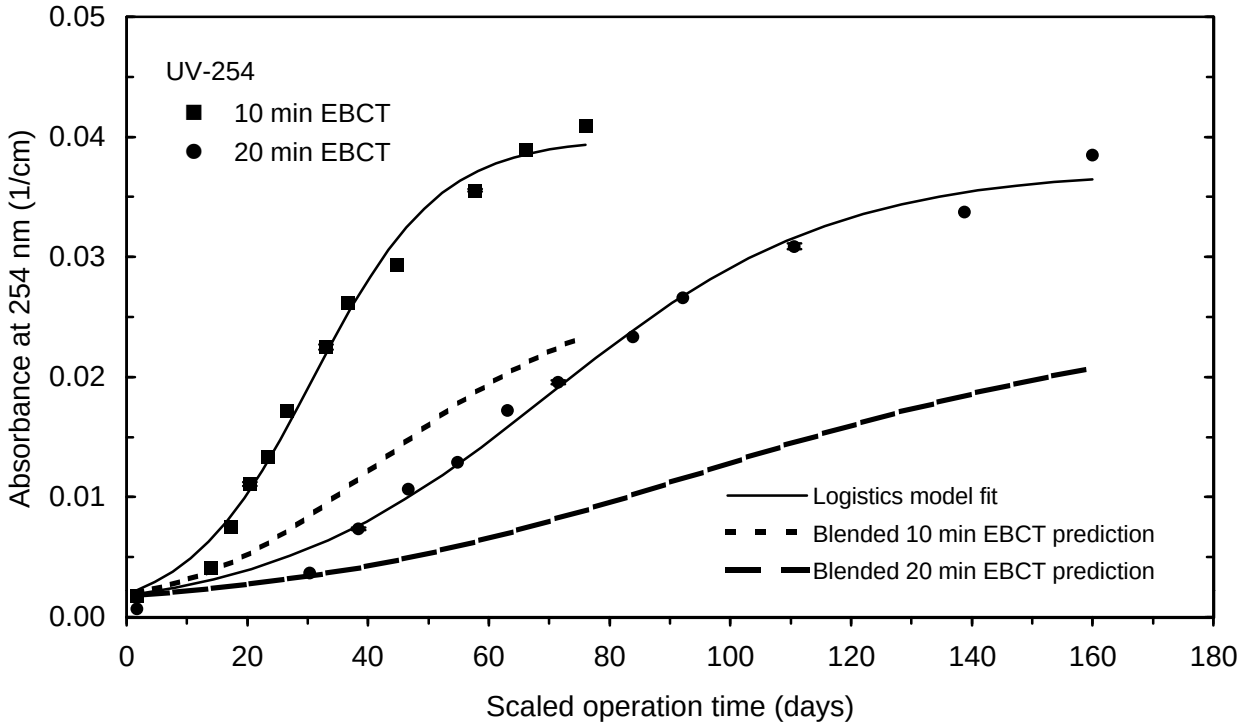


Figure 109 UV-254 breakthrough and effluent blending for 10 and 20 minute EBCT contactors during session 3 (June)

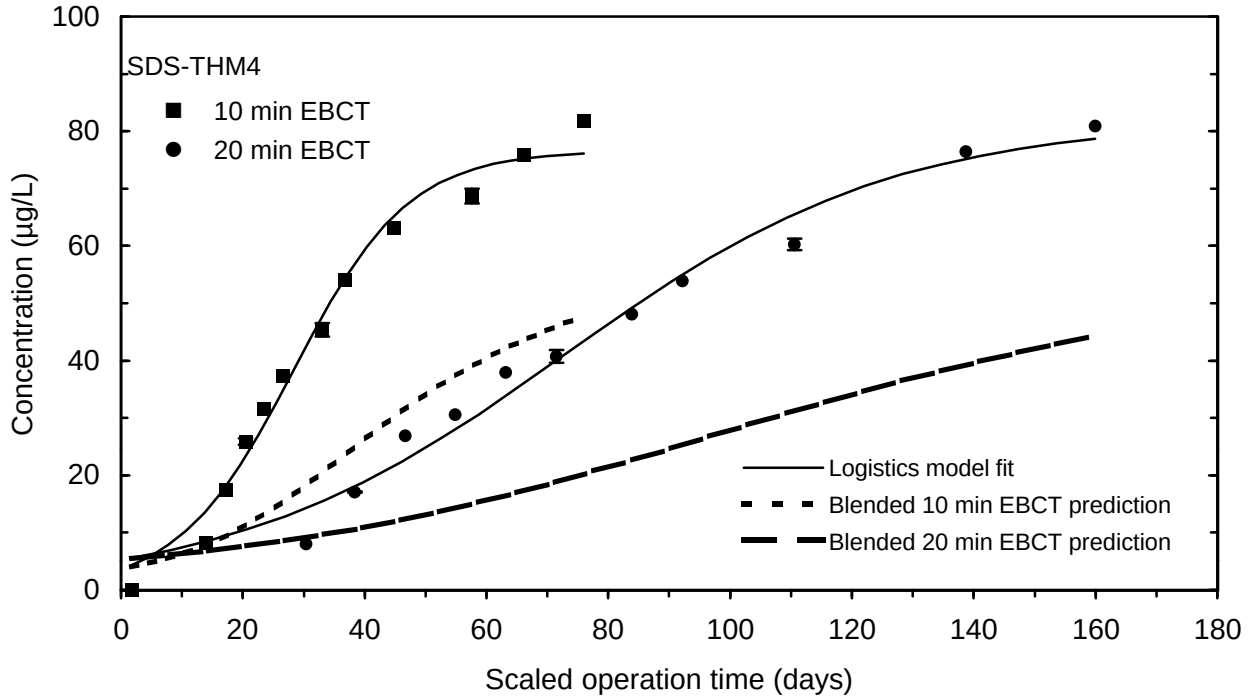


Figure 110 SDS-THM4 breakthrough and effluent blending for 10 and 20 minute EBCT contactors during session 3 (June)

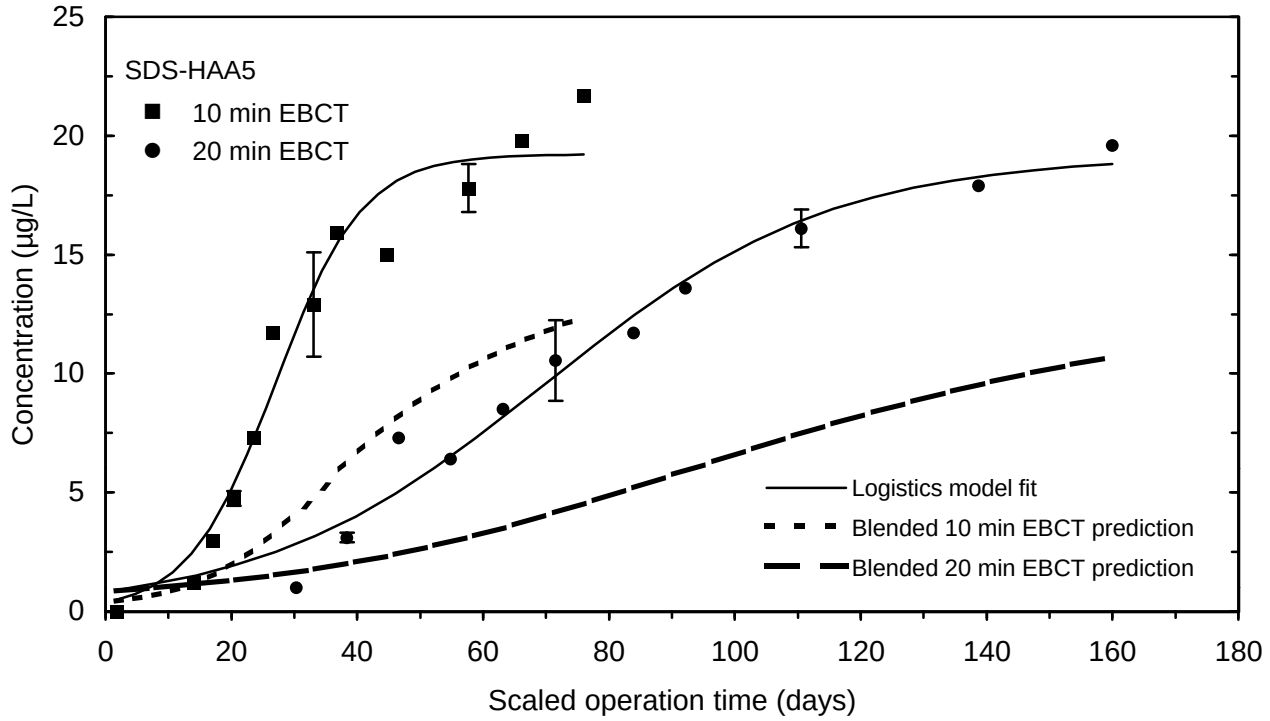


Figure 111 SDS-HAA5 breakthrough and effluent blending for 10 and 20 minute EBCT contactors during session 3 (June)

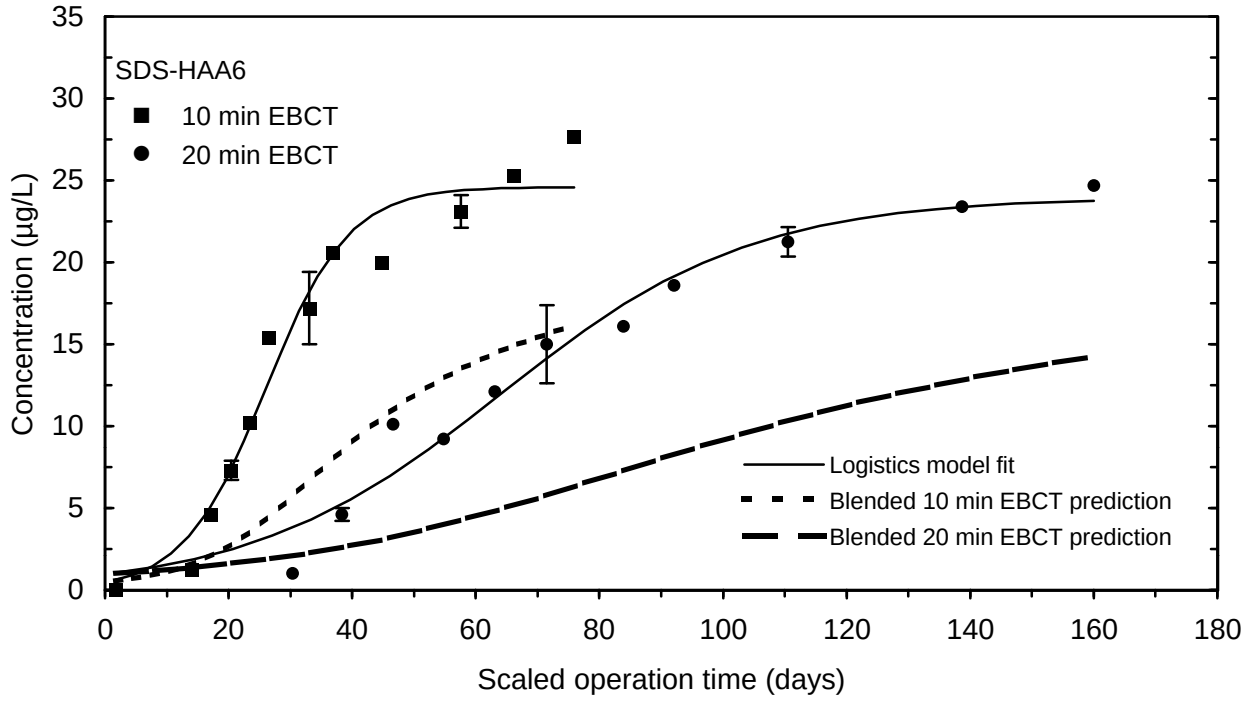


Figure 112 SDS-HAA6 breakthrough and effluent blending for 10 and 20 minute EBCT contactors during session 3 (June)

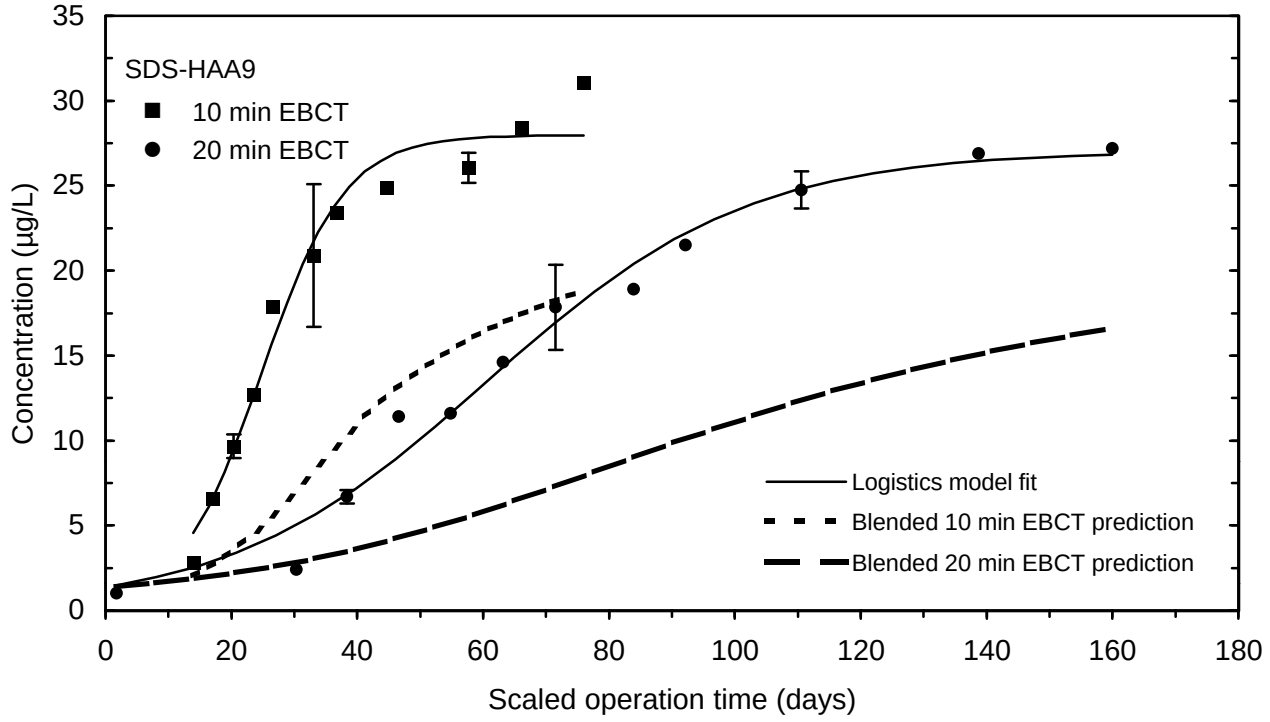


Figure 113 SDS-HAA9 breakthrough and effluent blending for 10 and 20 minute EBCT contactors during session 3 (June)

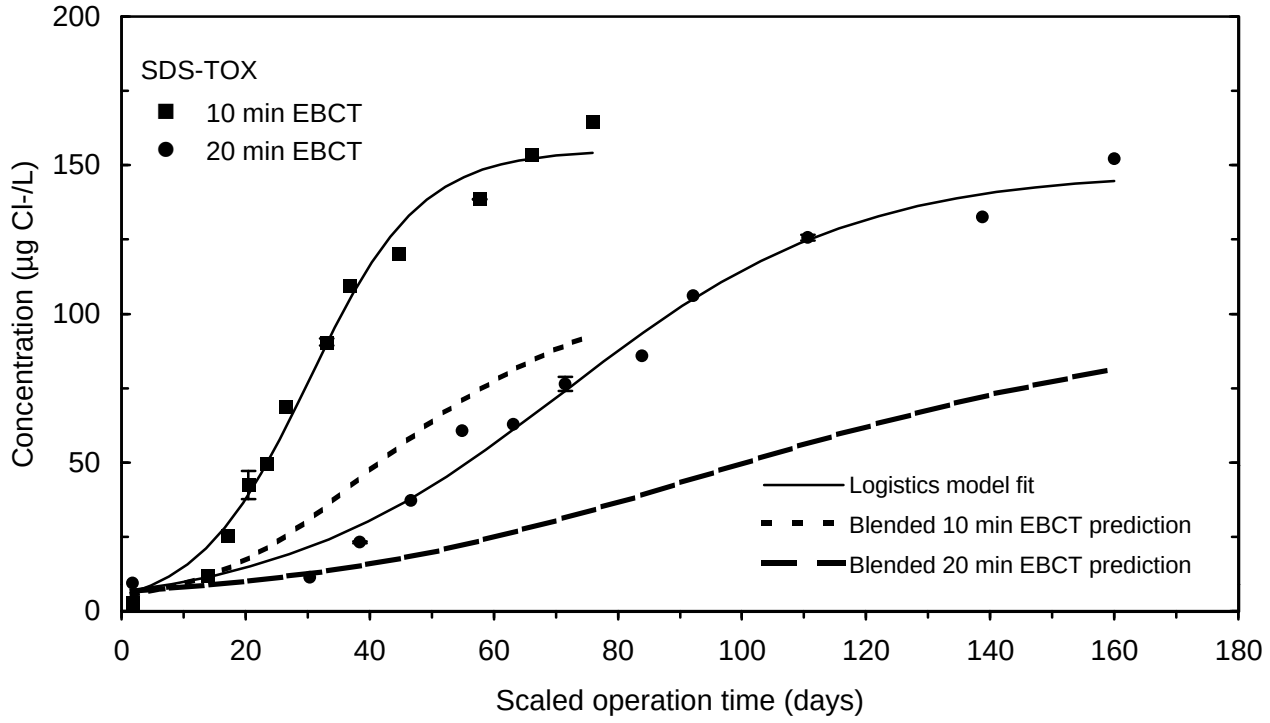


Figure 114 SDS-TOX breakthrough and effluent blending for 10 and 20 minute EBCT contactors during session 3 (June)

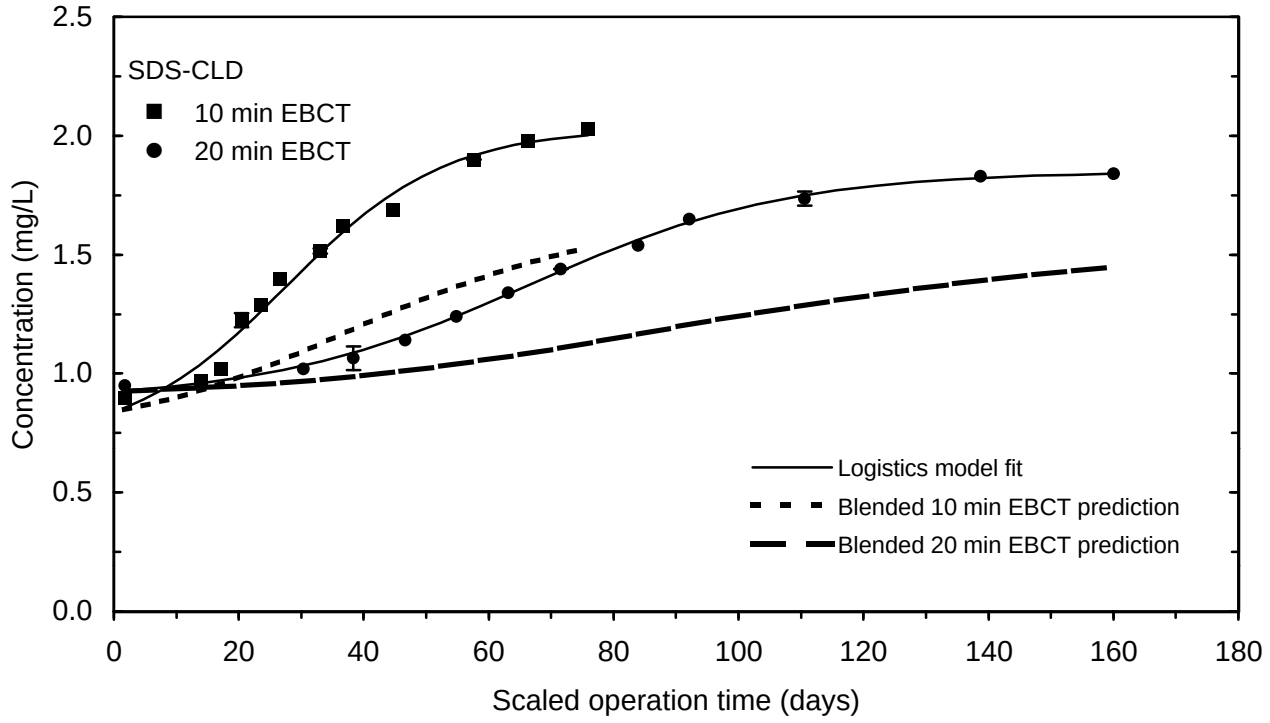


Figure 115 SDS-CLD breakthrough and effluent blending for 10 and 20 minute EBCT contactors during session 3 (June)

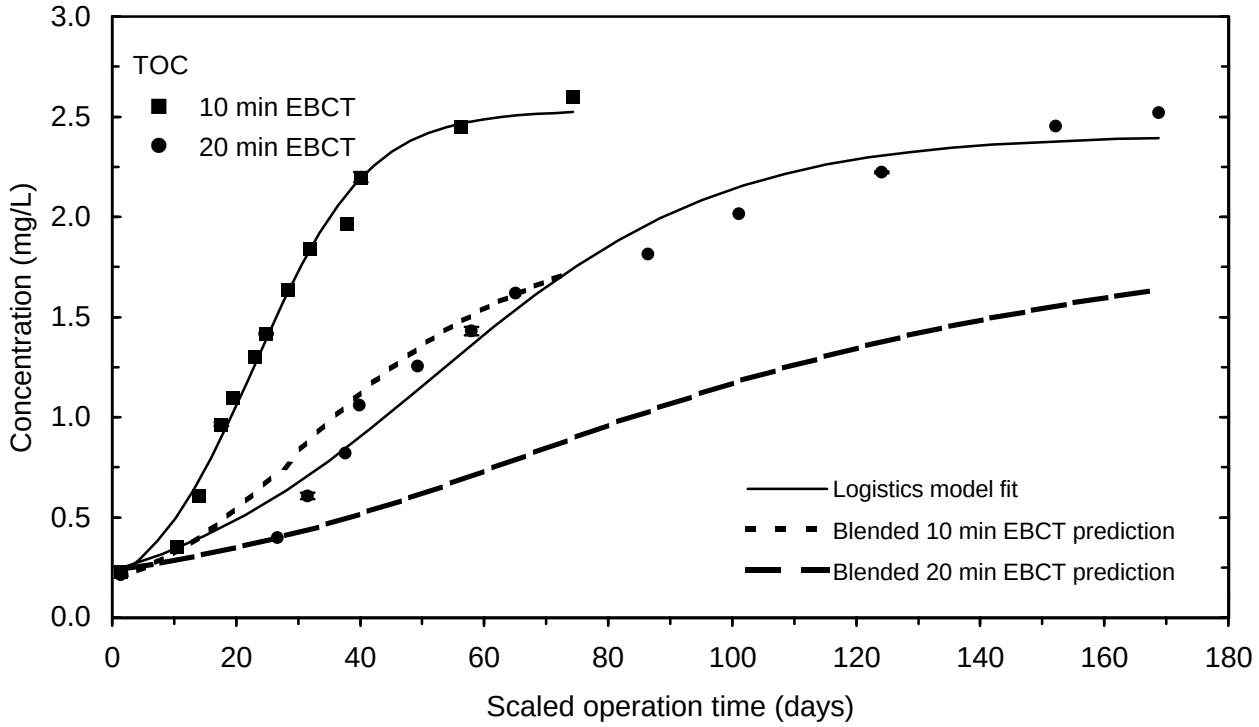


Figure 116 TOC breakthrough and effluent blending for 10 and 20 minute EBCT contactors during session 4 (October)

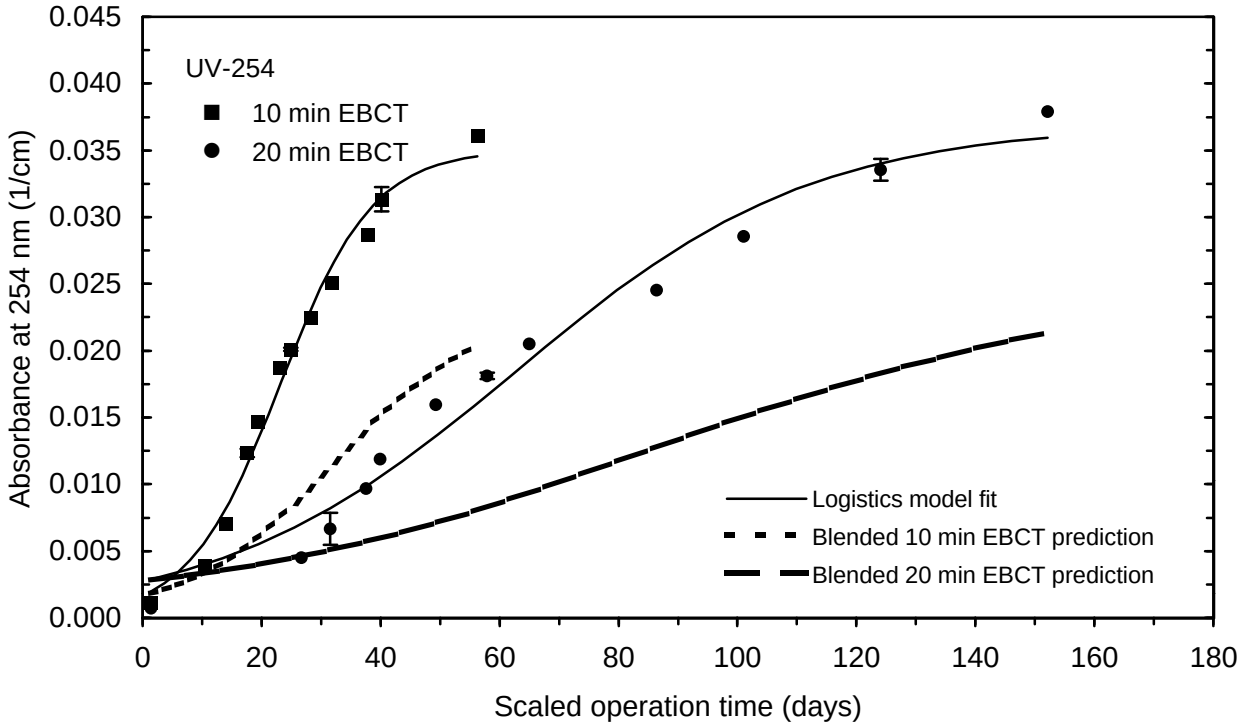


Figure 117 UV-254 breakthrough and effluent blending for 10 and 20 minute EBCT contactors during session 4 (October)

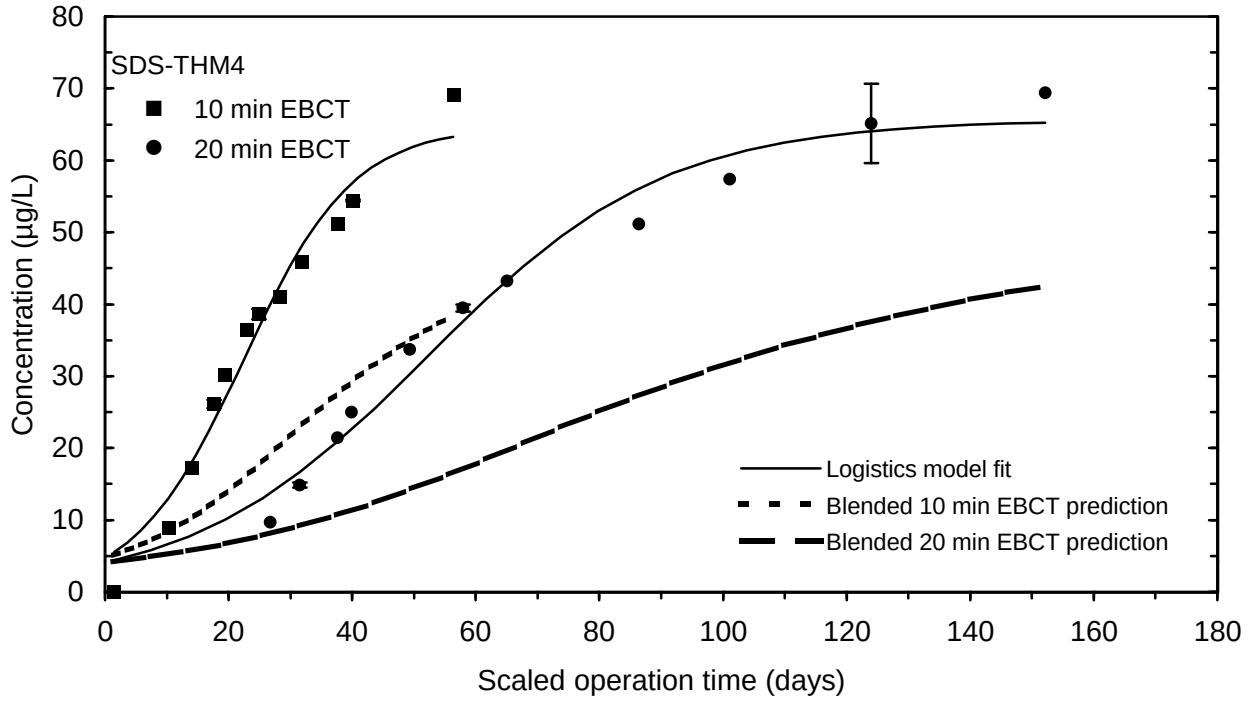


Figure 118 SDS-THM4 breakthrough and effluent blending for 10 and 20 minute EBCT contactors during session 4 (October)

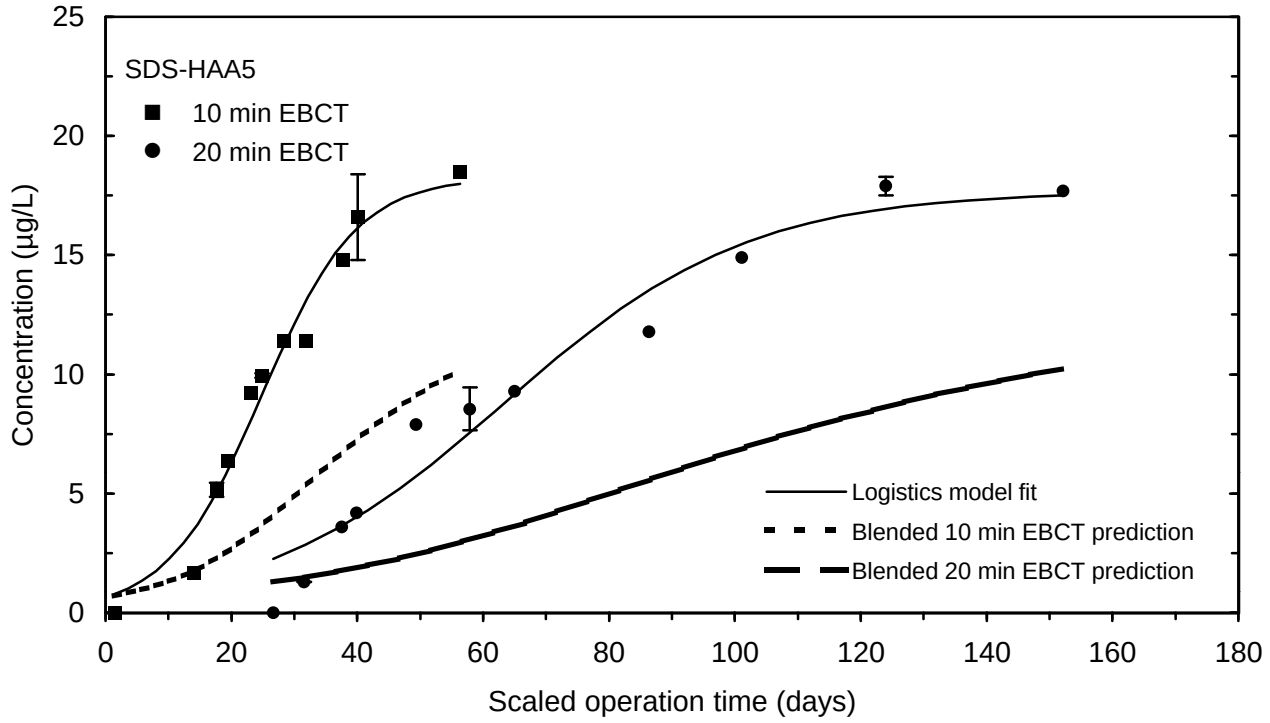


Figure 119 SDS-HAA5 breakthrough and effluent blending for 10 and 20 minute EBCT contactors during session 4 (October)

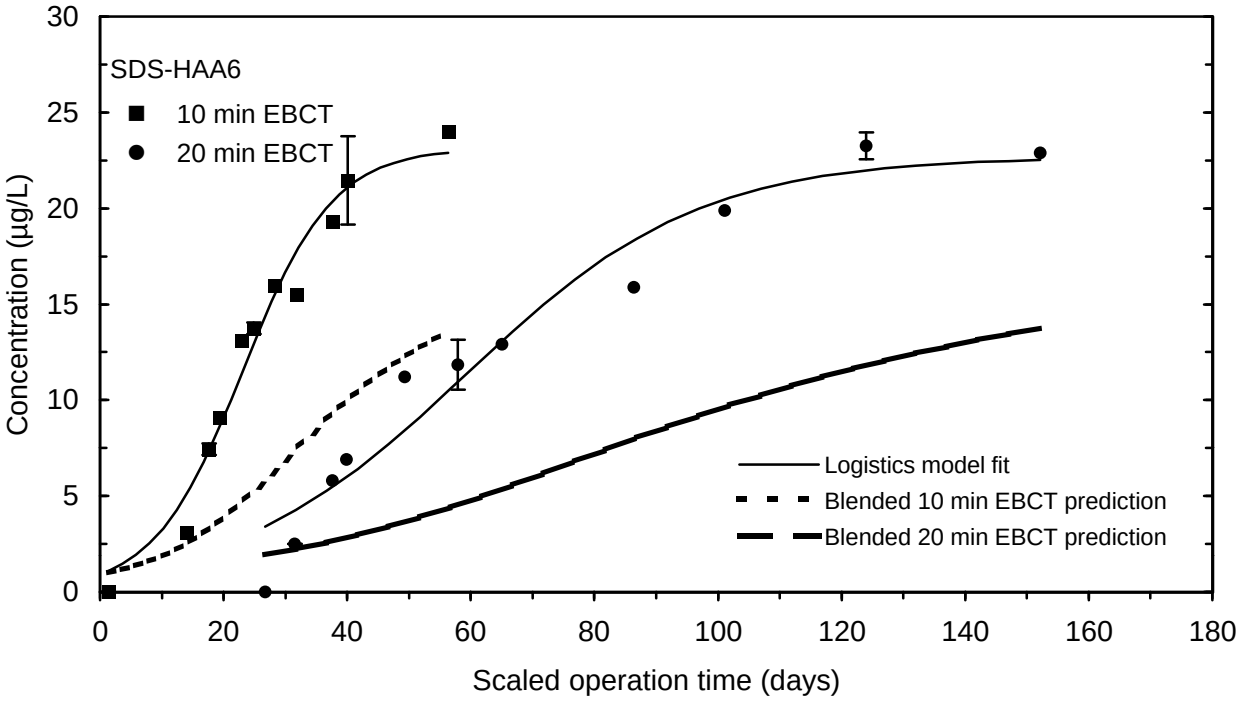


Figure 120 SDS-HAA6 breakthrough and effluent blending for 10 and 20 minute EBCT contactors during session 4 (October)

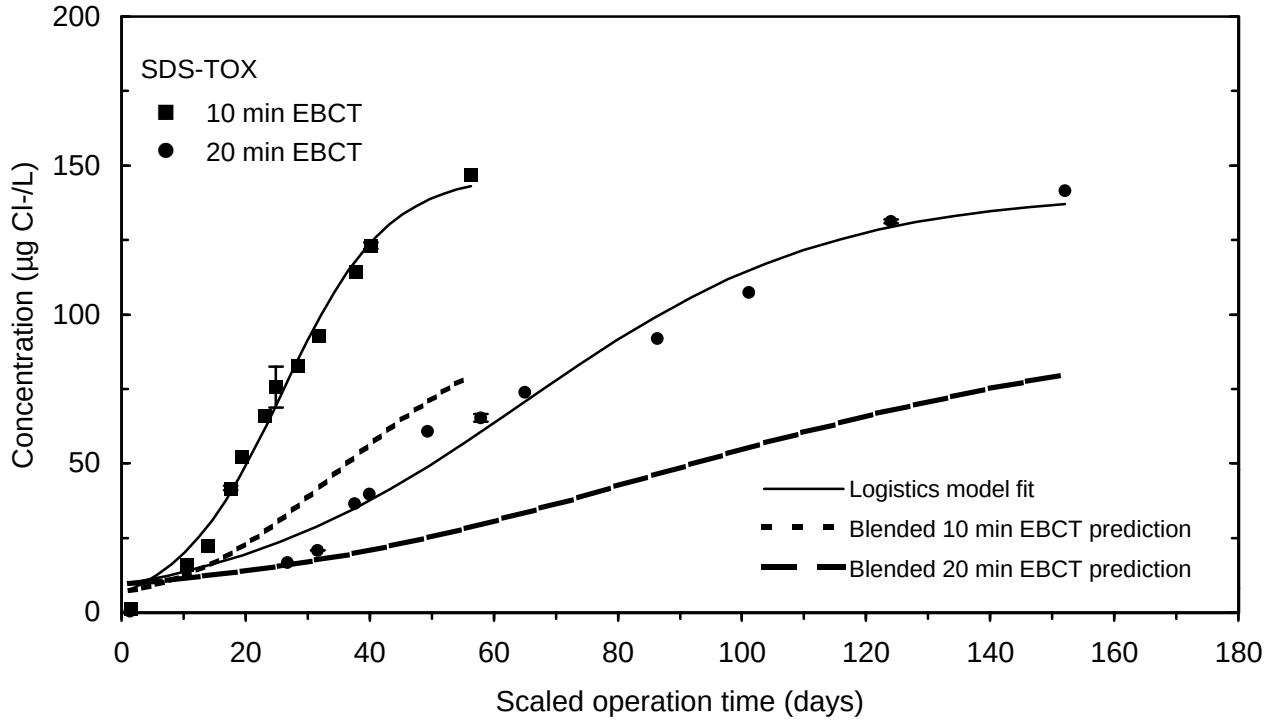


Figure 121 SDS-TOX breakthrough and effluent blending for 10 and 20 minute EBCT contactors during session 4 (October)

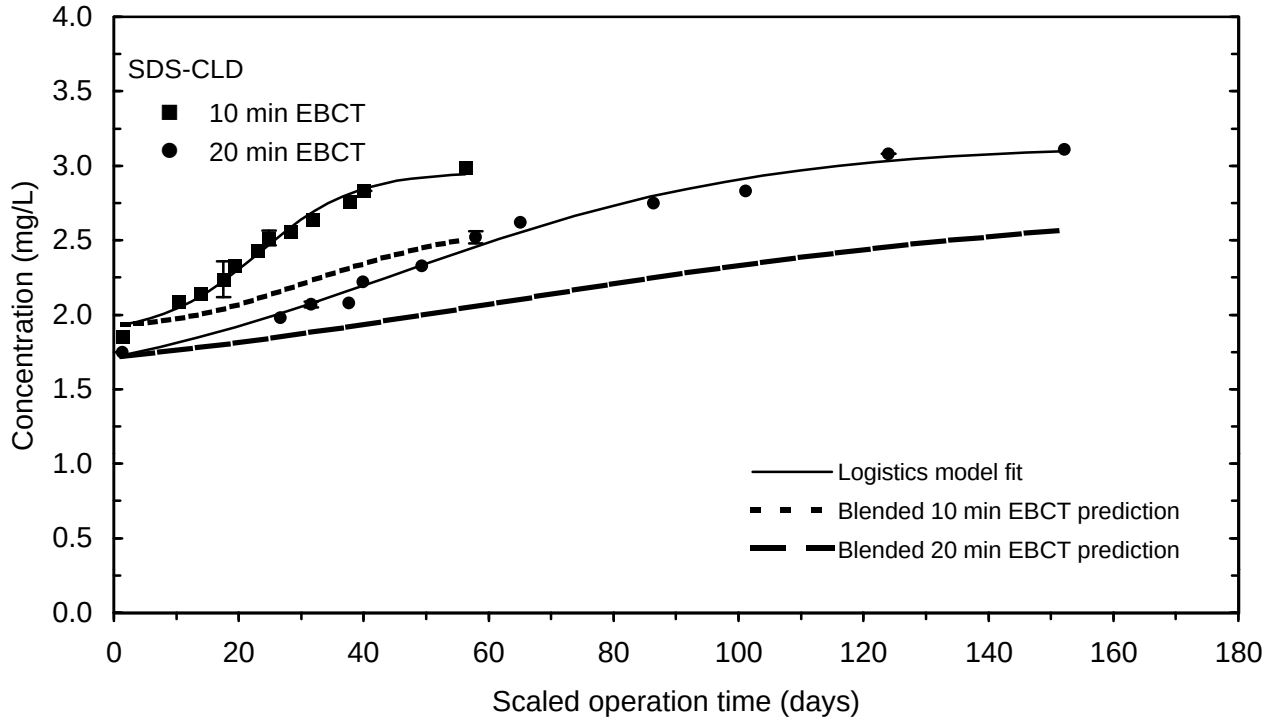


Figure 122 SDS-CLD breakthrough and effluent blending for 10 and 20 minute EBCT contactors during session 4 (October)

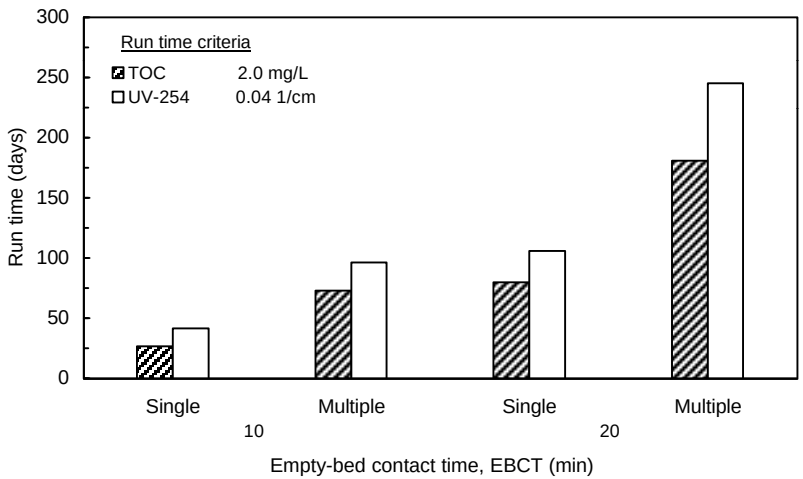


Figure 123 GAC run times based on single contactor breakthrough and effluent blending for TOC and UV-254 effluent criteria (high) during session 1 (January)

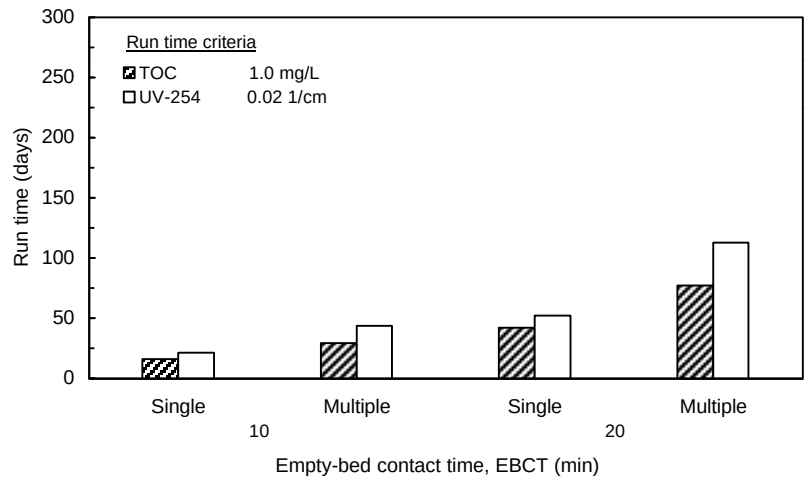


Figure 124 GAC run times based on single contactor breakthrough and effluent blending for TOC and UV-254 effluent criteria (low) during session 1 (January)

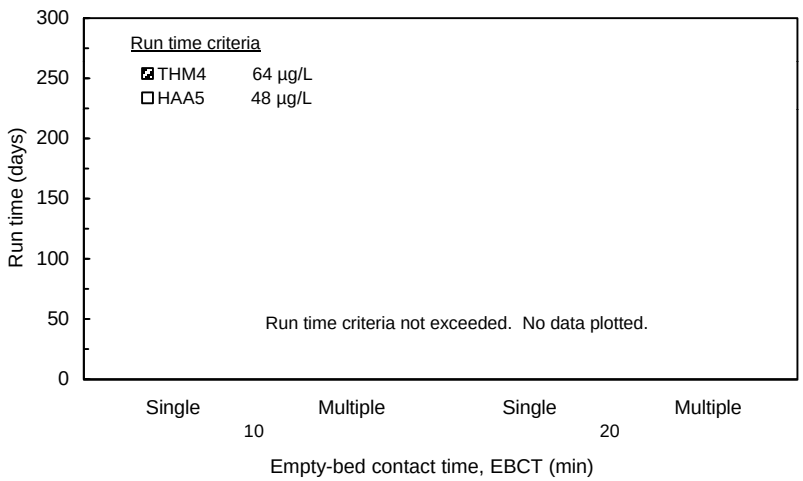


Figure 125 GAC run times based on single contactor breakthrough and effluent blending for Stage 1 THM4 and HAA5 effluent criteria during session 1 (January)

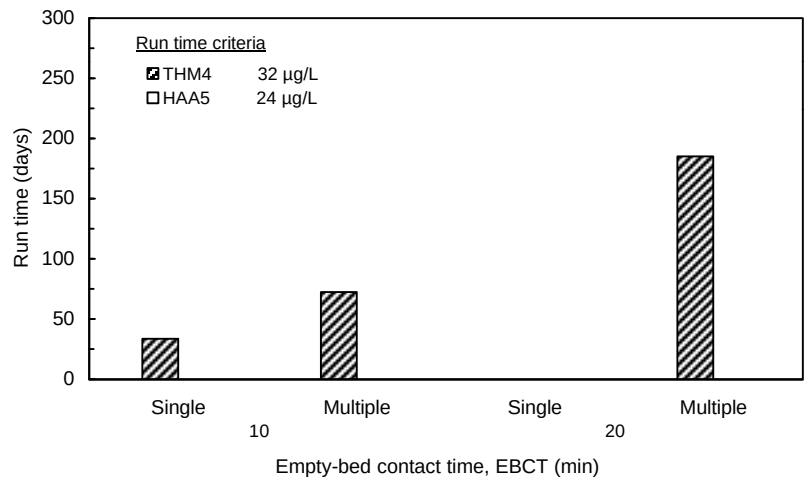


Figure 126 GAC run times based on single contactor breakthrough and effluent blending for Stage 2 THM4 and HAA5 effluent criteria during session 1 (January)

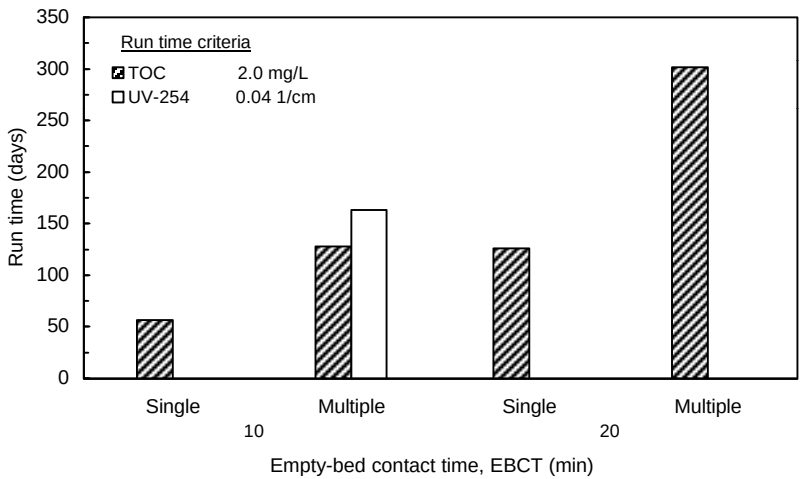


Figure 127 GAC run times based on single contactor breakthrough and effluent blending for TOC and UV-254 effluent criteria (high) during session 2 (April)

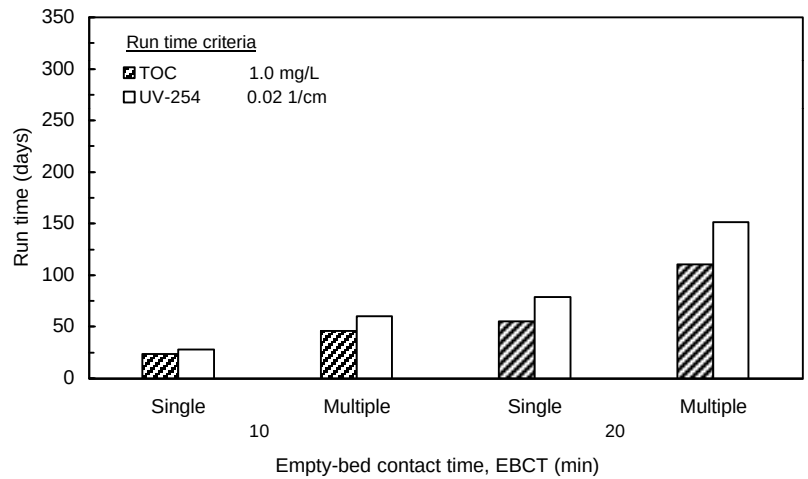


Figure 128 GAC run times based on single contactor breakthrough and effluent blending for TOC and UV-254 effluent criteria (low) during session 2 (April)

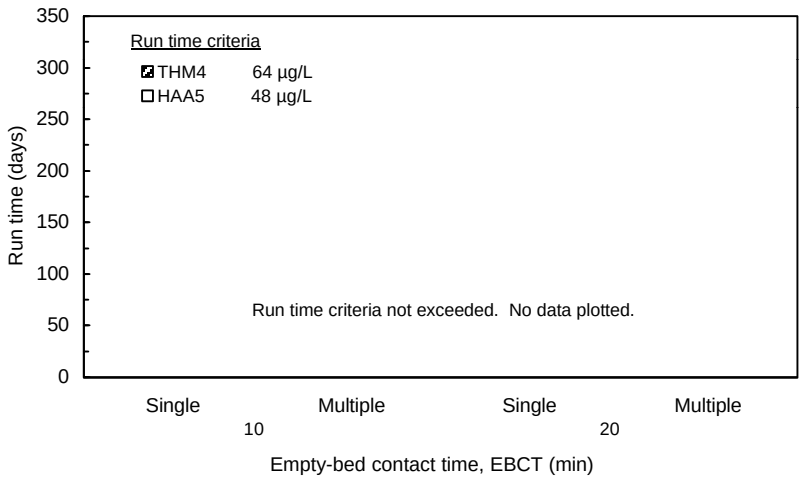


Figure 129 GAC run times based on single contactor breakthrough and effluent blending for Stage 1 THM4 and HAA5 effluent criteria during session 2 (April)

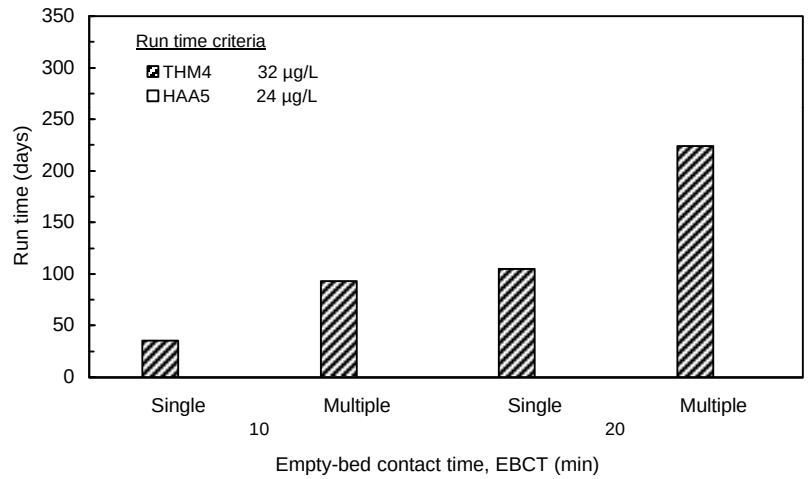


Figure 130 GAC run times based on single contactor breakthrough and effluent blending for Stage 2 THM4 and HAA5 effluent criteria during session 2 (April)

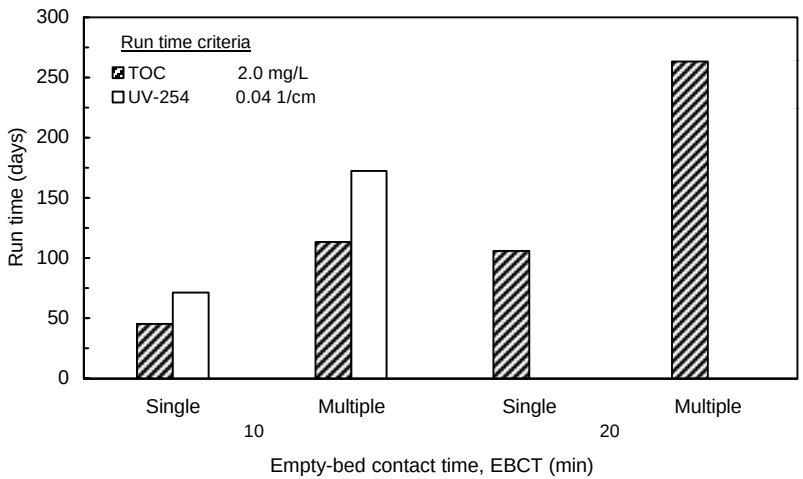


Figure 131 GAC run times based on single contactor breakthrough and effluent blending for TOC and UV-254 effluent criteria (high) during session 3 (June)

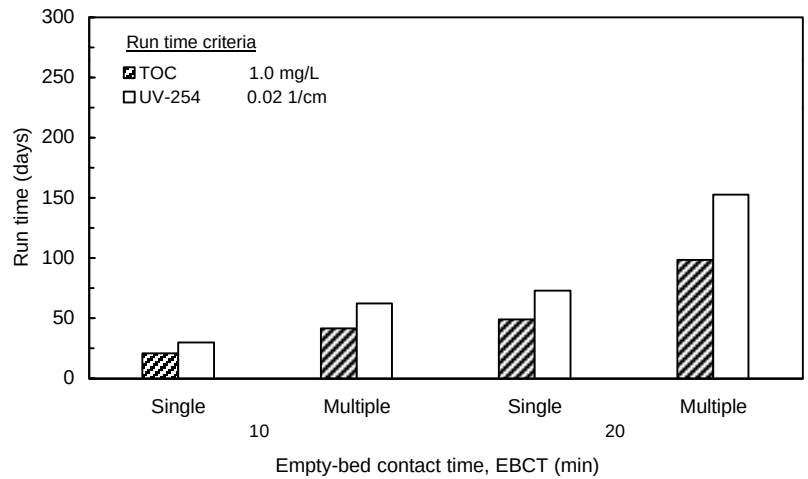


Figure 132 GAC run times based on single contactor breakthrough and effluent blending for TOC and UV-254 effluent criteria (low) during session 3 (June)

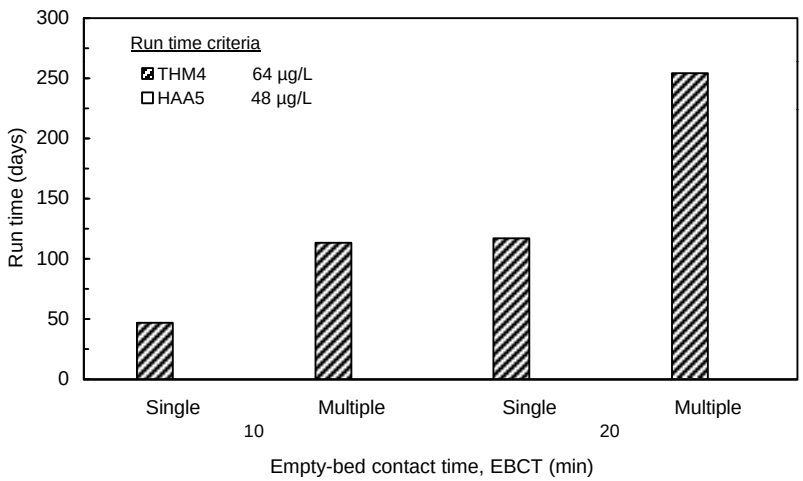


Figure 133 GAC run times based on single contactor breakthrough and effluent blending for Stage 1 THM4 and HAA5 effluent criteria during session 3 (June)

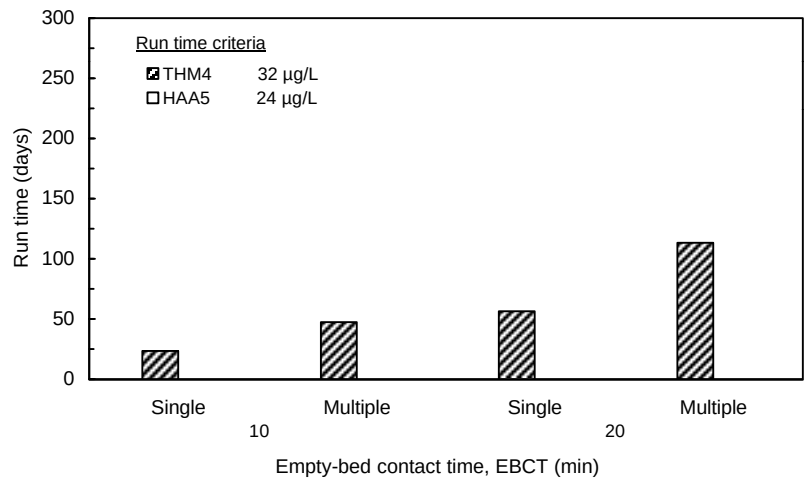


Figure 134 GAC run times based on single contactor breakthrough and effluent blending for Stage 2 THM4 and HAA5 effluent criteria during session 3 (June)

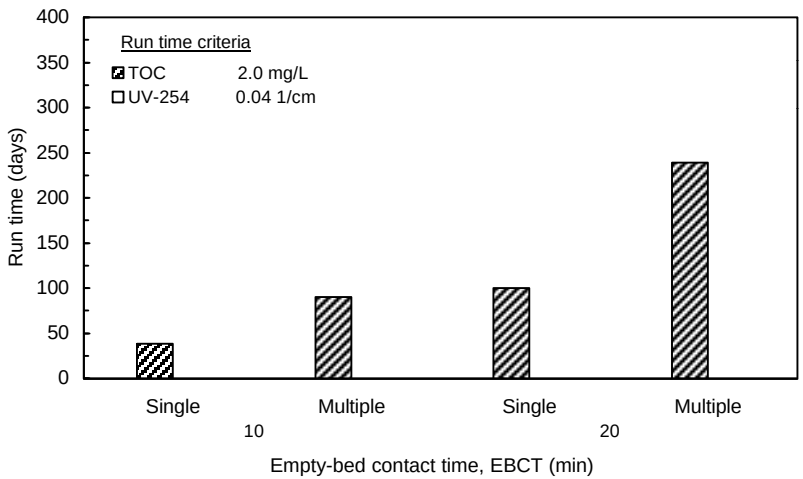


Figure 135 GAC run times based on single contactor breakthrough and effluent blending for TOC and UV-254 effluent criteria (high) during session 4 (October)

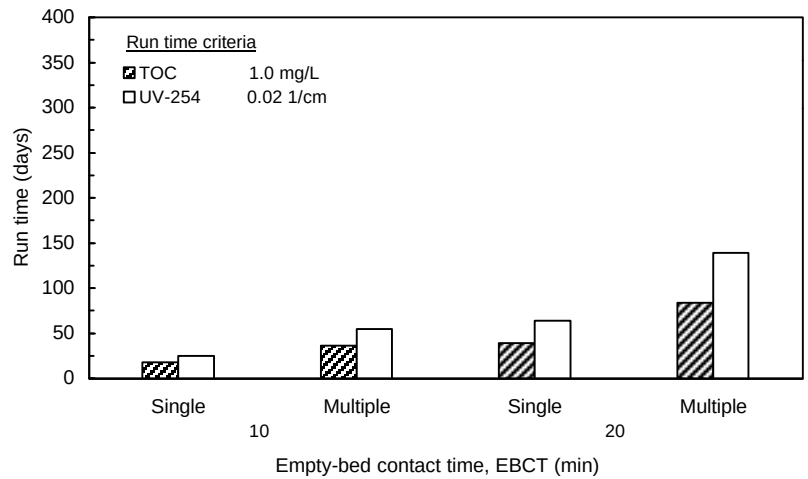


Figure 136 GAC run times based on single contactor breakthrough and effluent blending for TOC and UV-254 effluent criteria (low) during session 4 (October)

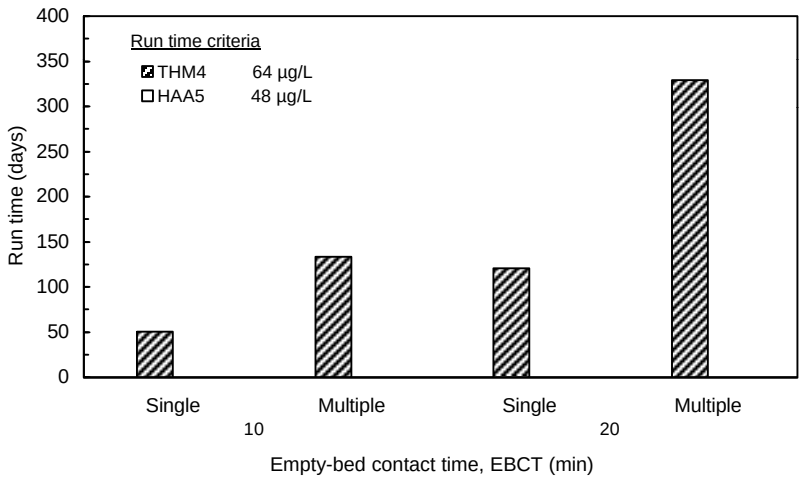


Figure 137 GAC run times based on single contactor breakthrough and effluent blending for Stage 1 THM4 and HAA5 effluent criteria during session 4 (October)

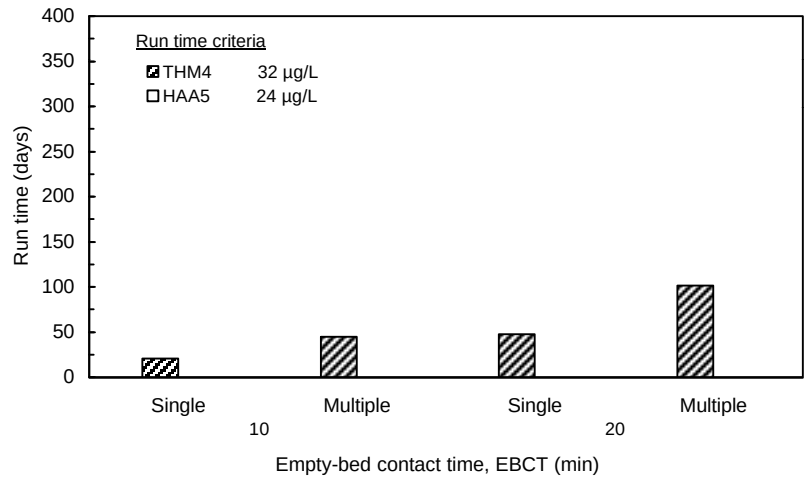


Figure 138 GAC run times based on single contactor breakthrough and effluent blending for Stage 2 THM4 and HAA5 effluent criteria during session 4 (October)

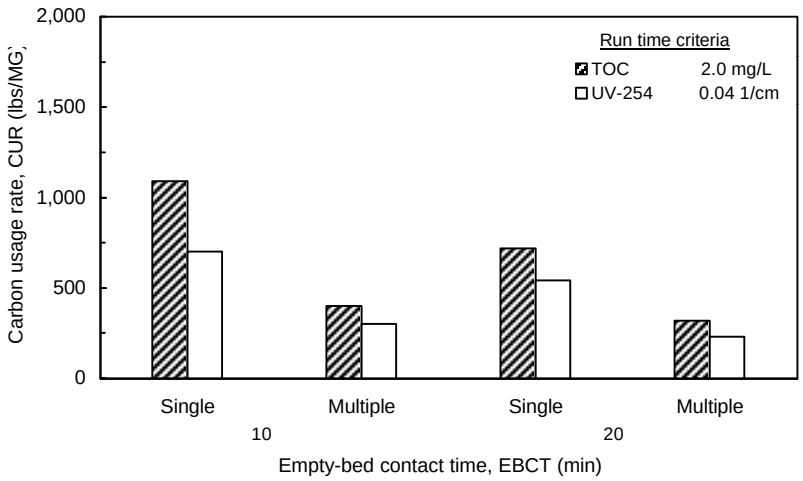


Figure 139 Carbon usage rates based on single contactor breakthrough and effluent blending for TOC and UV-254 effluent criteria (high) during session 1 (January)

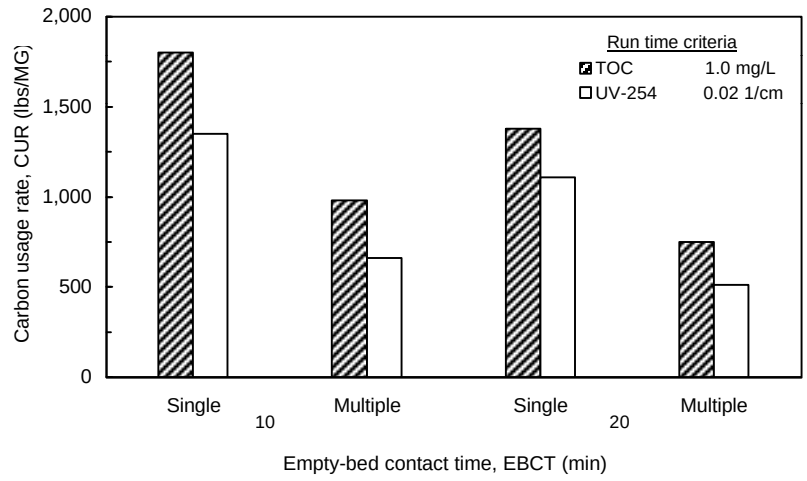


Figure 140 Carbon usage rates based on single contactor breakthrough and effluent blending for TOC and UV-254 effluent criteria (low) during session 1 (January)

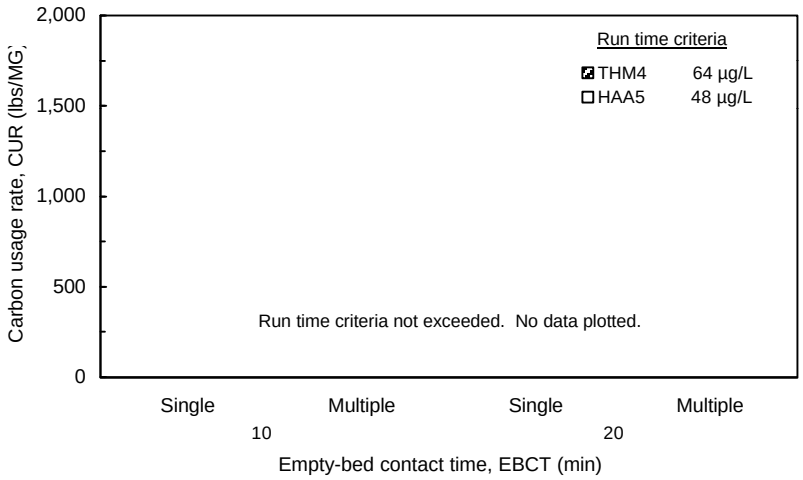


Figure 141 Carbon usage rates based on single contactor breakthrough and effluent blending for Stage 1 THM4 and HAA5 effluent criteria during session 1 (January)

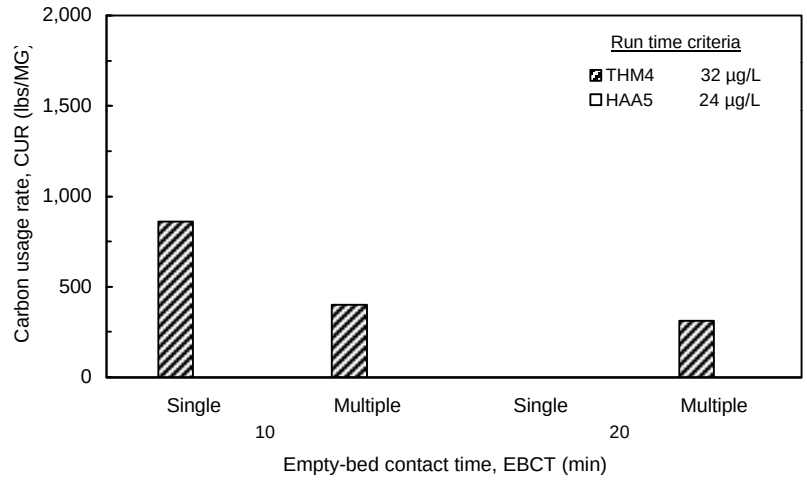


Figure 142 Carbon usage rates based on single contactor breakthrough and effluent blending for Stage 2 THM4 and HAA5 effluent criteria during session 1 (January)

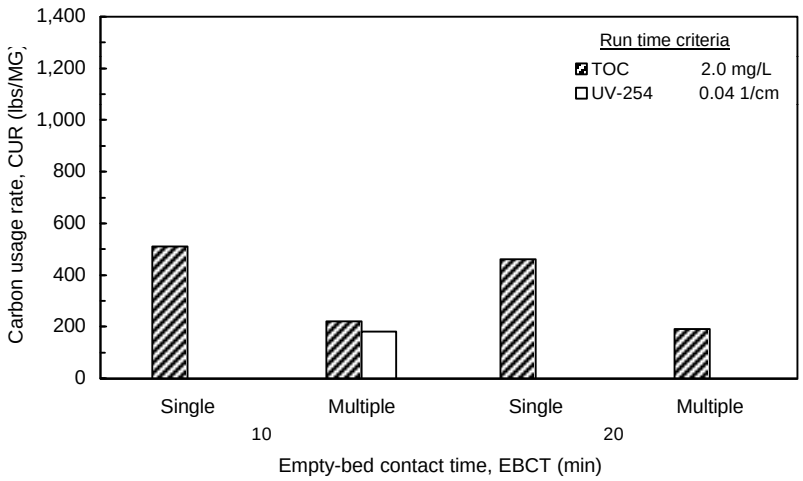


Figure 143 Carbon usage rates based on single contactor breakthrough and effluent blending for TOC and UV-254 effluent criteria (high) during session 2 (April)

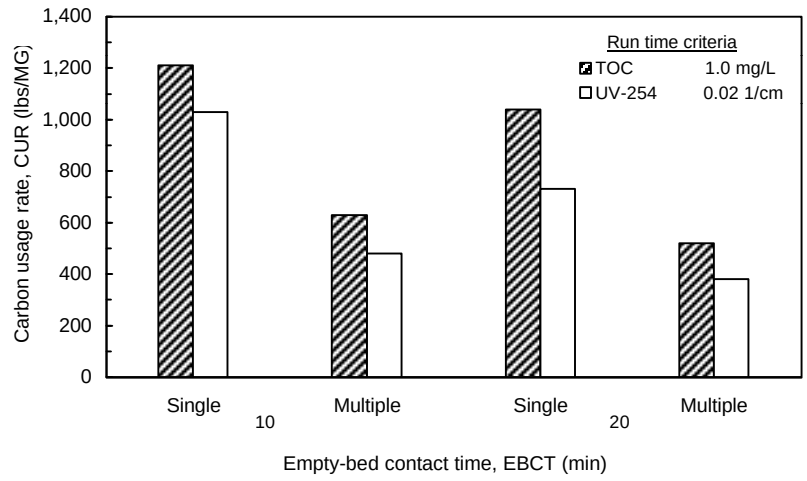


Figure 144 Carbon usage rates based on single contactor breakthrough and effluent blending for TOC and UV-254 effluent criteria (low) during session 2 (April)

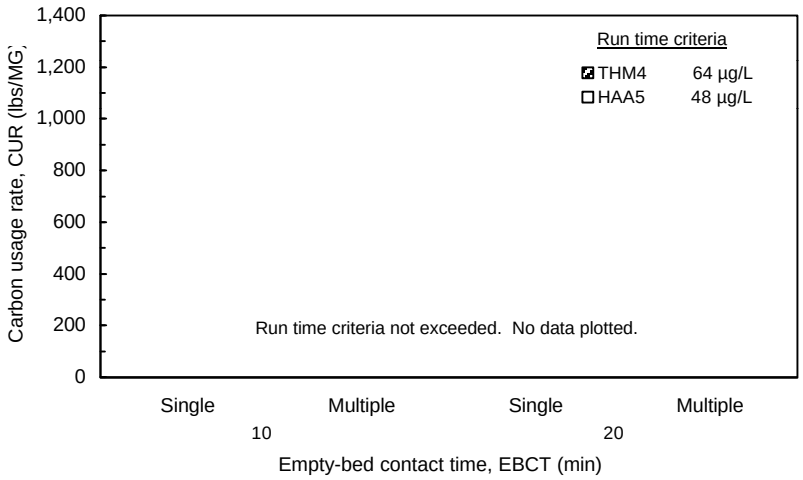


Figure 145 Carbon usage rates based on single contactor breakthrough and effluent blending for Stage 1 THM4 and HAA5 effluent criteria during session 2 (April)

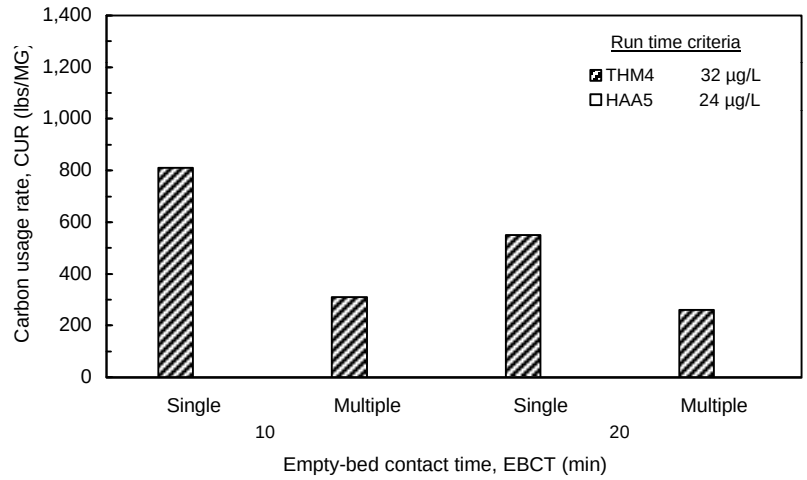


Figure 146 Carbon usage rates based on single contactor breakthrough and effluent blending for Stage 2 THM4 and HAA5 effluent criteria during session 2 (April)

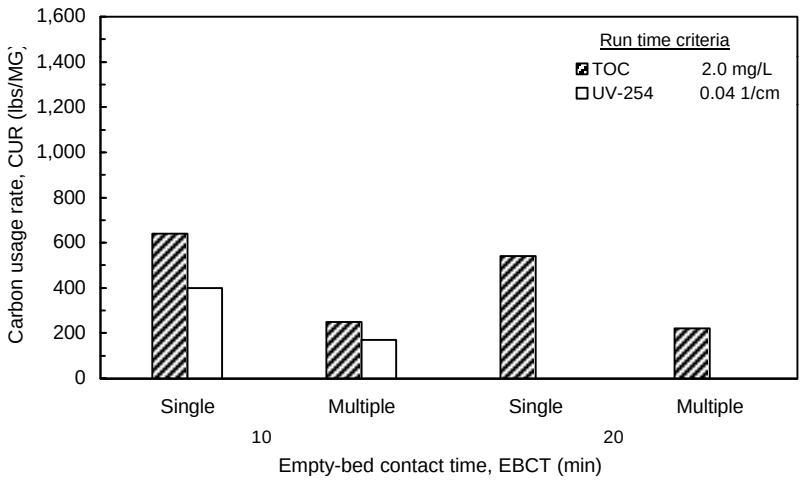


Figure 147 Carbon usage rates based on single contactor breakthrough and effluent blending for TOC and UV-254 effluent criteria (high) during session 3 (June)

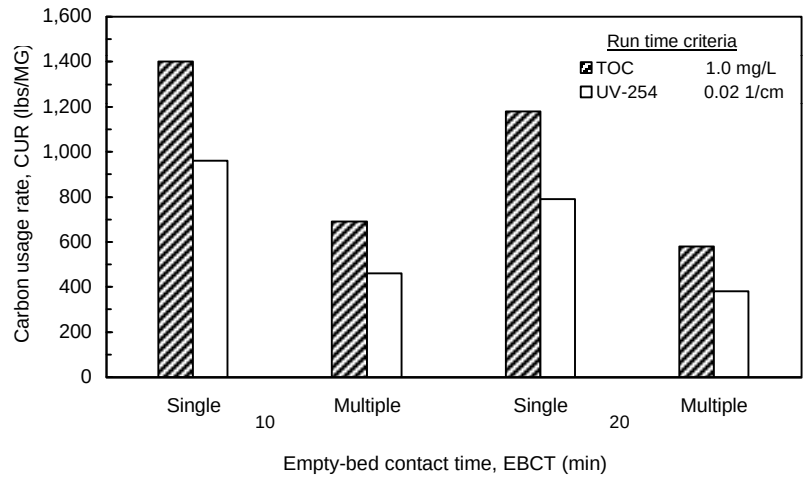


Figure 148 Carbon usage rates based on single contactor breakthrough and effluent blending for TOC and UV-254 effluent criteria (low) during session 3 (June)

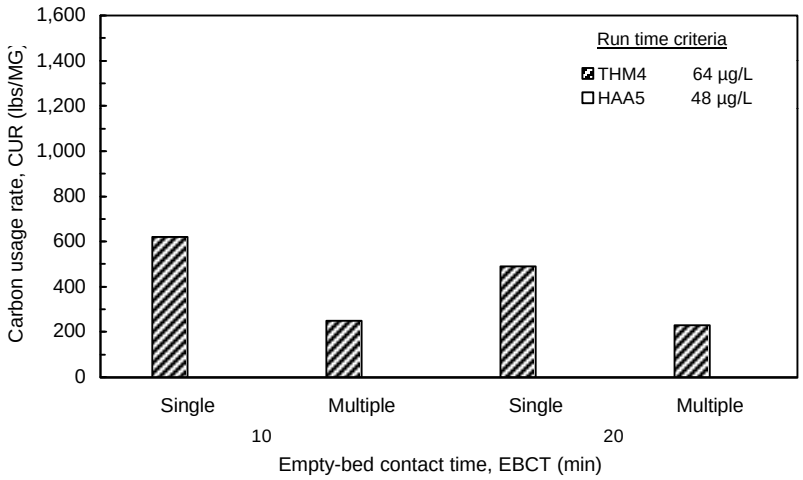


Figure 149 Carbon usage rates based on single contactor breakthrough and effluent blending for Stage 1 THM4 and HAA5 effluent criteria during session 3 (June)

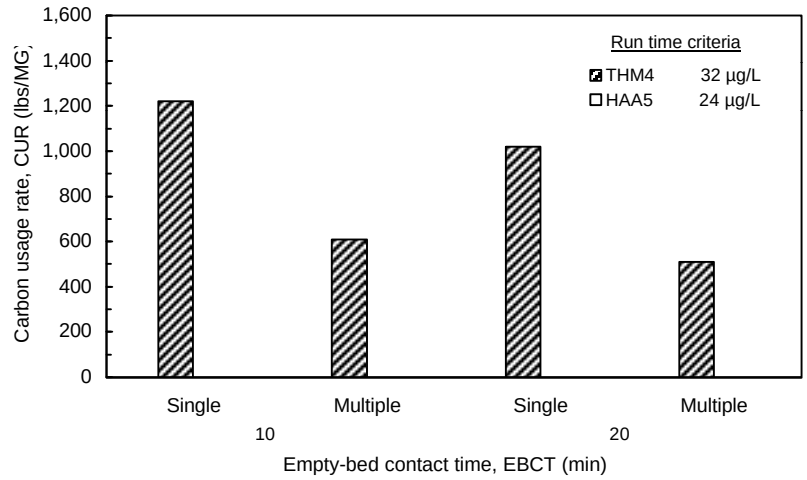


Figure 150 Carbon usage rates based on single contactor breakthrough and effluent blending for Stage 2 THM4 and HAA5 effluent criteria during session 3 (June)

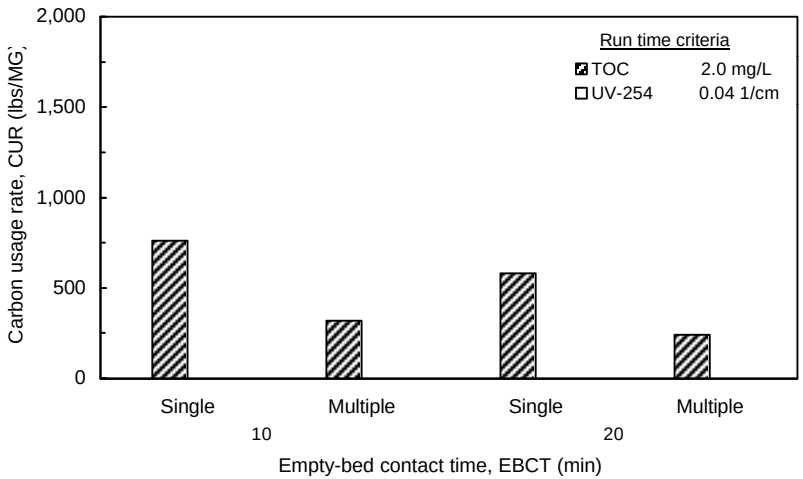


Figure 151 Carbon usage rates based on single contactor breakthrough and effluent blending for TOC and UV-254 effluent criteria (high) during session 4 (October)

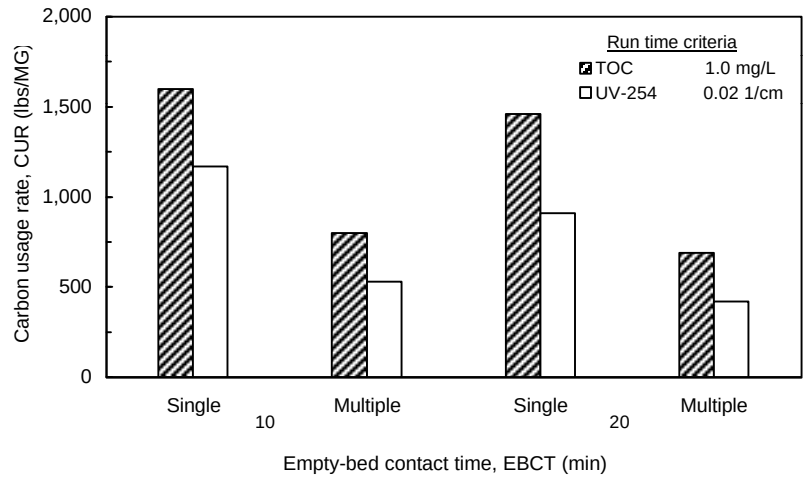


Figure 152 Carbon usage rates based on single contactor breakthrough and effluent blending for TOC and UV-254 effluent criteria (low) during session 4 (October)

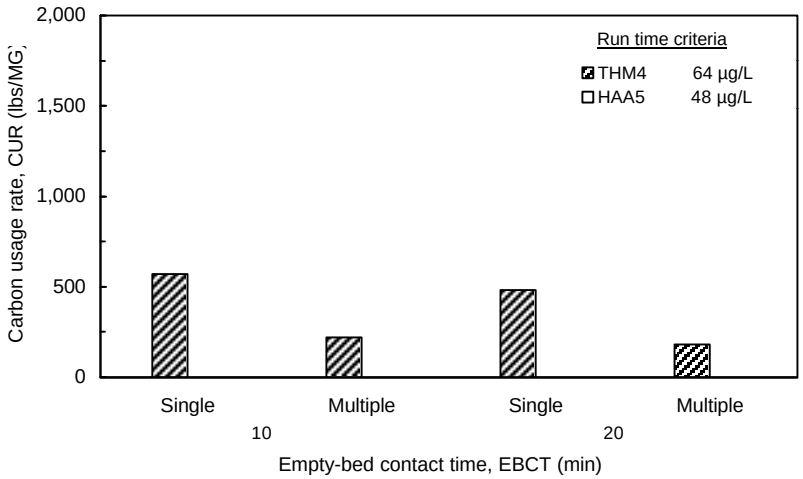


Figure 153 Carbon usage rates based on single contactor breakthrough and effluent blending for Stage 1 THM4 and HAA5 effluent criteria during session 4 (October)

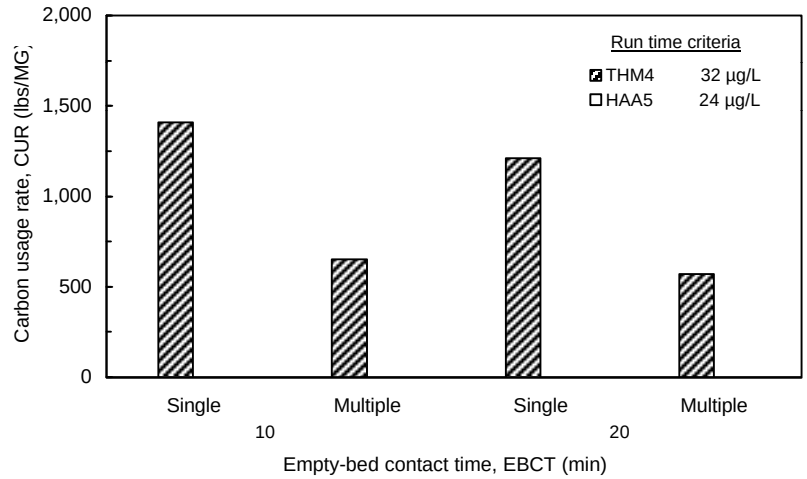


Figure 154 Carbon usage rates based on single contactor breakthrough and effluent blending for Stage 2 THM4 and HAA5 effluent criteria during session 4 (October)

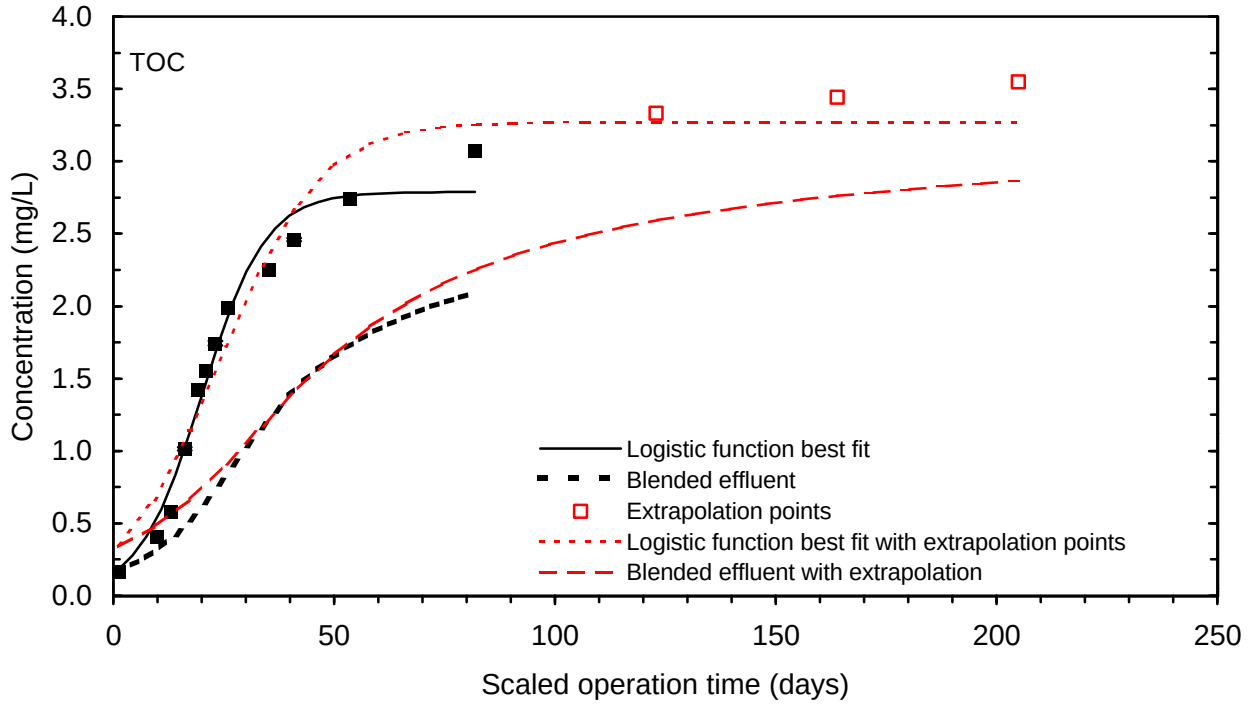


Figure 155 Single contactor and blended effluent extrapolated TOC breakthrough curve (10 minute EBCT) during session 1, January

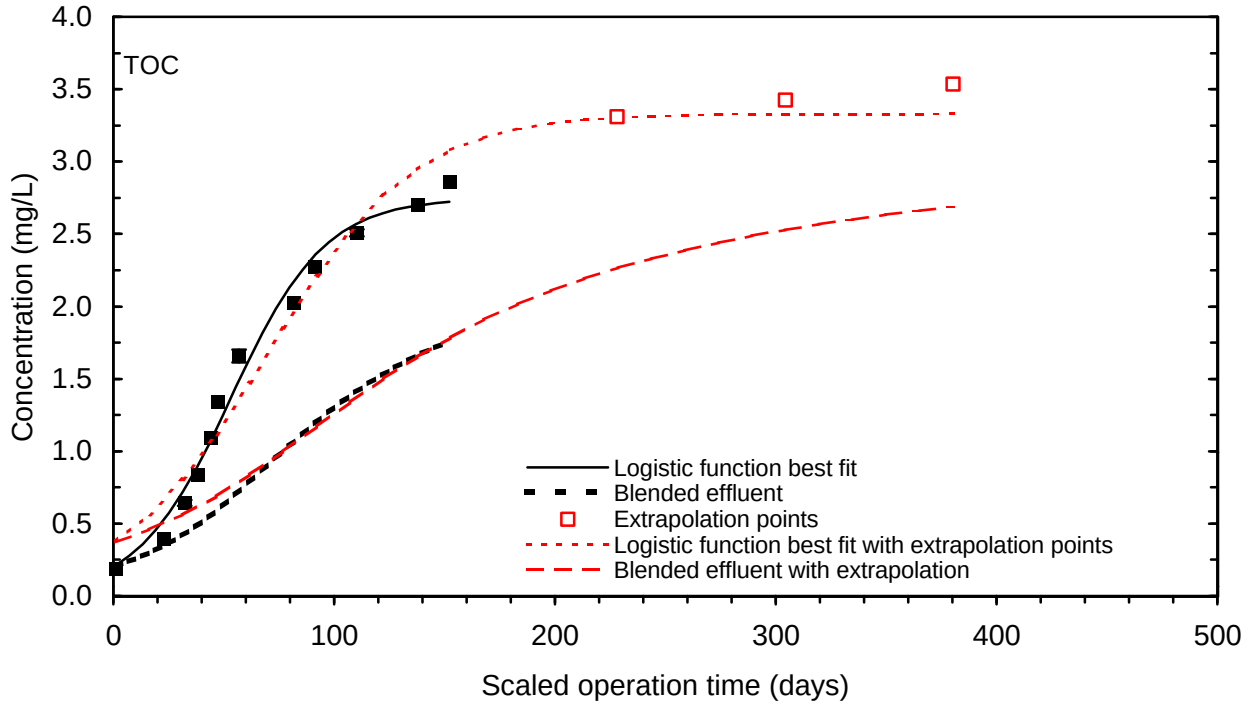


Figure 156 Single contactor and blended effluent extrapolated TOC breakthrough curve (20 minute EBCT) during session 1, January

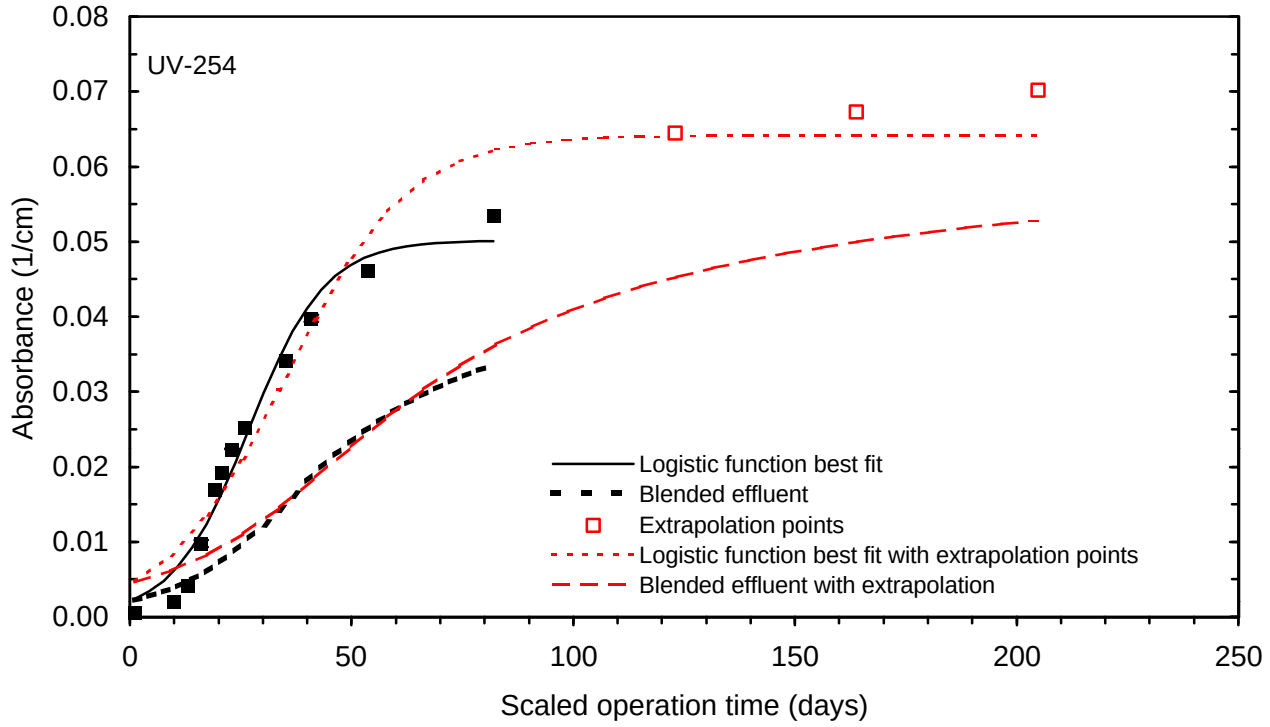


Figure 157 Single contactor and blended effluent extrapolated UV-254 breakthrough curve (10 minute EBCT) during session 1, January

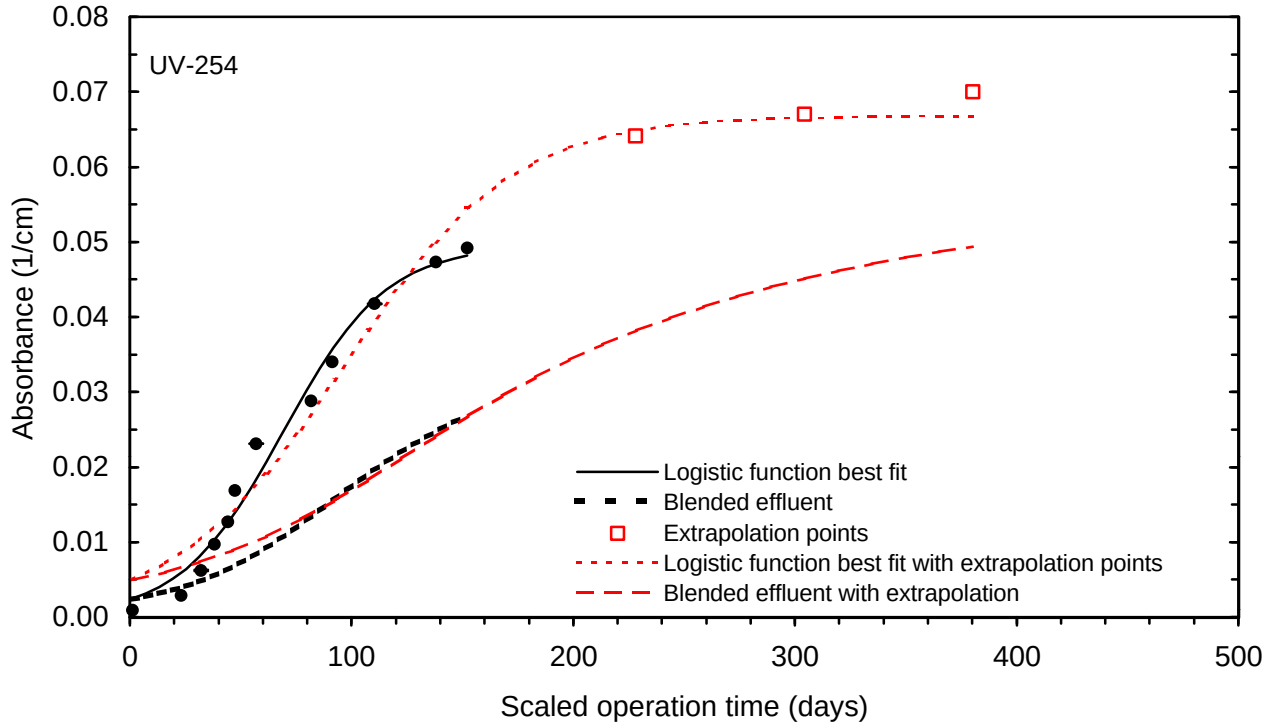


Figure 158 Single contactor and blended effluent extrapolated UV-254 breakthrough curve (20 minute EBCT) during session 1, January

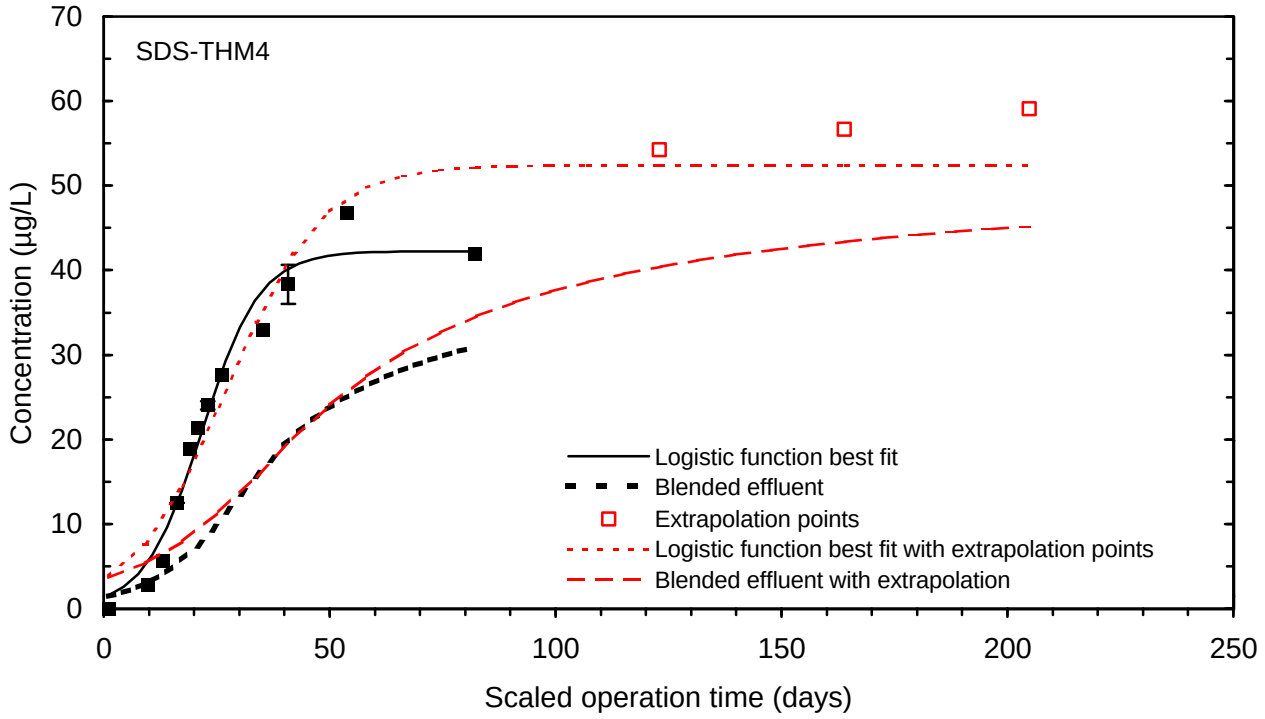


Figure 159 Single contactor and blended effluent extrapolated SDS-THM4 breakthrough curve (10 minute EBCT) during session 1, January

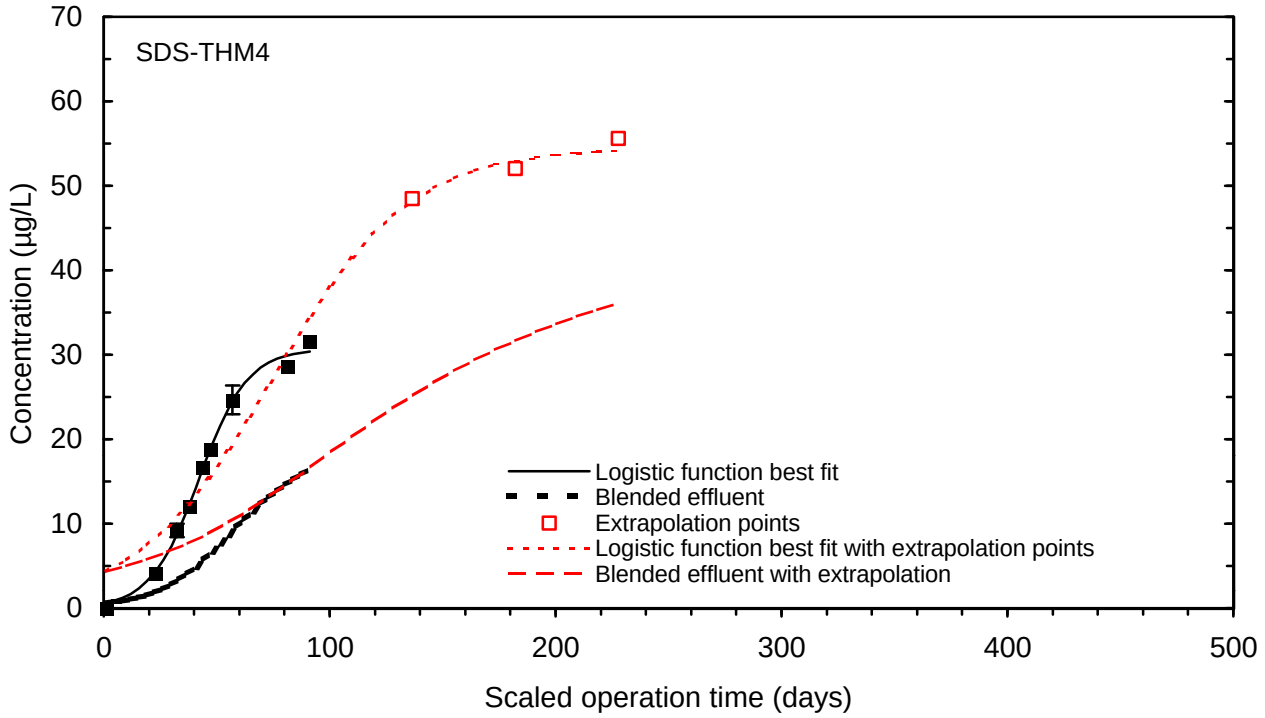


Figure 160 Single contactor and blended effluent extrapolated SDS-THM4 breakthrough curve (20 minute EBCT) during session 1, January

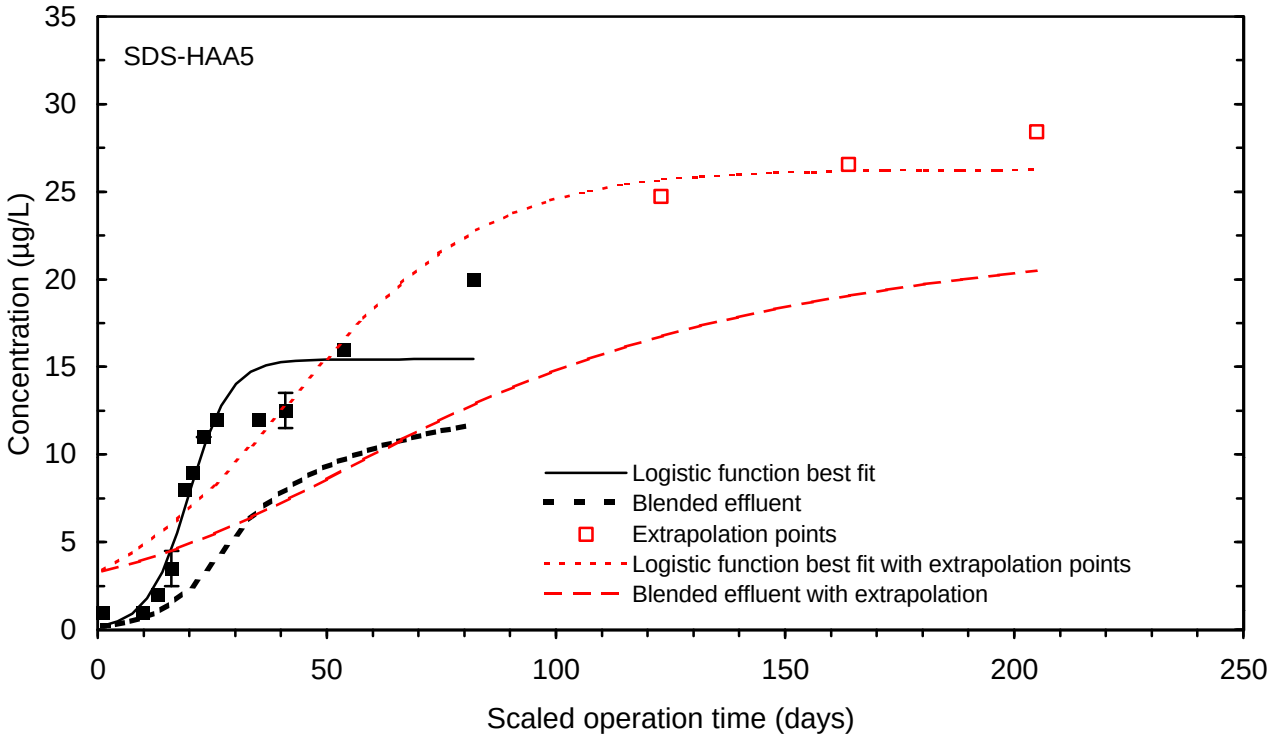


Figure 161 Single contactor and blended effluent extrapolated SDS-HAA5 breakthrough curve (10 minute EBCT) during session 1, January

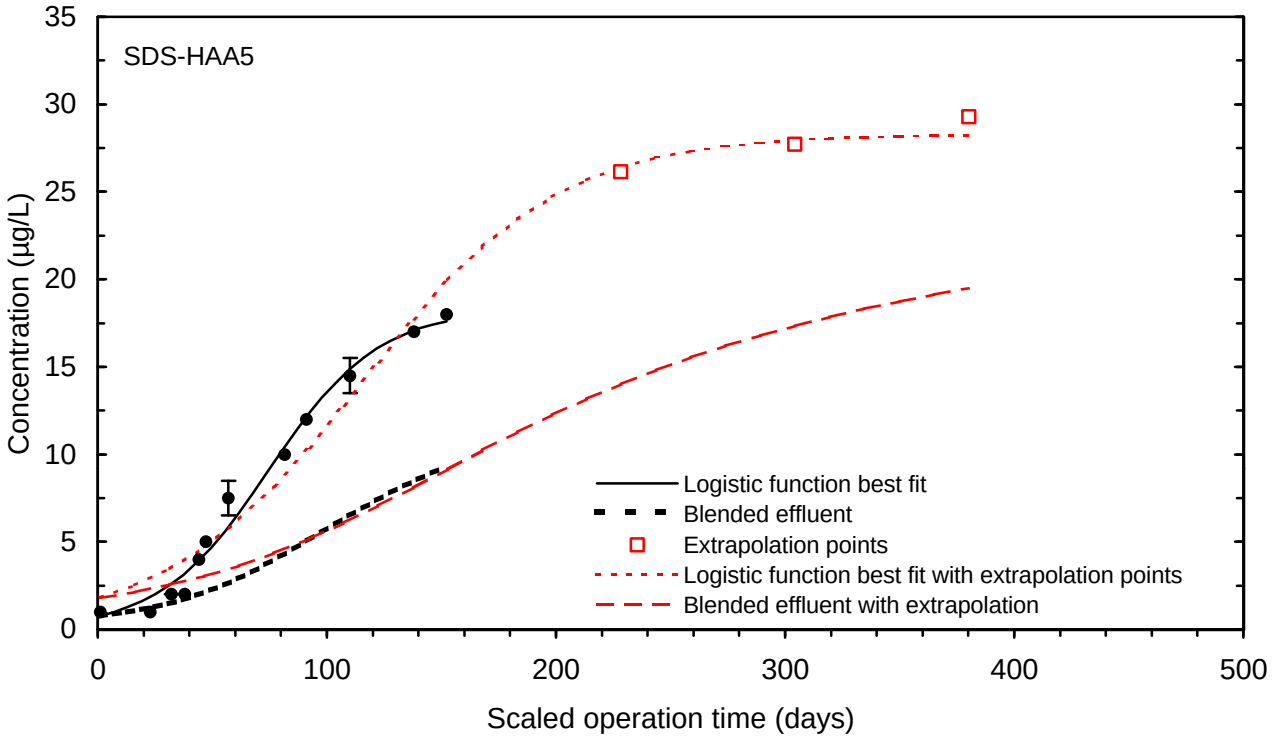


Figure 162 Single contactor and blended effluent extrapolated SDS-HAA5 breakthrough curve (20 minute EBCT) during session 1, January

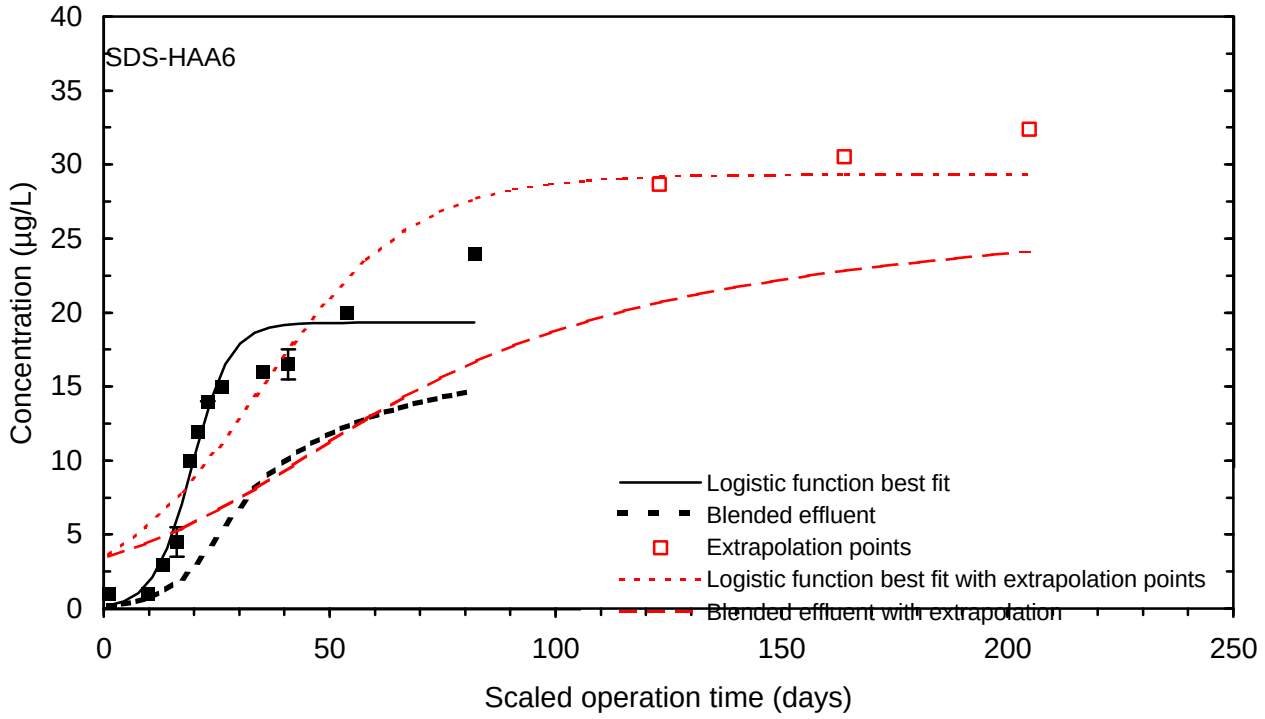


Figure 163 Single contactor and blended effluent extrapolated SDS-HAA6 breakthrough curve (10 minute EBCT) during session 1, January

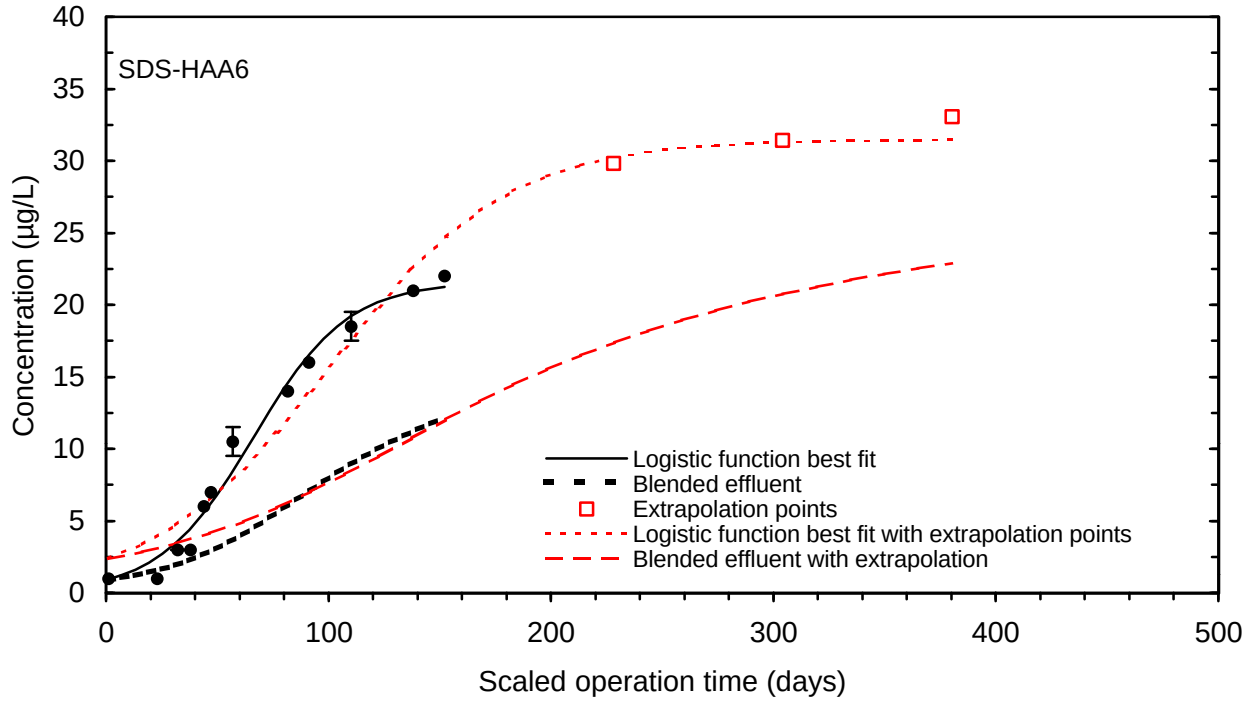


Figure 164 Single contactor and blended effluent extrapolated SDS-HAA6 breakthrough curve (20 minute EBCT) during session 1, January

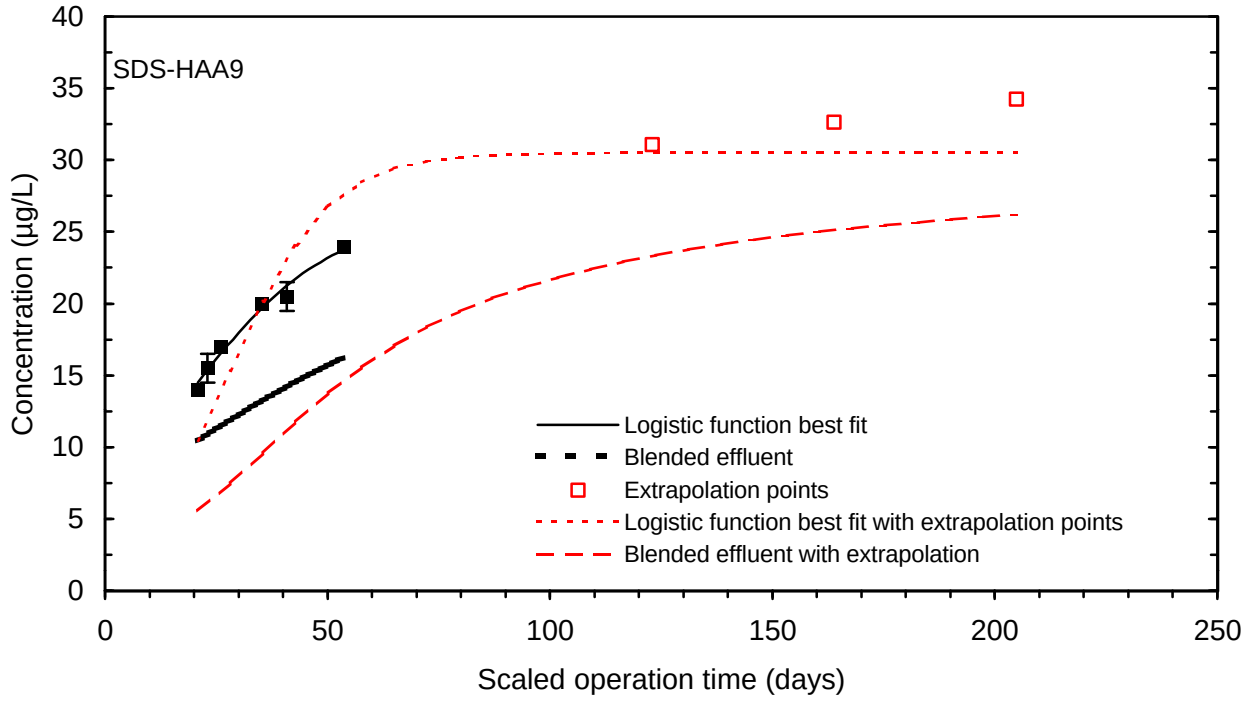


Figure 165 Single contactor and blended effluent extrapolated SDS-HAA9 breakthrough curve (10 minute EBCT) during session 1, January

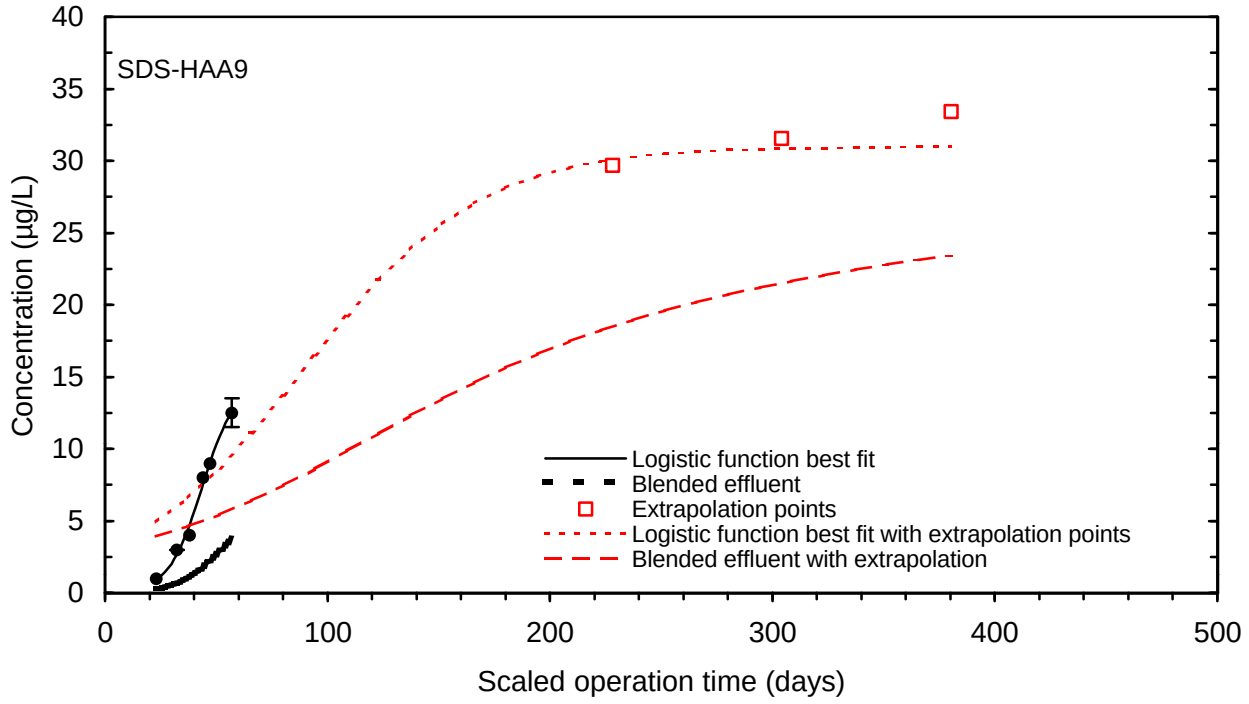


Figure 166 Single contactor and blended effluent extrapolated SDS-HAA9 breakthrough curve (20 minute EBCT) during session 1, January

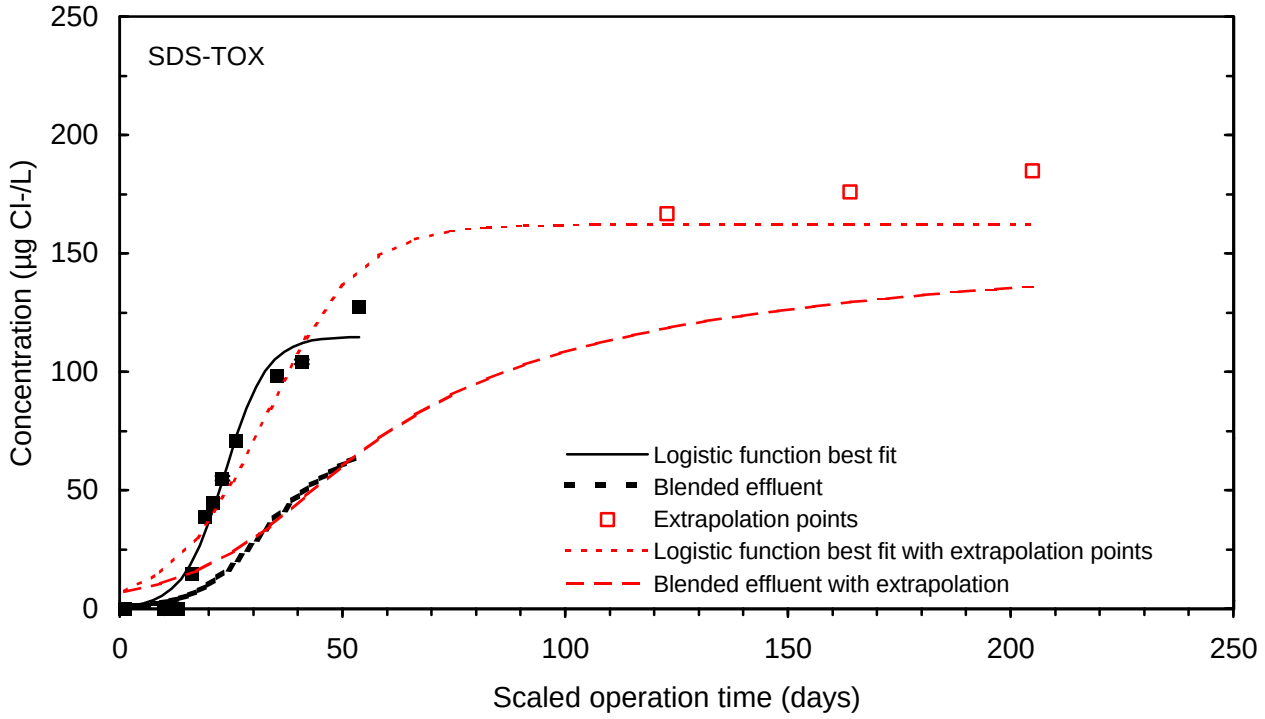


Figure 167 Single contactor and blended effluent extrapolated SDS-TOX breakthrough curve (10 minute EBCT) during session 1, January

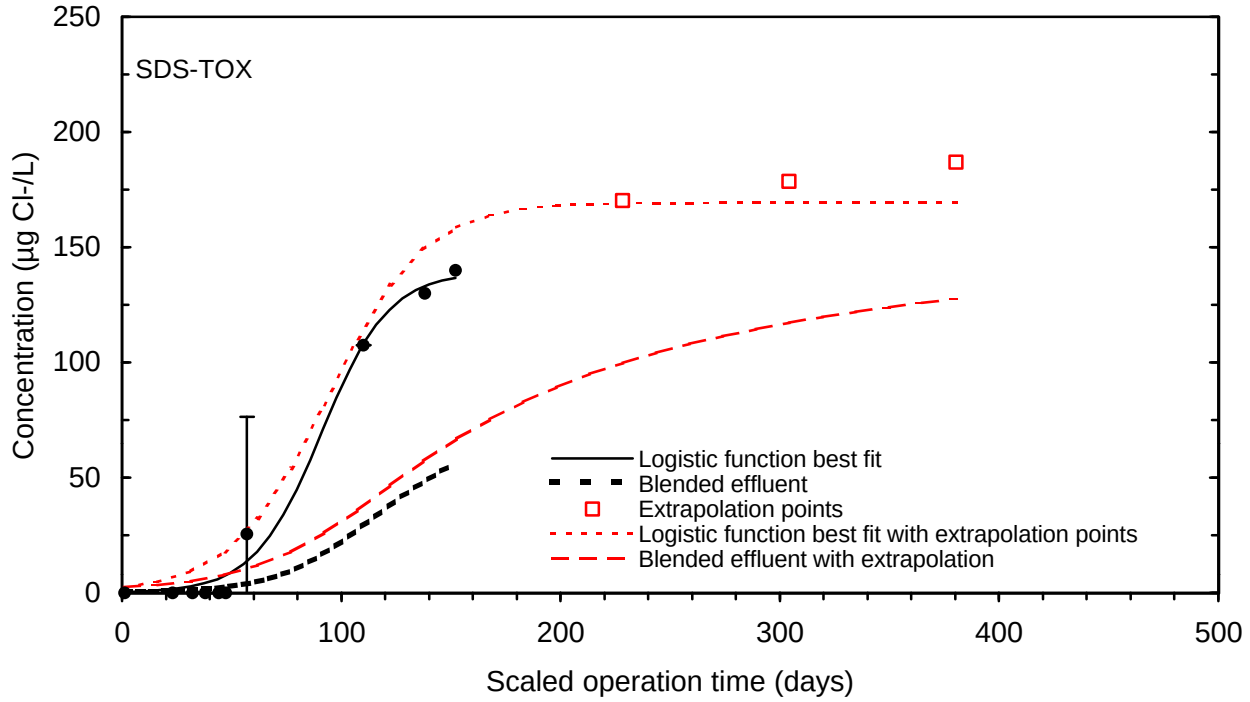


Figure 168 Single contactor and blended effluent extrapolated SDS-TOX breakthrough curve (20 minute EBCT) during session 1, January

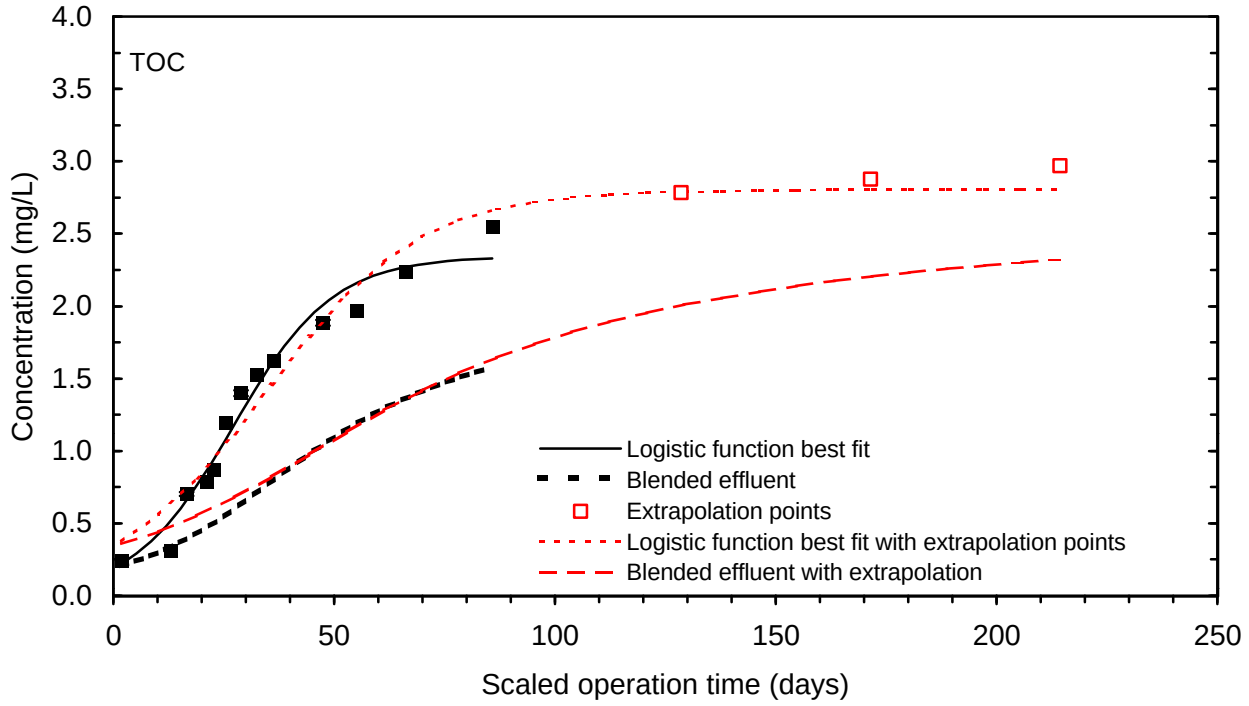


Figure 169 Single contactor and blended effluent extrapolated TOC breakthrough curve (10 minute EBCT) during session 2, April

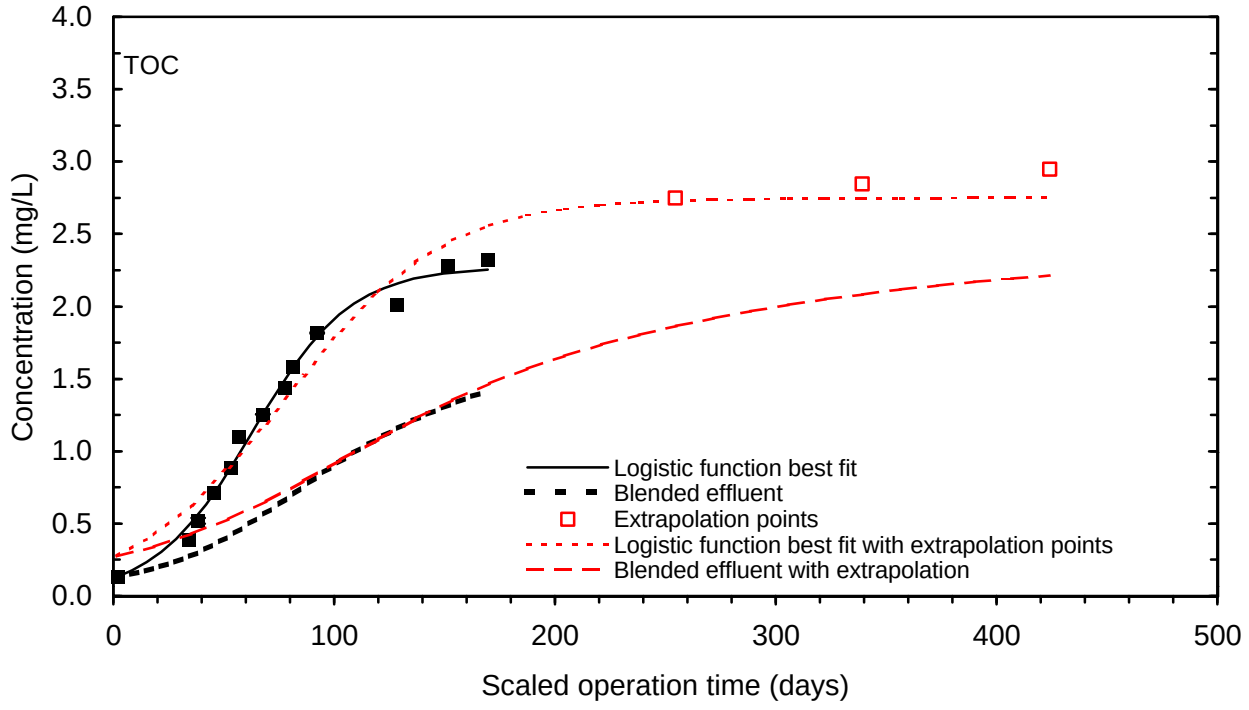


Figure 170 Single contactor and blended effluent extrapolated TOC breakthrough curve (20 minute EBCT) during session 2, April

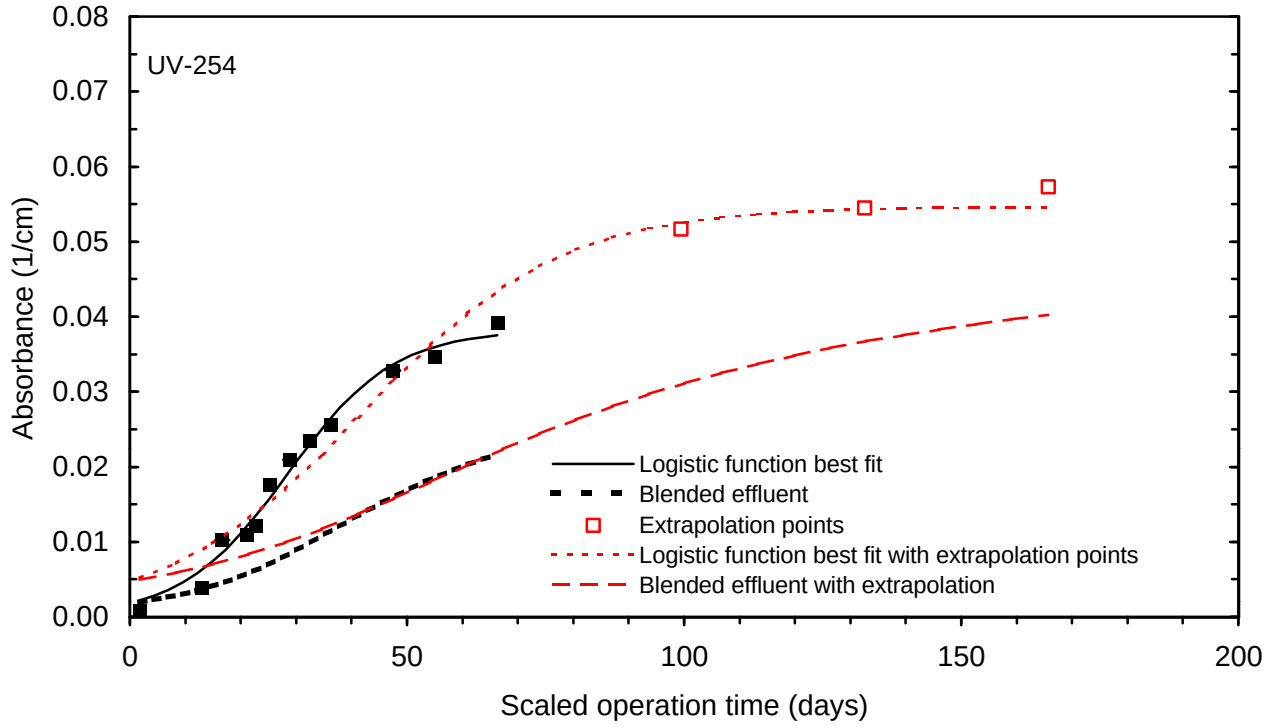


Figure 171 Single contactor and blended effluent extrapolated UV-254 breakthrough curve (10 minute EBCT) during session 2, April

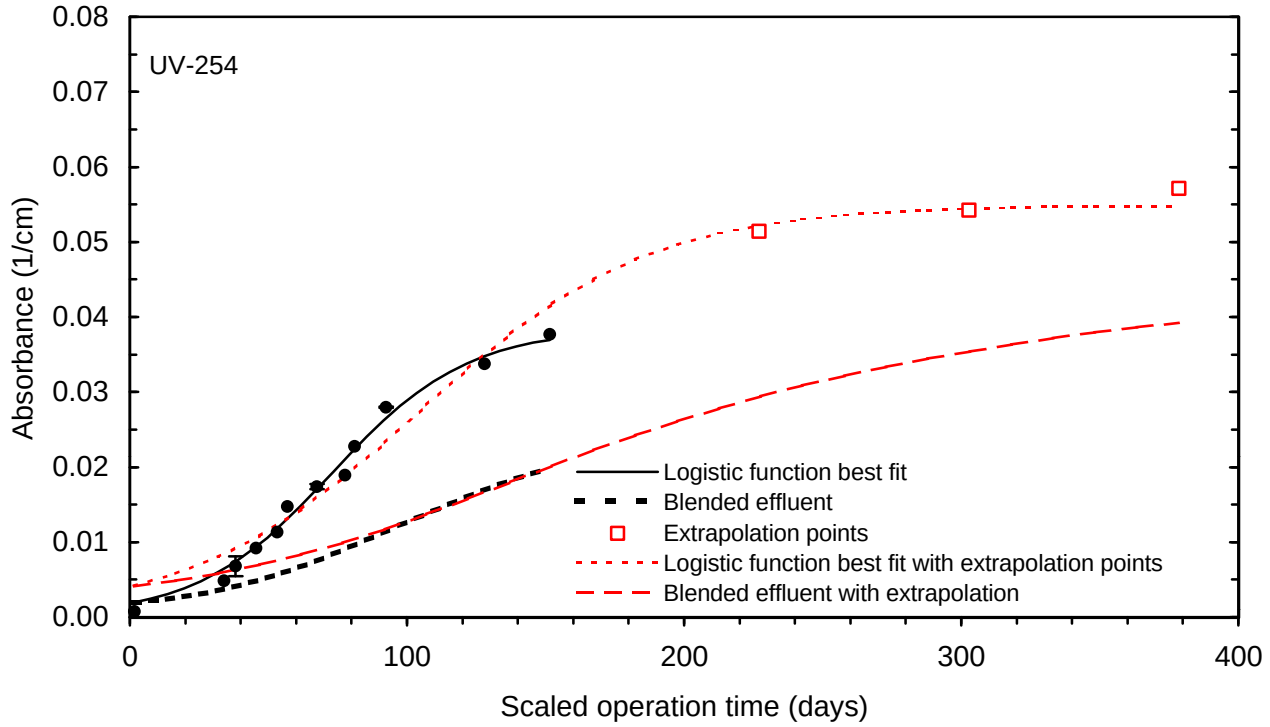


Figure 172 Single contactor and blended effluent extrapolated UV-254 breakthrough curve (20 minute EBCT) during session 2, April

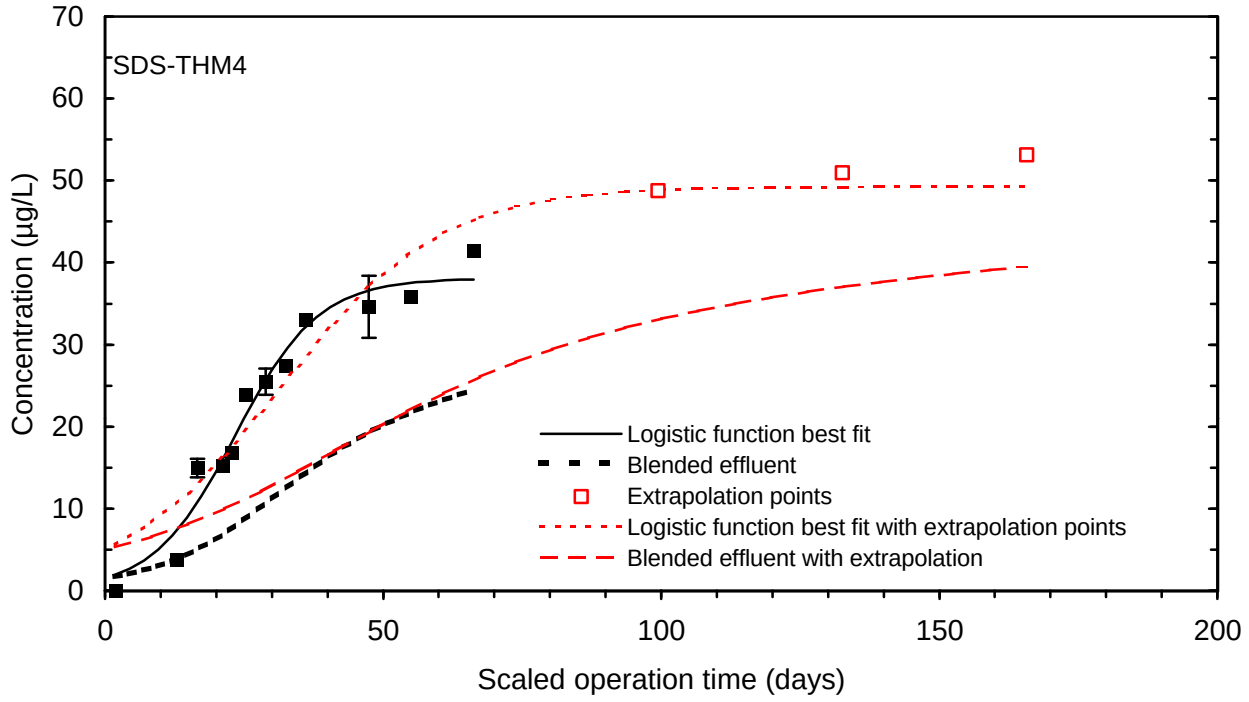


Figure 173 Single contactor and blended effluent extrapolated SDS-THM4 breakthrough curve (10 minute EBCT) during session 2, April

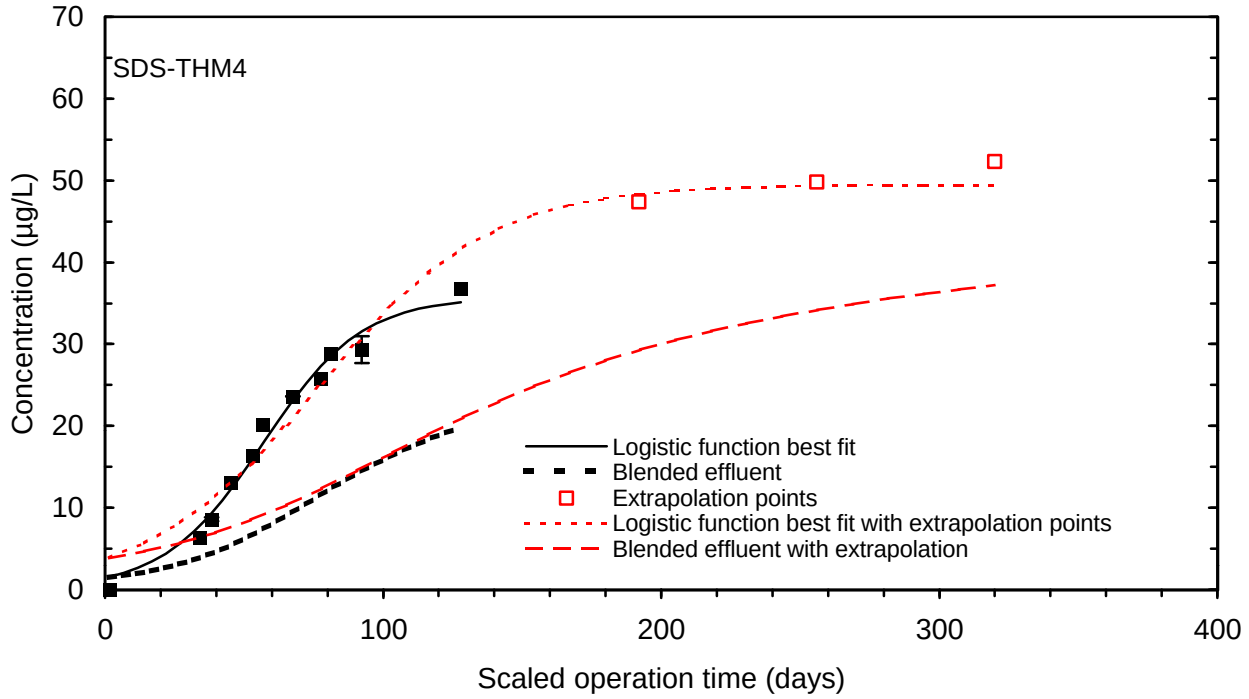


Figure 174 Single contactor and blended effluent extrapolated SDS-THM4 breakthrough curve (20 minute EBCT) during session 2, April

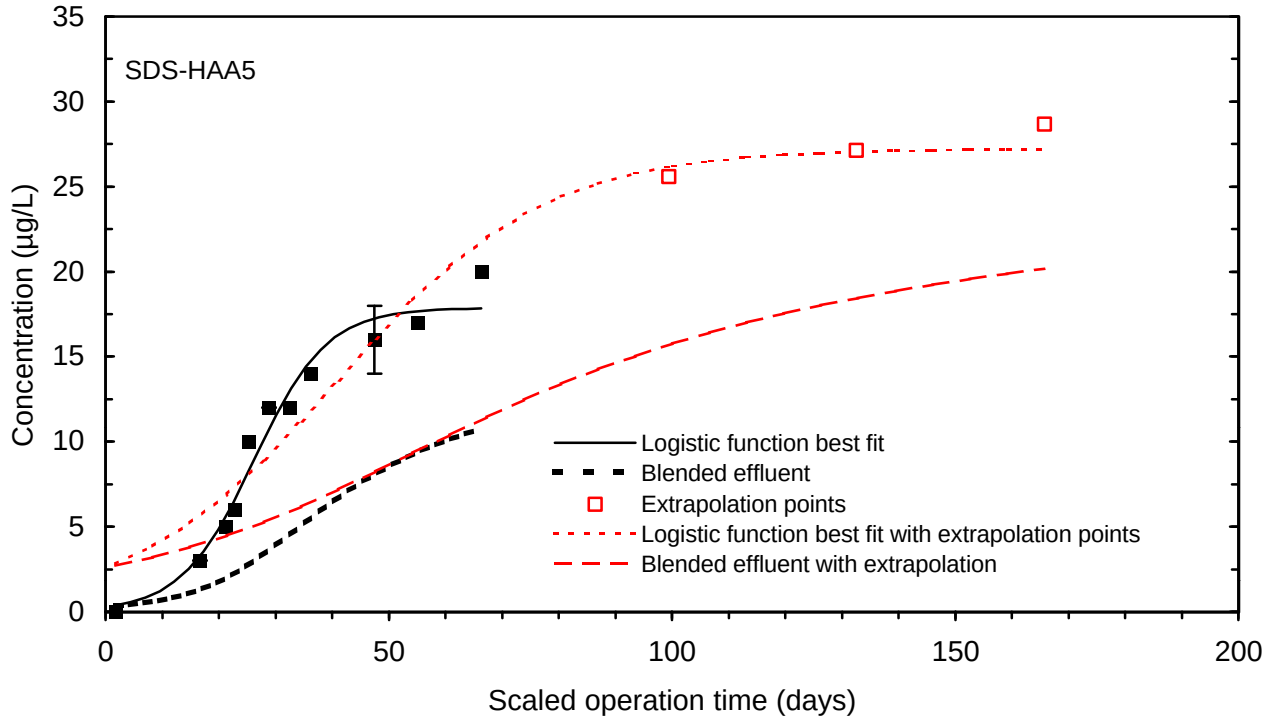


Figure 175 Single contactor and blended effluent extrapolated SDS-HAA5 breakthrough curve (10 minute EBCT) during session 2, April

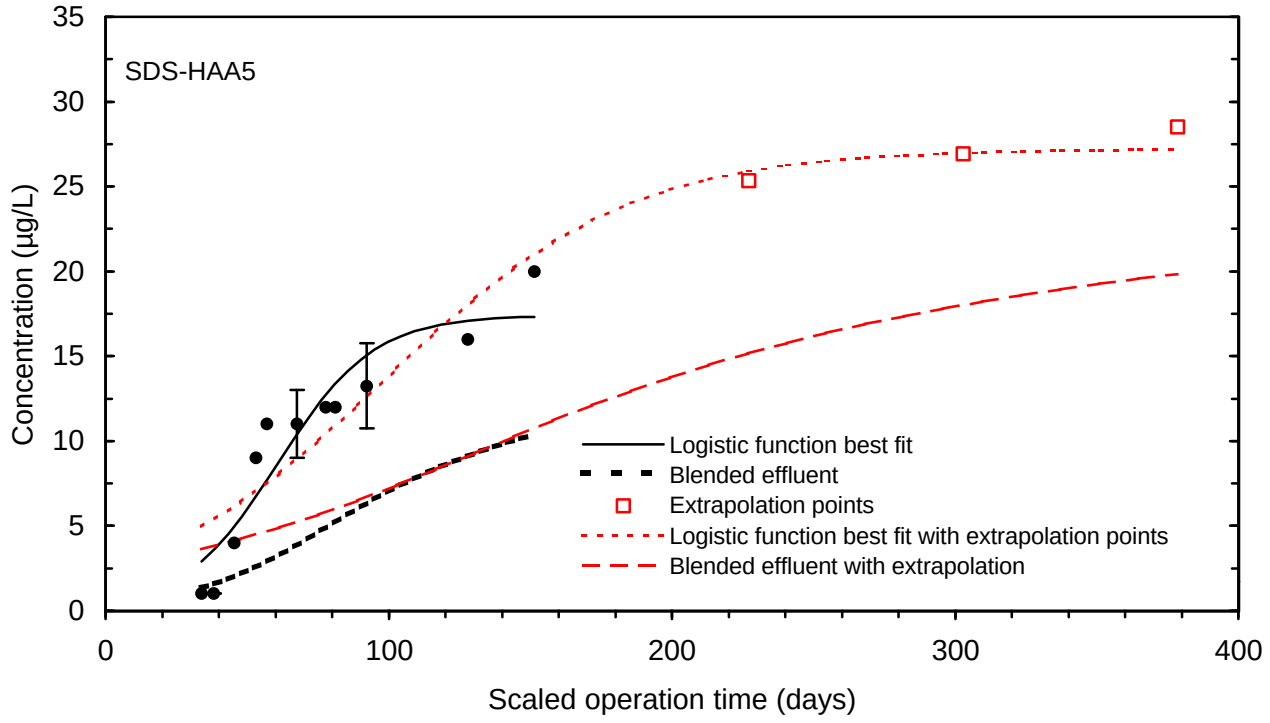


Figure 176 Single contactor and blended effluent extrapolated SDS-HAA5 breakthrough curve (20 minute EBCT) during session 2, April

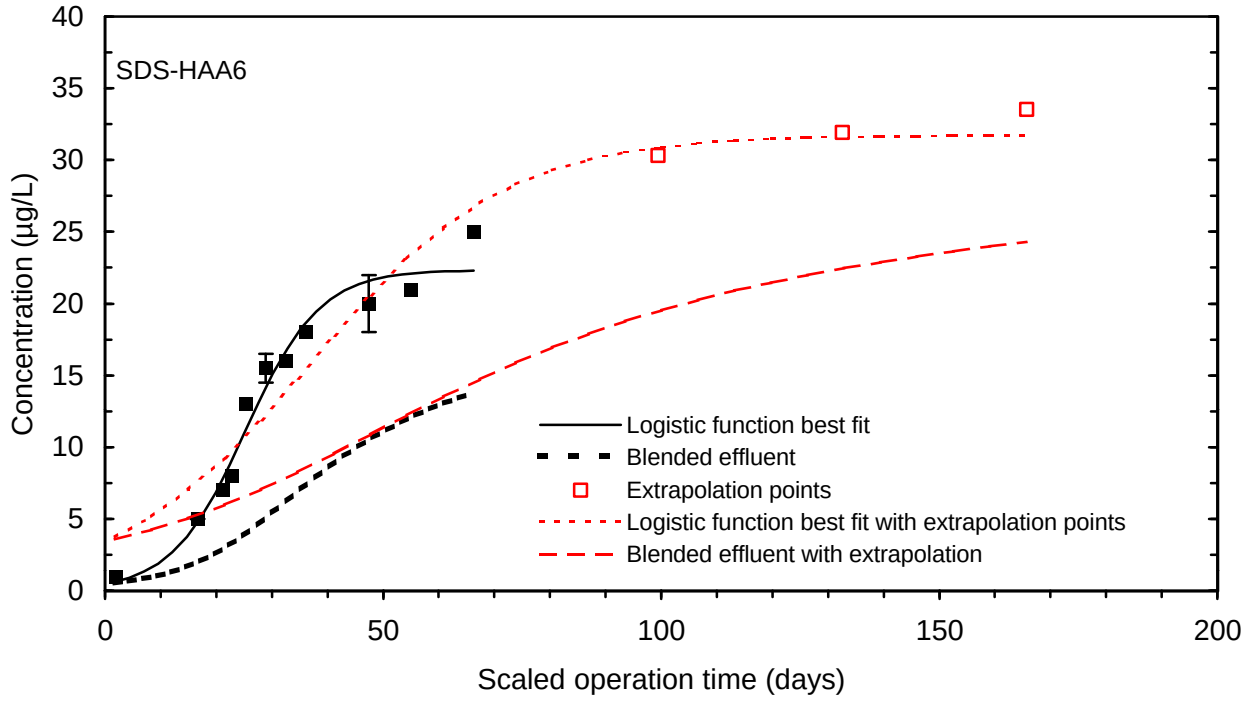


Figure 177 Single contactor and blended effluent extrapolated SDS-HAA6 breakthrough curve (10 minute EBCT) during session 2, April

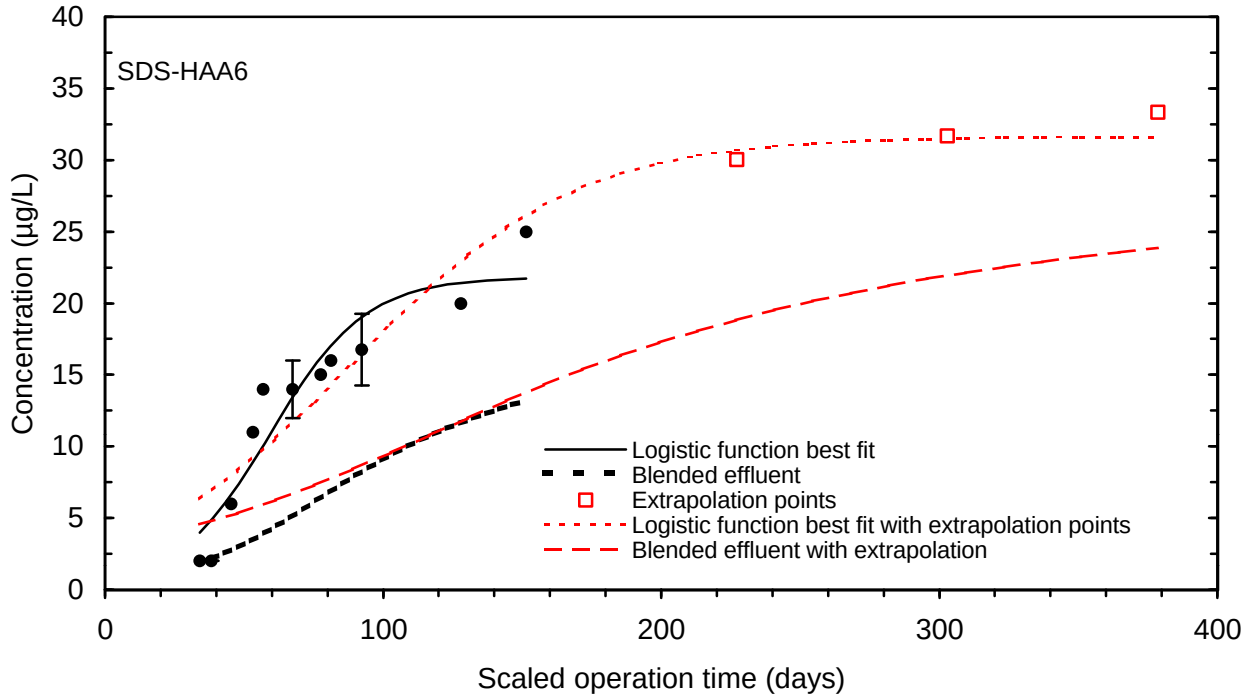


Figure 178 Single contactor and blended effluent extrapolated SDS-HAA6 breakthrough curve (20 minute EBCT) during session 2, April

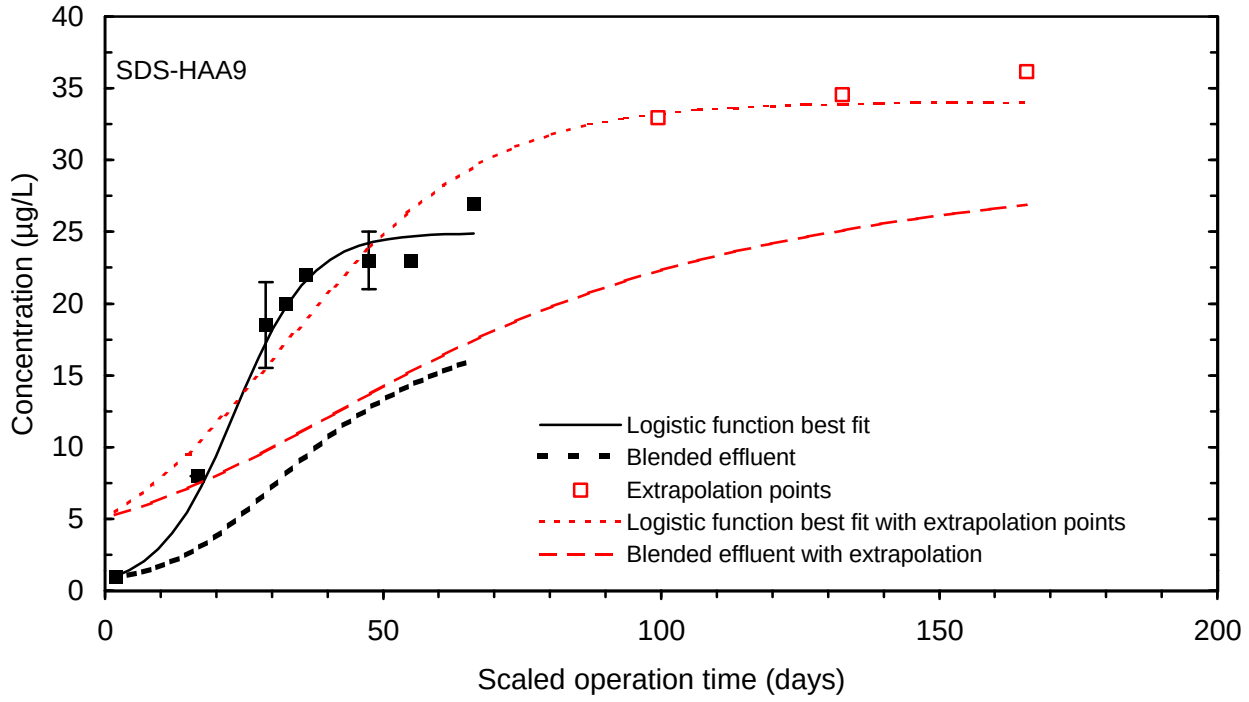


Figure 179 Single contactor and blended effluent extrapolated SDS-HAA9 breakthrough curve (10 minute EBCT) during session 2, April

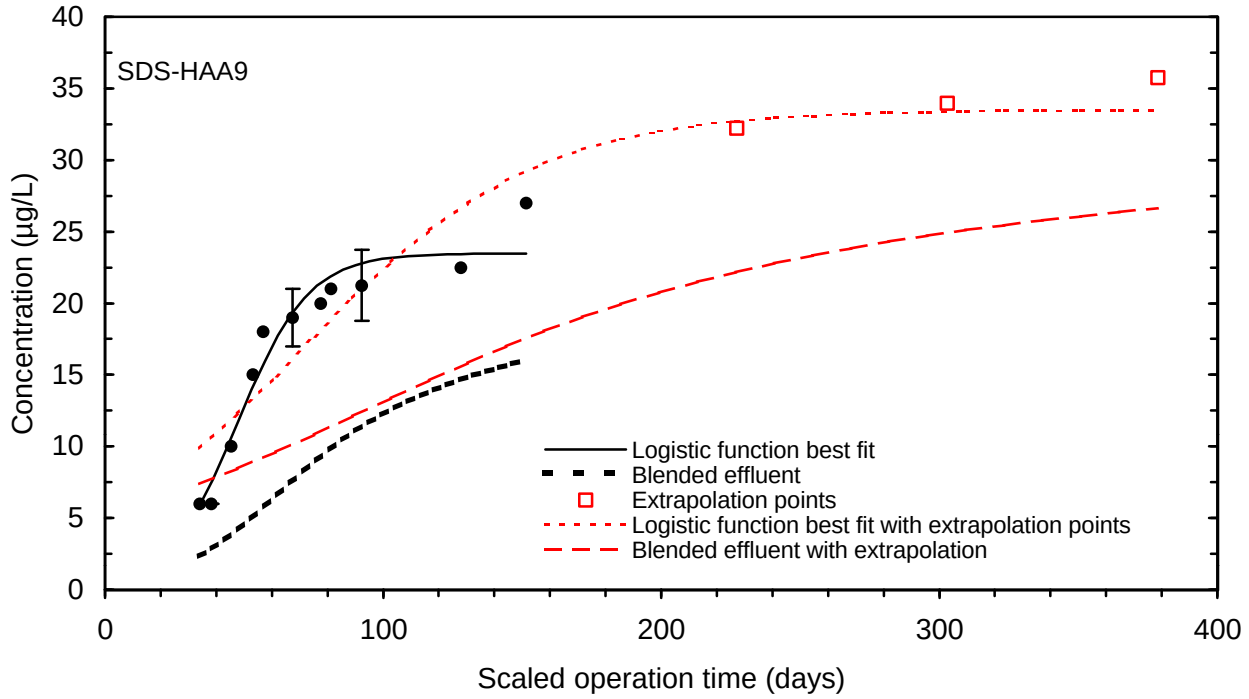


Figure 180 Single contactor and blended effluent extrapolated SDS-HAA9 breakthrough curve (20 minute EBCT) during session 2, April

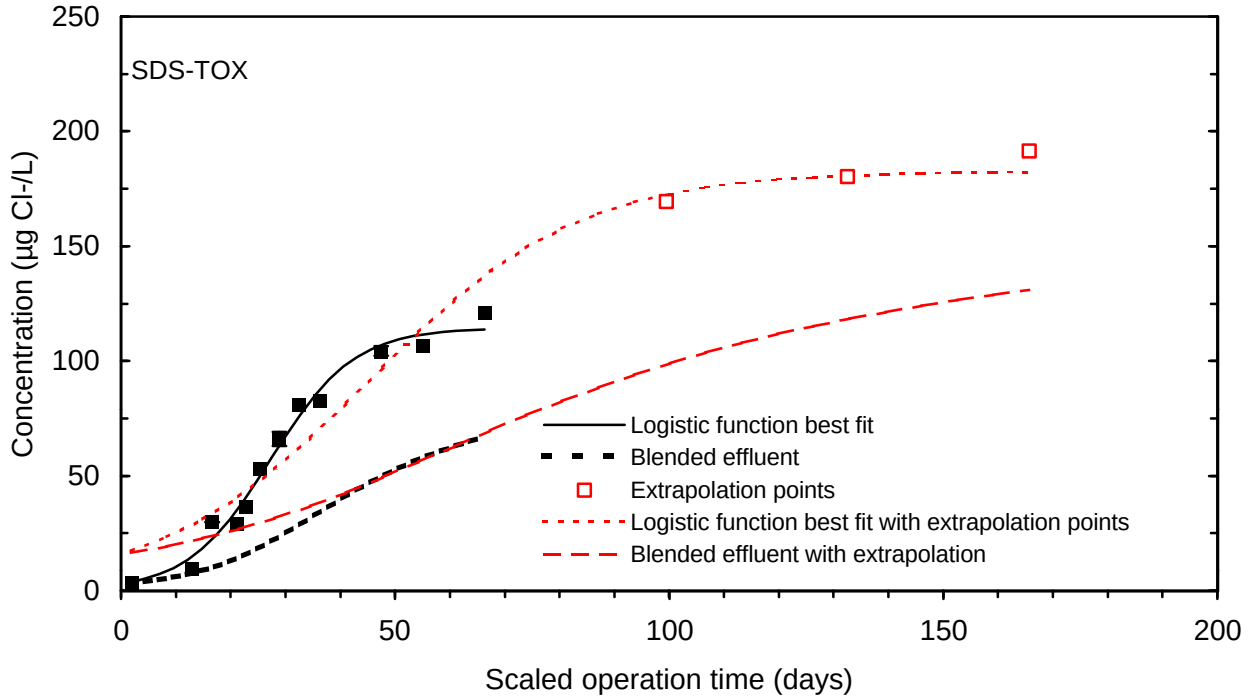


Figure 181 Single contactor and blended effluent extrapolated SDS-TOX breakthrough curve (10 minute EBCT) during session 2, April

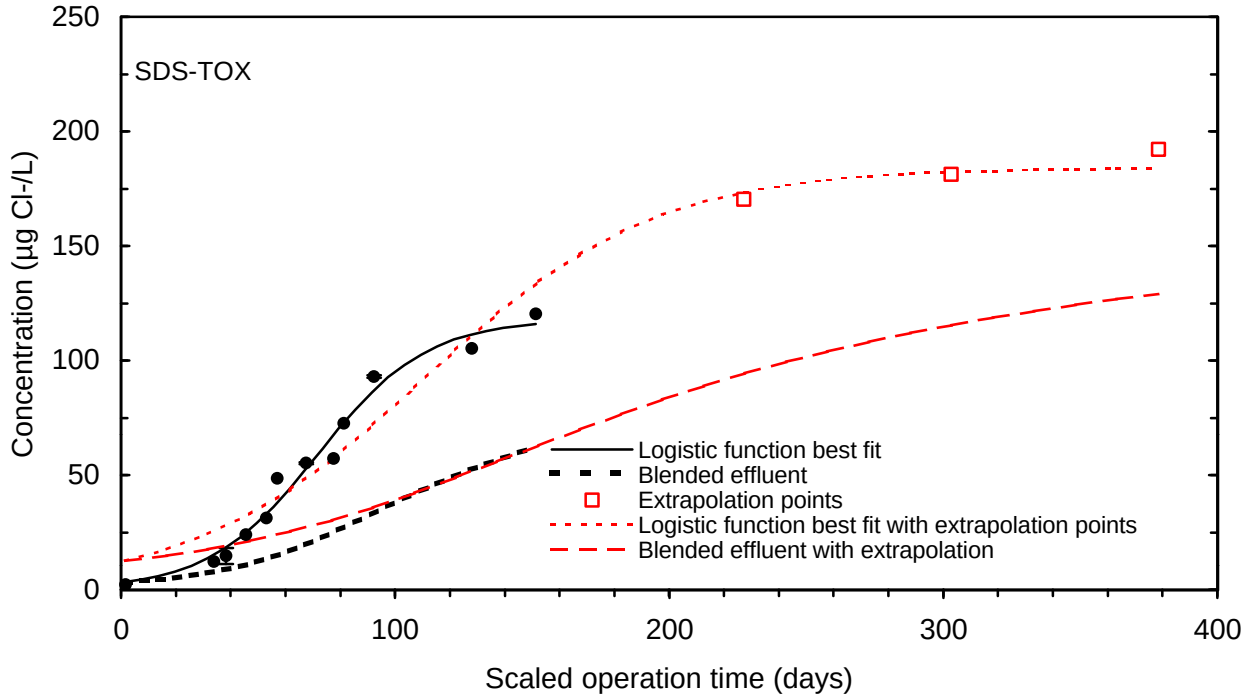


Figure 182 Single contactor and blended effluent extrapolated SDS-TOX breakthrough curve (20 minute EBCT) during session 2, April

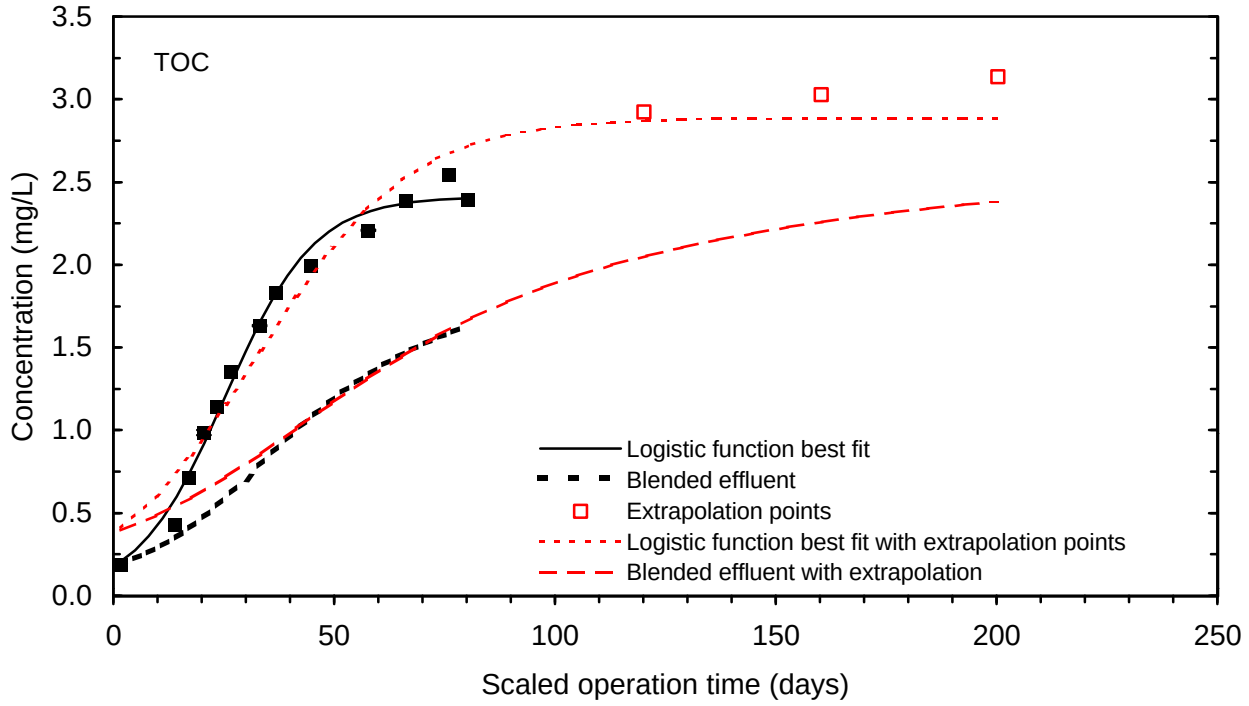


Figure 183 Single contactor and blended effluent extrapolated TOC breakthrough curve (10 minute EBCT) during session 3, June

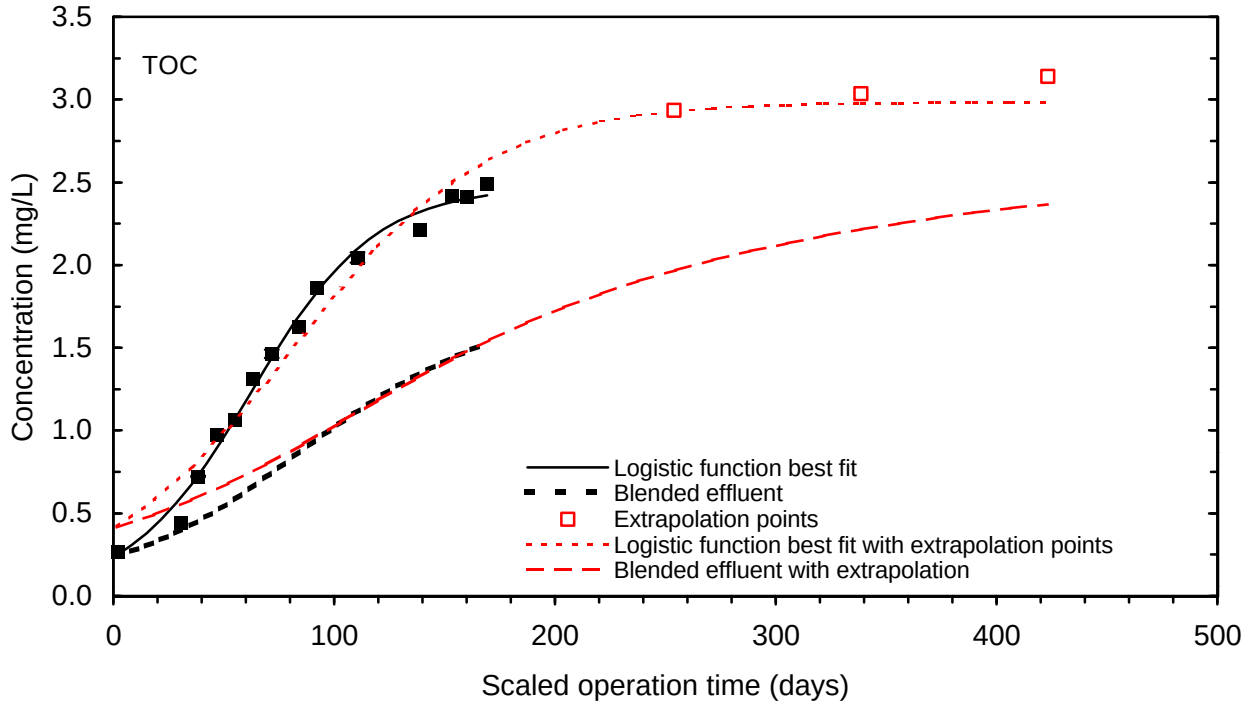


Figure 184 Single contactor and blended effluent extrapolated TOC breakthrough curve (20 minute EBCT) during session 3, June

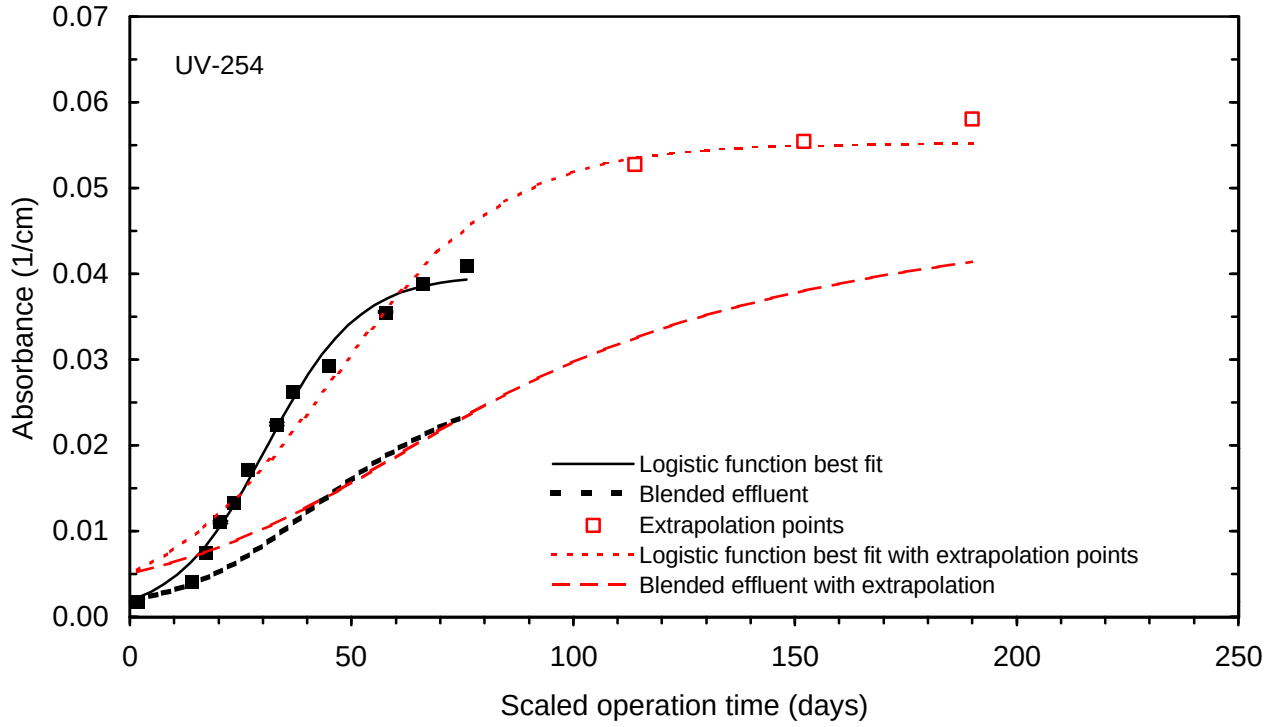


Figure 185 Single contactor and blended effluent extrapolated UV-254 breakthrough curve (10 minute EBCT) during session 3, June

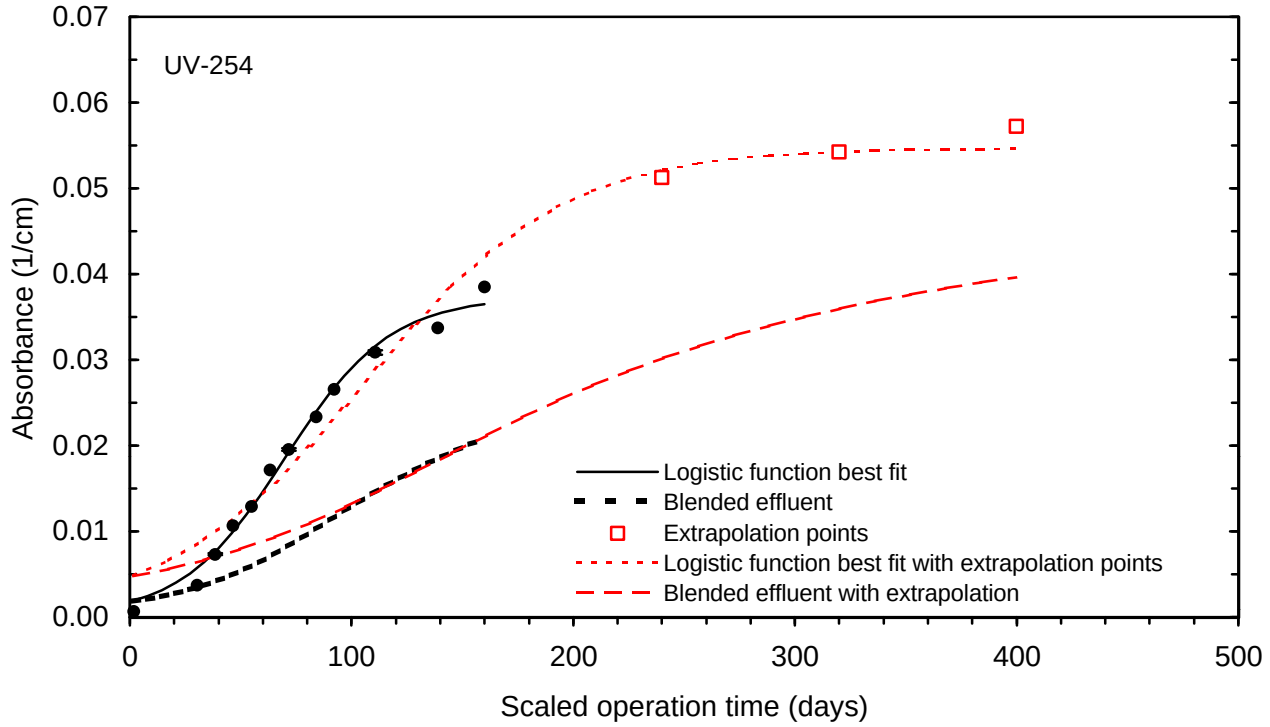


Figure 186 Single contactor and blended effluent extrapolated UV-254 breakthrough curve (20 minute EBCT) during session 3, June

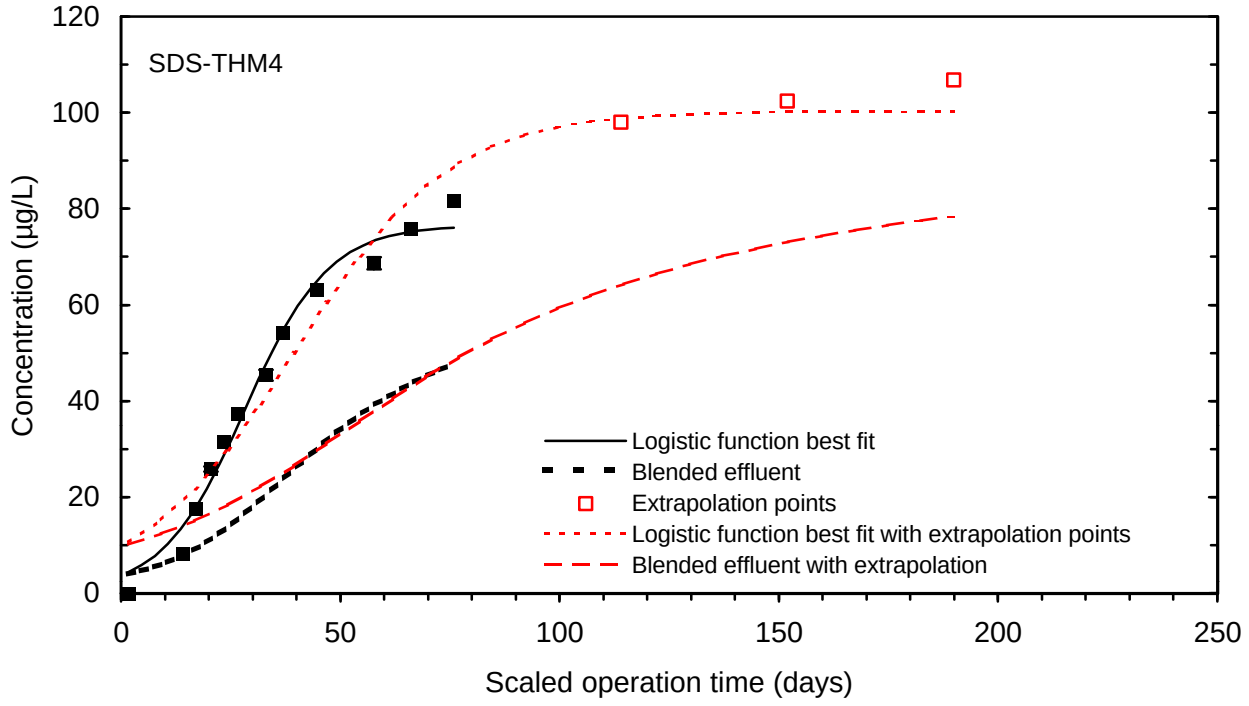


Figure 187 Single contactor and blended effluent extrapolated SDS-THM4 breakthrough curve (10 minute EBCT) during session 3, June

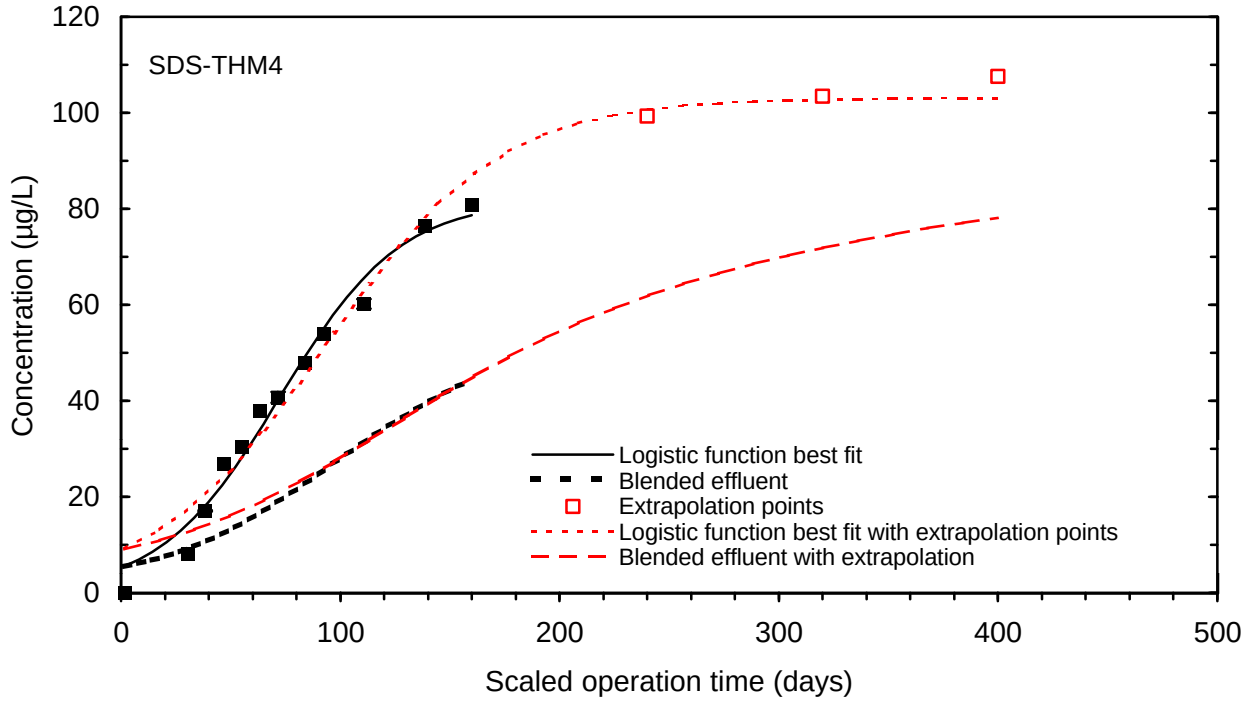


Figure 188 Single contactor and blended effluent extrapolated SDS-THM4 breakthrough curve (20 minute EBCT) during session 3, June

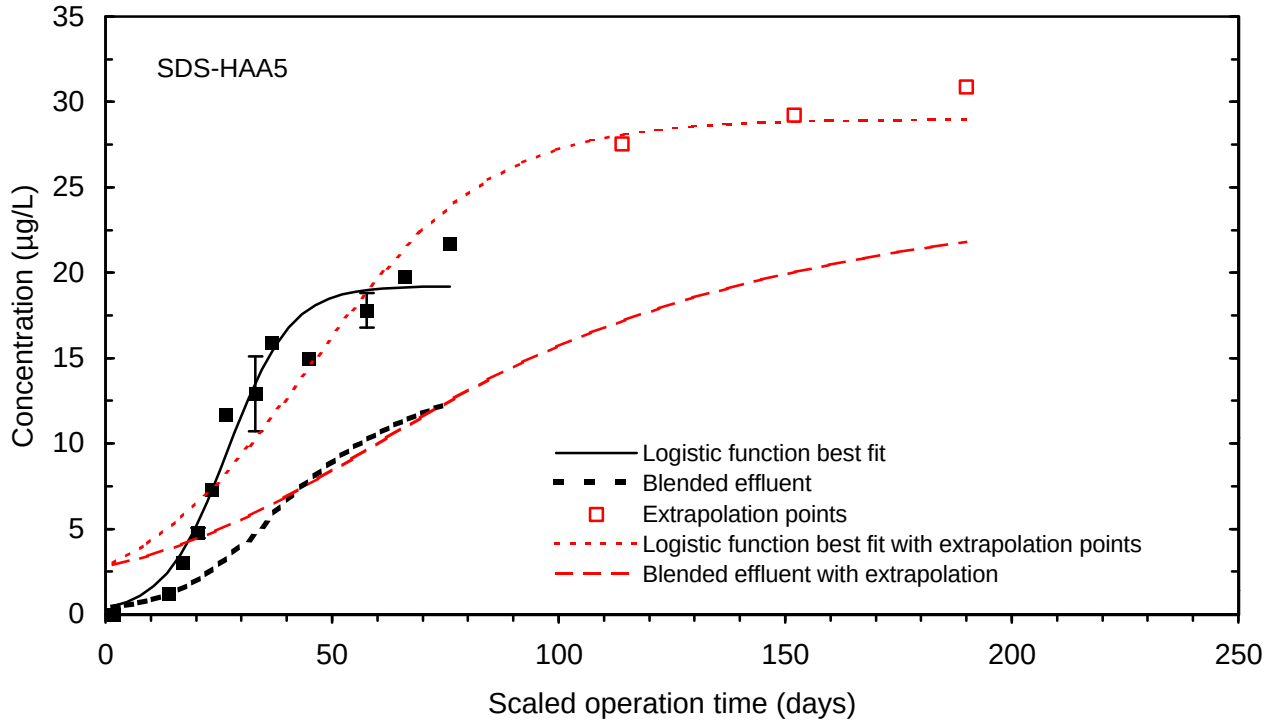


Figure 189 Single contactor and blended effluent extrapolated SDS-HAA5 breakthrough curve (10 minute EBCT) during session 3, June

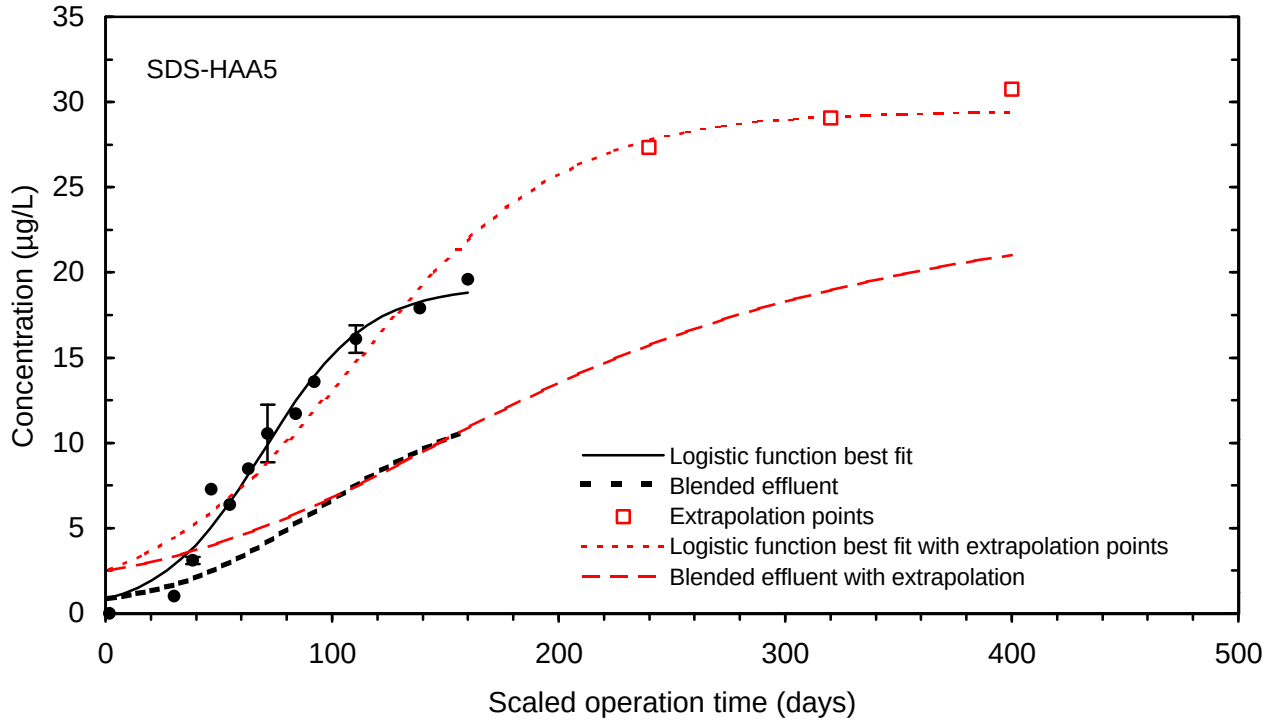


Figure 190 Single contactor and blended effluent extrapolated SDS-HAA5 breakthrough curve (20 minute EBCT) during session 3, June

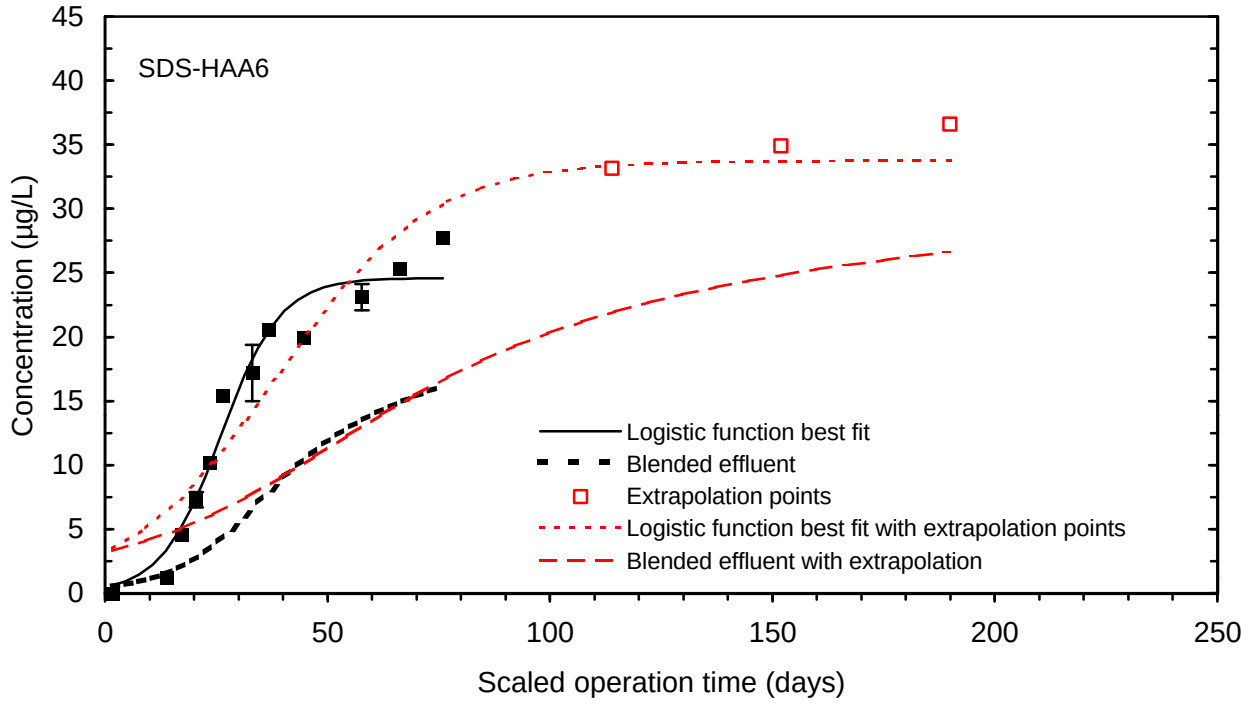


Figure 191 Single contactor and blended effluent extrapolated SDS-HAA6 breakthrough curve (10 minute EBCT) during session 3, June

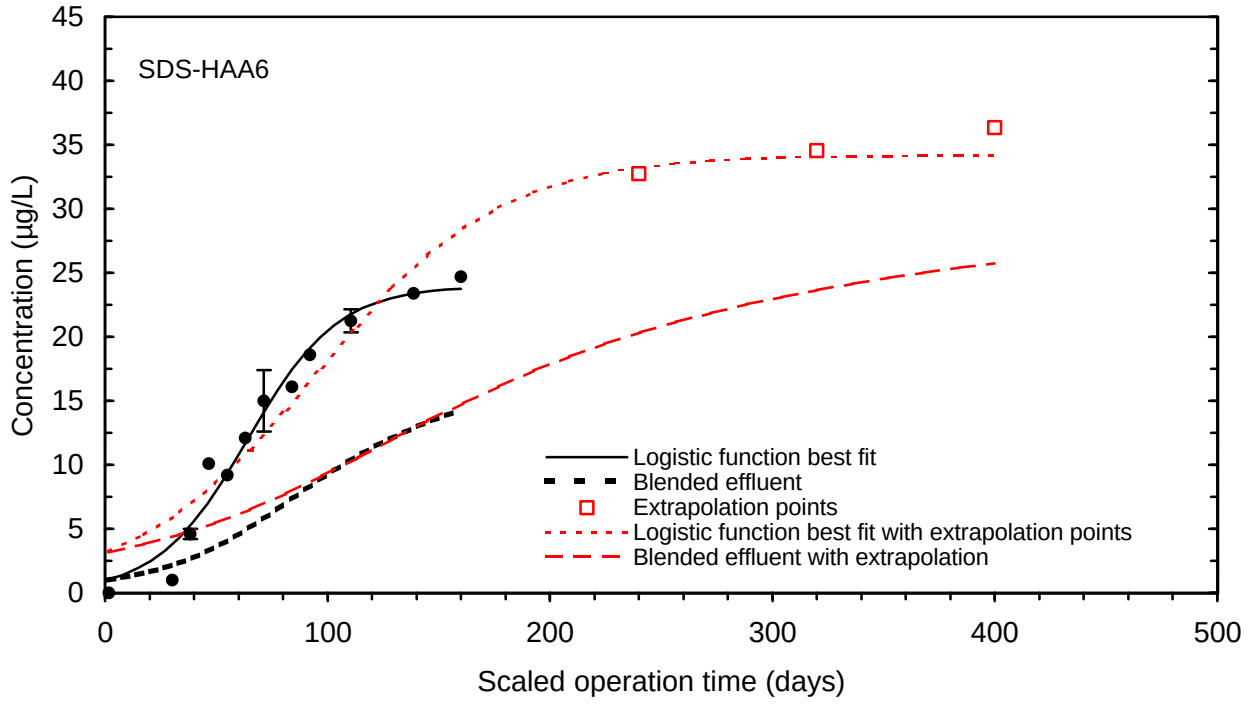


Figure 192 Single contactor and blended effluent extrapolated SDS-HAA6 breakthrough curve (20 minute EBCT) during session 3, June

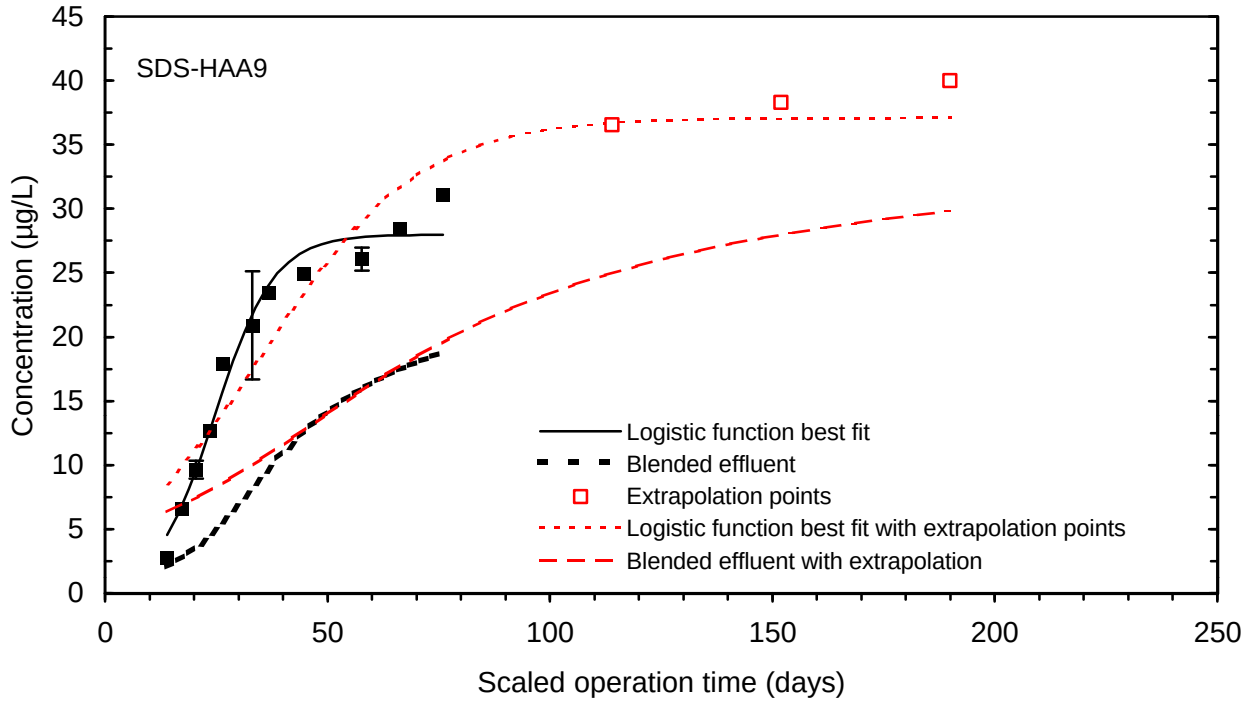


Figure 193 Single contactor and blended effluent extrapolated SDS-HAA9 breakthrough curve (10 minute EBCT) during session 3, June

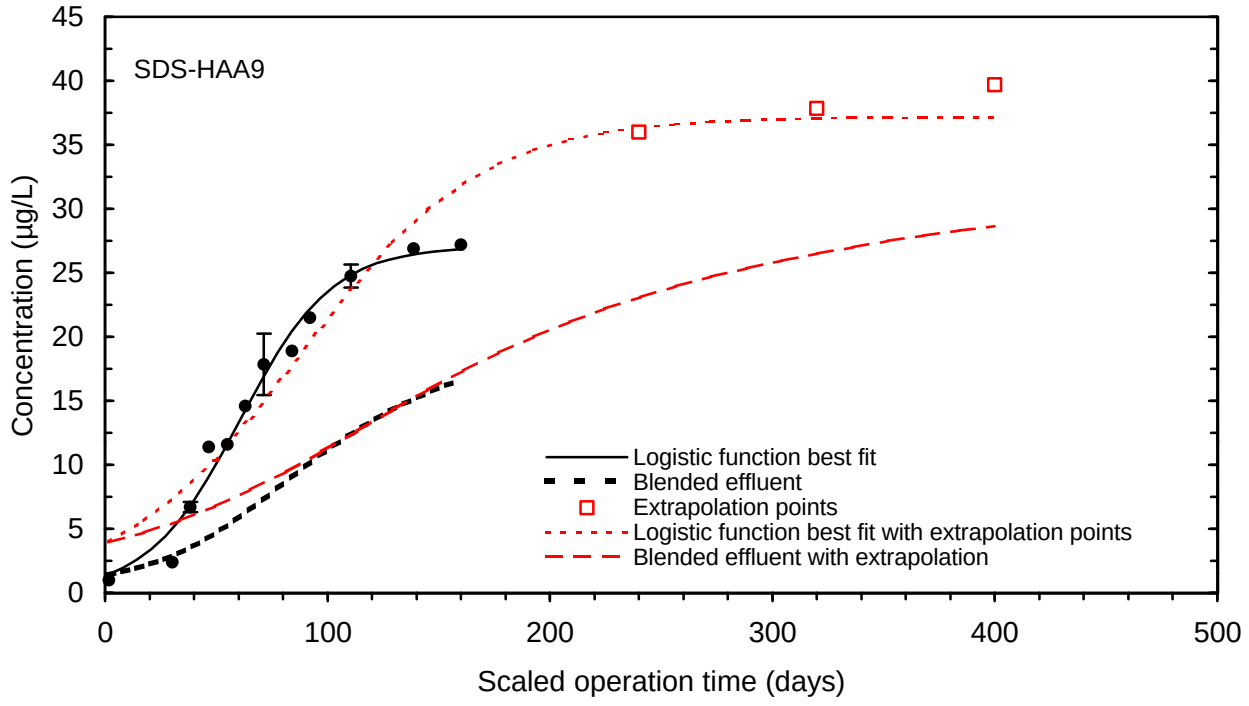


Figure 194 Single contactor and blended effluent extrapolated SDS-HAA9 breakthrough curve (20 minute EBCT) during session 3, June

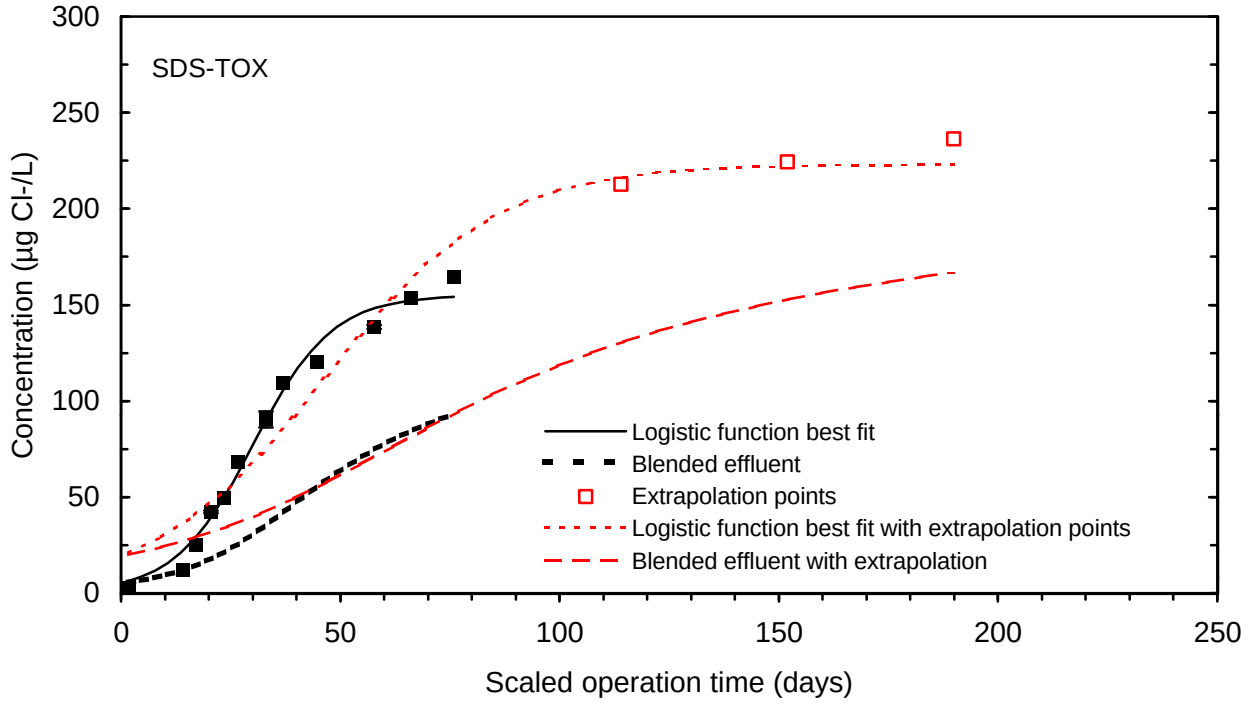


Figure 195 Single contactor and blended effluent extrapolated SDS-TOX breakthrough curve (10 minute EBCT) during session 3, June

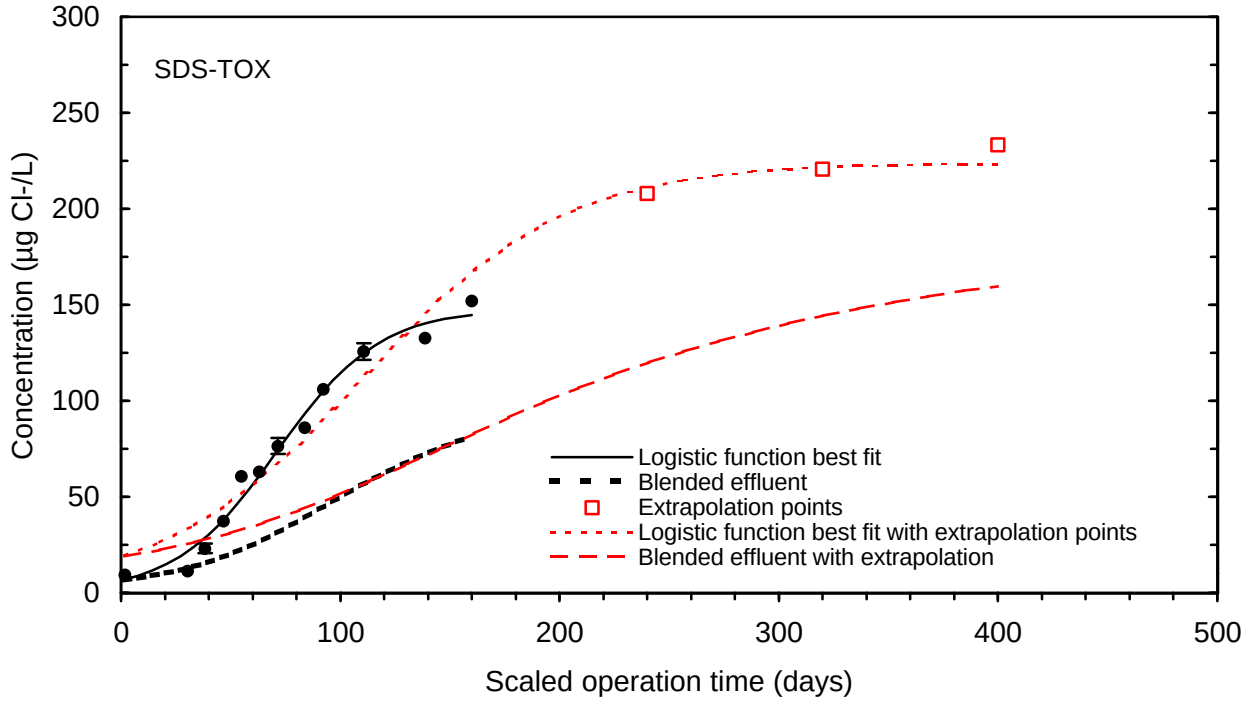


Figure 196 Single contactor and blended effluent extrapolated SDS-TOX breakthrough curve (20 minute EBCT) during session 3, June

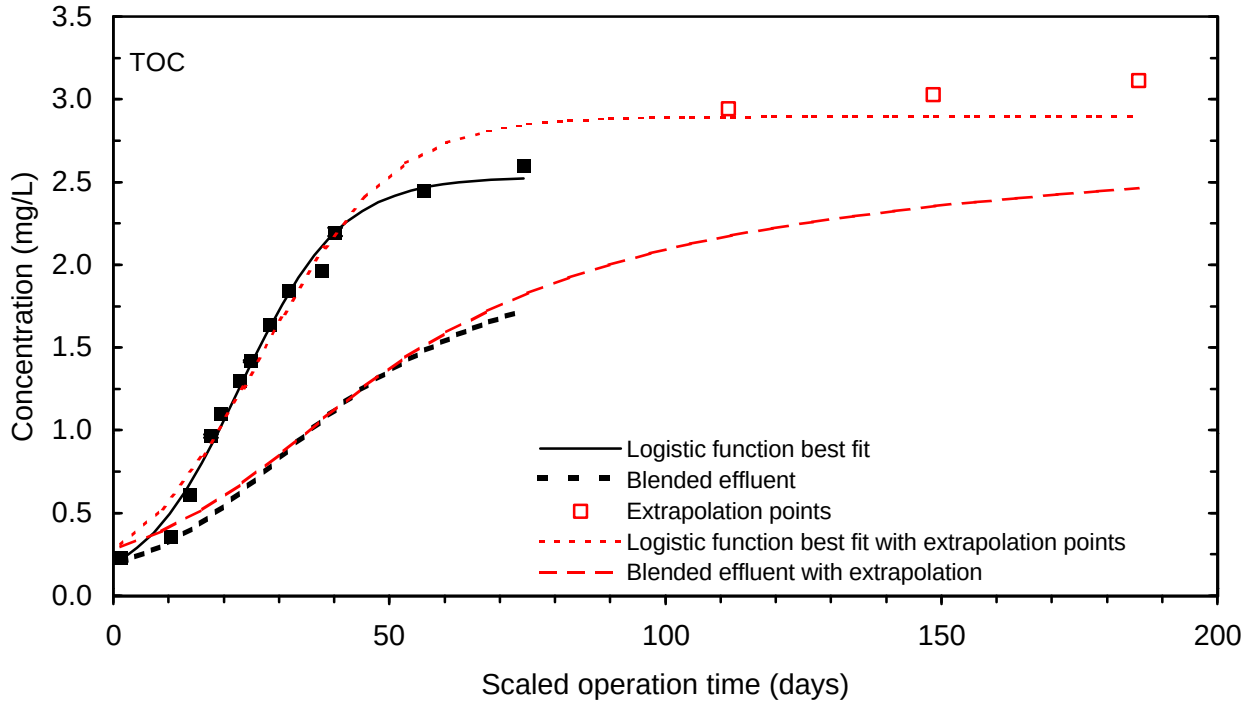


Figure 197 Single contactor and blended effluent extrapolated TOC breakthrough curve (10 minute EBCT) during session 4, October

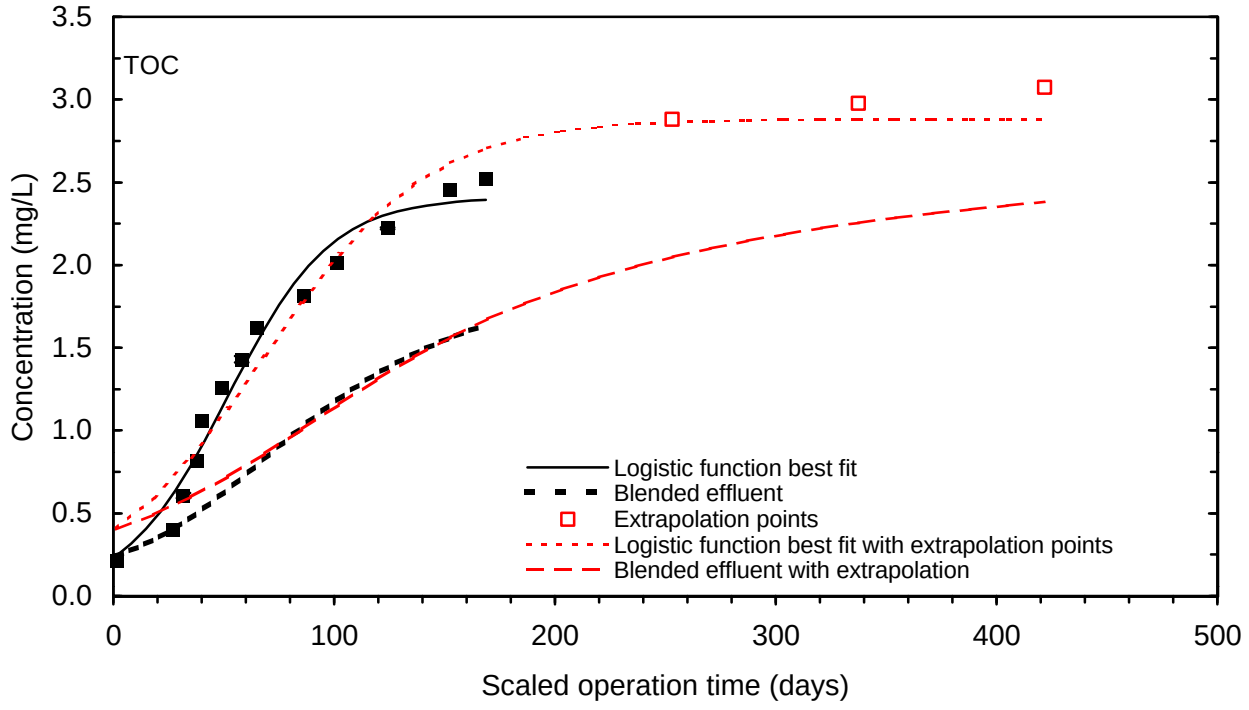


Figure 198 Single contactor and blended effluent extrapolated TOC breakthrough curve (20 minute EBCT) during session 4, October

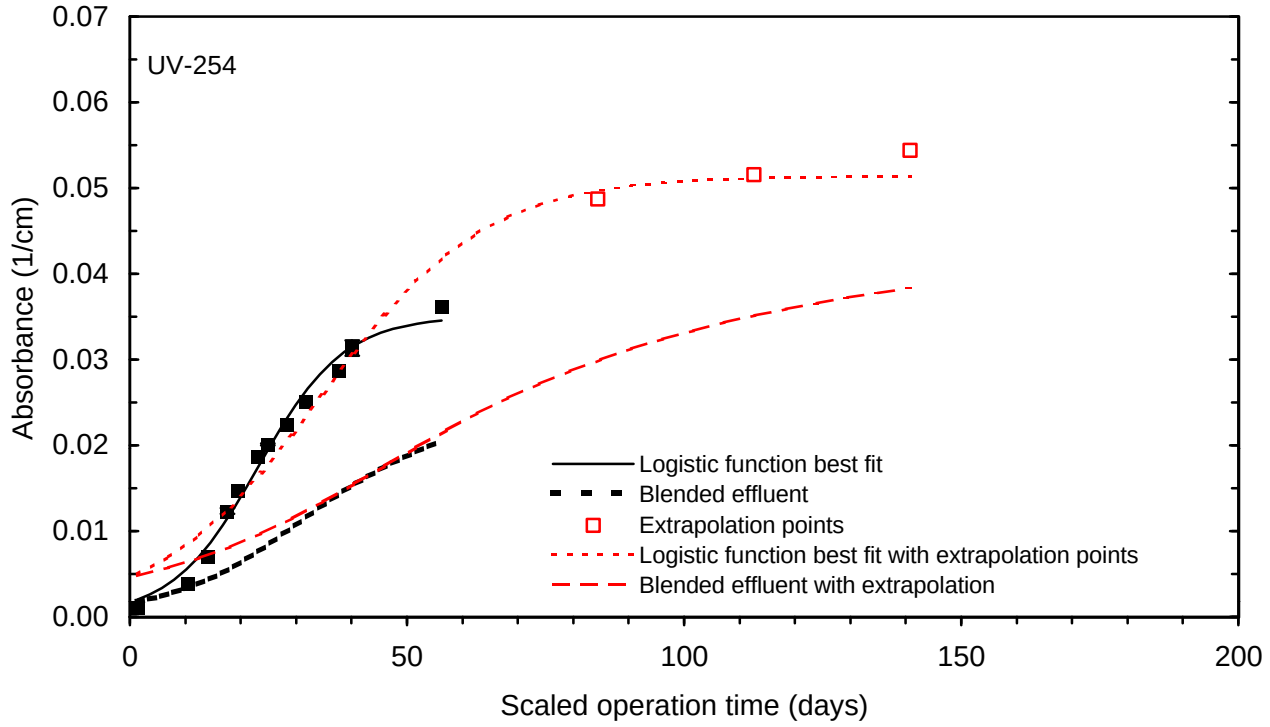


Figure 199 Single contactor and blended effluent extrapolated UV-254 breakthrough curve (10 minute EBCT) during session 4, October

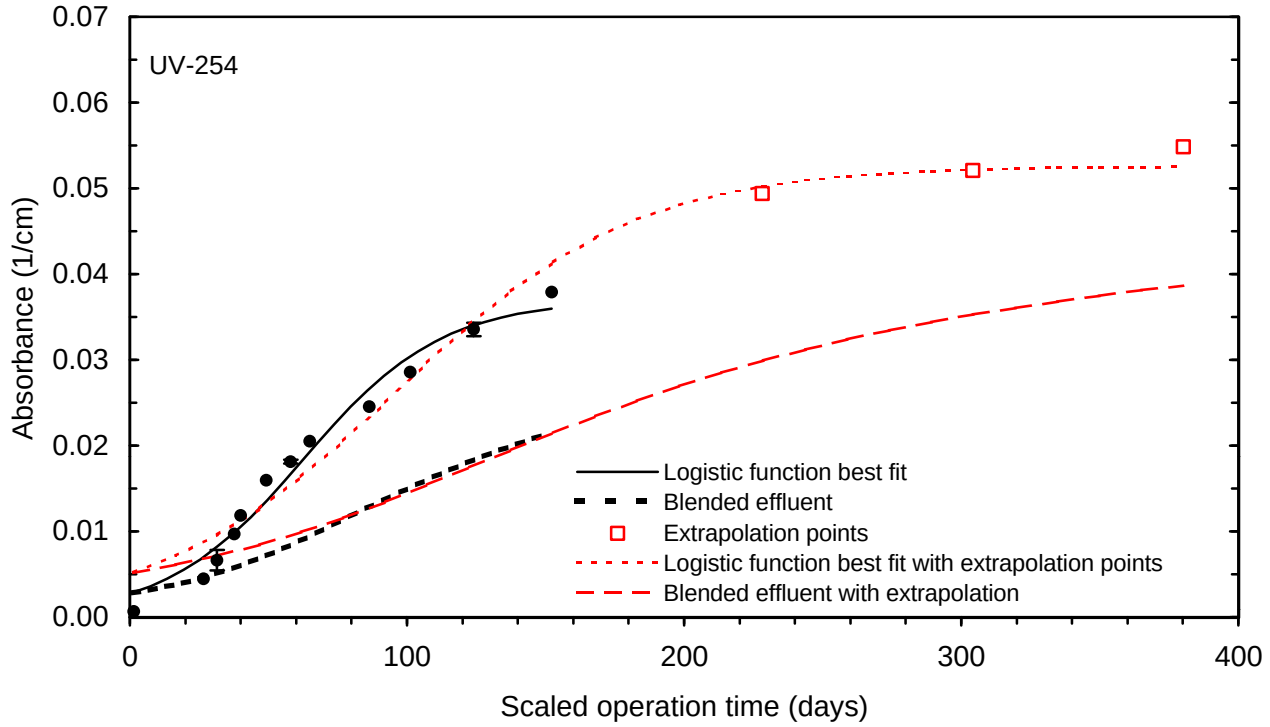


Figure 200 Single contactor and blended effluent extrapolated UV-254 breakthrough curve (20 minute EBCT) during session 4, October

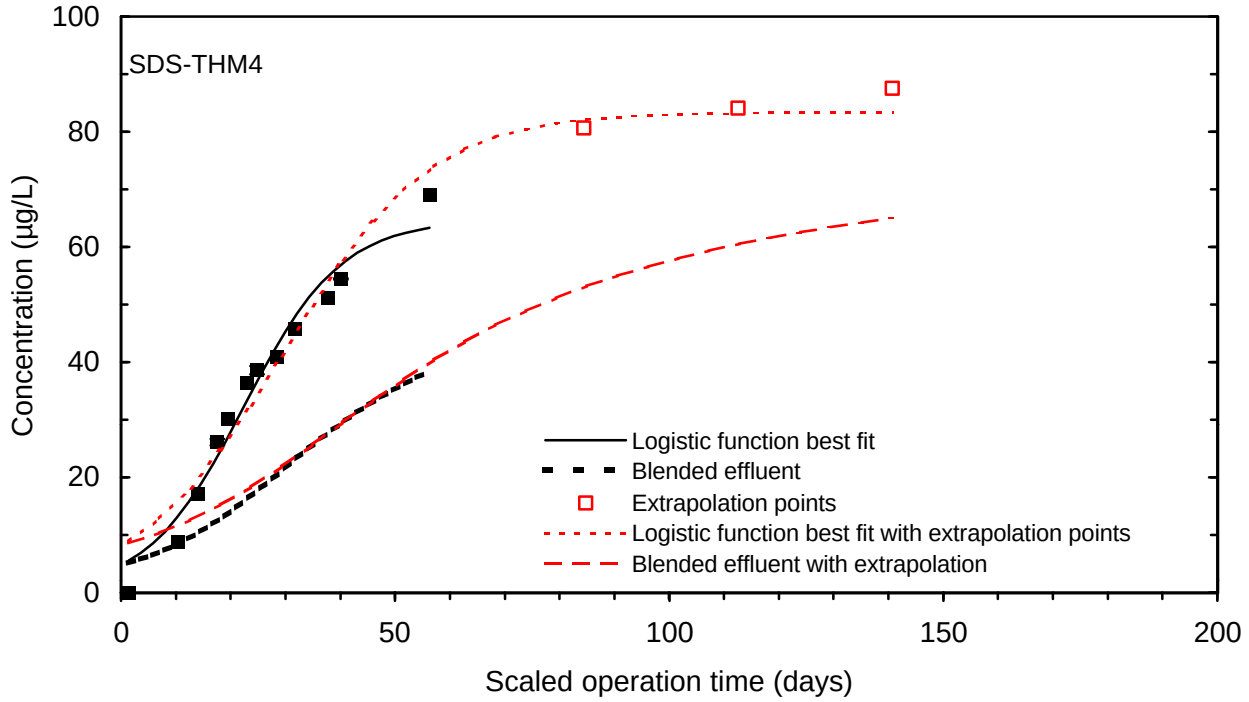


Figure 201 Single contactor and blended effluent extrapolated SDS-THM4 breakthrough curve (10 minute EBCT) during session 4, October

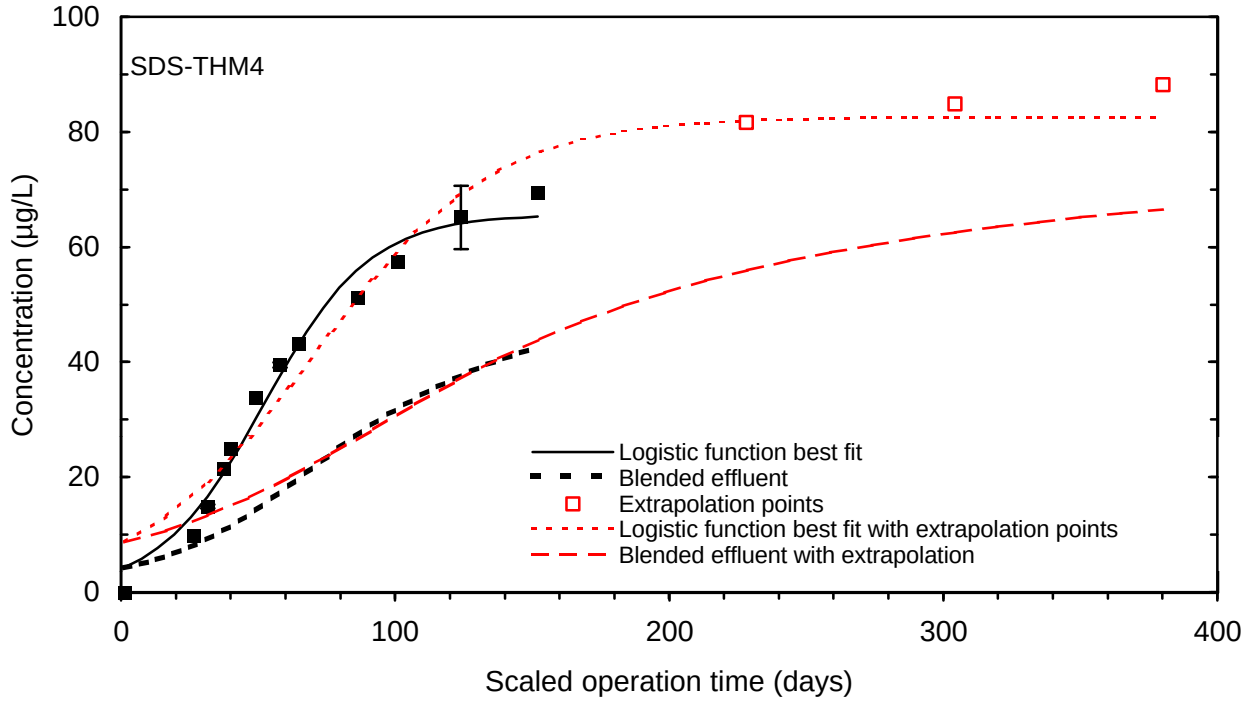


Figure 202 Single contactor and blended effluent extrapolated SDS-THM4 breakthrough curve (20 minute EBCT) during session 4, October

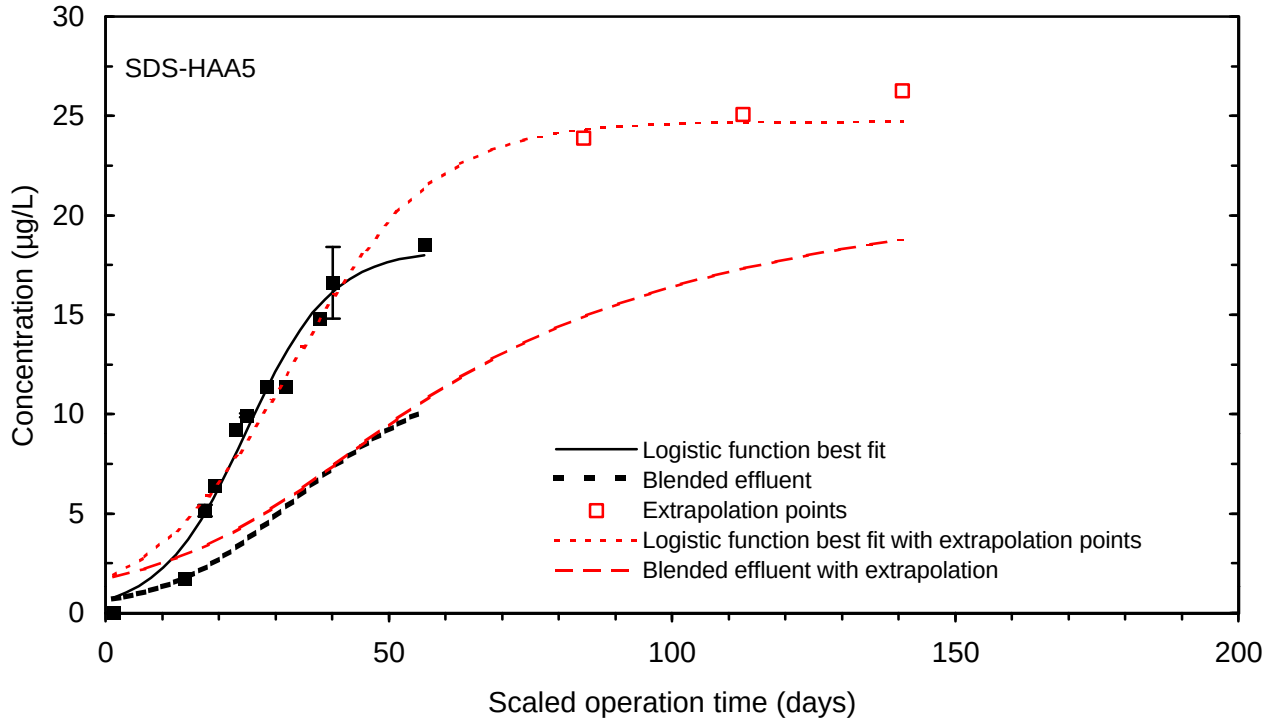


Figure 203 Single contactor and blended effluent extrapolated SDS-HAA5 breakthrough curve (10 minute EBCT) during session 4, October

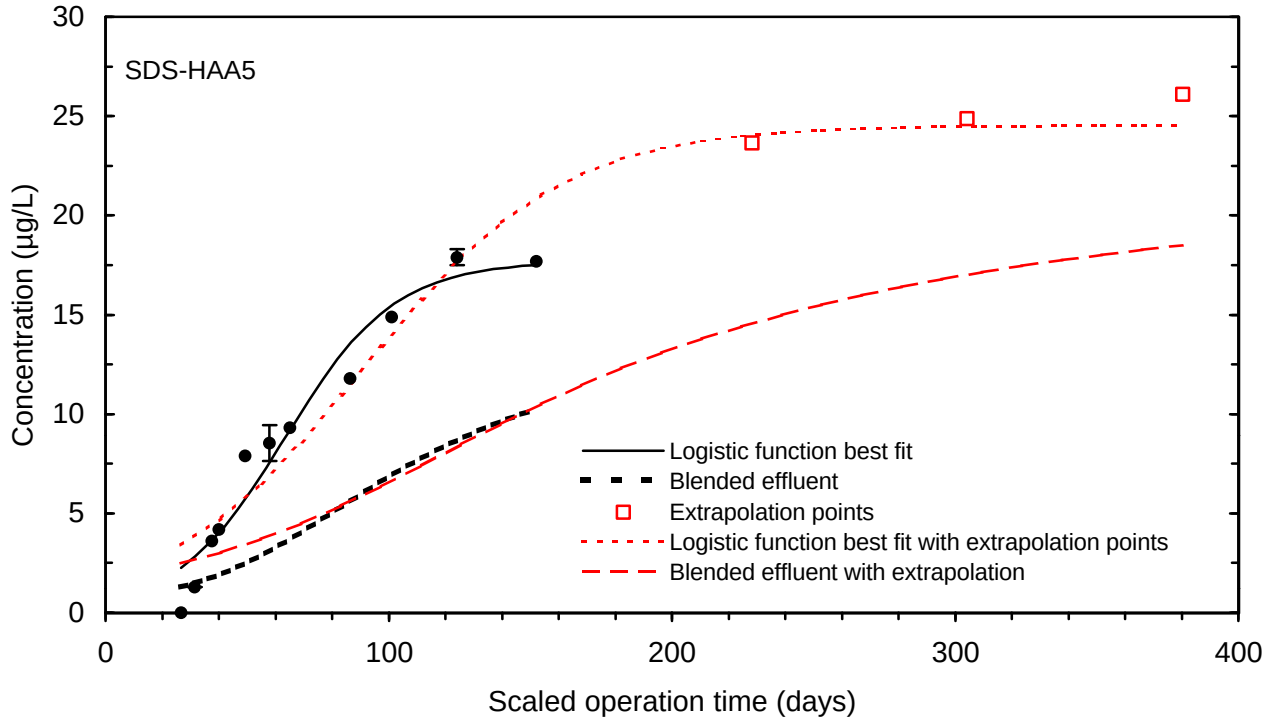


Figure 204 Single contactor and blended effluent extrapolated SDS-HAA5 breakthrough curve (20 minute EBCT) during session 4, October

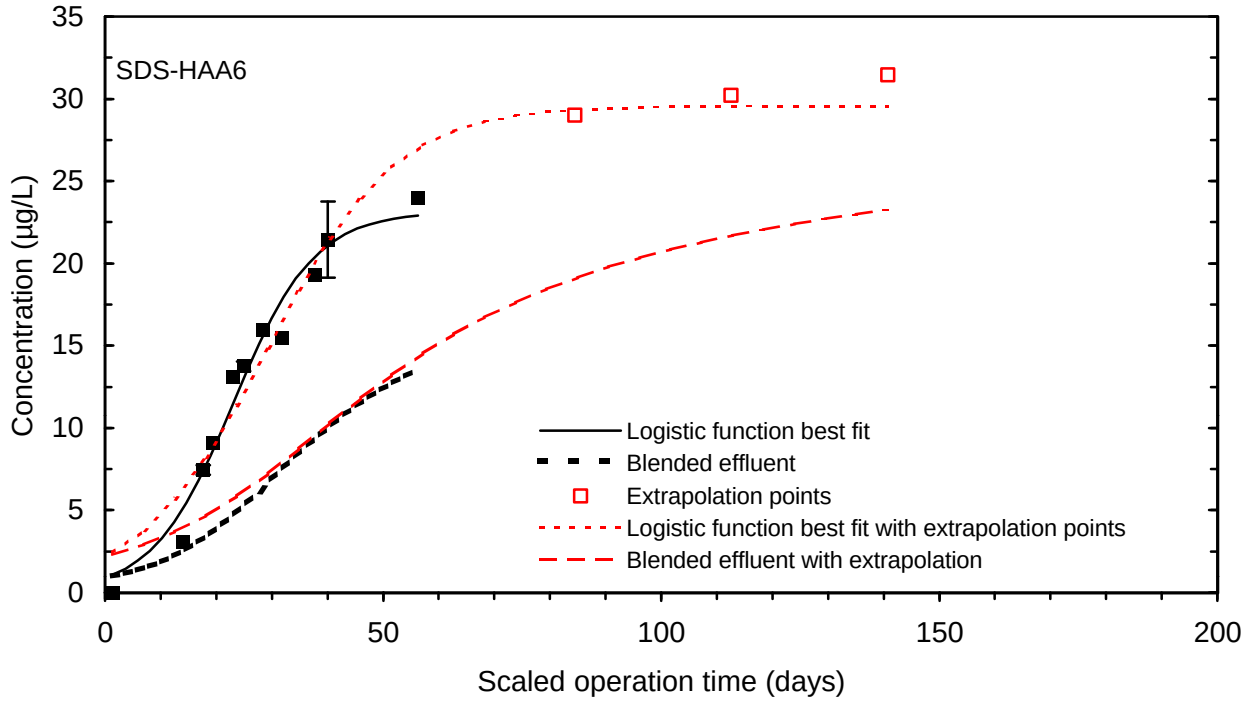


Figure 205 Single contactor and blended effluent extrapolated SDS-HAA6 breakthrough curve (10 minute EBCT) during session 4, October

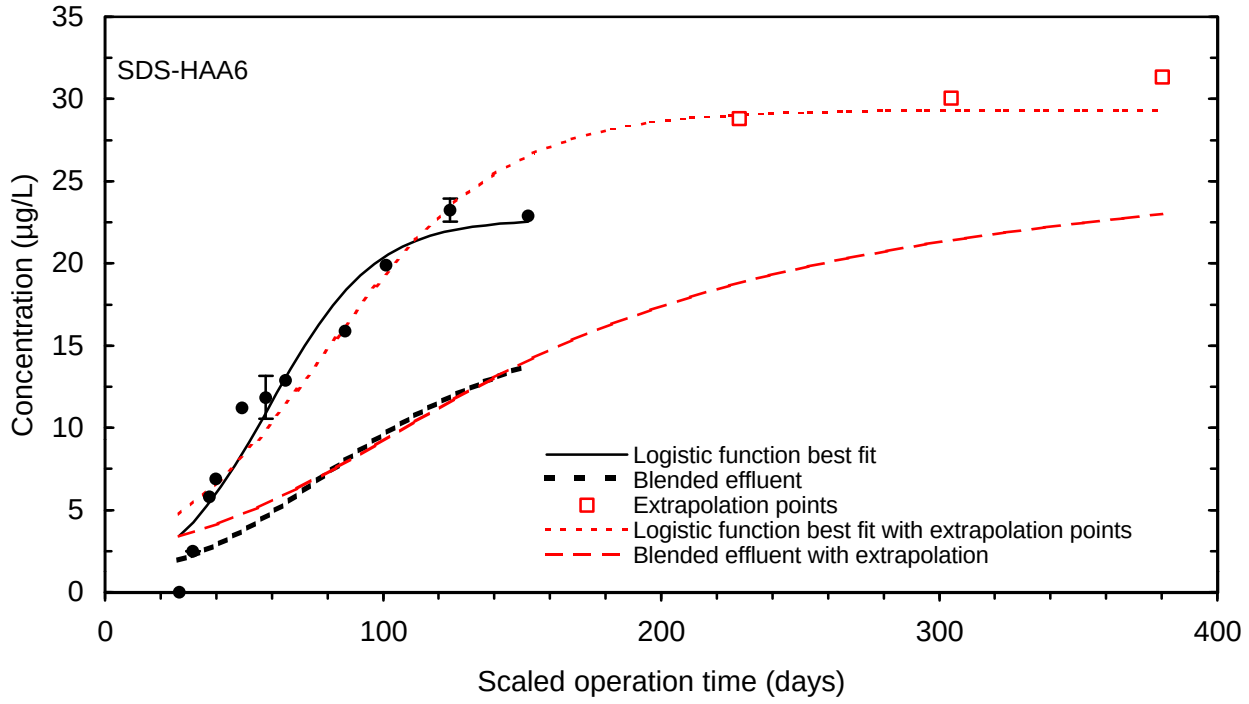


Figure 206 Single contactor and blended effluent extrapolated SDS-HAA6 breakthrough curve (20 minute EBCT) during session 4, October

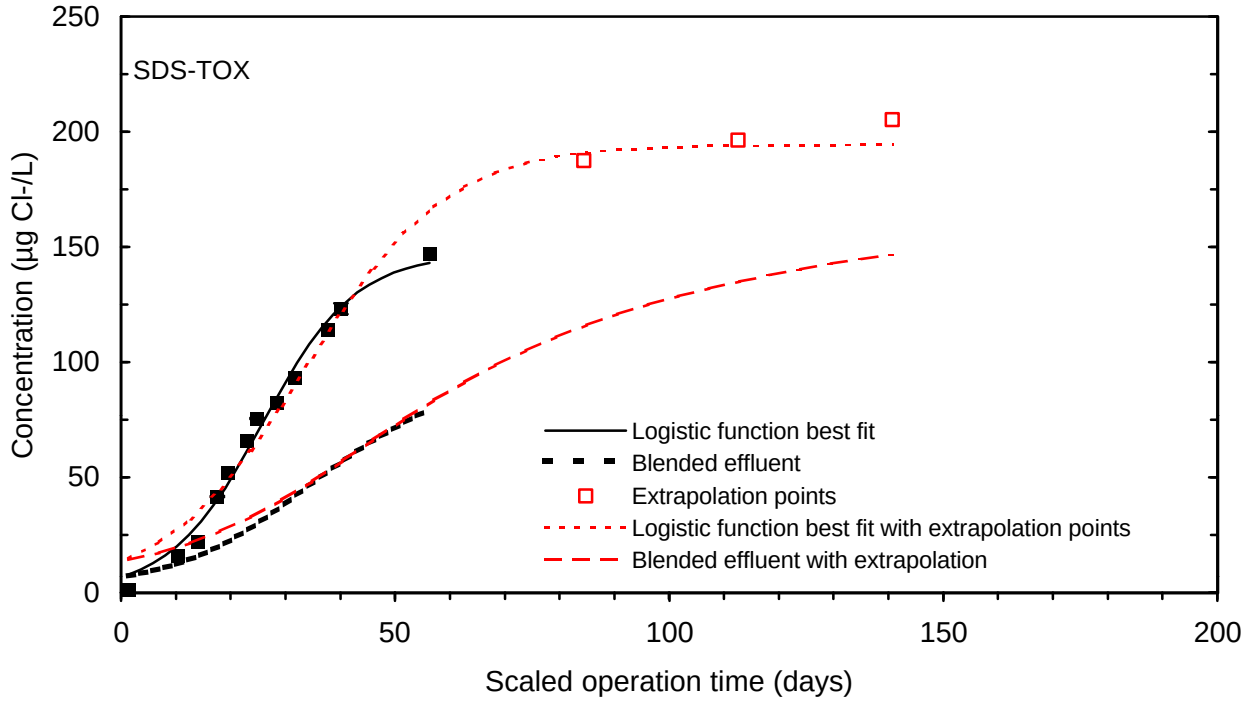


Figure 207 Single contactor and blended effluent extrapolated SDS-TOX breakthrough curve (10 minute EBCT) during session 4, October

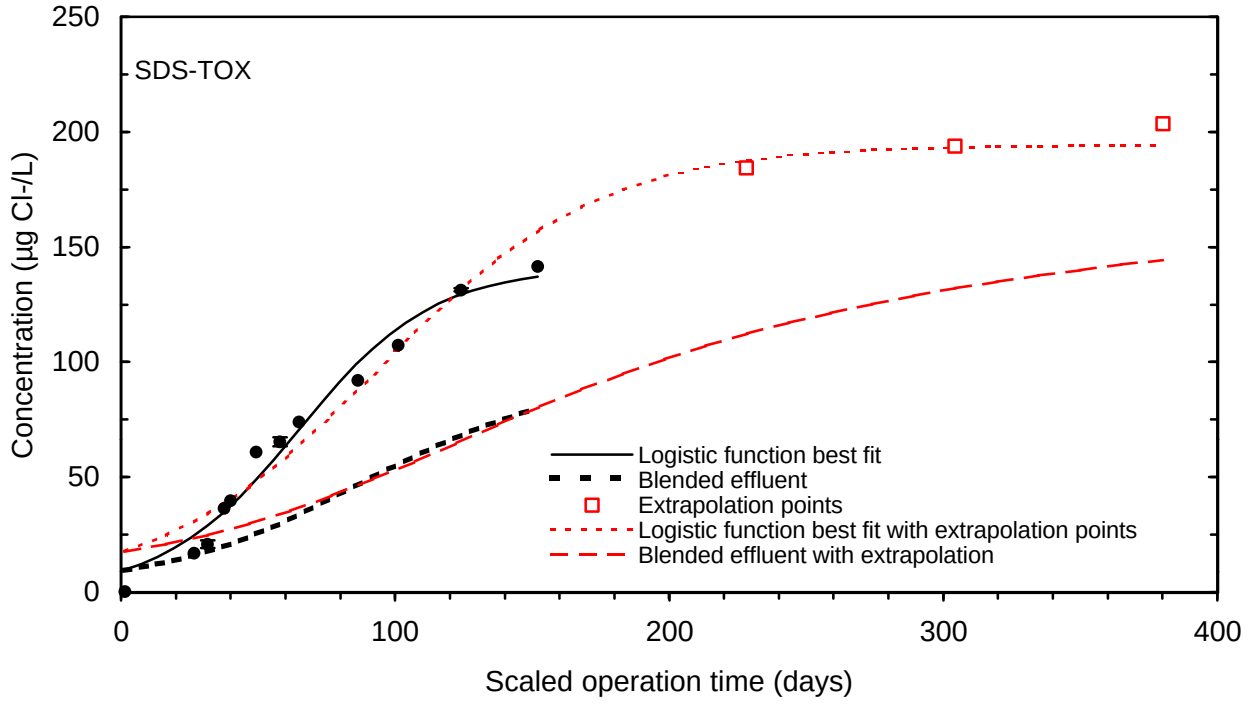


Figure 208 Single contactor and blended effluent extrapolated SDS-TOX breakthrough curve (20 minute EBCT) during session 4, October

11 *Normalized DBP Precursor Breakthrough*

11 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 are reliable indicators of DBP precursor breakthrough. Furthermore, the normalized comparison analysis can determine how well the surrogates serve as indicators of DBP precursor breakthrough.

The normalized breakthrough patterns for all parameters during the January sample for the 10 minute EBCT contactor are shown in Figure 209. High initial relative levels of chlorine demand are present, due mostly to the presence of inorganic chlorine demand. The normalized breakthrough of TOC occurs earlier and remains at a higher percent breakthrough than DBP precursors throughout the run time. Therefore, based on the January 10 minute EBCT contactor, TOC breakthrough can be used as a conservative indicator of DBP precursor breakthrough. The same pattern was observed for the 20 minute EBCT contactor for the January sample (Figure 210).

For both breakthrough curves, the relative breakthrough order of parameters is similar. TOC is followed by SDS-THM4, SDS-HAA9, UV_{254}, SDS-TOX, SDS-HAA6, and SDS-HAA5. It should be noted that the relative breakthrough of SDS-HAA9 is much higher than that of SDS-HAA6 or SDS-HAA5. Thus, if only HAA5 or HAA6 are analyzed, the removal of HAA precursors by GAC might be overstated.

The normalized breakthrough patterns for both EBCTs and all parameters for the April, June, and October samples are shown in Figures 211 through 216. Overall, on a normalized basis, TOC consistently served as a conservative indicator for DBP precursor breakthrough.

During all four quarters, and for both EBCTs, normalized UV_{254} and SDS-TOX breakthrough patterns were very similar. Thus, percent UV_{254} breakthrough can be used as a predictive tool for TOX breakthrough, once the influent TOX concentration is known. This relationship was independent of SDS chlorination temperature, and any variability in TOX precursor material during the four seasonal sessions.

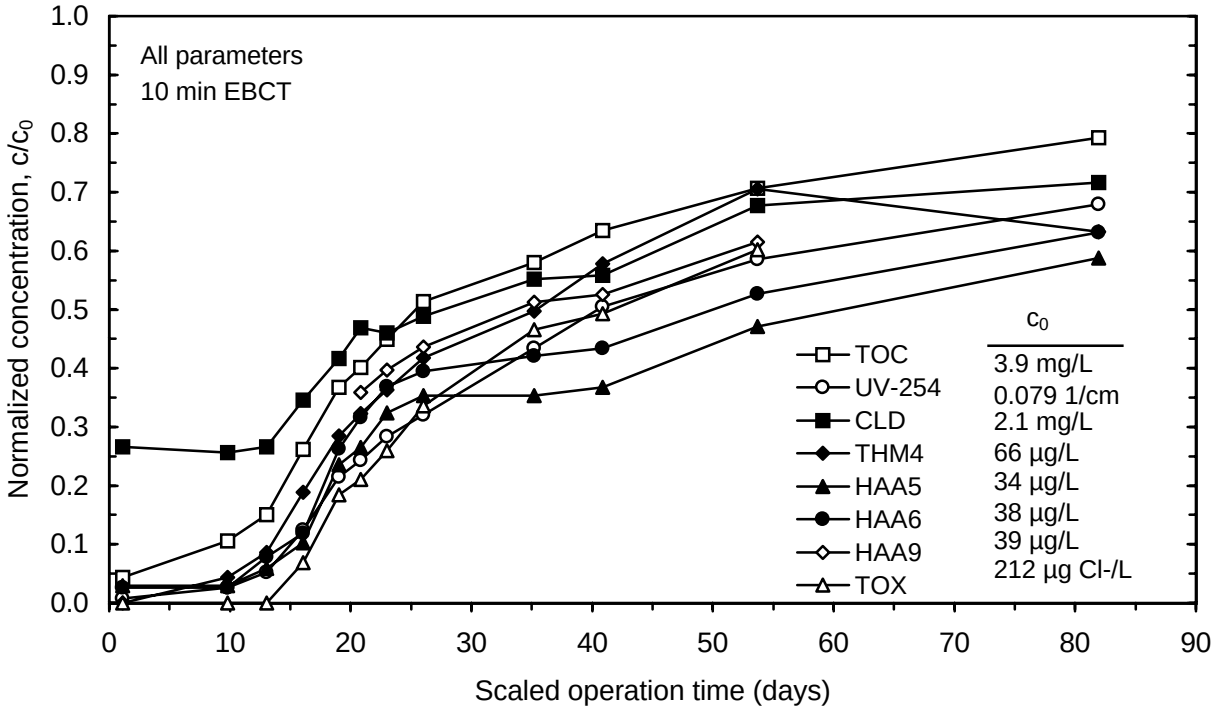


Figure 209 Normalized breakthrough patterns (10 minute EBCT) during session 1, January

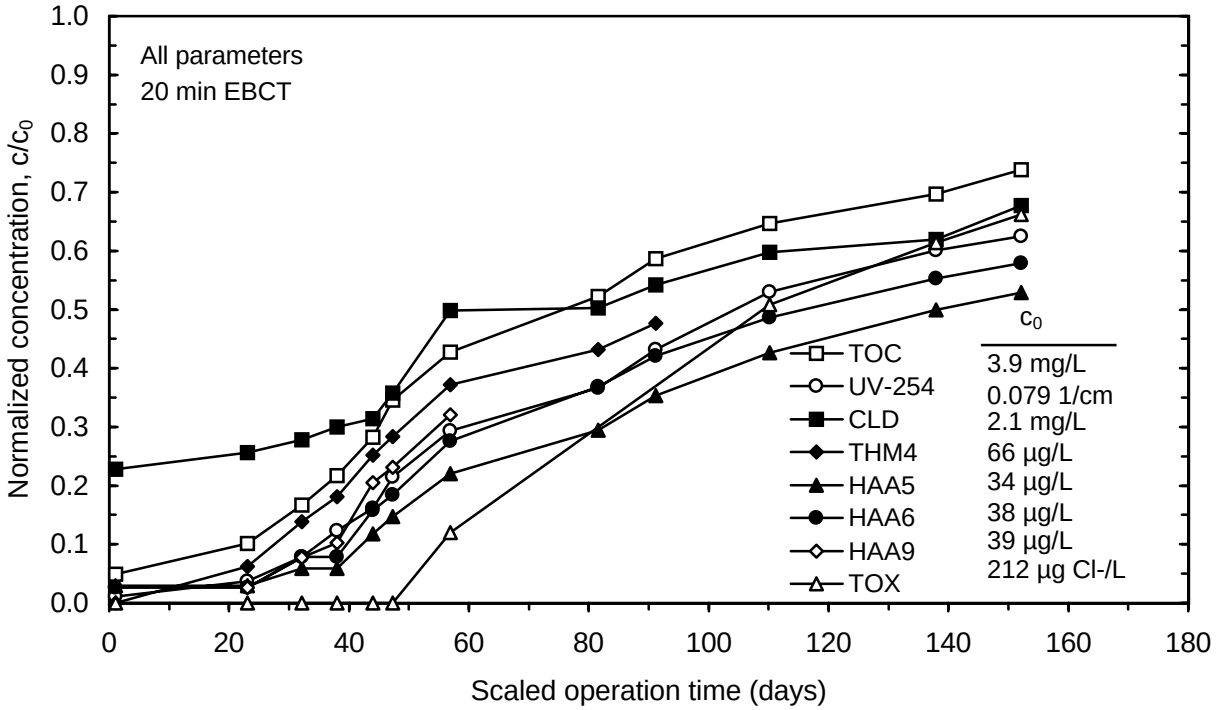


Figure 210 Normalized breakthrough patterns (20 minute EBCT) during session 1, January

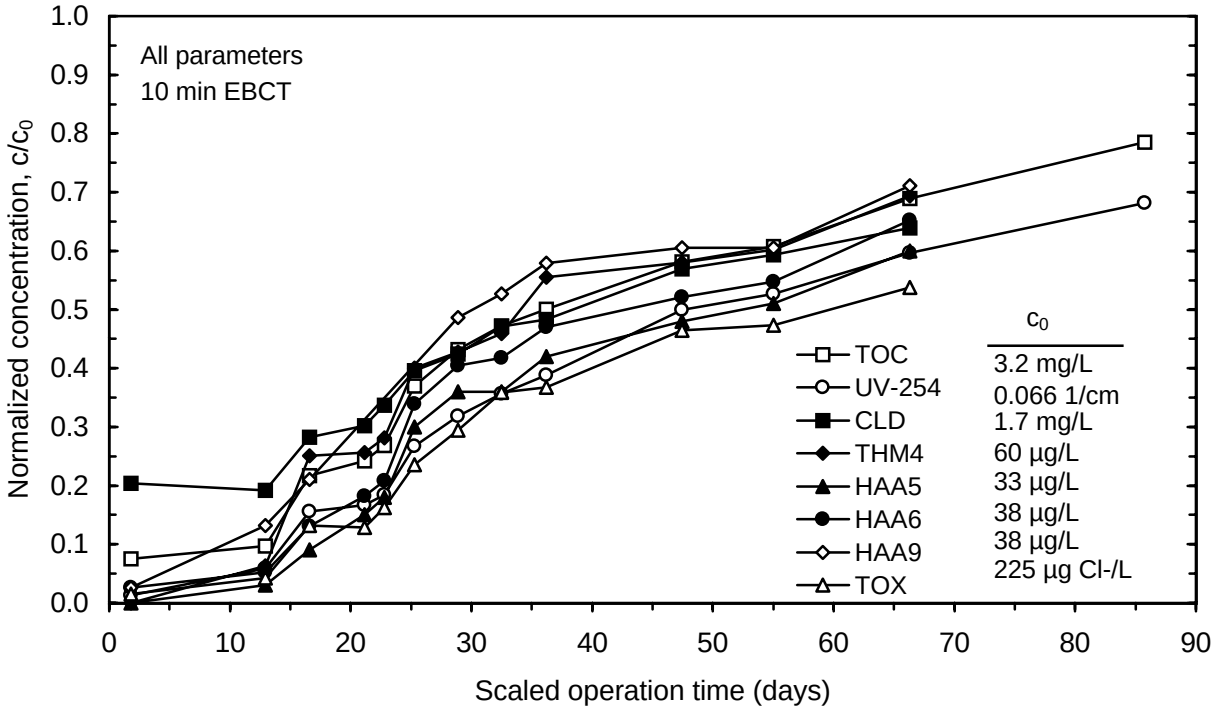


Figure 211 Normalized breakthrough patterns (10 minute EBCT) during session 2, April

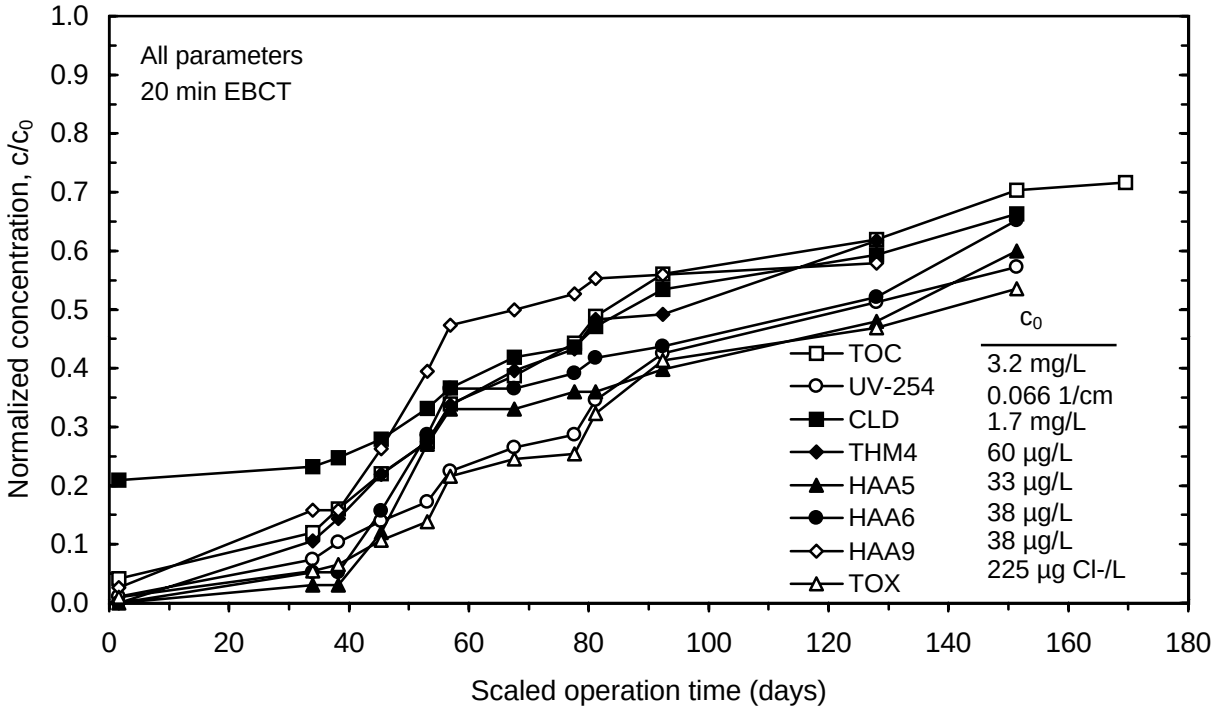


Figure 212 Normalized breakthrough patterns (20 minute EBCT) during session 2, April

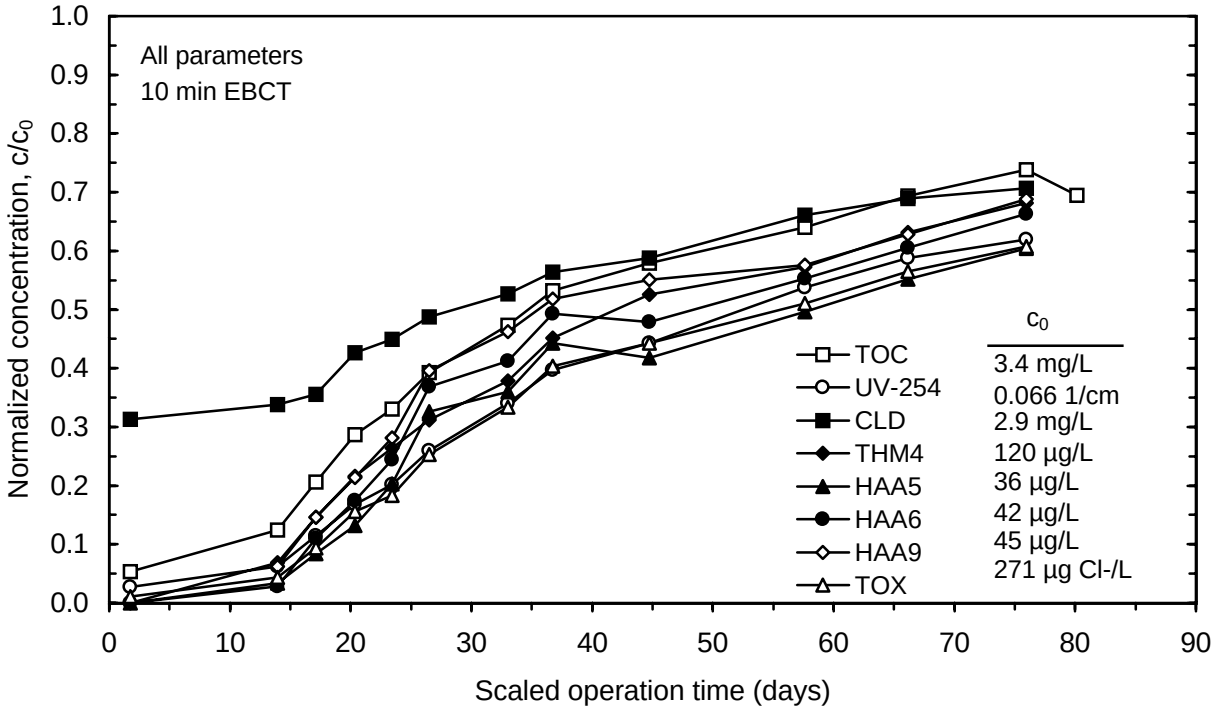


Figure 213 Normalized breakthrough patterns (10 minute EBCT) during session 3, June

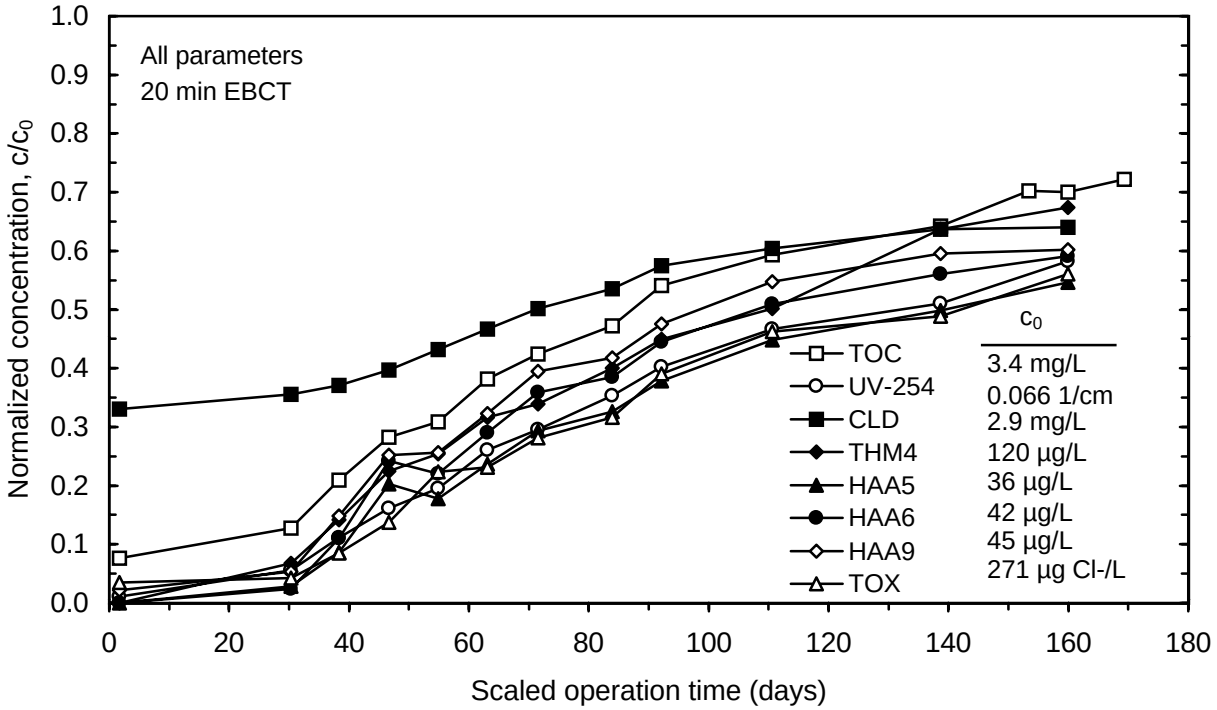


Figure 214 Normalized breakthrough patterns (20 minute EBCT) during session 3, June

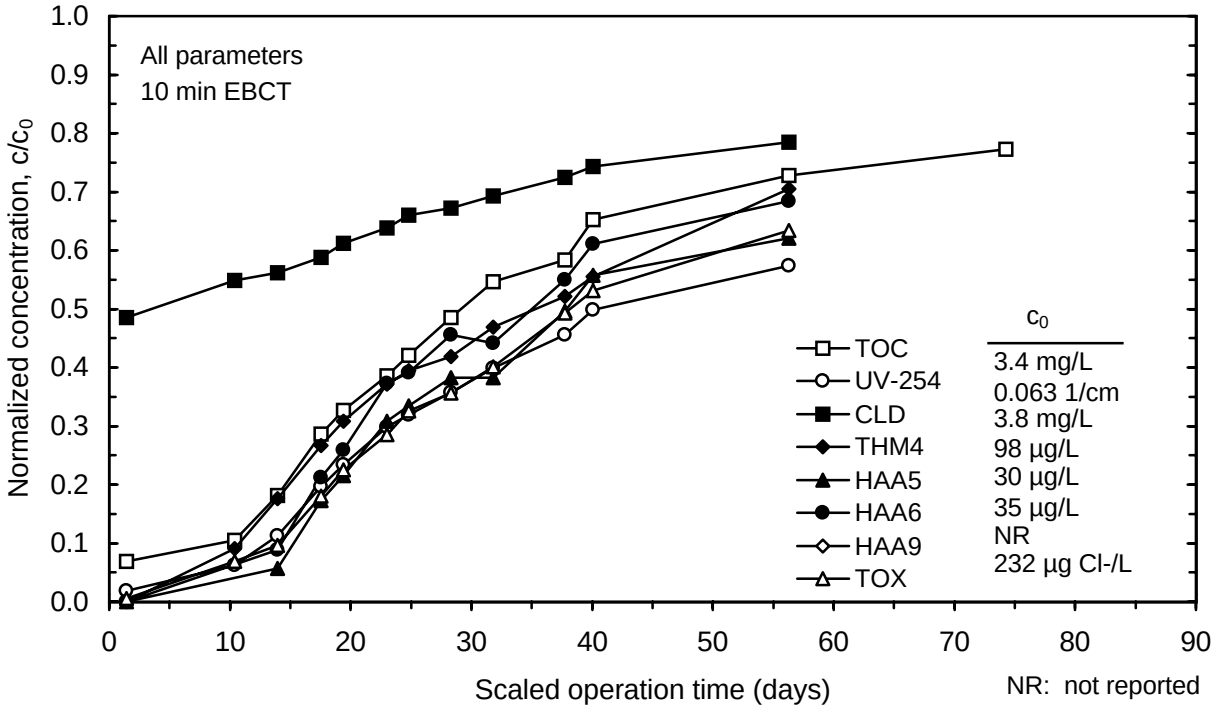


Figure 215 Normalized breakthrough patterns (10 minute EBCT) during session 4, October

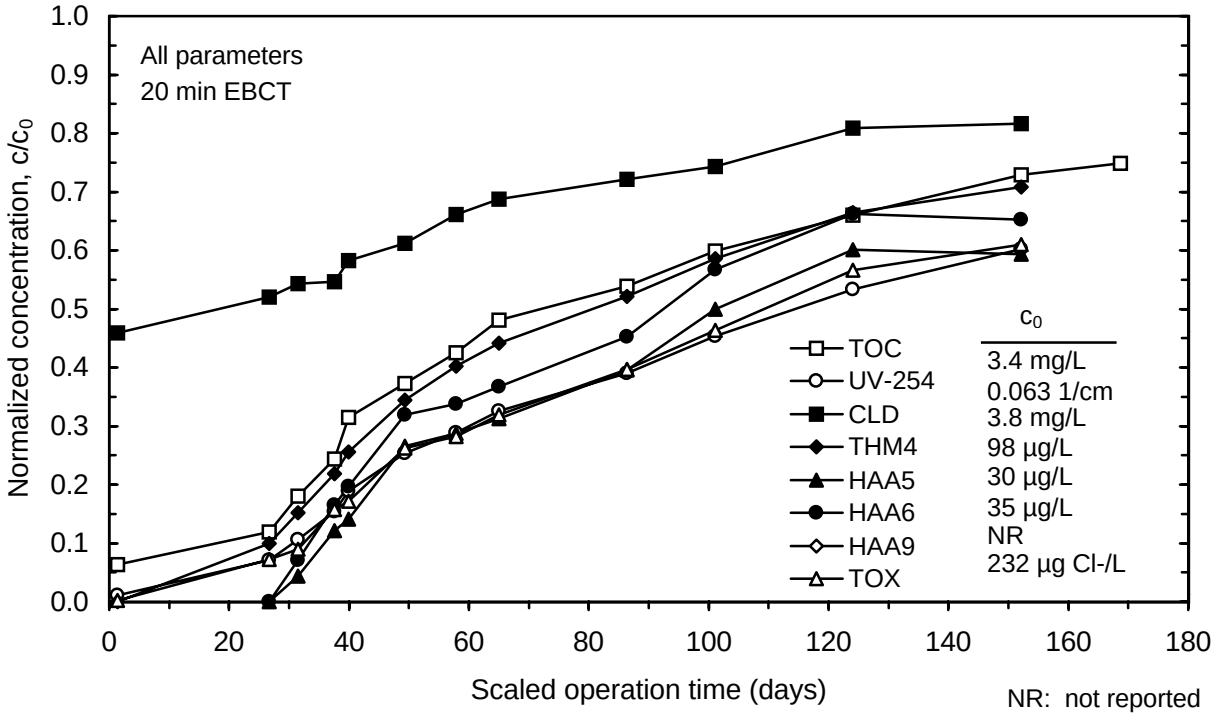


Figure 216 Normalized breakthrough patterns (20 minute EBCT) during session 4, October

12 *TOC-DBP and UV_{254}-DBP Relationships*

12 TOC-DBP and UV_{254}-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_{254} were generated on a concentration and normalized (percent breakthrough) basis. These plots are summarized in Figures 217 through 220. Both EBCTs evaluated and all four quarters are presented on the same plots.

In general, TOC and UV_{254} served as good predictors of GAC effluent DBP formation regardless of EBCT, and usually, regardless of season. Seasonal effects are evident in the plots of TOC and UV_{254} against SDS-THM4. The higher slope of the June and October data reflects higher THM4 formation per mg TOC, likely due to higher SDS chlorination incubation temperatures. HAA and TOX formation seemed to be less affected by seasonal variability or SDS chlorination incubation temperature.

In the paired normalized concentration data plots shown in Figures 219 and 220, 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_{254}) directly predicts the percent breakthrough of the formed DBP (data falls on the line), or if the surrogate parameter serves as a conservative indicator of the formed DBP breakthrough (data lies below the line). Examples of the former are SDS-HAA5 and SDS-TOX against UV_{254}. Examples of the latter are SDS-THM4, SDS-HAA, and SDS-TOX against TOC.

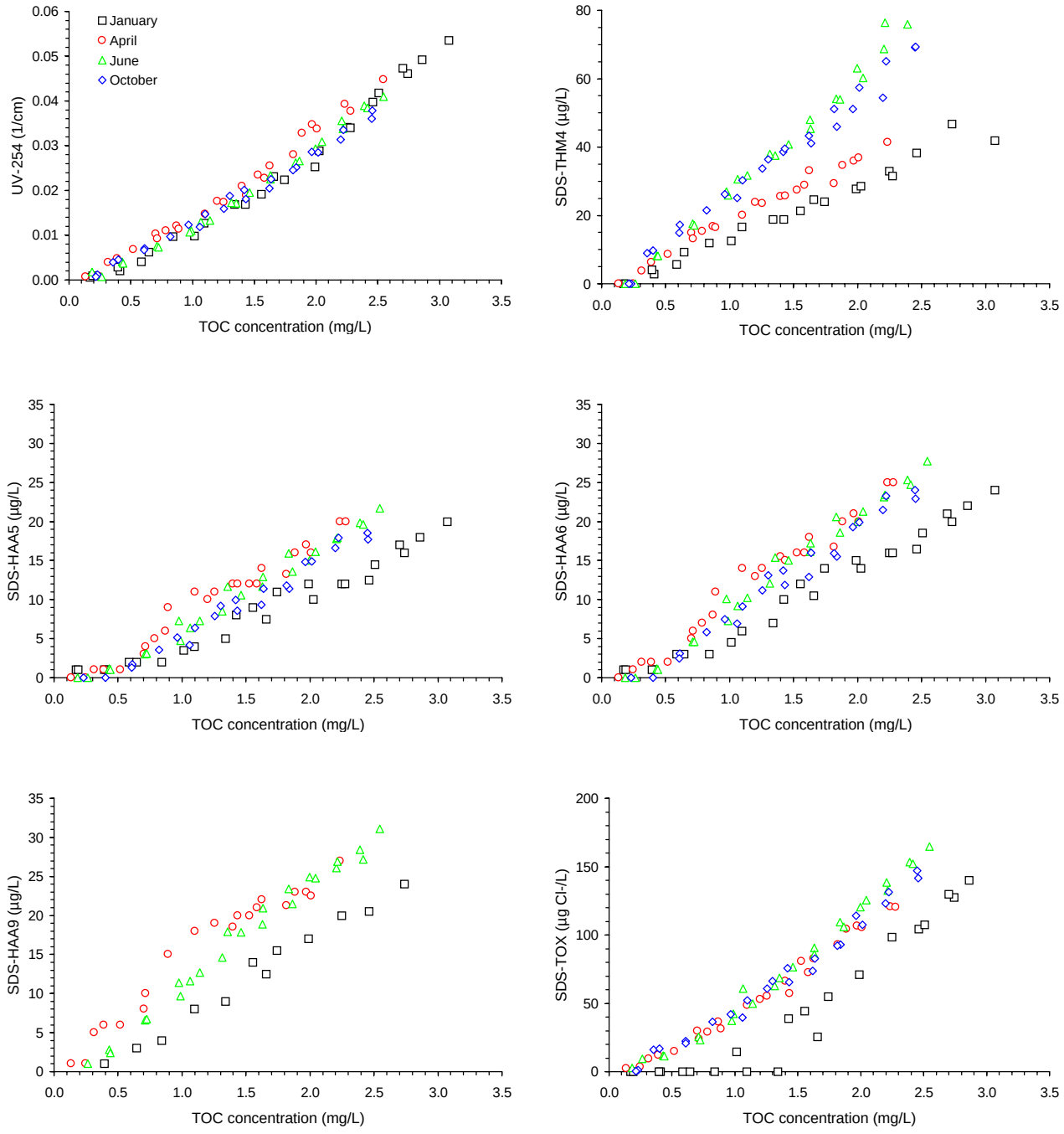


Figure 217 Correlation based on GAC effluent TOC concentration for both 10 and 20 minute EBCT contactors and all sessions

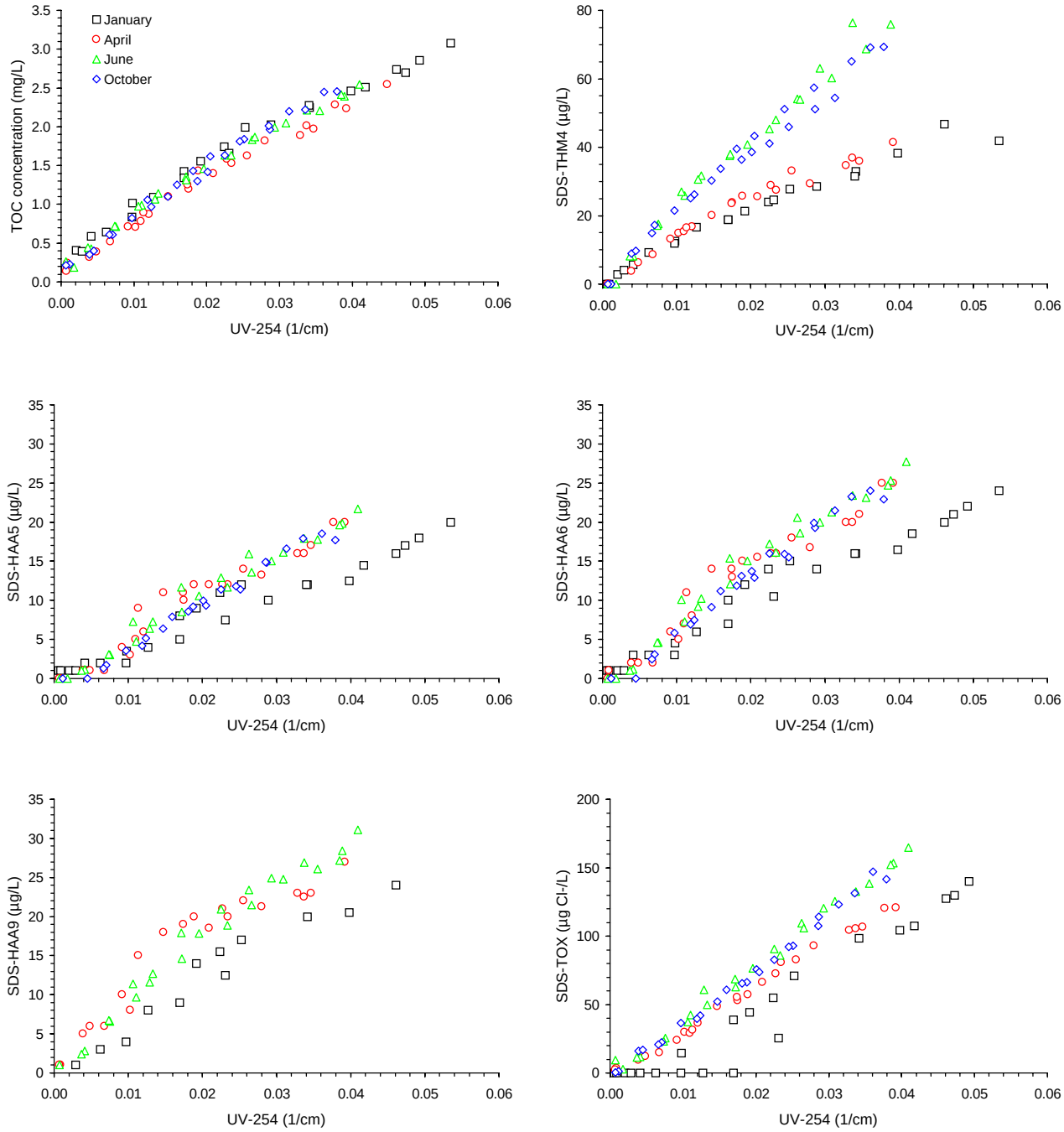


Figure 218 Correlation based on GAC effluent UV-254 for both 10 and 20 minute EBCT contactors and all sessions

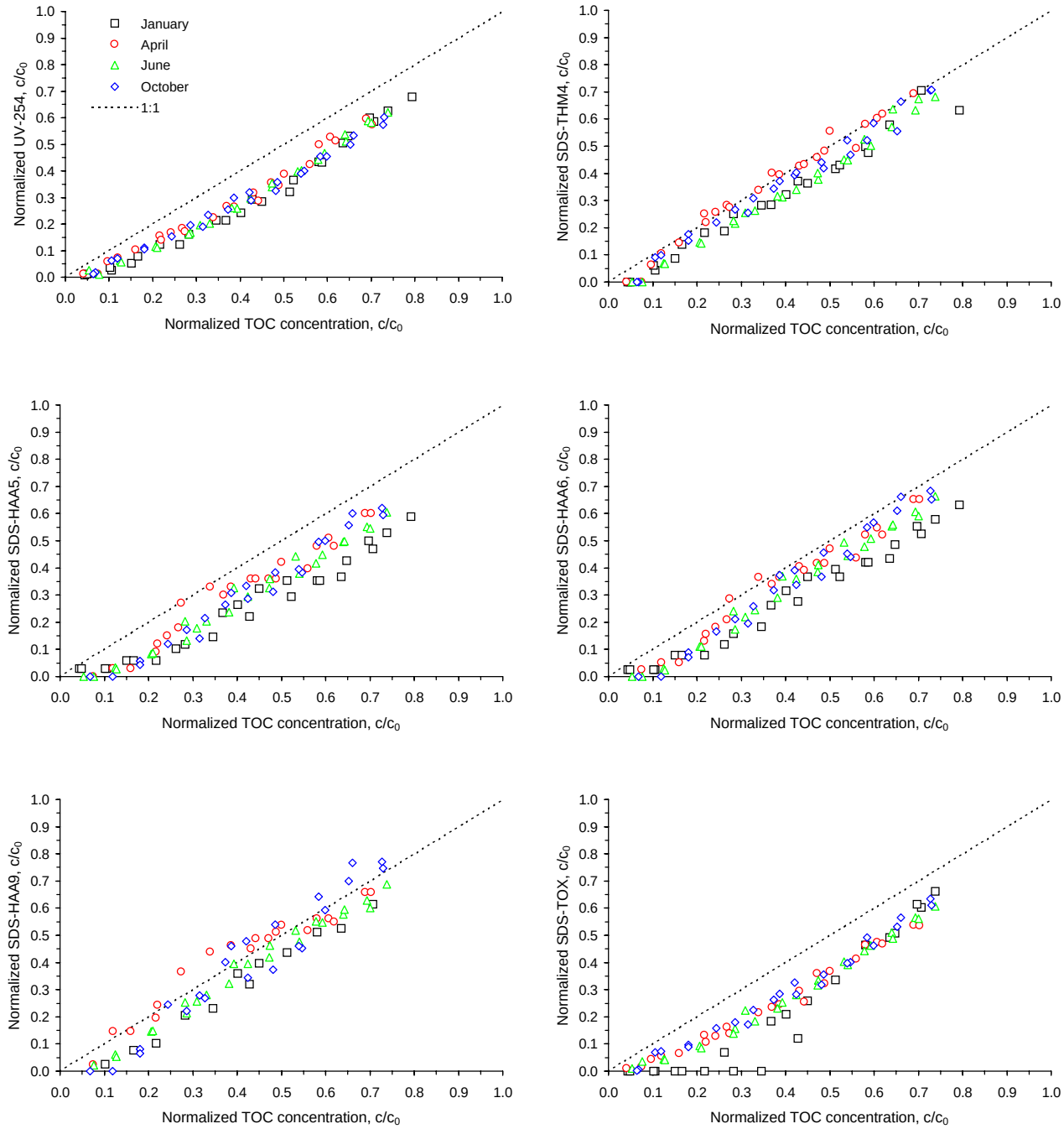


Figure 219 Correlation based on normalized GAC effluent TOC concentration for both 10 and 20 minute EBCT contactors and all sessions

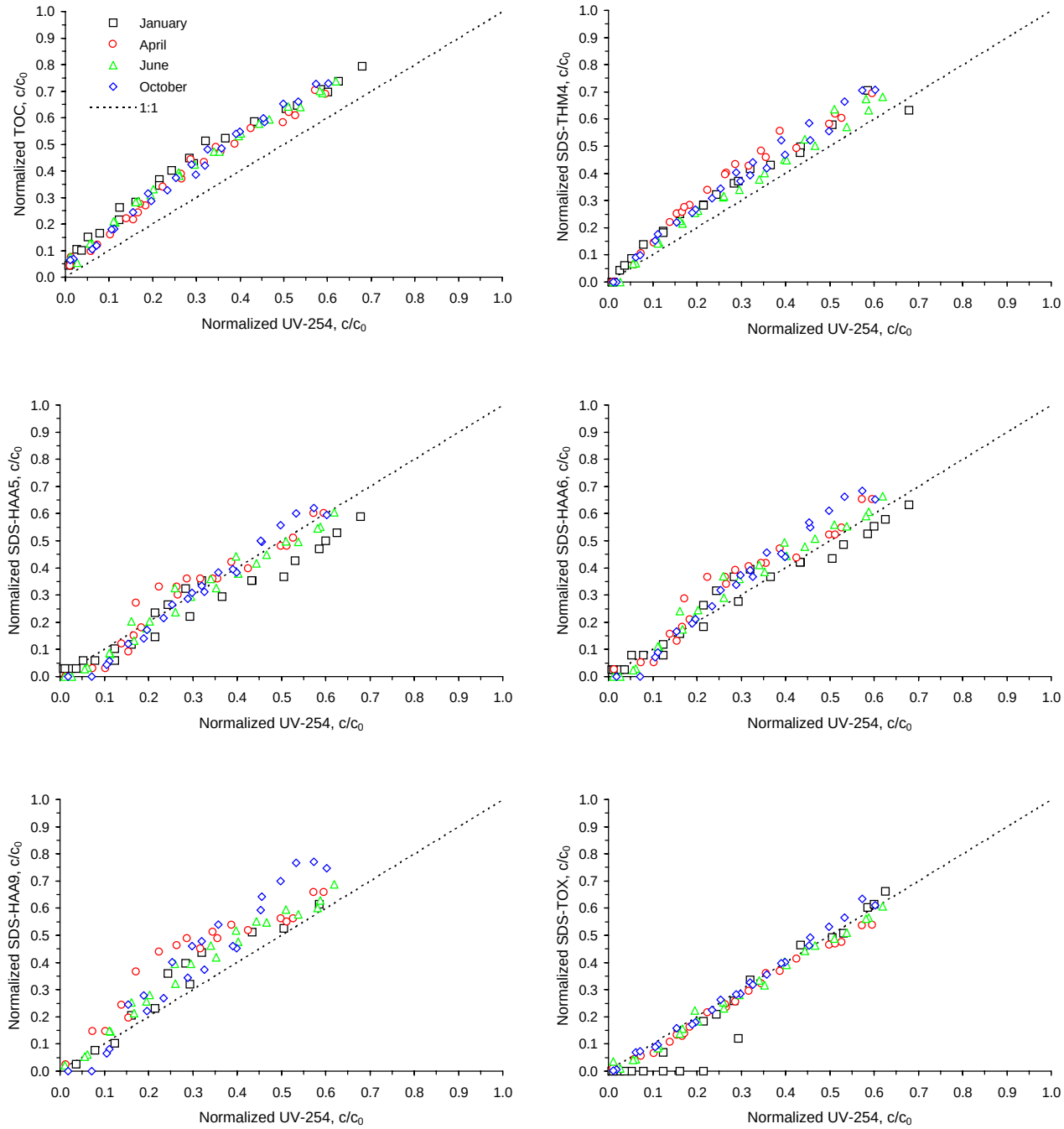


Figure 220 Correlation based on normalized GAC effluent UV-254 for both 10 and 20 minute EBCT contactors and all sessions

13 *TOC Breakthrough Performance Evaluation*

13 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 Meander Creek Reservoir Works water source after lime softening can be evaluated. The correlation is given by the following equation:

$$BV_{50} = \frac{18{,}000}{TOC_0} \tag{9}$$

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 221. The performance of an average water is given by the dashed line, which represents Equation 8. Figure 221 shows that in general, GAC performance was close to that predicted by Equation 8.

For all four quarters, the 10 minute EBCT contactor averaged a BV_{50} of 4,500 bed volumes. Based on the influent TOC concentrations of each of the four quarters, Equation 8 predicts an average BV_{50} of 5,200 bed volumes. Therefore, GAC run times were about 13 percent shorter than expected for the 10 minute EBCT contactor.

For the 20 minute EBCT contactor, however, the average BV_{50} during all four quarters was 5,700 bed volumes, or about 10 percent longer than expected, based on the correlation results.

GAC run times were likely shortened due to the relatively high GAC influent pH used (9.0). In general, at higher pH values, natural organic matter (NOM) is more soluble and therefore less adsorbable.

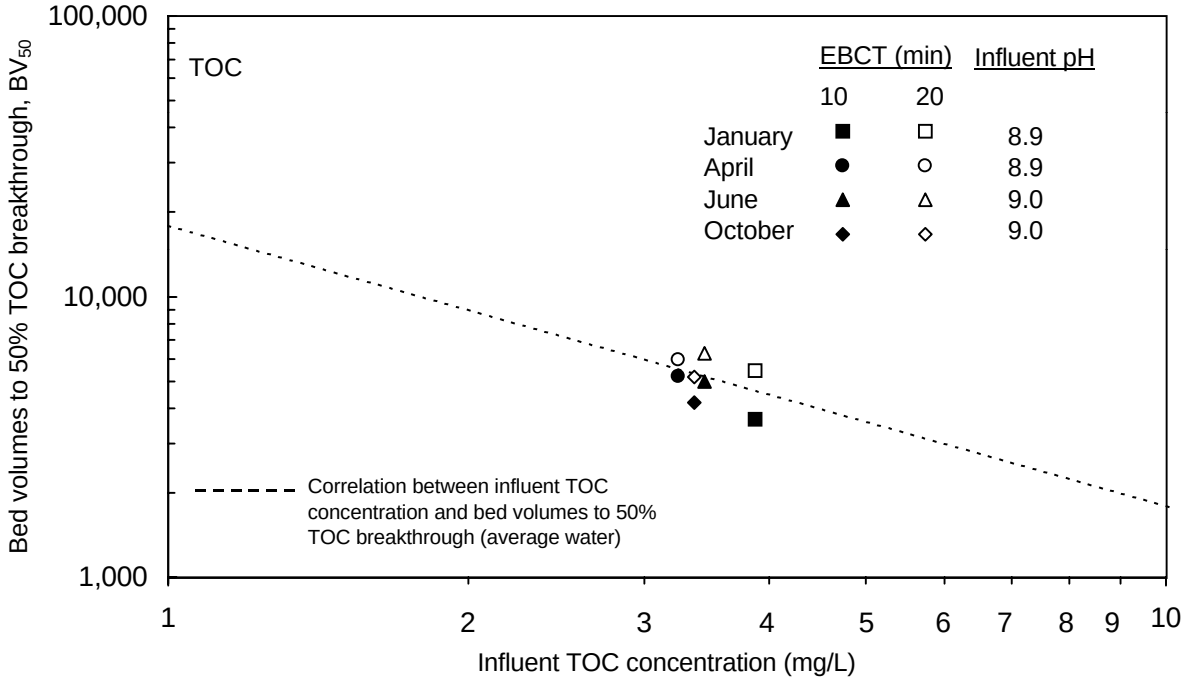


Figure 221 Comparison between GAC performance during treatment study testing and average water GAC performance

14 *Cost Information and Analysis*

14 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 included the cost of on-site spent carbon reactivation. Costs were evaluated using either steel pressure contactors or concrete gravity 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 60 MGD, 10 concrete gravity (723 ft^2) or 23 steel pressure contactors were required (20 ft diameter; 314 ft^2). Although average plant production varies throughout the year, an average of 31 MGD was used for all four quarters for modeling purposes. The economic input data to the model are summarized in Table 58.

On-site GAC reactivation was assumed for all 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, type of contactor, and spent carbon reactivation demand. A cost of 90 cents/lb GAC was assumed. The O&M costs are determined based on the service life of each contactor. Relative to the placeholders for DBP MCLs, THM4 formation was higher than HAA5 formation, and thus run time calculations are based on effluent SDS-THM4 levels. The service life input into the model was the run time to Stage 2 THM4 MCL (with a 20 percent safety factor). Thus, the blended effluent analysis run times determined in Section 10 (including breakthrough curve extrapolation calculations when necessary) were used to model costs for steel pressure contactors. Table 59 summarizes the estimated run times to comply with the placeholders for Stage 2 DBP MCLs.

Table 60 summarize the GAC cost analysis results. 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 concrete gravity contactors ranged from 27 to 35 cents/1,000 gal. Costs were highest based on the October session data, and lowest based on the April session data. The cost model results do not include the cost for pH adjustment (recarbonation) from the settled water pH of 10.7 to the GAC influent pH of 9.0, upon which the results of this study are based.

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 23 and 45 percent greater than those for 10 minute EBCT contactors, for concrete gravity and steel pressure contactors, respectively. The costs for concrete gravity contactors was on average 23 and 34 percent lower than that for steel pressure

contactors for 10 and 20 minute EBCT contactors, respectively. The use of 10 minute EBCT concrete gravity contactor was found to be most cost-effective.

A bar graph comparing GAC treatment costs for either concrete gravity or steel pressure contactors, and for both EBCTs evaluated, is shown in Figure 222. The error bars shown represent the standard deviation calculated from the costs of each session. This model assumed and included the costs for on-site GAC reactivation; off-site reactivation may be more cost-effective depending on the location and charges associated with a regional reactivation facility.

Parameter	Value
Capital recovery interest rate (%)	10
Capital recovery period (years)	20
Overhead & profit factor (% of construction costs)	5
Special sitework factor (% of construction costs)	5
Construction contingencies (% of construction costs)	10
Engineering fee factor (% of construction costs)	10
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 ($/manhour)	15
Labor overhead factor (% of labor)	10
Electric rate ($/kWh)	0.086
Fuel oil rate ($/gallon)	0.89
Natural gas rate ($/cu.ft.)	0.0055
Process water rate ($/1,000 gal)	0.35
Modifications to existing plant (% of construction cost)	5

Table 58 Economic input data to cost model

EBCT (min)	Influent pH	Session	Run time (days) for number of parallel contactors: Single	10 or more
10	8.9	January	33	72†
	8.9	April	35	93†
	9.0	June	24	47
	9.0	October	20	44
		Mean	28	64
		St. dev.	7	23
20	8.9	January	*	186†
	8.9	April	105	223†
	9.0	June	56	113
	9.0	October	47	102
		Mean	70	156
		St. dev.	31	58

†Extrapolation beyond maximum run time required for estimate
*Effluent did not exceed run time criteria

Table 59 Summary of GAC run times to meet the placeholder for Stage 2 MCLs

Contactor construction	Quarter	Cost (cents/1000 gal): 10 minute EBCT Capital	O&M	Total	20 minute EBCT Capital	O&M	Total
Concrete gravity	January	19	11	29	26	9	35
	April	18	9	27	26	8	34
	June	20	14	34	27	13	40
	October	20	15	35	28	14	41
	Mean	19	12	31	27	11	38
	St. dev.	1	3	4	1	3	3
Steel pressure	January	26	12	38	45	10	55
	April	26	10	36	45	9	54
	June	27	16	43	46	14	60
	October	27	16	44	46	15	61
	Mean	27	13	40	45	12	58
	St. dev.	1	3	4	1	3	4

Table 60 Summary of GAC adsorption costs to meet the placeholders for Stage 2 MCL compliance

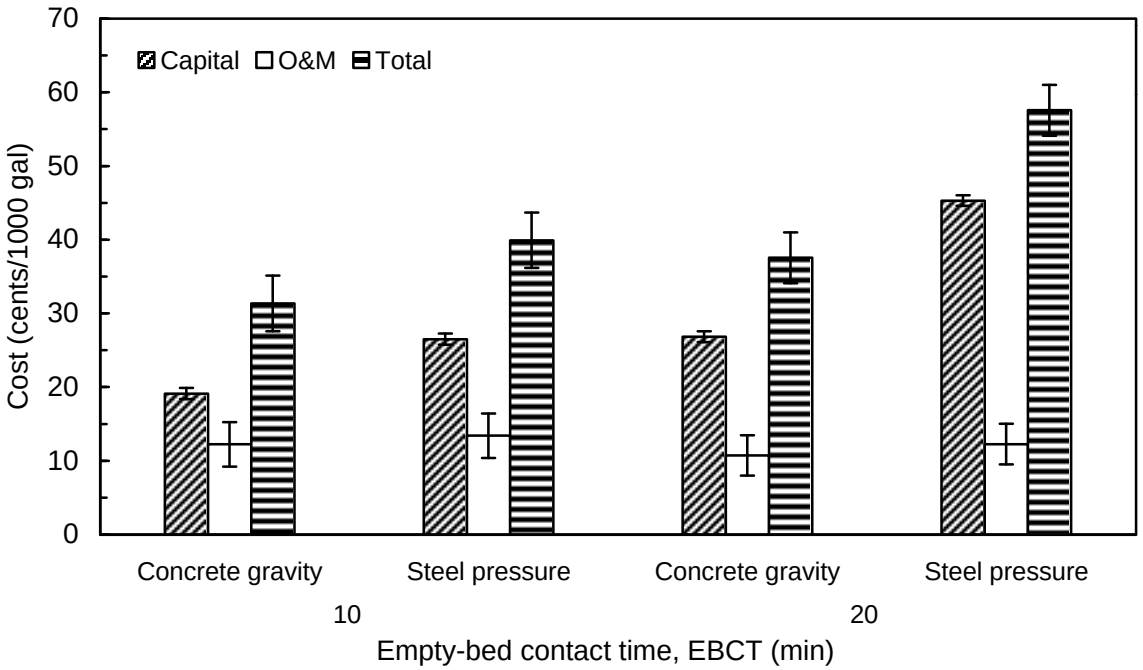


Figure 222 Average costs for GAC treatment with on-site reactivation

15 *Summary of Significant Results*

15 Summary of Significant Results

Although large changes in influent TOC concentration due to seasonal variability were not observed, seasonal variability in temperature seemed to have the greatest impact of GAC performance, due to the impact of SDS temperature on DBP formation. During the summer and fall, influent SDS-THM4 levels were 50 to 100 percent higher than in the winter or spring, while the influent TOC concentration did not change substantially. Furthermore, the breakthrough of SDS-THM4 reached higher levels more quickly in the summer and fall. Conversely, HAA formation, as measured by HAA5, HAA6, or HAA9, remained relatively low throughout all four quarters, and showed little sensitivity to SDS chlorination temperature between 5 and 20°C.

All chlorination was conducted at pH 9.0, which may have favored the base-catalyzed formation of THMs. In comparison to Stage 1 or the placeholders for Stage 2 DBP MCLs, HAA formation was much lower than THM4 formation. Thus, the cost estimates were based on the breakthrough of SDS-THM4.

Overall, SDS-DBP formation was well-controlled by GAC. The run times to the placeholders for Stage 2 MCLs (with a 20 percent safety factor) averaged 28 days for the 10 minute EBCT contactors and 70 days for the 20 minute EBCT contactors. Once effluent blending is taken into account, run times averaged 64 days for the 10 minute EBCT contactors and 156 days for the 20 minute EBCT contactors, assuming 10 or more contactors in service. For effluent blending of four contactors in parallel operation, run times averaged 52 days for the 10 minute EBCT contactors and 122 days for the 20 minute EBCT contactors. During all quarterly sessions and for both EBCTs, the formation of THM4 controlled the maximum contactor run time for the placeholders for Stage 2 MCL compliance.

A normalized breakthrough evaluation showed that TOC served as a conservative indicator for the breakthrough of all DBP precursors, while UV_{254} served as an excellent predictor of SDS-TOX breakthrough.

Based on an EPA cost model, the average cost for GAC to maintain SDS-THM4 levels below the placeholders for Stage 2 MCLs using concrete gravity contactors is 31 and 38 cents/1,000 gallons for 10 minute and 20 minute EBCT contactors, respectively. The cost estimate for steel pressure contactors was slightly higher, at 38 and 58 cents/1,000 gal for EBCTs of 10 and 20 minutes, respectively. These costs do not include the cost for pH adjustment (recarbonation) from the settled water pH of 10.7 to the GAC influent pH of 9.0, upon which the results of this study are based.

Based on the average influent TOC concentration during each quarterly session, the contactor operation time measured as BV_{50} was expected to average 5,200 bed volumes. During the four quarters of testing, the 10 minute EBCT contactor averaged a BV_{50} of 4,500 bed volumes. Therefore, GAC run times were about 13 percent shorter than expected for the 10 minute EBCT contactor. For the 20 minute EBCT contactor, however, the average BV_{50} during all four quarters was 5,700 bed volumes, or about 10 percent longer than expected. On a throughput basis, normalized for EBCT, the 20 minute EBCT contactor outperformed the 10 minute EBCT contactor. Thus, the carbon usage rate and O&M costs for a 20 minute EBCT contactor are

lower than those for a 10 minute EBCT contactor. However, due to higher capital costs for 20 minute EBCT contactors, use of 10 minute EBCT contactors was more cost-effective.

GAC influent TOC concentration varied from 3.2 to 3.9 during the four sessions evaluated, and bromide concentration varied from 36 to 42 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 and bromoform, 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.

16 *QA/QC Summary*

16 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 61.

16.1 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. Where analysis was performed by two different laboratories during the course of the study, calibration procedures utilized by each laboratory are given.

16.1.1 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 µL 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.

16.1.2 Haloacetic Acids (Standard Method 6251 B)

An internal standard calibration procedure is used for this method. A calibration mix containing all target analytes is prepared and diluted to a minimum of five calibration concentration levels. The lowest calibration standard is at a concentration equal to the minimum reporting level. The standards are extracted and injected using the same procedure that is used to process the actual samples. A working calibration curve is calculated for each analyte. If the relative standard deviation (RSD) of the response factors is less than 20 percent over the working range, linearity through the origin is assumed, and the average response factor may be used in place of the calibration curve. If the RSD for any analyte is greater than 20 percent, the calibration curve as a second order fit is used.

16.1.3 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*.

16.1.4 Total Organic Halide (Standard Method 5320 B, Quarter 1)

An instrument calibration verification is performed every six months. The standard is injected directly into the carbon columns. The concentrations are given in Table 62.

The calibration curve is defined as first order; the correlation coefficient must be greater than 0.995. The curve is used only as a means of verifying the instrument accuracy. For samples analyzed, the results of the titration are taken from the instrument directly, without fitting them to the established curve.

Before each run, 3 5-µL injections of a 1,000 ppm as Cl^- sodium chloride standard are made directly into the titration cell as a cell check. Whenever the electrodes are replaced or polished, sodium chloride injections are made at 1, 5, and 15 µL volumes.

16.1.5 Total Organic Halide (Standard Method 5320 B, Quarters 2-4)

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^- 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^- 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.

16.1.6 Trihalomethanes (EPA Method 551, Quarters 1-2)

An external standard calibration procedure is used for this method. A calibration mix containing all target analytes is prepared and diluted to a minimum of five calibration concentration levels. The lowest calibration standard is at a concentration equal to the MRL. The standards are extracted and injected using the same procedure that is used to process the actual samples. A working calibration curve is calculated for each analyte. If the RSD of the response factors is less than 20 percent over the working range, linearity through the origin is assumed, and the average response factor may be used in place of the calibration curve. If the RSD for any analyte is greater than 20 percent, the calibration curve as a second order fit is used.

16.1.7 Trihalomethanes (EPA Method 551.1, Quarters 3-4)

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 63.

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 ICR 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 six levels of the calibration curve are analyzed (2-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	1.3	0.4	1.0	1.6
UV-254	24	2.6	0.2	0.8	2.1
pH	24	0.3	0.1	0.2	0.4
Temperature	24	0.6	0.0	0.2	0.5
SDS-TOX	23	22.4	1.0	3.5	10.6
SDS-THM4	24	4.3	1.8	2.4	6.4
SDS-HAA5	24	8.1	0.8	6.4	12.7
SDS-HAA6	24	7.3	2.8	6.3	10.8
SDS-HAA9	24	6.3	1.2	5.4	9.3
SDS-chlorine residual	24	3.7	1.2	1.9	4.2
THM Species					
SDS-$CHCl_3$	22	6.9	1.5	3.3	9.0
SDS-BDCM	23	3.4	1.1	2.2	4.9
SDS-DBCM	24	3.2	1.4	2.5	3.5
SDS-$CHBR_3$	19	16.2	0.0	3.9	10.7
HAA Species					
SDS-MCAA	5	200	200	200	200
SDS-DCAA	22	4.3	0.0	2.0	8.5
SDS-TCAA	17	6.8	0.0	0.0	4.9
SDS-MBAA	0	NA	NA	NA	NA
SDS-DBAA	24	5.9	0.0	0.0	5.1
SDS-BCAA	24	4.6	0.0	0.0	10.4
SDS-TBAA	6	11.1	0.0	0.0	0.0
SDS-CDBAA	11	37.1	0.0	0.0	3.9
SDS-DCBAA	19	1.9	0.0	0.0	3.2

RPD: relative percent difference
NA: not applicable

Table 61 Summary of field duplicate precision for both EBCTs and all quarters

Level	Concentration (µg Cl^-/L)
1	10
2	25
3	50
4	200
5	500

Table 62 Standard concentrations for TOX calibration verification (Quarter 1)

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

Table 63 Trihalomethane aqueous calibration standard concentrations (EPA Method 551.1)

17 *References*

17 References

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Appendix: Summary of Treatment Study Data

Summers & Hooper, Inc.

RSSCT Sampling Summary Report

Study title: ICR RSSCT #1

Client: Mahoning Valley Sanitary District **Study#:** 3

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 (ºC)	pH	SDS Chlorination Conditions* Dose (mg/L)	Res. (mg/L)	Dem (mg/L)	Temp (ºC)	pH	Time hrs	Alk. (mg/L)	Hard-Tot (mg/L as CaCO3)	Hard-CA	Turb. (ntu)
Effluent C	**EBCT:** 10 min	**Carbon Type:** Bituminous	**Influent pH:**	**Scaling Factor:** 9.44																	
1	9701-57	3.1.10.EFF.1	1/19/97 20:10	1/20/97 1:00		0.12	1	0.17	0.001	21.7	8.8	1.25	0.70	0.55	4.2	9.14	24.0				
2	9701-68	3.1.10.EFF.4	1/20/97 17:00	1/21/97 0:15		1.04	10	0.41	0.002	21.0	7.8	1.23	0.70	0.53	5.2	9.12	24.0				
3	9701-72	3.1.10.EFF.5	1/21/97 1:05	1/21/97 8:45		1.38	13	0.58	0.004	20.8	7.4	1.33	0.78	0.55	5.2	9.14	24.0				
4	9701-77	3.1.10.EFF.6	1/21/97 9:05	1/21/97 16:10		1.70	16	1.01	0.010	22.9	8.1	1.48	0.77	0.71	5.2	9.10	24.1				
4d	9701-78	3.1.10.EFF.6d	1/21/97 9:05	1/21/97 16:10		1.70	16	1.02	0.010	22.9	8.1	1.48	0.76	0.72	5.2	9.11	24.1				
5	9701-82	3.1.10.EFF.7	1/21/97 17:20	1/21/97 22:50		2.01	19	1.42	0.017	23.6	8.5	1.55	0.69	0.86	5.2	9.16	24.2				
6	9701-89	3.1.10.EFF.8	1/21/97 22:55	1/22/97 2:25		2.20	21	1.56	0.019	23.8	8.5	1.60	0.63	0.97	4.7	9.06	24.3				
7	9701-91	3.1.10.EFF.9	1/22/97 2:30	1/22/97 10:00		2.44	23	1.75	0.022	23.8	8.4	1.67	0.71	0.96	4.7	9.05	24.3				
7d	9701-92	3.1.10.EFF.9d	1/22/97 2:30	1/22/97 10:00		2.44	23	1.73	0.022	23.8	8.4	1.67	0.73	0.94	4.7	9.06	24.4				
8	9701-96	3.1.10.EFF.10	1/22/97 10:15	1/22/97 17:30		2.76	26	1.99	0.025	24.4	8.2	1.80	0.79	1.01	4.7	9.05	24.4				
9	9701-109	3.1.10.EFF.13	1/23/97 9:30	1/23/97 16:50		3.73	35	2.25	0.034	21.6	8.2	1.87	0.73	1.14	4.7	9.07	24.3				
10	9701-117	3.1.10.EFF.15	1/24/97 0:00	1/24/97 7:15		4.33	41	2.46	0.040	22.0	8.2	2.03	0.88	1.15	4.7	9.06	24.0				
10d	9701-118	3.1.10.EFF.15d	1/24/97 0:00	1/24/97 7:15		4.33	41	2.46	0.040	22.1	8.2	2.03	0.87	1.16	4.7	9.06	24.0				
11	9701-131	3.1.10.EFF.19	1/25/97 8:40	1/25/97 16:00	0.00	5.69	54	2.74	0.046	21.0	8.3	2.29	0.89	1.40	4.7	9.02	24.1				
12	9701-151	3.1.10.EFF.26	1/28/97 8:40	1/28/97 15:40	0.00	8.68	82	3.08	0.053	20.9	8.0	2.31	0.83	1.48	5.0	8.93	24.3				
Effluent C	**EBCT:** 20 min	**Carbon Type:** Bituminous	**Influent pH:**	**Scaling Factor:** 9.44																	
1	9701-58	3.1.20.EFF.1	1/19/97 20:10	1/20/97 1:00		0.12	1	0.19	0.001	21.8	9.5	1.25	0.78	0.47	4.2	9.19	24.1				
2	9701-93	3.1.20.EFF.9	1/22/97 2:30	1/22/97 10:00		2.44	23	0.40	0.003	23.9	7.9	1.04	0.51	0.53	4.7	9.06	24.4				
3	9701-106	3.1.20.EFF.12	1/23/97 1:45	1/23/97 9:20		3.41	32	0.66	0.006	20.8	8.2	1.29	0.74	0.55	4.7	9.08	24.5				
3d	9701-107	3.1.20.EFF.12d	1/23/97 1:45	1/23/97 9:20		3.41	32	0.64	0.006	20.7	8.2	1.29	0.69	0.60	4.7	9.08	24.5				
4	9701-115	3.1.20.EFF.14	1/23/97 16:55	1/23/97 23:40		4.02	38	0.84	0.010	20.7	8.1	1.42	0.80	0.62	4.7	9.06	24.5				
5	9701-122	3.1.20.EFF.16	1/24/97 7:50	1/24/97 15:45	0.00	4.66	44	1.10	0.013	21.2	7.9	1.52	0.87	0.65	4.7	9.03	24.0				
6	9701-126	3.1.20.EFF.17	1/24/97 16:15	1/24/97 23:40	0.00	5.01	47	1.34	0.017	21.2	8.4	1.48	0.74	0.74	4.7	9.06	24.0				
7	9701-135	3.1.20.EFF.20	1/25/97 16:45	1/26/97 0:00	0.00	6.02	57	1.68	0.023	20.8	8.4	1.83	0.88	0.95	5.1	9.00	23.9				
7d	9701-136	3.1.20.EFF.20d	1/25/97 16:45	1/26/97 0:00	0.00	6.02	57	1.64	0.023	20.8	8.4	1.83	0.72	1.11	5.1	8.98	23.9				
8	9701-152	3.1.20.EFF.26	1/28/97 8:40	1/28/97 14:15	0.01	8.64	82	2.02	0.029	21.3	8.3	1.86	0.82	1.04	5.0	8.98	24.4				
9	9701-154	3.1.20.EFF.27	1/29/97 10:00	1/29/97 13:30	0.01	9.65	91	2.27	0.034	21.3	8.4	1.93	0.81	1.12	5.0	8.93	24.5				
10	9701-165	3.1.20.EFF.31	1/31/97 8:40	1/31/97 15:40	0.01	11.67	110	2.50	0.042	22.6	8.4	1.99	0.76	1.23	4.9	8.92	24.1				
10d	9701-166	3.1.20.EFF.31d	1/31/97 8:40	1/31/97 15:40	0.01	11.67	110	2.52	0.042	22.6	8.4	1.99	0.75	1.24	4.9	8.92	24.1				
11	9702-11	3.1.20.EFF.38	2/3/97 9:30	2/3/97 13:10	0.03	14.62	138	2.70	0.047	21.7	8.6	2.00	0.72	1.28	5.0	8.93	24.2				
12	9702-20	3.1.20.EFF.39	2/4/97 22:30	2/5/97 2:15	0.08	16.11	152	2.86	0.049	22.6	8.1	2.15	0.75	1.40	5.0	8.94	24.3				

ND: Non-detect. Blank Results: Either analysis was not performed or result did not meet ICR QC requirements.

Summers & Hooper, Inc.

RSSCT Sampling Summary Report

Study title: ICR RSSCT #1

Client: Mahoning Valley Sanitary District **Study#:** 3

#	SamplesID	ClientSampleID	F-S L (days)	TOC (mg/L)	TOX (µg Cl-/L)	Trihalomethanes (µg/L) CF	BDCM	DBCM	BF	TTHM	Haloacetic Acids (µg/L) MCAA	DCAA	TCAA	MBAA	DBAA	BCAA	BDCAA	DBCAA	TBAA	HAA6	HAA9	NH3-N (mg/L)	Brom (µg/L)
Effluent C		**EBCT:** 10 min	**Carbon Type:** Bituminous			**Influent pH:**			**Scaling Factor:** 9.44														
1	9701-57	3.1.10.EFF.1	1	0.17	ND	ND	ND	ND	ND	**ND**	ND	1	ND	ND	ND	ND				**1**			
2	9701-68	3.1.10.EFF.4	10	0.41	ND	ND	0.6	1.2	1.1	**2.9**	ND	1	ND	ND	ND	ND				**1**			
3	9701-72	3.1.10.EFF.5	13	0.58	ND	0.5	1.3	2.2	1.7	**5.7**	ND	1	ND	ND	1	1				**3**			
4	9701-77	3.1.10.EFF.6	16	1.01	29	1.8	3.6	5.0	2.1	**12.5**	ND	2	ND	ND	1	1				**4**			
4d	9701-78	3.1.10.EFF.6d	16	1.02	ND	1.8	3.6	5.0	2.1	**12.5**	ND	2	ND	ND	2	1				**5**			
5	9701-82	3.1.10.EFF.7	19	1.42	39	5.1	6.6	5.8	1.4	**18.9**	ND	5	1	ND	2	2				**10**			
6	9701-89	3.1.10.EFF.8	21	1.56	45	5.3	7.5	6.8	1.8	**21.4**	ND	6	1	ND	2	3	1	1	ND	**12**	**14**		
7	9701-91	3.1.10.EFF.9	23	1.75	56	7.6	8.3	6.5	1.4	**23.8**	ND	8	1	ND	2	3	1	1	ND	**14**	**16**		
7d	9701-92	3.1.10.EFF.9d	23	1.73	55	7.5	8.4	6.7	1.7	**24.3**	ND	8	1	ND	2	3	1	ND	ND	**14**	**15**		
8	9701-96	3.1.10.EFF.10	26	1.99	71	9.6	9.9	6.9	1.3	**27.7**	ND	9	2	ND	1	3	1	1	ND	**15**	**17**		
9	9701-109	3.1.10.EFF.13	35	2.25	99	15.2	10.8	5.9	1.1	**33.0**	ND	8	3	ND	1	4	2	2	ND	**16**	**20**		
10	9701-117	3.1.10.EFF.15	41	2.46	101	21.0	12.4	5.6	0.5	**39.5**	ND	7	4	ND	1	4	2	2	ND	**16**	**20**		
10d	9701-118	3.1.10.EFF.15d	41	2.46	108	19.5	11.6	5.5	0.6	**37.2**	ND	8	4	ND	1	4	2	2	ND	**17**	**21**		
11	9701-131	3.1.10.EFF.19	54	2.74	128	27.8	13.7	5.3	ND	**46.8**	ND	9	6	ND	1	4	2	2	ND	**20**	**24**		
12	9701-151	3.1.10.EFF.26	82	3.08		26.6	11.5	3.8	ND	**41.9**	ND	12	7	ND	1	4				**24**			
Effluent C		**EBCT:** 20 min	**Carbon Type:** Bituminous			**Influent pH:**			**Scaling Factor:** 9.44														
1	9701-58	3.1.20.EFF.1	1	0.19	ND	ND	ND	ND	ND	**ND**	ND	1	ND	ND	ND	ND				**1**			
2	9701-93	3.1.20.EFF.9	23	0.40	ND	ND	0.7	1.7	1.7	**4.1**	ND	1	ND	ND	ND	ND	ND	ND	ND	**1**	**1**		
3	9701-106	3.1.20.EFF.12	32	0.66	ND	0.8	2.1	3.9	2.8	**9.6**	ND	1	ND	ND	1	1	ND	ND	ND	**3**	**3**		
3d	9701-107	3.1.20.EFF.12d	32	0.64	ND	0.6	2.0	3.7	2.5	**8.8**	ND	1	ND	ND	1	1	ND	ND	ND	**3**	**3**		
4	9701-115	3.1.20.EFF.14	38	0.84	ND	1.0	3.3	5.1	2.6	**12.0**	ND	1	ND	ND	1	1	ND	1	ND	**3**	**4**		
5	9701-122	3.1.20.EFF.16	44	1.10	ND	2.6	5.1	6.6	2.4	**16.7**	ND	2	ND	ND	2	2	1	1	ND	**6**	**8**		
6	9701-126	3.1.20.EFF.17	47	1.34	ND	3.7	6.3	6.9	1.9	**18.8**	ND	2	1	ND	2	2	1	1	ND	**7**	**9**		
7	9701-135	3.1.20.EFF.20	57	1.68	ND	8.0	9.1	7.2	1.2	**25.5**	ND	4	2	ND	2	3	1	1	ND	**11**	**13**		
7d	9701-136	3.1.20.EFF.20d	57	1.64	51	7.3	8.5	6.8	1.2	**23.8**	ND	4	1	ND	2	3	1	1	ND	**10**	**12**		
8	9701-152	3.1.20.EFF.26	82	2.02		11.9	9.8	6.1	0.8	**28.6**	ND	6	3	ND	1	4				**14**			
9	9701-154	3.1.20.EFF.27	91	2.27		14.7	10.6	5.7	0.6	**31.6**	ND	7	4	ND	1	4				**16**			
10	9701-165	3.1.20.EFF.31	110	2.50	108			4.6	ND		ND	9	5	ND	1	4				**19**			
10d	9701-166	3.1.20.EFF.31d	110	2.52	108			5.1	0.5		ND	8	5	ND	1	4				**18**			
11	9702-11	3.1.20.EFF.38	138	2.70	130			3.8	ND		ND	10	6	ND	1	4				**21**			
12	9702-20	3.1.20.EFF.39	152	2.86	140			4.2	2.1		ND	11	6	ND	1	4				**22**			

Summers & Hooper, Inc.

RSSCT Sampling Summary Report

Study title: ICR RSSCT #1

Client: Mahoning Valley Sanitary District **Study#:** 3

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 (ºC)	pH	SDS Chlorination Conditions* Dose (mg/L)	Res. (mg/L)	Dem (mg/L)	Temp (ºC)	pH	Time hrs	Alk. (mg/L)	Hard-Tot (mg/L as CaCO3)	Hard-CA	Turb. (ntu)
Influent A		**EBCT:**	**Carbon Type:**			**Influent pH:**		**Scaling Factor:**	9.44												
1	9701-55	3.1.10.20.INF.A-1	1/19/97 19:00	1/19/97 19:00		-0.03	0											15	102	72	
2	9701-140	3.1.10.20.INF.A-2	1/26/97 13:30	1/26/97 13:30		6.74	64											23	94	72	
Influent B		**EBCT:**	**Carbon Type:**			**Influent pH:**		**Scaling Factor:**	9.44												
1	9701-56	3.1.10.20.INF.B-1	1/19/97 20:10	1/19/97 20:10		0.02	0	3.91	0.077	20.5	8.8	2.90	0.75	2.15	4.2	9.15	24.1				0.10
2	9701-141	3.1.10.20.INF.B-2	1/26/97 13:30	1/26/97 13:30		6.74	64	3.86	0.079	21.8	9.0	2.83	0.80	2.03	5.1	9.04	23.9				0.10
3	9702-21	3.1.10.20.INFB-3	2/5/97 1:00	2/5/97 1:00		16.22	153	3.87	0.080	22.7	8.9	2.78	0.76	2.02	5.0	8.98	24.3				0.10
PreStudy		**EBCT:**	**Carbon Type:**			**Influent pH:**		**Scaling Factor:**													
1	9701-51	Barrel #5 unfiltered	1/17/97 12:00					4.05													
2	9701-52	Barrel #1 filtered	1/17/97 17:00					3.81													
3	9701-50	Barrel #3 unfiltered	1/17/97 9:30					4.00													
4	9701-25	Treat. Study Sample	1/14/97 9:45					4.29													
5	9701-53	Barrel #2 filtered	1/17/97 17:00					3.84													
6	9701-46	Inf unfiltered barrel #5	1/16/97 0:00					4.41													

***Target SDS Chlorination Conditions**

Free Cl2 Residual: 0.75 mg/L **pH:** 9.0 **Temperature:** 5.0 ºC **Holding time:** 24.0 hrs

Study Comments

Summers & Hooper, Inc.

RSSCT Sampling Summary Report

Study title: ICR RSSCT #1

Client: Mahoning Valley Sanitary District **Study#:** 3

#	SamplesID	ClientSampleID	F-S L (days)	TOC (mg/L)	TOX (µg Cl-/L)	Trihalomethanes (µg/L) CF	BDCM	DBCM	BF	TTHM	Haloacetic Acids (µg/L) MCAA	DCAA	TCAA	MBAA	DBAA	BCAA	BDCAA	DBCAA	TBAA	HAA6	HAA9	NH3-N (mg/L)	Brom (µg/L)
Influent A		**EBCT:**	**Carbon Type:**			**Influent pH:**			**Scaling Factor:**		9.44												
1	9701-55	3.1.10.20.INF.A-1	0																			0.05	38
2	9701-140	3.1.10.20.INF.A-2	64																			ND	34
Influent B		**EBCT:**	**Carbon Type:**			**Influent pH:**			**Scaling Factor:**		9.44												
1	9701-56	3.1.10.20.INF.B-1	0	3.91	228	51.2	11.8	2.7	ND	**65.7**	3	19	11	ND	1	4				**38**			
2	9701-141	3.1.10.20.INF.B-2	64	3.86	183	50.2	13.5	3.2	ND	**66.9**	3	17	12	ND	1	4	2	ND	ND	**37**	**39**		
3	9702-21	3.1.10.20.INFB-3	153	3.87	225			3.1	3.4		4	18	12	ND	1	4				**39**			
PreStudy		**EBCT:**	**Carbon Type:**			**Influent pH:**			**Scaling Factor:**														
1	9701-51	Barrel #5 unfiltered		4.05																			
2	9701-52	Barrel #1 filtered influent		3.81																			
3	9701-50	Barrel #3 unfiltered		4.00																			
4	9701-25	Treat. Study Sample Pt.		4.29																			
5	9701-53	Barrel #2 filtered influent		3.84																			
6	9701-46	Inf unfiltered barrel #5		4.41																			

Summers & Hooper, Inc.

RSSCT Sampling Summary Report

Study title: ICR RSSCT #2

Client: Mahoning Valley Sanitary District **Study#:** 39

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 (ºC)	pH	SDS Chlorination Conditions* Dose (mg/L)	Res. (mg/L)	Dem (mg/L)	Temp (ºC)	pH	Time hrs	Alk. (mg/L)	Hard-Tot (mg/L as CaCO3)	Hard-CA	Turb. (ntu)
Effluent C		**EBCT:** 10 min	**Carbon Type:** Bituminous				**Influent pH:**		**Scaling Factor:** 9.44														
1	9704-76	39.10.Eff.1	4/15/97	13:00	4/15/97	18:15		0.19	2	0.25	0.001	22.5	8.9	1.08	0.73	0.35	10.0	8.95	23.9				
2	9704-83	39.10.Eff.3	4/16/97	15:30	4/17/97	0:45	0.01	1.37	13	0.32	0.004	21.3	8.7	1.31	0.98	0.33	10.0	8.97	24.0				
3	9704-95	39.10.Eff.4	4/17/97	0:57	4/17/97	9:53	0.01	1.76	17	0.69	0.010	21.1	9.2	1.33	0.84	0.49	10.0	9.02	24.0				
3d	9704-96	39.10.Eff.4d	4/17/97	0:57	4/17/97	9:53	0.01	1.76	17	0.71	0.010	21.2	9.2	1.33	0.85	0.48	10.0	9.03	24.1				
4	9704-103	39.10.Eff.6	4/17/97	14:55	4/17/97	19:05	0.01	2.24	21	0.79	0.011	21.3	8.5	1.24	0.72	0.52	10.1	8.97	24.0				
5	9704-104	39.10.Eff.7	4/17/97	19:10	4/17/97	23:12	0.01	2.41	23	0.87	0.012	22.3	8.5	1.42	0.84	0.58	10.1	8.99	24.1				
6	9704-106	39.10.Eff.8d	4/17/97	23:14	4/18/97	7:54	0.01	2.68	25	1.20	0.018	22.6	8.1	1.53	0.85	0.68	10.1	8.93	24.1				
7	9704-108	39.10.Eff.9	4/18/97	8:04	4/18/97	17:11	0.01	3.06	29	1.39	0.021	22.7	8.7	1.54	0.80	0.74	10.1	8.99	24.2				
7d	9704-109	39.10.Eff.9d	4/18/97	8:04	4/18/97	17:11	0.01	3.06	29	1.41	0.021	22.8	8.6	1.54	0.82	0.72	10.1	8.98	24.2				
8	9704-114	39.10.Eff.10	4/18/97	17:21	4/19/97	2:25	0.01	3.44	33	1.53	0.023	23.1	8.5	1.76	0.95	0.81	10.0	8.95	23.9				
9	9704-115	39.10.Eff.11	4/19/97	2:35	4/19/97	11:52	0.01	3.83	36	1.63	0.026	21.9	8.7	1.61	0.78	0.83	10.1	9.00	24.0				
10	9704-131	39.10.Eff.14	4/20/97	7:14	4/20/97	16:44	0.02	5.02	47	1.90	0.033	22.4	8.5	1.70	0.72	0.98	9.9	8.97	24.3				
10d	9704-132	39.10.Eff.14d	4/20/97	7:14	4/20/97	16:44	0.02	5.02	47	1.88	0.033	22.5	8.6	1.70	0.72	0.98	9.9	8.98	24.4				
11	9704-144	39.10.Eff.16d	4/21/97	2:34	4/21/97	12:05	0.02	5.83	55	1.97	0.035	22.2	8.6	1.75	0.73	1.02	9.8	8.96	23.9				
12	9704-162	39.10.Eff.19	4/22/97	7:28	4/22/97	16:45	0.02	7.02	66	2.23	0.039	22.1	8.6	1.78	0.68	1.10	9.9	9.00	24.3				
13	9704-188	39.10.Eff.21	4/24/97	9:45	4/24/97	18:44	0.05	9.08	86	2.54	0.045	22.2	8.4										
Effluent C		**EBCT:** 20 min	**Carbon Type:** Bituminous				**Influent pH:**		**Scaling Factor:** 9.44														
1	9704-77	39.20.Eff.1	4/15/97	13:00	4/15/97	18:15		0.17	2	0.14	0.001	22.6	9.2	1.23	0.87	0.36	10.0	9.03	24.1				
2	9704-111	39.20.Eff.4	4/18/97	20:15	4/19/97	8:15	0.02	3.60	34	0.39	0.005	22.0	8.6	1.19	0.79	0.40	10.1	8.97	24.3				
3	9704-116	39.20.Eff.5	4/19/97	8:30	4/19/97	17:34	0.02	4.05	38	0.51	0.006	23.6	8.6	1.16	0.74	0.42	9.9	8.98	24.1				
3d	9704-117	39.20.Eff.5d	4/19/97	8:30	4/19/97	17:34	0.02	4.05	38	0.53	0.007	23.7	8.6	1.16	0.73	0.43	9.9	8.98	24.2				
4	9704-129	39.20.Eff.7d	4/20/97	3:06	4/20/97	12:01	0.02	4.81	45	0.71	0.009	20.7	8.6	1.44	0.96	0.48	9.9	8.96	24.3				
5	9704-139	39.20.Eff.9	4/20/97	22:10	4/21/97	8:02	0.02	5.63	53	0.89	0.011	22.8	8.5	1.38	0.81	0.57	10.1	8.99	24.0				
6	9704-148	39.20.Eff.10	4/21/97	8:12	4/21/97	17:12	0.02	6.03	57	1.10	0.015	22.7	8.6	1.45	0.82	0.63	10.1	9.00	24.0				
7	9704-163	39.20.Eff.13	4/22/97	11:36	4/22/97	19:57	0.02	7.15	68	1.25	0.017	22.1	8.6	1.58	0.87	0.71	9.8	8.96	24.0				
7d	9704-164	39.20.Eff.13d	4/22/97	11:36	4/22/97	19:57	0.02	7.15	68	1.25	0.018	22.2	8.7	1.58	0.85	0.73	9.8	8.95	24.0				
8	9704-181	39.20.Eff.16	4/23/97	13:15	4/23/97	21:49	0.03	8.22	78	1.44	0.019	22.9	8.5	1.56	0.81	0.75	9.8	8.95	24.1				
9	9704-182	39.20.Eff.17	4/23/97	21:59	4/24/97	7:07	0.03	8.60	81	1.59	0.023	20.9	8.5	1.61	0.80	0.81	9.8	8.95	24.1				
10	9704-192	39.20.Eff.20	4/25/97	2:36	4/25/97	12:02	0.05	9.78	92	1.82	0.028	22.2	8.8	1.76	0.83	0.93	10.2	8.97	23.9				
10d	9704-193	39.20.Eff.20d	4/25/97	2:36	4/25/97	12:02	0.05	9.78	92	1.81	0.028	22.2	8.8	1.76	0.85	0.91	10.2	8.94	24.0				
11	9704-264	39.20.Eff.29	4/28/97	22:01	4/29/97	6:41	0.06	13.56	128	2.01	0.034	20.5	8.8	1.74	0.72	1.02	10.2	8.96	24.0				
12	9705-8	39.20.Eff.31	5/1/97	8:30	5/1/97	19:10	0.06	16.04	151	2.28	0.038	22.9	8.4	1.84	0.70	1.14	10.0	8.87	25.0				

ND: Non-detect. Blank Results: Either analysis was not performed or result did not meet ICR QC requirements.

Summers & Hooper, Inc.

RSSCT Sampling Summary Report

Study title: ICR RSSCT #2

Client: Mahoning Valley Sanitary District **Study#:** 39

#	SamplesID	ClientSampleID	F-S L (days)	TOC (mg/L)	TOX (µg Cl-/L)	Trihalomethanes (µg/L) CF	BDCM	DBCM	BF	TTHM	Haloacetic Acids (µg/L) MCAA	DCAA	TCAA	MBAA	DBAA	BCAA	BDCAA	DBCAA	TBAA	HAA6	HAA9	NH3-N (mg/L)	Brom (µg/L)
Effluent C		**EBCT:** 10 min	**Carbon Type:** Bituminous			**Influent pH:**			**Scaling Factor:** 9.44														
1	9704-76	39.10.Eff.1	2	0.25	3	ND	ND	ND	ND	**ND**	ND	ND	ND	ND	ND	1	ND	ND	ND	**1**	**1**		
2	9704-83	39.10.Eff.3	13	0.32	10	ND	ND	2.3	1.5	**3.8**	ND	ND	ND	ND	1	1	1	1	1	**2**	**5**		
3	9704-95	39.10.Eff.4	17	0.69	28	1.5	4.6	6.2	2.1	**14.4**	ND	1	ND	ND	2	2	1	1	1	**5**	**8**		
3d	9704-96	39.10.Eff.4d	17	0.71	32	2.1	4.7	6.4	2.3	**15.5**	ND	1	ND	ND	2	2	1	1	1	**5**	**8**		
4	9704-103	39.10.Eff.6	21	0.79	29	2.0	4.8	6.4	2.1	**15.3**	ND	3	ND	ND	2	2		1	1	**7**			
5	9704-104	39.10.Eff.7	23	0.87	37	2.7	5.6	6.7	1.8	**16.8**	ND	4	ND	ND	2	2		1	1	**8**			
6	9704-106	39.10.Eff.8d	25	1.20	53	7.3	8.3	7.3	1.0	**23.9**	ND	7	1	ND	2	3			2	**13**			
7	9704-108	39.10.Eff.9	29	1.39	67	8.9	8.9	6.9	ND	**24.7**	ND	8	2	ND	2	4			1	**16**			
7d	9704-109	39.10.Eff.9d	29	1.41	66	10.1	9.2	7.0	ND	**26.3**	ND	8	2	ND	2	3	2	1	2	**15**	**20**		
8	9704-114	39.10.Eff.10	33	1.53	81	11.1	9.7	6.6	ND	**27.4**	ND	8	2	ND	2	4	2	1	1	**16**	**20**		
9	9704-115	39.10.Eff.11	36	1.63	83	15.8	10.7	6.6	ND	**33.1**	2	8	2	ND	2	4	2	ND	2	**18**	**22**		
10	9704-131	39.10.Eff.14	47	1.90	110	16.4	10.6	5.7	ND	**32.7**	ND	10	4	ND	1	4	2	ND	1	**19**	**22**		
10d	9704-132	39.10.Eff.14d	47	1.88	99	18.7	11.9	5.9	ND	**36.5**	2	10	4	ND	1	4	2	ND	1	**21**	**24**		
11	9704-144	39.10.Eff.16d	55	1.97	107	19.3	11.3	5.3	ND	**35.9**	2	10	4	ND	1	4	2	ND	ND	**21**	**23**		
12	9704-162	39.10.Eff.19	66	2.23	121	23.7	12.5	5.2	ND	**41.4**	2	12	5	ND	1	5	2	ND	ND	**25**	**27**		
13	9704-188	39.10.Eff.21	86	2.54																			
Effluent C		**EBCT:** 20 min	**Carbon Type:** Bituminous			**Influent pH:**			**Scaling Factor:** 9.44														
1	9704-77	39.20.Eff.1	2	0.14	2	ND	ND	ND	ND	**ND**	ND	ND	ND	ND	ND	ND	1	ND	ND	**ND**	**1**		
2	9704-111	39.20.Eff.4	34	0.39	12	ND	1.4	3.1	1.8	**6.3**	ND	ND	ND	ND	1	1	1	1	2	**2**	**6**		
3	9704-116	39.20.Eff.5	38	0.51	13	ND	2.1	4.2	2.4	**8.7**	ND	ND	ND	ND	1	1	1	1	2	**2**	**6**		
3d	9704-117	39.20.Eff.5d	38	0.53	17	ND	2.0	4.1	2.4	**8.5**	ND	ND	ND	ND	1	1	1	1	2	**2**	**6**		
4	9704-129	39.20.Eff.7d	45	0.71	24	1.2	4.0	5.7	2.2	**13.1**	ND	2	ND	ND	2	2	1	1	2	**6**	**10**		
5	9704-139	39.20.Eff.9	53	0.89	31	2.4	5.4	6.6	2.0	**16.4**	ND	7	ND	ND	2	2	1	1	2	**11**	**15**		
6	9704-148	39.20.Eff.10	57	1.10	49	4.3	7.1	7.2	1.5	**20.1**	ND	8	1	ND	2	3	1	1	2	**14**	**18**		
7	9704-163	39.20.Eff.13	68	1.25	55	7.0	8.5	7.1	1.0	**23.6**	ND	7	1	ND	2	3	2	1	2	**13**	**18**		
7d	9704-164	39.20.Eff.13d	68	1.25	55	6.9	8.5	7.2	1.0	**23.6**	2	7	1	ND	2	3	2	1	2	**15**	**20**		
8	9704-181	39.20.Eff.16	78	1.44	57	8.7	9.6	7.5	ND	**25.8**	2	7	1	ND	2	3	2	1	2	**15**	**20**		
9	9704-182	39.20.Eff.17	81	1.59	73	11.5	10.2	7.1	ND	**28.8**	ND	8	2	ND	2	4	2	1	2	**16**	**21**		
10	9704-192	39.20.Eff.20	92	1.82	93	12.1	10.4	7.1	0.5	**30.1**	ND	8	2	ND	2	4	2	1	2	**16**	**20**		
10d	9704-193	39.20.Eff.20d	92	1.81	93	11.1	10.0	6.9	0.5	**28.5**	2	9	2	ND	2	4	2	1	2	**18**	**23**		
11	9704-264	39.20.Eff.29	128	2.01	105	19.6	11.7	5.6	ND	**36.9**	1	10	4	ND	1	4	2	ND	1	**20**	**23**		
12	9705-8	39.20.Eff.31	151	2.28	120						3	11	5	ND	1	5	2	ND		**25**			

ND: Non-detect. Blank Results: Either analysis was not performed or result did not meet ICR QC requirements.

Summers & Hooper, Inc.

RSSCT Sampling Summary Report

Study title: ICR RSSCT #2

Client: Mahoning Valley Sanitary District **Study#:** 39

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 (ºC)	pH	SDS Chlorination Conditions* Dose (mg/L)	Res. (mg/L)	Dem (mg/L)	Temp (ºC)	pH	Time hrs	Alk. (mg/L)	Hard-Tot (mg/L as CaCO3)	Hard-CA	Turb. (ntu)
13	9705-20	39.20.Eff.33	5/3/97	7:55	5/3/97	16:12	0.06	17.96	170	2.33		22.0	8.5										
Influent A		**EBCT:**	**Carbon Type:**			**Influent pH:**			**Scaling Factor:**	9.44													
1	9704-86	39.10.20.Inf.A-1	4/16/97	15:30	4/16/97	15:30		1.19	11											19	93	78	
2	9704-155	39.10.20.Inf.A-2	4/22/97	14:00	4/22/97	14:00		7.13	67											25	95	78	
Influent B		**EBCT:**	**Carbon Type:**			**Influent pH:**			**Scaling Factor:**	9.44													
1	9704-88	39.10.20.Inf.B-1	4/16/97	15:30	4/16/97	15:30		1.19	11	3.14	0.065	18.3	8.9	2.46	0.77	1.69	10.0	8.98	24.1				0.10
2	9704-156	39.10.20.Inf.B-2	4/22/97	14:00	4/22/97	14:00		7.13	67	3.21	0.066	16.9	8.9	2.49	0.78	1.71	9.8	8.99	24.0				0.15
3	9705-2	39.10.20.Inf.B-3	5/1/97	12:00	5/1/97	12:00		16.04	151	3.38	0.066	18.5	9.0	2.46	0.70	1.76	10.0	8.92	25.0				0.15
PreStudy		**EBCT:**	**Carbon Type:**			**Influent pH:**			**Scaling Factor:**														
1	9704-25	Settled water post	4/10/97	0:00						3.28													
2	9704-16	Representative	4/8/97	0:00						3.67													
3	9704-17	Representative	4/8/97	0:00																48	102	87	2.00
4	9704-23	MVSD Settled Water	4/8/97	0:00																			
5	9704-24	Settled Water on	4/8/97	0:00						3.45													

***Target SDS Chlorination Conditions**

Free Cl2 Residual: 0.75 mg/L **pH:** 9.0 **Temperature:** 10.0 ºC **Holding time:** 24.0 hrs

Study Comments

Summers & Hooper, Inc.

RSSCT Sampling Summary Report

Study title: ICR RSSCT #2

Client: Mahoning Valley Sanitary District **Study#:** 39

#	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		
13	9705-20	39.20.Eff.33	170	2.33																			
Influent A		**EBCT:**	**Carbon Type:**			**Influent pH:**			**Scaling Factor:**		9.44												
1	9704-86	39.10.20.Inf.A-1	11																			0.08	40
2	9704-155	39.10.20.Inf.A-2	67																			ND	39
Influent B		**EBCT:**	**Carbon Type:**			**Influent pH:**			**Scaling Factor:**		9.44												
1	9704-88	39.10.20.Inf.B-1	11	3.14	230	44.2	12.5	3.3	ND	**60.0**	3	20	10	ND	1	5		ND	ND	**39**			
2	9704-156	39.10.20.Inf.B-2	67	3.21	224	43.4	12.9	3.0	ND	**59.3**	ND	19	10	ND	1	5	3	ND	ND	**35**	**38**		
3	9705-2	39.10.20.Inf.B-3	151	3.38	221						4	21	10	ND	1	5	3	ND		**41**			
PreStudy		**EBCT:**	**Carbon Type:**			**Influent pH:**			**Scaling Factor:**														
1	9704-25	Settled water post 1.0		3.28																			
2	9704-16	Representative Sample		3.67																			
3	9704-17	Representative Sample																					
4	9704-23	MVSD Settled Water			26	3.2	ND	ND	ND	**3.2**	ND	3	1	ND	ND	ND	1	ND	ND	**4**	**5**		
5	9704-24	Settled Water on arrival		3.45																			

Summers & Hooper, Inc.

RSSCT Sampling Summary Report

Study title: ICR RSSCT #3

Client: Mahoning Valley Sanitary District **Study#:** 66

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 (ºC)	pH	SDS Chlorination Conditions* Dose (mg/L)	Res. (mg/L)	Dem (mg/L)	Temp (ºC)	pH	Time hrs	Alk. (mg/L)	Hard-Tot (mg/L as CaCO3)	Hard-CA	Turb. (ntu)
Effluent C		**EBCT:** 10 min	**Carbon Type:** Bituminous				**Influent pH:**		**Scaling Factor:** 9.44														
1	9707-342	66.10.Eff.1	7/30/97	10:00	7/30/97	15:21		0.18	2	0.19	0.002	21.8	8.8	1.62	0.72	0.90	20.6	9.02	24.0				
2	9708-1	66.10.Eff.3	7/31/97	14:25	8/1/97	1:00		1.48	14	0.43	0.004	21.5	8.3	1.72	0.75	0.97	20.6	9.03	23.9				
3	9708-2	66.10.Eff.4	8/1/97	1:10	8/1/97	6:27		1.81	17	0.71	0.008	21.1	8.5	1.83	0.81	1.02	20.6	9.04	24.0				
4	9708-16	66.10.Eff.5	8/1/97	6:37	8/1/97	17:29		2.16	20	0.98	0.011	21.9	8.4	1.95	0.74	1.21	20.6	9.02	24.0				
4d	9708-17	66.10.Eff.5d	8/1/97	6:37	8/1/97	17:29		2.16	20	1.00	0.011	21.9	8.4	1.95	0.71	1.24	20.6	9.02	24.0				
5	9708-19	66.10.Eff.6	8/1/97	17:36	8/1/97	22:08		2.48	23	1.14	0.013	22.2	8.4	2.01	0.72	1.29	20.6	9.03	24.2				
6	9708-21	66.10.Eff.7	8/1/97	22:18	8/2/97	9:03		2.81	27	1.36	0.017	21.2	8.4	2.11	0.71	1.40	20.6	8.97	24.0				
7	9708-39	66.10.Eff.9	8/2/97	14:53	8/3/97	1:30		3.50	33	1.63	0.022	22.0	8.3	2.22	0.71	1.51	20.1	9.00	24.0				
7d	9708-40	66.10.Eff.9d	8/2/97	14:53	8/3/97	1:30		3.50	33	1.63	0.023	22.0	8.4	2.22	0.70	1.52	20.1	9.00	24.0				
8	9708-41	66.10.Eff.10	8/3/97	1:40	8/3/97	9:33		3.89	37	1.84	0.026	21.4	8.6	2.30	0.68	1.62	20.1	9.00	24.0				
9	9708-49	66.10.Eff.12	8/3/97	20:33	8/4/97	7:18		4.74	45	2.00	0.029	21.3	8.4	2.36	0.67	1.69	20.1	9.00	24.0				
10	9708-84	66.10.Eff.15	8/5/97	5:20	8/5/97	16:10		6.10	58	2.21	0.036	21.8	8.3	2.52	0.62	1.90	20.2	8.98	24.0				
10d	9708-85	66.10.Eff.15d	8/5/97	5:20	8/5/97	16:10		6.10	58	2.21	0.035	21.8	8.3	2.52	0.62	1.90	20.2	8.98	24.0				
11	9708-89	66.10.Eff.17	8/6/97	3:03	8/6/97	13:47		7.01	66	2.39	0.039	21.6	8.4	2.59	0.61	1.98	20.2	8.98	24.0				
12	9708-115	66.10.Eff.20	8/7/97	4:06	8/7/97	14:39		8.05	76	2.54	0.041	21.9	8.5	2.76	0.73	2.03	19.8	8.96	24.0				
13	9708-120	66.10.Eff.22	8/7/97	20:00	8/7/97	20:00		8.49	80	2.40													
Effluent C		**EBCT:** 20 min	**Carbon Type:** Bituminous				**Influent pH:**		**Scaling Factor:** 9.44														
1	9707-343	66.20.Eff.1	7/30/97	10:00	7/30/97	15:19		0.18	2	0.27	0.001	22.1	8.8	1.66	0.71	0.95	20.6	9.05	24.0				
2	9708-36	66.20.Eff.4	8/2/97	8:50	8/2/97	17:58		3.21	30	0.44	0.004	22.1	8.3	1.73	0.71	1.02	20.6	9.03	24.1				
3	9708-45	66.20.Eff.6	8/3/97	4:24	8/3/97	15:02		4.06	38	0.72	0.007	23.2	8.1	1.86	0.82	1.04	20.1	9.00	24.0				
3d	9708-46	66.20.Eff.6d	8/3/97	4:24	8/3/97	15:02		4.06	38	0.72	0.007	22.2	8.1	1.86	0.77	1.09	20.1	9.00	24.0				
4	9708-59	66.20.Eff.8	8/4/97	1:30	8/4/97	12:01		4.94	47	0.97	0.011	22.2	8.0	1.97	0.83	1.14	20.1	9.01	24.0				
5	9708-72	66.20.Eff.10	8/4/97	22:28	8/5/97	8:52		5.81	55	1.06	0.013	22.3	7.9	2.00	0.76	1.24	20.2	8.98	24.1				
6	9708-88	66.20.Eff.12	8/5/97	19:31	8/6/97	5:54		6.69	63	1.31	0.017	22.0	7.9	2.09	0.75	1.34	20.2	8.98	24.1				
7	9708-94	66.20.Eff.14	8/6/97	16:49	8/7/97	3:08		7.57	71	1.48	0.020	22.0	7.9	2.21	0.77	1.44	19.8	8.96	24.0				
7d	9708-95	66.20.Eff.14d	8/6/97	16:49	8/7/97	3:08		7.57	71	1.45	0.020	23.0	7.9	2.21	0.77	1.44	19.8	8.97	24.0				
8	9708-126	66.20.Eff.17	8/8/97	0:17	8/8/97	10:48		8.89	84	1.63	0.023	22.7	7.9	2.30	0.76	1.54	19.8	8.97	23.9				
9	9708-131	66.20.Eff.19	8/8/97	21:13	8/9/97	7:40		9.76	92	1.87	0.027	23.1	8.6	2.42	0.77	1.65	19.8	8.97	23.9				
10	9708-140	66.20.Eff.22	8/10/97	20:08	8/11/97	6:31		11.71	111	2.03	0.031	22.0	8.5	2.54	0.82	1.72	19.8	8.95	23.8				
10d	9708-141	66.20.Eff.22d	8/10/97	20:08	8/11/97	6:31		11.71	111	2.06	0.031	22.1	8.5	2.54	0.79	1.75	19.8	8.96	23.9				
11	9708-178	66.20.Eff.26	8/13/97	19:55	8/14/97	6:13	0.01	14.70	139	2.21	0.034	22.7	8.5	2.59	0.76	1.83	19.8	8.98	24.0				
12	9708-189	66.20.Eff.27	8/15/97	14:32	8/15/97	16:15	0.04	16.26	153	2.42													

ND: Non-detect. Blank Results: Either analysis was not performed or result did not meet ICR QC requirements.

Summers & Hooper, Inc.

RSSCT Sampling Summary Report

Study title: ICR RSSCT #3

Client: Mahoning Valley Sanitary District **Study#:** 66

#	SamplesID	ClientSampleID	F-S L (days)	TOC (mg/L)	TOX (µg Cl-/L)	Trihalomethanes (µg/L) CF	BDCM	DBCM	BF	TTHM	Haloacetic Acids (µg/L) MCAA	DCAA	TCAA	MBAA	DBAA	BCAA	BDCAA	DBCAA	TBAA	HAA6	HAA9	NH3-N (mg/L)	Brom (µg/L)
Effluent C		**EBCT:** 10 min	**Carbon Type:** Bituminous			**Influent pH:**			**Scaling Factor:** 9.44														
1	9707-342	66.10.Eff.1	2	0.19	3	ND	ND	ND	ND	**ND**	ND	ND	ND	ND	ND	ND				**ND**			
2	9708-1	66.10.Eff.3	14	0.43	12	ND	4.1	1.8	2.2	**8.2**	ND	ND	ND	ND	1	ND	2	ND	ND	**1**	**3**		
3	9708-2	66.10.Eff.4	17	0.71	25	1.9	7.6	5.1	2.9	**17.6**	ND	1	ND	ND	2	2	2	ND	ND	**5**	**7**		
4	9708-16	66.10.Eff.5	20	0.98	40	5.2	9.8	8.9	2.3	**26.1**	ND	3	ND	ND	2	3	2	ND	ND	**8**	**10**		
4d	9708-17	66.10.Eff.5d	20	1.00	45	5.4	9.3	8.8	2.1	**25.6**	ND	2	ND	ND	2	2	2	ND	ND	**7**	**9**		
5	9708-19	66.10.Eff.6	23	1.14	50	8.5	9.9	11.5	1.7	**31.6**	ND	4	1	ND	2	3	3	ND	ND	**10**	**13**		
6	9708-21	66.10.Eff.7	27	1.36	69	13.7	10.1	13.6	ND	**37.4**	2	5	2	ND	3	4	3	ND	ND	**15**	**18**		
7	9708-39	66.10.Eff.9	33	1.63	91	21.7	8.9	15.4	ND	**45.9**	2	7	3	ND	2	4	3	2	ND	**18**	**23**		
7d	9708-40	66.10.Eff.9d	33	1.63	90	21.1	8.8	14.9	ND	**44.8**	ND	7	3	ND	2	4	3	ND	ND	**16**	**19**		
8	9708-41	66.10.Eff.10	37	1.84	110	29.0	8.8	17.2	ND	**55.0**	2	8	3	ND	2	5	3	ND	ND	**21**	**23**		
9	9708-49	66.10.Eff.12	45	2.00	120	35.5	8.8	18.8	ND	**63.1**	ND	9	4	ND	2	5	3	2	ND	**20**	**25**		
10	9708-84	66.10.Eff.15	58	2.21	139	41.3	7.7	19.0	ND	**68.0**	ND	12	5	ND	2	5	3	ND	ND	**24**	**27**		
10d	9708-85	66.10.Eff.15d	58	2.21	139	42.6	7.8	18.9	ND	**69.3**	ND	11	5	ND	2	5	3	ND	ND	**23**	**26**		
11	9708-89	66.10.Eff.17	66	2.39	153	48.8	7.3	18.8	ND	**74.8**	ND	13	5	ND	2	6	3	ND	ND	**25**	**28**		
12	9708-115	66.10.Eff.20	76	2.54	165	55.1	7.2	19.5	ND	**81.8**	ND	14	6	ND	2	6	3	ND	ND	**28**	**31**		
13	9708-120	66.10.Eff.22	80	2.40																			
Effluent C		**EBCT:** 20 min	**Carbon Type:** Bituminous			**Influent pH:**			**Scaling Factor:** 9.44														
1	9707-343	66.20.Eff.1	2	0.27	9	ND	ND	ND	ND	**ND**	ND	ND	ND	ND	ND	ND	1	ND	ND	**ND**	**1**		
2	9708-36	66.20.Eff.4	30	0.44	11	ND	3.9	1.8	2.3	**8.1**	ND	ND	ND	ND	1	ND	1	ND	ND	**1**	**2**		
3	9708-45	66.20.Eff.6	38	0.72	22	1.8	7.5	4.9	2.9	**17.1**	ND	1	ND	ND	2	1	2	ND	ND	**4**	**7**		
3d	9708-46	66.20.Eff.6d	38	0.72	24	1.8	7.4	5.0	2.8	**17.0**	ND	1	ND	ND	2	2	2	ND	ND	**5**	**7**		
4	9708-59	66.20.Eff.8	47	0.97	37	5.0	10.3	9.3	2.5	**26.9**	ND	3	1	ND	3	3	1	ND	ND	**10**	**11**		
5	9708-72	66.20.Eff.10	55	1.06	61	6.9	10.6	10.6	2.5	**30.5**	ND	4	ND	ND	2	3	2	ND	ND	**9**	**12**		
6	9708-88	66.20.Eff.12	63	1.31	63	12.5	10.6	12.9	1.9	**37.9**	ND	5	1	ND	2	4	3	ND	ND	**12**	**15**		
7	9708-94	66.20.Eff.14	71	1.48	78	15.7	9.8	14.4	1.3	**41.3**	ND	6	2	ND	2	4	3	ND	ND	**14**	**17**		
7d	9708-95	66.20.Eff.14d	71	1.45	74	15.4	9.6	13.7	1.5	**40.1**	ND	7	2	ND	3	5	3	ND	ND	**16**	**19**		
8	9708-126	66.20.Eff.17	84	1.63	86	21.8	9.7	15.4	1.2	**48.1**	ND	7	3	ND	2	4	3	ND	ND	**16**	**19**		
9	9708-131	66.20.Eff.19	92	1.87	106	27.6	9.2	17.1	ND	**53.9**	ND	8	3	ND	2	5	3	ND	ND	**19**	**22**		
10	9708-140	66.20.Eff.22	111	2.03	128	34.1	8.7	18.0	ND	**60.7**	ND	10	4	ND	2	5	4	ND	ND	**22**	**25**		
10d	9708-141	66.20.Eff.22d	111	2.06	123	33.6	8.6	17.6	ND	**59.8**	ND	10	4	ND	2	5	3	ND	ND	**21**	**24**		
11	9708-178	66.20.Eff.26	139	2.21	133	47.7	8.2	20.5	ND	**76.4**	ND	11	5	ND	2	6	4	ND	ND	**23**	**27**		
12	9708-189	66.20.Eff.27	153	2.42																			

ND: Non-detect. Blank Results: Either analysis was not performed or result did not meet ICR QC requirements.

Summers & Hooper, Inc.

RSSCT Sampling Summary Report

Study title: ICR RSSCT #3

Client: Mahoning Valley Sanitary District **Study#:** 66

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 (ºC)	pH	SDS Chlorination Conditions* Dose (mg/L)	Res. (mg/L)	Dem (mg/L)	Temp (ºC)	pH	Time hrs	Alk. (mg/L)	Hard-Tot (mg/L as CaCO3)	Hard-CA	Turb. (ntu)
13	9708-191	66.20.Eff-29	8/16/97	2:59	8/16/97	13:04	0.04	16.95	160	2.42	0.039	23.0	8.3	2.68	0.84	1.84	19.9	8.95	24.3				
14	9708-199	66.20.Eff-31	8/17/97	3:58	8/17/97	11:30	0.04	17.93	169	2.49													
Influent A		**EBCT:**	**Carbon Type:**				**Influent pH:**		**Scaling Factor:**	9.44													
1	9707-339	66.10.20.Inf.A-1	7/30/97	14:30	7/30/97	14:30		0.26	2											19	92	73	
2	9708-105	66.10.20.INF.A-2	8/7/97	11:15	8/7/97	11:15		8.13	77											23	90	74	
Influent B		**EBCT:**	**Carbon Type:**				**Influent pH:**		**Scaling Factor:**	9.44													
1	9707-340	66.10.20.Inf.B-1	7/30/97	14:35	7/30/97	14:35		0.26	2	3.42	0.066	18.6	9.1	3.75	0.81	2.94	20.6	9.05	24.0				0.05
2	9708-106	66.10.20.INF.B-2	8/7/97	11:10	8/7/97	11:10		8.12	77	3.41	0.067	17.6	9.0	3.65	0.77	2.88	19.8	9.00	24.0				0.10
3	9708-194	66.10.20.Inf.B-3	8/17/97	11:00	8/17/97	11:00		18.11	171			19.3	9.0										
4	9708-220	66.10.20.Inf.B-4	8/18/97	10:00	8/18/97	10:00		19.07	180	3.51				3.65	0.85	2.80	19.9	8.97	24.1				0.15
PreStudy		**EBCT:**	**Carbon Type:**				**Influent pH:**		**Scaling Factor:**														
1	9707-169	Plant settled water	7/14/97	9:05						3.73			10.							47	101	82	14.0
2	9707-179	Settled Water on	7/16/97	0:00						3.63													

***Target SDS Chlorination Conditions**

Free Cl2 Residual: 0.75 mg/L **pH:** 9.0 **Temperature:** 20.0 ºC **Holding time:** 24.0 hrs

Study Comments

Summers & Hooper, Inc.

RSSCT Sampling Summary Report

Study title: ICR RSSCT #3

Client: Mahoning Valley Sanitary District **Study#:** 66

#	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		
13	9708-191	66.20.Eff-29	160	2.42	152	51.6	8.0	21.3	ND	**80.9**	ND	12	6	ND	2	5	3	ND	ND	**25**	**27**		
14	9708-199	66.20.Eff-31	169	2.49																			
Influent A		**EBCT:**	**Carbon Type:**			**Influent pH:**			**Scaling Factor:**		9.44												
1	9707-339	66.10.20.Inf.A-1	2																			0.07	39
2	9708-105	66.10.20.INF.A-2	77																			0.06	40
Influent B		**EBCT:**	**Carbon Type:**			**Influent pH:**			**Scaling Factor:**		9.44												
1	9707-340	66.10.20.Inf.B-1	2	3.42	261	88.8	4.4	21.4	ND	**114.5**	2	24	11	ND	1	6	4	ND	ND	**44**	**48**		
2	9708-106	66.10.20.INF.B-2	77	3.41	270	91.4	4.6	20.8	ND	**116.9**	2	22	11	ND	ND	6	3	ND	ND	**41**	**44**		
3	9708-194	66.10.20.Inf.B-3	171																				
4	9708-220	66.10.20.Inf.B-4	180	3.51	283	101.6	4.3	22.9	ND	**128.7**	ND	23	11	ND	ND	6	3	ND	ND	**40**	**43**		
PreStudy		**EBCT:**	**Carbon Type:**			**Influent pH:**			**Scaling Factor:**														
1	9707-169	Plant settled water		3.73	7	1.2	ND	ND	ND	**1.2**	ND	1	ND	ND	ND	ND				**1**			
2	9707-179	Settled Water on Arrival		3.63																			

Summers & Hooper, Inc.

RSSCT Sampling Summary Report

Study title: ICR RSSCT #4

Client: Mahoning Valley Sanitary District **Study#:** 92

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 (ºC)	pH	SDS Chlorination Conditions* Dose (mg/L)	Res. (mg/L)	Dem (mg/L)	Temp (ºC)	pH	Time hrs	Alk. (mg/L)	Hard-Tot (mg/L as CaCO3)	Hard-CA	Turb. (ntu)
Effluent C		**EBCT:** 10 min	**Carbon Type:** Bituminous		**Influent pH:**		**Scaling Factor:** 9.44														
1	9710-374	92.10.E-1	10/31/97 13:10	10/31/97 16:07		0.15	1	0.23	0.001	24.5	8.6	2.59	0.74	1.85	14.9	9.06	24.2				
2	9711-10	92.10.E-2	11/1/97 10:33	11/1/97 16:19		1.10	10	0.35	0.004	22.3	8.4	2.66	0.57	2.09	15.0	9.05	24.1				
3	9711-12	92.10.E-3	11/1/97 19:36	11/2/97 1:22		1.48	14	0.61	0.007	21.2	8.4	2.72	0.58	2.14	15.0	9.05	24.3				
4	9711-13	92.10.E-4	11/2/97 4:43	11/2/97 10:37		1.86	18	0.96	0.012	21.4	8.3	2.96	0.66	2.30	15.0	9.06	24.1				
4d	9711-14	92.10.E-4d	11/2/97 4:43	11/2/97 10:37		1.86	18	0.97	0.013	21.4	8.3	2.97	0.79	2.18	15.0	9.09	24.1				
5	9711-16	92.10.E-5	11/2/97 10:47	11/2/97 13:44		2.05	19	1.10	0.015	21.6	8.3	3.03	0.70	2.33	15.0	9.05	24.2				
6	9711-20	92.10.E-7	11/2/97 19:55	11/2/97 22:55		2.43	23	1.30	0.019	21.2	8.4	3.13	0.70	2.43	14.9	9.01	24.1				
7	9711-21	92.10.E-8	11/2/97 23:05	11/3/97 5:04		2.63	25	1.42	0.020	21.0	8.4	3.19	0.70	2.49	14.8	9.01	24.1				
7d	9711-22	92.10.E-8d	11/2/97 23:05	11/3/97 5:04		2.63	25	1.42	0.020	21.1	8.4	3.19	0.65	2.54	14.5	9.03	24.1				
8	9711-32	92.10.E-10	11/3/97 8:22	11/3/97 13:39		3.00	28	1.63	0.022	21.1	8.3	3.30	0.74	2.56	14.6	9.04	24.2				
9	9711-43	92.10.E-12	11/3/97 17:00	11/3/97 22:44		3.37	32	1.84	0.025	20.9	8.3	3.20	0.56	2.64	15.0	9.04	24.3				
10	9711-51	92.10.E-15	11/4/97 8:02	11/4/97 13:47		4.00	38	1.96	0.029	20.8	8.2	3.46	0.70	2.76	15.0	9.03	24.3				
11	9711-55	92.10.E-16	11/4/97 13:57	11/4/97 19:52		4.25	40	2.19	0.031	21.9	8.2	3.57	0.74	2.83	15.0	9.05	24.3				
11d	9711-56	92.10.E-16d	11/4/97 13:57	11/4/97 19:52		4.25	40	2.21	0.032	22.1	8.3	3.57	0.74	2.83	15.0	9.04	24.3				
12	9711-79	92.10.E-21	11/6/97 8:12	11/6/97 12:01		5.96	56	2.45	0.036	21.8	8.2	3.70	0.71	2.99	15.0	9.03	24.0				
13	9711-99	92.10.E-22	11/8/97 6:18	11/8/97 9:24		7.87	74	2.60		21.0	8.2										
Effluent C		**EBCT:** 20 min	**Carbon Type:** Bituminous		**Influent pH:**		**Scaling Factor:** 9.44														
1	9710-373	92.20.E-1	10/31/97 13:15	10/31/97 15:41		0.14	1	0.22	0.001	24.5	8.5	2.59	0.84	1.75	15.0	9.07	24.3				
2	9711-30	92.20.E-5	11/3/97 3:52	11/3/97 9:45		2.83	27	0.40	0.004	21.4	8.3	2.68	0.70	1.98	15.0	9.05	24.2				
3	9711-46	92.20.E-7	11/3/97 15:58	11/3/97 22:17		3.34	32	0.60	0.006	21.0	8.3	2.78	0.72	2.06	15.0	9.02	24.3				
3d	9711-47	92.20.E-7d	11/3/97 15:58	11/3/97 22:17		3.34	32	0.61	0.007	21.0	8.3	2.79	0.71	2.08	15.0	9.01	24.3				
4	9711-50	92.20.E-9	11/4/97 7:36	11/4/97 13:23		3.98	38	0.82	0.010	21.1	8.3	2.89	0.81	2.08	15.0	9.05	24.2				
5	9711-60	92.20.E-10	11/4/97 13:33	11/4/97 19:17		4.23	40	1.06	0.012	22.0	8.4	3.01	0.79	2.22	15.0	9.06	23.9				
6	9711-70	92.20.E-13	11/5/97 14:31	11/5/97 20:51	0.06	5.22	49	1.25	0.016	22.5	8.2	3.11	0.78	2.33	15.0	9.06	23.9				
7	9711-82	92.20.E-17	11/6/97 12:34	11/6/97 18:29	0.06	6.13	58	1.42	0.018	22.2	8.3	3.22	0.72	2.50	15.1	9.07	24.1				
7d	9711-83	92.20.E-17d	11/6/97 12:34	11/6/97 18:29	0.06	6.13	58	1.44	0.018	22.2	8.3	3.23	0.69	2.54	15.1	9.08	24.0				
8	9711-95	92.20.E-19d	11/7/97 6:44	11/7/97 12:39	0.06	6.89	65	1.62	0.020	22.1	8.0	3.31	0.69	2.62	15.1	9.04	24.0				
9	9711-107	92.20.E-24	11/9/97 13:04	11/9/97 18:51	0.06	9.15	86	1.81	0.025	20.8	8.3	3.41	0.66	2.75	15.1	9.05	24.1				
10	9711-116	92.20.E-26	11/11/97 3:52	11/11/97 6:56	0.06	10.71	101	2.01	0.029	21.5	8.3	3.53	0.70	2.83	15.3	9.01	24.1				
11	9711-137	92.20.E-29	11/13/97 12:45	11/13/97 18:39	0.06	13.14	124	2.23	0.034	21.4	8.2	3.63	0.55	3.08	15.1	8.98	24.6				
11d	9711-138	92.20.E-29d	11/13/97 12:45	11/13/97 18:39	0.06	13.14	124	2.22	0.033	21.4	8.2	3.63	0.55	3.08	15.1	8.98	24.7				
12	9711-142	92.20.E-30	11/16/97 12:01	11/16/97 18:10	0.06	16.11	152	2.46	0.038	21.8	8.3	3.71	0.60	3.11	14.7	9.00	24.1				

ND: Non-detect. Blank Results: Either analysis was not performed or result did not meet ICR QC requirements.

Summers & Hooper, Inc.

RSSCT Sampling Summary Report

Study title: ICR RSSCT #4

Client: Mahoning Valley Sanitary District **Study#:** 92

#	SamplesID	ClientSampleID	F-S L (days)	TOC (mg/L)	TOX (µg Cl-/L)	Trihalomethanes (µg/L) CF	BDCM	DBCM	BF	TTHM	Haloacetic Acids (µg/L) MCAA	DCAA	TCAA	MBAA	DBAA	BCAA	BDCAA	DBCAA	TBAA	HAA6	HAA9	NH3-N (mg/L)	Brom (µg/L)
Effluent C		**EBCT:** 10 min	**Carbon Type:** Bituminous			**Influent pH:**			**Scaling Factor:** 9.44														
1	9710-374	92.10.E-1	1	0.23	1	ND	ND	ND	ND	**ND**	ND	ND	ND	ND	ND	ND	ND	ND		**ND**			
2	9711-10	92.10.E-2	10	0.35	16	1.1	3.4	2.0	2.4	**8.9**													
3	9711-12	92.10.E-3	14	0.61	22	2.4	6.7	4.7	3.3	**17.2**	ND	ND	ND	ND	2	1	ND	ND		**3**			
4	9711-13	92.10.E-4	18	0.96	41	5.6	9.3	8.6	2.9	**26.4**	ND	2	1	ND	2	2	1	ND		**8**			
4d	9711-14	92.10.E-4d	18	0.97	42	5.5	9.1	8.4	2.9	**25.8**	ND	2	1	ND	2	2	1	ND		**7**			
5	9711-16	92.10.E-5	19	1.10	52	7.2	10.1	10.2	2.7	**30.2**	ND	3	1	ND	2	3	1	ND		**9**			
6	9711-20	92.10.E-7	23	1.30	66	11.5	10.2	12.6	2.1	**36.4**	ND	5	2	ND	2	4	2	2		**13**			
7	9711-21	92.10.E-8	25	1.42	79	13.1	9.9	13.3	1.9	**38.3**	ND	6	2	ND	2	4	2	2		**14**			
7d	9711-22	92.10.E-8d	25	1.42	72	13.7	9.9	13.5	1.8	**39.0**	ND	5	3	ND	2	4	2	2		**14**			
8	9711-32	92.10.E-10	28	1.63	83	16.0	9.6	14.1	1.4	**41.1**	ND	6	3	ND	2	5	2	2		**16**			
9	9711-43	92.10.E-12	32	1.84	93	19.6	9.7	15.1	1.5	**45.9**	ND	7	3	ND	2	4	2	ND		**15**			
10	9711-51	92.10.E-15	38	1.96	114	24.1	9.3	16.4	1.3	**51.2**	ND	9	4	ND	2	5	3	2		**19**			
11	9711-55	92.10.E-16	40	2.19	123	26.9	9.2	17.0	1.2	**54.3**	ND	9	5	ND	2	5	3	2		**20**			
11d	9711-56	92.10.E-16d	40	2.21	124	27.2	9.2	16.9	1.1	**54.5**	2	9	5	ND	2	5	3	2		**23**			
12	9711-79	92.10.E-21	56	2.45	147	38.0	9.1	19.8	1.1	**67.9**	ND	11	6	ND	2	6	3	2		**24**			
13	9711-99	92.10.E-22	74	2.60																			
Effluent C		**EBCT:** 20 min	**Carbon Type:** Bituminous			**Influent pH:**			**Scaling Factor:** 9.44														
1	9710-373	92.20.E-1	1	0.22	0	ND	ND	ND	ND	**ND**													
2	9711-30	92.20.E-5	27	0.40	17	1.1	3.9	2.2	2.6	**9.7**	ND	ND	ND	ND	ND	ND	ND	ND		**ND**			
3	9711-46	92.20.E-7	32	0.60	22	1.7	6.0	3.8	3.2	**14.7**	ND	ND	ND	ND	1	1	ND	ND		**3**			
3d	9711-47	92.20.E-7d	32	0.61	20	1.8	6.1	3.9	3.2	**15.1**	ND	ND	ND	ND	1	1	ND	ND		**3**			
4	9711-50	92.20.E-9	38	0.82	37	3.2	8.4	6.4	3.5	**21.5**	ND	2	ND	ND	2	2	2	2		**6**			
5	9711-60	92.20.E-10	40	1.06	40	4.3	9.3	8.3	3.1	**25.0**	ND	2	ND	ND	2	3	2	2		**7**			
6	9711-70	92.20.E-13	49	1.25	61	8.7	10.7	11.8	2.7	**33.8**	ND	4	2	ND	2	3	2	2		**11**			
7	9711-82	92.20.E-17	58	1.42	64	12.6	11.2	13.7	2.2	**39.7**	ND	5	2	ND	3	4	1			**13**			
7d	9711-83	92.20.E-17d	58	1.44	66	12.9	10.8	13.3	2.3	**39.2**	ND	4	2	ND	2	3	1			**11**			
8	9711-95	92.20.E-19d	65	1.62	74	15.6	10.7	14.9	2.0	**43.3**	ND	5	2	ND	2	4	1			**13**			
9	9711-107	92.20.E-24	86	1.81	92	22.9	10.4	16.5	1.4	**51.1**	ND	7	3	ND	2	4	2			**16**			
10	9711-116	92.20.E-26	101	2.01	107	27.4	10.2	18.5	1.3	**57.4**	ND	9	4	ND	2	5	3	ND		**20**			
11	9711-137	92.20.E-29	124	2.23	132	33.0	9.3	19.1	1.0	**62.4**	ND	10	6	ND	2	6	3	3		**24**			
11d	9711-138	92.20.E-29d	124	2.22	131	34.4	10.7	21.7	1.1	**67.9**	ND	10	6	ND	2	5	3	3		**23**			
12	9711-142	92.20.E-30	152	2.46	142	40.0	9.1	20.3	ND	**69.4**	ND	10	6	ND	2	5	3	3		**23**			

ND: Non-detect. Blank Results: Either analysis was not performed or result did not meet ICR QC requirements.

Summers & Hooper, Inc.

RSSCT Sampling Summary Report

Study title: ICR RSSCT #4

Client: Mahoning Valley Sanitary District **Study#:** 92

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 (ºC)	pH	SDS Chlorination Conditions* Dose (mg/L)	Res. (mg/L)	Dem (mg/L)	Temp (ºC)	pH	Time hrs	Alk. (mg/L)	Hard-Tot (mg/L as CaCO3)	Hard-CA	Turb. (ntu)
13	9711-150	92.20.E-32	11/18/97	8:09	11/18/97	10:39	0.06	17.87	169	2.52		21.7	8.3										
Influent A		**EBCT:**	**Carbon Type:**			**Influent pH:**			**Scaling Factor:**	9.44													
1	9710-375	92.Inf.A-1	10/31/97	16:30	10/31/97	16:30		0.23	2											27	98	77	
2	9711-85	92.INF.A-2	11/7/97	9:50	11/7/97	9:50		6.95	66											22	95	76	
Influent B		**EBCT:**	**Carbon Type:**			**Influent pH:**			**Scaling Factor:**	9.44													
1	9711-8	92.Inf.B-1	11/1/97	14:40	11/1/97	14:40		1.15	11	3.30	0.063	17.0	9.1	4.45	0.64	3.81	15.0	9.07	24.3				0.10
2	9711-86	92.INF.B-4	11/7/97	10:00	11/7/97	10:00		6.96	66	3.52	0.063	14.0	9.0	4.54	0.65	3.89	15.1	9.05	24.1				0.10
3	9711-140	92.INF.B-6	11/16/97	14:30	11/16/97	14:30		16.15	152	3.28	0.063	18.7	9.0	4.41	0.68	3.73	14.7	9.04	24.1				0.10
PreStudy		**EBCT:**	**Carbon Type:**			**Influent pH:**			**Scaling Factor:**														
1	9710-297	Settled Water Barrel 1	10/24/97	11:50						3.70													
2	9710-271	Settled Water	10/22/97	11:15						3.96			10.							53	99	79	8.10
3	9710-296	Settled Water Barrel 6	10/24/97	11:10						3.65													

***Target SDS Chlorination Conditions**

Free Cl2 Residual: 0.75 mg/L **pH:** 9.0 **Temperature:** 15.0 ºC **Holding time:** 24.0 hrs

Study Comments

Summers & Hooper, Inc.

RSSCT Sampling Summary Report

Study title: ICR RSSCT #4

Client: Mahoning Valley Sanitary District **Study#:** 92

#	SamplesID	ClientSampleID	F-S L (days)	TOC (mg/L)	TOX (µg Cl-/L)	Trihalomethanes (µg/L) CF	BDCM	DBCM	BF	TTHM	Haloacetic Acids (µg/L) MCAA	DCAA	TCAA	MBAA	DBAA	BCAA	BDCAA	DBCAA	TBAA	HAA6	HAA9	NH3-N (mg/L)	Brom (µg/L)
13	9711-150	92.20.E-32	169	2.52																			
Influent A		**EBCT:**	**Carbon Type:**			**Influent pH:**			**Scaling Factor:**		9.44												
1	9710-375	92.Inf.A-1	2																			0.20	40
2	9711-85	92.INF.A-2	66																			0.20	43
Influent B		**EBCT:**	**Carbon Type:**			**Influent pH:**			**Scaling Factor:**		9.44												
1	9711-8	92.Inf.B-1	11	3.30	235	66.5	6.1	20.6	ND	**93.1**	3	18	9	ND	1	5	3	ND		**36**			
2	9711-86	92.INF.B-4	66	3.52	234	71.9	6.9	22.9	ND	**101.7**	ND	17	9	ND	1	5	3			**32**			
3	9711-140	92.INF.B-6	152	3.28	227	71.8	6.7	22.6	ND	**101.1**	2	17	11	ND	2	6	4	ND		**38**			
PreStudy		**EBCT:**	**Carbon Type:**			**Influent pH:**			**Scaling Factor:**														
1	9710-297	Settled Water Barrel 1		3.70																			
2	9710-271	Settled Water		3.96	9	ND	ND	ND	ND	**ND**	ND	ND	ND	ND	ND	ND	ND	ND		**ND**			
3	9710-296	Settled Water Barrel 6		3.65																			

Summers & Hooper, Inc.
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Laboratory Report

Client:

Mr. John Zackasee
Superintendant-Purification
Mahoning Valley Sanitation District
P.O. Box 4119
Youngstown, OH 44515

Phone: 330-652-3614 Fax: 330-652-6293

Study Title: ICR RSSCT #1

Study #: 3

Reviewed By: _____
Stuart M. Hooper

Date Reviewed: 7/12/99

Electronic copies of the results and quality control data are available upon request.

Summers & Hooper, Inc.
6 Knollcrest Drive
Cincinnati, OH 45237
Phone: (513) 679-2200
Fax: (513) 679-2201

Laboratory Test Results

Mr. John Zackasee
Superintendent-Purification
Mahoning Valley Sanitary District
P.O. Box 4119
Youngstown, OH 44515

Phone: 330-652-3614 Fax: 330-652-6293

Study#: 3
Study Title: ICR RSSCT #1

Sample ID: Treat. Study Sample Pt. **S&H ID:** 9701-25 **Date Sampled:** 1/14/97 9:45:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
1	TOC-ICR	TOC	4.32	mg/L	SM 5310 C	1	0.50	1/14/97		1/15/97	7-0-8
2	TOC-ICR	TOC (Dupl)	4.26	mg/L	SM 5310 C	1	0.50	1/14/97		1/15/97	7-0-8
			4.29	**mg/L**	**1.4 % RPD**						

Sample ID: Inf unfiltered barrel #5 **S&H ID:** 9701-46 **Date Sampled:** 1/16/97

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
3	TOC-ICR	TOC	4.41	mg/L	SM 5310 C	1	0.50	1/16/97		1/16/97	7-0-9

Sample ID: Barrel #3 unfiltered influent **S&H ID:** 9701-50 **Date Sampled:** 1/17/97 9:30:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
4	TOC-ICR	TOC	4.01	mg/L	SM 5310 C	1	0.50	1/17/97		1/20/97	7-0-10
5	TOC-ICR	TOC (Dupl)	3.98	mg/L	SM 5310 C	1	0.50	1/17/97		1/20/97	7-0-10
			4.00	**mg/L**	**0.7 % RPD**						

Sample ID: Barrel #5 unfiltered influent **S&H ID:** 9701-51 **Date Sampled:** 1/17/97 12:00:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
6	TOC-ICR	TOC	4.01	mg/L	SM 5310 C	1	0.50	1/17/97		1/20/97	7-0-10
7	TOC-ICR	TOC (Dupl)	4.08	mg/L	SM 5310 C	1	0.50	1/17/97		1/20/97	7-0-10
			4.04	**mg/L**	**1.7 % RPD**						

Sample ID: Barrel #1 filtered influent **S&H ID:** 9701-52 **Date Sampled:** 1/17/97 5:00:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
8	TOC-ICR	TOC	3.78	mg/L	SM 5310 C	1	0.50	1/17/97		1/24/97	7-0-14
9	TOC-ICR	TOC (Dupl)	3.84	mg/L	SM 5310 C	1	0.50	1/17/97		1/24/97	7-0-14
			3.81	**mg/L**	**1.6 % RPD**						

Sample ID: Barrel #2 filtered influent **S&H ID:** 9701-53 **Date Sampled:** 1/17/97 5:00:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
10	TOC-ICR	TOC	3.83	mg/L	SM 5310 C	1	0.50	1/17/97		1/24/97	7-0-14
11	TOC-ICR	TOC (Dupl)	3.85	mg/L	SM 5310 C	1	0.50	1/17/97		1/24/97	7-0-14
			3.84	**mg/L**	**0.5 % RPD**						

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

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

Summers & Hooper, Inc.
6 Knollcrest Drive
Cincinnati, OH 45237

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 3
Study Title: ICR RSSCT #1

Sample ID: 3.1.10.20.INF.A-1 **S&H ID:** 9701-55 **Date Sampled:** 1/19/97 7:00:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
12	ALK	Alkalinity	15	mg/L	SM 2320 B	1	5	1/19/97		1/20/97	1-0-1
13	NH3	Ammonia Nitrogen	0.05	mg/L	EPA 350.1	1	0.05	1/19/97		2/12/97	MW59746
14	BR	Bromide	0.038	mg/L	EPA 300.0 A	1	0.020	1/19/97		2/3/97	MW59282
15	CaHard	Calcium Hardness	72	mg/L CaCO3	SM 3500-Ca D	1	5	1/19/97		1/20/97	33-0-1
16	TotHard	Total Hardness	102	mg/L CaCO3	SM 2340 C	1	5	1/19/97		1/20/97	3-0-1

Sample ID: 3.1.10.20.INF.B-1 **S&H ID:** 9701-56 **Date Sampled:** 1/19/97 8:10:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
17	Cl2Dose	Chlorine Dose	2.90	mg/L as Cl2	SM 4500-Cl B	1	n/a	1/23/97		1/23/97	n/a
18	Cl2Res	Chlorine Residual	0.75	mg/L as Cl2	SM 4500-Cl F	1	0.10	1/23/97		1/24/97	n/a
19	HAA	Bromochloroacetic acid	4.0	µg/L	SM 6251 B	1	1.0	1/24/97	2/10/97	2/10/97	MW59564
20	HAA	Bromodichloroacetic acid	NR	µg/L	SM 6251 B	1	1.0	1/24/97	2/10/97	2/10/97	MW59564
21	HAA	Chlorodibromoacetic acid	NR	µg/L	SM 6251 B	1	1.0	1/24/97	2/10/97	2/10/97	MW59564
22	HAA	Dibromoacetic acid	1.0	µg/L	SM 6251 B	1	1.0	1/24/97	2/10/97	2/10/97	MW59564
23	HAA	Dichloroacetic acid	19.0	µg/L	SM 6251 B	1	1.0	1/24/97	2/10/97	2/10/97	MW59564
24	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	1/24/97	2/10/97	2/10/97	MW59564
25	HAA	Monochloroacetic acid	3.0	µg/L	SM 6251 B	1	2.0	1/24/97	2/10/97	2/10/97	MW59564
26	HAA	Tribromoacetic acid	NR	µg/L	SM 6251 B	1	1.0	1/24/97	2/10/97	2/10/97	MW59564
27	HAA	Trichloroacetic acid	11.0	µg/L	SM 6251 B	1	1.0	1/24/97	2/10/97	2/10/97	MW59564
28	pH	Cl2 pH - Final	9.1	Unit	SM 4500-H+ B	1	n/a	1/23/97		1/24/97	n/a
29	pH	Cl2 pH - Initial	9.2	Unit	SM 4500-H+ B	1	n/a	1/23/97		1/23/97	n/a
30	pH	pH	8.8	Unit	SM 4500-H+ B	1	n/a	1/19/97		1/21/97	n/a
31	TEMP	Cl2 Temperature	4.2	ºC	SM 2550 B	1	n/a	1/23/97		1/24/97	n/a
32	TEMP	Temperature	20.5	ºC	SM 2550 B	1	n/a	1/19/97		1/21/97	n/a
33	TIME	Cl2 Incubation Time	24.1	hrs	n/a	1	n/a	1/23/97		1/24/97	n/a
34	TOC-ICR	TOC	3.93	mg/L	SM 5310 C	1	0.50	1/19/97		1/20/97	7-0-10
35	TOC-ICR	TOC (Dupl)	3.89	mg/L	SM 5310 C	1	0.50	1/19/97		1/20/97	7-0-10
			3.91	**mg/L**	**1.0 % RPD**						
36	TOX-ICR	TOX	230	µg Cl-/L	SM 5320 B	1	25	1/24/97		2/5/97	MW59545
37	TOX-ICR	TOX (Dupl)	225	µg Cl-/L	SM 5320 B	1	25	1/24/97		2/5/97	MW59545
			228	**µg Cl-/L**	**2.2 % RPD**						
38	THM4	Bromodichloromethane	11.8	µg/L	EPA 551	1	0.5	1/24/97	2/5/97	2/5/97	MW59396
39	THM4	Bromoform	ND	µg/L	EPA 551	1	0.5	1/24/97	2/5/97	2/5/97	MW59396
40	THM4	Chloroform	51.2	µg/L	EPA 551	1	0.5	1/24/97	2/5/97	2/5/97	MW59396
41	THM4	Dibromochloromethane	2.7	µg/L	EPA 551	1	0.5	1/24/97	2/5/97	2/5/97	MW59396
42	TURB	Turbidity	0.10	ntu	SM 2130 B	1	0.05	1/19/97		1/19/97	9-0-1

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 3
Study Title: ICR RSSCT #1

43	UV-ICR	UV	0.077	1/cm	SM 5910 B	1	0.009	1/19/97		1/21/97	8-0-12
44	UV-ICR	UV (Dupl)	0.077	1/cm	SM 5910 B	1	0.009	1/19/97		1/21/97	8-0-12
			0.077	**1/cm**	**0.0 % RPD**						

Sample ID: 3.1.10.EFF.1 **S&H ID:** 9701-57 **Date Sampled:** 1/20/97 1:00:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
45	Cl2Dose	Chlorine Dose	1.25	mg/L as Cl2	SM 4500-Cl B	1	n/a	1/23/97		1/23/97	n/a
46	Cl2Res	Chlorine Residual	0.70	mg/L as Cl2	SM 4500-Cl F	1	0.10	1/23/97		1/24/97	n/a
47	HAA	Bromochloroacetic acid	ND	µg/L	SM 6251 B	1	1.0	1/24/97	2/10/97	2/11/97	MW59564
48	HAA	Bromodichloroacetic acid	NR	µg/L	SM 6251 B	1	1.0	1/24/97	2/10/97	2/11/97	MW59564
49	HAA	Chlorodibromoacetic acid	NR	µg/L	SM 6251 B	1	1.0	1/24/97	2/10/97	2/11/97	MW59564
50	HAA	Dibromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	1/24/97	2/10/97	2/11/97	MW59564
51	HAA	Dichloroacetic acid	1.0	µg/L	SM 6251 B	1	1.0	1/24/97	2/10/97	2/11/97	MW59564
52	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	1/24/97	2/10/97	2/11/97	MW59564
53	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	1/24/97	2/10/97	2/11/97	MW59564
54	HAA	Tribromoacetic acid	NR	µg/L	SM 6251 B	1	1.0	1/24/97	2/10/97	2/11/97	MW59564
55	HAA	Trichloroacetic acid	ND	µg/L	SM 6251 B	1	1.0	1/24/97	2/10/97	2/11/97	MW59564
56	pH	Cl2 pH - Final	9.1	Unit	SM 4500-H+ B	1	n/a	1/23/97		1/24/97	n/a
57	pH	Cl2 pH - Initial	9.2	Unit	SM 4500-H+ B	1	n/a	1/23/97		1/23/97	n/a
58	pH	pH	8.8	Unit	SM 4500-H+ B	1	n/a	1/20/97		1/21/97	n/a
59	TEMP	Cl2 Temperature	4.2	ºC	SM 2550 B	1	n/a	1/23/97		1/24/97	n/a
60	TEMP	Temperature	21.7	ºC	SM 2550 B	1	n/a	1/19/97		1/21/97	n/a
61	TIME	Cl2 Incubation Time	24.0	hrs	n/a	1	n/a	1/23/97		1/24/97	n/a
62	TOC-ICR	TOC	ND	mg/L	SM 5310 C	1	0.50	1/20/97		1/20/97	7-0-10
63	TOC-ICR	TOC (Dupl)	ND	mg/L	SM 5310 C	1	0.50	1/20/97		1/20/97	7-0-10
			ND	**mg/L**							
64	TOX-ICR	TOX	ND	µg Cl-/L	SM 5320 B	1	25	1/24/97		2/5/97	MW59545
65	TOX-ICR	TOX (Dupl)	ND	µg Cl-/L	SM 5320 B	1	25	1/24/97		2/5/97	MW59545
			ND	**µg Cl-/L**							
66	THM4	Bromodichloromethane	ND	µg/L	EPA 551	1	0.5	1/24/97	2/5/97	2/5/97	MW59396
67	THM4	Bromoform	ND	µg/L	EPA 551	1	0.5	1/24/97	2/5/97	2/5/97	MW59396
68	THM4	Chloroform	ND	µg/L	EPA 551	1	0.5	1/24/97	2/5/97	2/5/97	MW59396
69	THM4	Dibromochloromethane	ND	µg/L	EPA 551	1	0.5	1/24/97	2/5/97	2/5/97	MW59396
70	UV-ICR	UV	ND	1/cm	SM 5910 B	1	0.009	1/20/97		1/21/97	8-0-12
71	UV-ICR	UV (Dupl)	ND	1/cm	SM 5910 B	1	0.009	1/20/97		1/21/97	8-0-12
			ND	**1/cm**							

Sample ID: 3.1.20.EFF.1 **S&H ID:** 9701-58 **Date Sampled:** 1/20/97 1:00:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 3
Study Title: ICR RSSCT #1

72	Cl2Dose	Chlorine Dose	1.25	mg/L as Cl2	SM 4500-Cl B	1	n/a	1/23/97		1/23/97	n/a
73	Cl2Res	Chlorine Residual	0.78	mg/L as Cl2	SM 4500-Cl F	1	0.10	1/23/97		1/24/97	n/a
74	HAA	Bromochloroacetic acid	ND	µg/L	SM 6251 B	1	1.0	1/24/97	2/10/97	2/11/97	MW59564
75	HAA	Bromodichloroacetic acid	NR	µg/L	SM 6251 B	1	1.0	1/24/97	2/10/97	2/11/97	MW59564
76	HAA	Chlorodibromoacetic acid	NR	µg/L	SM 6251 B	1	1.0	1/24/97	2/10/97	2/11/97	MW59564
77	HAA	Dibromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	1/24/97	2/10/97	2/11/97	MW59564
78	HAA	Dichloroacetic acid	1.0	µg/L	SM 6251 B	1	1.0	1/24/97	2/10/97	2/11/97	MW59564
79	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	1/24/97	2/10/97	2/11/97	MW59564
80	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	1/24/97	2/10/97	2/11/97	MW59564
81	HAA	Tribromoacetic acid	NR	µg/L	SM 6251 B	1	1.0	1/24/97	2/10/97	2/11/97	MW59564
82	HAA	Trichloroacetic acid	ND	µg/L	SM 6251 B	1	1.0	1/24/97	2/10/97	2/11/97	MW59564
83	pH	Cl2 pH - Final	9.2	Unit	SM 4500-H+ B	1	n/a	1/23/97		1/24/97	n/a
84	pH	Cl2 pH - Initial	9.2	Unit	SM 4500-H+ B	1	n/a	1/23/97		1/23/97	n/a
85	pH	pH	9.5	Unit	SM 4500-H+ B	1	n/a	1/21/97		1/21/97	n/a
86	TEMP	Cl2 Temperature	4.2	ºC	SM 2550 B	1	n/a	1/23/97		1/24/97	n/a
87	TEMP	Temperature	21.8	ºC	SM 2550 B	1	n/a	1/19/97		1/21/97	n/a
88	TIME	Cl2 Incubation Time	24.1	hrs	n/a	1	n/a	1/23/97		1/24/97	n/a
89	TOC-ICR	TOC	ND	mg/L	SM 5310 C	1	0.50	1/20/97		1/20/97	7-0-10
90	TOC-ICR	TOC (Dupl)	ND	mg/L	SM 5310 C	1	0.50	1/20/97		1/20/97	7-0-10
			ND	**mg/L**							
91	TOX-ICR	TOX	ND	µg Cl-/L	SM 5320 B	1	25	1/24/97		2/5/97	MW59545
92	TOX-ICR	TOX (Dupl)	ND	µg Cl-/L	SM 5320 B	1	25	1/24/97		2/5/97	MW59545
			ND	**µg Cl-/L**							
93	THM4	Bromodichloromethane	ND	µg/L	EPA 551	1	0.5	1/24/97	2/5/97	2/6/97	MW59396
94	THM4	Bromoform	ND	µg/L	EPA 551	1	0.5	1/24/97	2/5/97	2/6/97	MW59396
95	THM4	Chloroform	ND	µg/L	EPA 551	1	0.5	1/24/97	2/5/97	2/6/97	MW59396
96	THM4	Dibromochloromethane	ND	µg/L	EPA 551	1	0.5	1/24/97	2/5/97	2/6/97	MW59396
97	UV-ICR	UV	ND	1/cm	SM 5910 B	1	0.009	1/20/97		1/21/97	8-0-12
98	UV-ICR	UV (Dupl)	ND	1/cm	SM 5910 B	1	0.009	1/20/97		1/21/97	8-0-12
			ND	**1/cm**							

Sample ID: 3.1.10.EFF.4 **S&H ID:** 9701-68 **Date Sampled:** 1/21/97 12:15:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
99	Cl2Dose	Chlorine Dose	1.23	mg/L as Cl2	SM 4500-Cl B	1	n/a	1/25/97		1/25/97	n/a
100	Cl2Res	Chlorine Residual	0.70	mg/L as Cl2	SM 4500-Cl F	1	0.10	1/25/97		1/26/97	n/a
101	HAA	Bromochloroacetic acid	ND	µg/L	SM 6251 B	1	1.0	1/26/97	2/10/97	2/11/97	MW59564
102	HAA	Bromodichloroacetic acid	NR	µg/L	SM 6251 B	1	1.0	1/26/97	2/10/97	2/11/97	MW59564
103	HAA	Chlorodibromoacetic acid	NR	µg/L	SM 6251 B	1	1.0	1/26/97	2/10/97	2/11/97	MW59564
104	HAA	Dibromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	1/26/97	2/10/97	2/11/97	MW59564

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 3
Study Title: ICR RSSCT #1

105	HAA	Dichloroacetic acid	1.0	µg/L	SM 6251 B	1	1.0	1/26/97	2/10/97	2/11/97	MW59564
106	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	1/26/97	2/10/97	2/11/97	MW59564
107	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	1/26/97	2/10/97	2/11/97	MW59564
108	HAA	Tribromoacetic acid	NR	µg/L	SM 6251 B	1	1.0	1/26/97	2/10/97	2/11/97	MW59564
109	HAA	Trichloroacetic acid	ND	µg/L	SM 6251 B	1	1.0	1/26/97	2/10/97	2/11/97	MW59564
110	pH	Cl2 pH - Final	9.1	Unit	SM 4500-H+ B	1	n/a	1/25/97		1/26/97	n/a
111	pH	Cl2 pH - Initial	9.1	Unit	SM 4500-H+ B	1	n/a	1/25/97		1/25/97	n/a
112	pH	pH	7.8	Unit	SM 4500-H+ B	1	n/a	1/21/97		1/21/97	n/a
113	TEMP	Cl2 Temperature	5.2	ºC	SM 2550 B	1	n/a	1/25/97		1/26/97	n/a
114	TEMP	Temperature	21.0	ºC	SM 2550 B	1	n/a	1/21/97		1/21/97	n/a
115	TIME	Cl2 Incubation Time	24.0	hrs	n/a	1	n/a	1/25/97		1/26/97	n/a
116	TOC-ICR	TOC	ND	mg/L	SM 5310 C	1	0.50	1/21/97		1/21/97	7-0-11
117	TOC-ICR	TOC (Dupl)	ND	mg/L	SM 5310 C	1	0.50	1/21/97		1/21/97	7-0-11
			ND	**mg/L**							
118	TOX-ICR	TOX	ND	µg Cl-/L	SM 5320 B	1	25	1/26/97		2/5/97	MW59545
119	TOX-ICR	TOX (Dupl)	ND	µg Cl-/L	SM 5320 B	1	25	1/26/97		2/5/97	MW59545
			ND	**µg Cl-/L**							
120	THM4	Bromodichloromethane	0.6	µg/L	EPA 551	1	0.5	1/26/97	2/5/97	2/6/97	MW59396
121	THM4	Bromoform	1.1	µg/L	EPA 551	1	0.5	1/26/97	2/5/97	2/6/97	MW59396
122	THM4	Chloroform	ND	µg/L	EPA 551	1	0.5	1/26/97	2/5/97	2/6/97	MW59396
123	THM4	Dibromochloromethane	1.2	µg/L	EPA 551	1	0.5	1/26/97	2/5/97	2/6/97	MW59396
124	UV-ICR	UV	ND	1/cm	SM 5910 B	1	0.009	1/21/97		1/22/97	8-0-13
125	UV-ICR	UV (Dupl)	ND	1/cm	SM 5910 B	1	0.009	1/21/97		1/22/97	8-0-13
			ND	**1/cm**							

Sample ID: 3.1.10.EFF.5 **S&H ID:** 9701-72 **Date Sampled:** 1/21/97 8:45:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
126	Cl2Dose	Chlorine Dose	1.33	mg/L as Cl2	SM 4500-Cl B	1	n/a	1/25/97		1/25/97	n/a
127	Cl2Res	Chlorine Residual	0.78	mg/L as Cl2	SM 4500-Cl F	1	0.10	1/25/97		1/26/97	n/a
128	HAA	Bromochloroacetic acid	1.0	µg/L	SM 6251 B	1	1.0	1/26/97	2/10/97	2/11/97	MW59564
129	HAA	Bromodichloroacetic acid	NR	µg/L	SM 6251 B	1	1.0	1/26/97	2/10/97	2/11/97	MW59564
130	HAA	Chlorodibromoacetic acid	NR	µg/L	SM 6251 B	1	1.0	1/26/97	2/10/97	2/11/97	MW59564
131	HAA	Dibromoacetic acid	1.0	µg/L	SM 6251 B	1	1.0	1/26/97	2/10/97	2/11/97	MW59564
132	HAA	Dichloroacetic acid	1.0	µg/L	SM 6251 B	1	1.0	1/26/97	2/10/97	2/11/97	MW59564
133	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	1/26/97	2/10/97	2/11/97	MW59564
134	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	1/26/97	2/10/97	2/11/97	MW59564
135	HAA	Tribromoacetic acid	NR	µg/L	SM 6251 B	1	1.0	1/26/97	2/10/97	2/11/97	MW59564
136	HAA	Trichloroacetic acid	ND	µg/L	SM 6251 B	1	1.0	1/26/97	2/10/97	2/11/97	MW59564
137	pH	Cl2 pH - Final	9.1	Unit	SM 4500-H+ B	1	n/a	1/25/97		1/26/97	n/a

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 3
Study Title: ICR RSSCT #1

138	pH	Cl2 pH - Initial	9.2	Unit	SM 4500-H+ B	1	n/a	1/25/97		1/25/97	n/a
139	pH	pH	7.4	Unit	SM 4500-H+ B	1	n/a	1/21/97		1/21/97	n/a
140	TEMP	Cl2 Temperature	5.2	ºC	SM 2550 B	1	n/a	1/25/97		1/26/97	n/a
141	TEMP	Temperature	20.8	ºC	SM 2550 B	1	n/a	1/21/97		1/21/97	n/a
142	TIME	Cl2 Incubation Time	24.0	hrs	n/a	1	n/a	1/25/97		1/26/97	n/a
143	TOC-ICR	TOC	0.61	mg/L	SM 5310 C	1	0.50	1/21/97		1/21/97	7-0-11
144	TOC-ICR	TOC (Dupl)	0.56	mg/L	SM 5310 C	1	0.50	1/21/97		1/21/97	7-0-11
			0.58	**mg/L**	**8.6 % RPD**						
145	TOX-ICR	TOX	ND	µg Cl-/L	SM 5320 B	1	25	1/26/97		2/5/97	MW59545
146	TOX-ICR	TOX (Dupl)	ND	µg Cl-/L	SM 5320 B	1	25	1/26/97		2/5/97	MW59545
			ND	**µg Cl-/L**							
147	THM4	Bromodichloromethane	1.3	µg/L	EPA 551	1	0.5	1/26/97	2/5/97	2/6/97	MW59396
148	THM4	Bromoform	1.7	µg/L	EPA 551	1	0.5	1/26/97	2/5/97	2/6/97	MW59396
149	THM4	Chloroform	0.5	µg/L	EPA 551	1	0.5	1/26/97	2/5/97	2/6/97	MW59396
150	THM4	Dibromochloromethane	2.2	µg/L	EPA 551	1	0.5	1/26/97	2/5/97	2/6/97	MW59396
151	UV-ICR	UV	ND	1/cm	SM 5910 B	1	0.009	1/21/97		1/22/97	8-0-13
152	UV-ICR	UV (Dupl)	ND	1/cm	SM 5910 B	1	0.009	1/21/97		1/22/97	8-0-13
			ND	**1/cm**							

Sample ID: 3.1.10.EFF.6 **S&H ID:** 9701-77 **Date Sampled:** 1/21/97 4:10:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
153	Cl2Dose	Chlorine Dose	1.48	mg/L as Cl2	SM 4500-Cl B	1	n/a	1/25/97		1/25/97	n/a
154	Cl2Res	Chlorine Residual	0.77	mg/L as Cl2	SM 4500-Cl F	1	0.10	1/25/97		1/26/97	n/a
155	HAA	Bromochloroacetic acid	1.0	µg/L	SM 6251 B	1	1.0	1/26/97	2/10/97	2/11/97	MW59564
156	HAA	Bromodichloroacetic acid	NR	µg/L	SM 6251 B	1	1.0	1/26/97	2/10/97	2/11/97	MW59564
157	HAA	Chlorodibromoacetic acid	NR	µg/L	SM 6251 B	1	1.0	1/26/97	2/10/97	2/11/97	MW59564
158	HAA	Dibromoacetic acid	1.0	µg/L	SM 6251 B	1	1.0	1/26/97	2/10/97	2/11/97	MW59564
159	HAA	Dichloroacetic acid	2.0	µg/L	SM 6251 B	1	1.0	1/26/97	2/10/97	2/11/97	MW59564
160	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	1/26/97	2/10/97	2/11/97	MW59564
161	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	1/26/97	2/10/97	2/11/97	MW59564
162	HAA	Tribromoacetic acid	NR	µg/L	SM 6251 B	1	1.0	1/26/97	2/10/97	2/11/97	MW59564
163	HAA	Trichloroacetic acid	ND	µg/L	SM 6251 B	1	1.0	1/26/97	2/10/97	2/11/97	MW59564
164	pH	Cl2 pH - Final	9.2	Unit	SM 4500-H+ B	1	n/a	1/25/97		1/26/97	n/a
165	pH	Cl2 pH - Initial	9.0	Unit	SM 4500-H+ B	1	n/a	1/25/97		1/25/97	n/a
166	pH	pH	8.1	Unit	SM 4500-H+ B	1	n/a	1/22/97		1/22/97	n/a
167	TEMP	Cl2 Temperature	5.2	ºC	SM 2550 B	1	n/a	1/25/97		1/26/97	n/a
168	TEMP	Temperature	22.9	ºC	SM 2550 B	1	n/a	1/22/97		1/22/97	n/a
169	TIME	Cl2 Incubation Time	24.1	hrs	n/a	1	n/a	1/25/97		1/26/97	n/a
170	TOC-ICR	TOC	1.00	mg/L	SM 5310 C	1	0.50	1/21/97		1/21/97	7-0-11

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 3
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171	TOC-ICR	TOC (Dupl)	1.02	mg/L	SM 5310 C	1	0.50	1/21/97		1/21/97	7-0-11
			1.01	**mg/L**	**2.0 % RPD**						
172	TOX-ICR	TOX	ND	µg Cl-/L	SM 5320 B	1	50	1/26/97		2/5/97	MW59545
173	TOX-ICR	TOX (Dupl)	ND	µg Cl-/L	SM 5320 B	1	50	1/26/97		2/5/97	MW59545
			ND	**µg Cl-/L**							
174	THM4	Bromodichloromethane	3.6	µg/L	EPA 551	1	0.5	1/26/97	2/5/97	2/6/97	MW59396
175	THM4	Bromoform	2.1	µg/L	EPA 551	1	0.5	1/26/97	2/5/97	2/6/97	MW59396
176	THM4	Chloroform	1.8	µg/L	EPA 551	1	0.5	1/26/97	2/5/97	2/6/97	MW59396
177	THM4	Dibromochloromethane	5.0	µg/L	EPA 551	1	0.5	1/26/97	2/5/97	2/6/97	MW59396
178	UV-ICR	UV	0.010	1/cm	SM 5910 B	1	0.009	1/21/97		1/22/97	8-0-13
179	UV-ICR	UV (Dupl)	0.010	1/cm	SM 5910 B	1	0.009	1/21/97		1/22/97	8-0-13
			0.010	**1/cm**	**0.0 % RPD**						

Sample ID: 3.1.10.EFF.6d **S&H ID:** 9701-78 **Date Sampled:** 1/21/97 4:10:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
180	Cl2Dose	Chlorine Dose	1.48	mg/L as Cl2	SM 4500-Cl B	1	n/a	1/25/97		1/25/97	n/a
181	Cl2Res	Chlorine Residual	0.76	mg/L as Cl2	SM 4500-Cl F	1	0.10	1/25/97		1/26/97	n/a
182	HAA	Bromochloroacetic acid	1.0	µg/L	SM 6251 B	1	1.0	1/26/97	2/10/97	2/11/97	MW59564
183	HAA	Bromodichloroacetic acid	NR	µg/L	SM 6251 B	1	1.0	1/26/97	2/10/97	2/11/97	MW59564
184	HAA	Chlorodibromoacetic acid	NR	µg/L	SM 6251 B	1	1.0	1/26/97	2/10/97	2/11/97	MW59564
185	HAA	Dibromoacetic acid	2.0	µg/L	SM 6251 B	1	1.0	1/26/97	2/10/97	2/11/97	MW59564
186	HAA	Dichloroacetic acid	2.0	µg/L	SM 6251 B	1	1.0	1/26/97	2/10/97	2/11/97	MW59564
187	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	1/26/97	2/10/97	2/11/97	MW59564
188	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	1/26/97	2/10/97	2/11/97	MW59564
189	HAA	Tribromoacetic acid	NR	µg/L	SM 6251 B	1	1.0	1/26/97	2/10/97	2/11/97	MW59564
190	HAA	Trichloroacetic acid	ND	µg/L	SM 6251 B	1	1.0	1/26/97	2/10/97	2/11/97	MW59564
191	pH	Cl2 pH - Final	9.1	Unit	SM 4500-H+ B	1	n/a	1/25/97		1/26/97	n/a
192	pH	Cl2 pH - Initial	9.1	Unit	SM 4500-H+ B	1	n/a	1/25/97		1/25/97	n/a
193	pH	pH	8.1	Unit	SM 4500-H+ B	1	n/a	1/21/97		1/22/97	n/a
194	TEMP	Cl2 Temperature	5.2	ºC	SM 2550 B	1	n/a	1/25/97		1/26/97	n/a
195	TEMP	Temperature	22.9	ºC	SM 2550 B	1	n/a	1/22/97		1/22/97	n/a
196	TIME	Cl2 Incubation Time	24.1	hrs	n/a	1	n/a	1/25/97		1/26/97	n/a
197	TOC-ICR	TOC	1.02	mg/L	SM 5310 C	1	0.50	1/21/97		1/22/97	7-0-12
198	TOC-ICR	TOC (Dupl)	1.02	mg/L	SM 5310 C	1	0.50	1/21/97		1/22/97	7-0-12
			1.02	**mg/L**	**0.0 % RPD**						
199	TOX-ICR	TOX	ND	µg Cl-/L	SM 5320 B	1	25	1/26/97		2/5/97	MW59545
200	TOX-ICR	TOX (Dupl)	ND	µg Cl-/L	SM 5320 B	1	25	1/26/97		2/5/97	MW59545
			ND	**µg Cl-/L**							
201	THM4	Bromodichloromethane	3.6	µg/L	EPA 551	1	0.5	1/26/97	2/5/97	2/6/97	MW59396
202	THM4	Bromoform	2.1	µg/L	EPA 551	1	0.5	1/26/97	2/5/97	2/6/97	MW59396

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 3
Study Title: ICR RSSCT #1

203	THM4	Chloroform	1.8	µg/L	EPA 551	1	0.5	1/26/97	2/5/97	2/6/97	MW59396
204	THM4	Dibromochloromethane	5.0	µg/L	EPA 551	1	0.5	1/26/97	2/5/97	2/6/97	MW59396
205	UV-ICR	UV	0.010	1/cm	SM 5910 B	1	0.009	1/21/97		1/22/97	8-0-13
206	UV-ICR	UV (Dupl)	0.010	1/cm	SM 5910 B	1	0.009	1/21/97		1/22/97	8-0-13
			0.010	**1/cm**	**0.0 % RPD**						

Sample ID: 3.1.10.EFF.7 **S&H ID:** 9701-82 **Date Sampled:** 1/21/97 10:50:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
207	Cl2Dose	Chlorine Dose	1.55	mg/L as Cl2	SM 4500-Cl B	1	n/a	1/25/97		1/25/97	n/a
208	Cl2Res	Chlorine Residual	0.69	mg/L as Cl2	SM 4500-Cl F	1	0.10	1/25/97		1/26/97	n/a
209	HAA	Bromochloroacetic acid	2.0	µg/L	SM 6251 B	1	1.0	1/26/97	2/10/97	2/11/97	MW59564
210	HAA	Bromodichloroacetic acid	NR	µg/L	SM 6251 B	1	1.0	1/26/97	2/10/97	2/11/97	MW59564
211	HAA	Chlorodibromoacetic acid	NR	µg/L	SM 6251 B	1	1.0	1/26/97	2/10/97	2/11/97	MW59564
212	HAA	Dibromoacetic acid	2.0	µg/L	SM 6251 B	1	1.0	1/26/97	2/10/97	2/11/97	MW59564
213	HAA	Dichloroacetic acid	5.0	µg/L	SM 6251 B	1	1.0	1/26/97	2/10/97	2/11/97	MW59564
214	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	1/26/97	2/10/97	2/11/97	MW59564
215	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	1/26/97	2/10/97	2/11/97	MW59564
216	HAA	Tribromoacetic acid	NR	µg/L	SM 6251 B	1	1.0	1/26/97	2/10/97	2/11/97	MW59564
217	HAA	Trichloroacetic acid	1.0	µg/L	SM 6251 B	1	1.0	1/26/97	2/10/97	2/11/97	MW59564
218	pH	Cl2 pH - Final	9.2	Unit	SM 4500-H+ B	1	n/a	1/25/97		1/26/97	n/a
219	pH	Cl2 pH - Initial	9.2	Unit	SM 4500-H+ B	1	n/a	1/25/97		1/25/97	n/a
220	pH	pH	8.5	Unit	SM 4500-H+ B	1	n/a	1/21/97		1/22/97	n/a
221	TEMP	Cl2 Temperature	5.2	ºC	SM 2550 B	1	n/a	1/25/97		1/26/97	n/a
222	TEMP	Temperature	23.6	ºC	SM 2550 B	1	n/a	1/22/97		1/22/97	n/a
223	TIME	Cl2 Incubation Time	24.2	hrs	n/a	1	n/a	1/25/97		1/26/97	n/a
224	TOC-ICR	TOC	1.41	mg/L	SM 5310 C	1	0.50	1/21/97		1/22/97	7-0-12
225	TOC-ICR	TOC (Dupl)	1.44	mg/L	SM 5310 C	1	0.50	1/21/97		1/22/97	7-0-12
			1.42	**mg/L**	**2.1 % RPD**						
226	TOX-ICR	TOX	39	µg Cl-/L	SM 5320 B	1	25	1/26/97		2/5/97	MW59545
227	TOX-ICR	TOX (Dupl)	39	µg Cl-/L	SM 5320 B	1	25	1/26/97		2/5/97	MW59545
			39	**µg Cl-/L**	**0.0 % RPD**						
228	THM4	Bromodichloromethane	6.6	µg/L	EPA 551	1	0.5	1/26/97	2/5/97	2/6/97	MW59396
229	THM4	Bromoform	1.4	µg/L	EPA 551	1	0.5	1/26/97	2/5/97	2/6/97	MW59396
230	THM4	Chloroform	5.1	µg/L	EPA 551	1	0.5	1/26/97	2/5/97	2/6/97	MW59396
231	THM4	Dibromochloromethane	5.8	µg/L	EPA 551	1	0.5	1/26/97	2/5/97	2/6/97	MW59396
232	UV-ICR	UV	0.017	1/cm	SM 5910 B	1	0.009	1/21/97		1/23/97	8-0-14
233	UV-ICR	UV (Dupl)	0.017	1/cm	SM 5910 B	1	0.009	1/21/97		1/23/97	8-0-14
			0.017	**1/cm**	**0.0 % RPD**						

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Summers & Hooper, Inc.
6 Knollcrest Drive
Cincinnati, OH 45237

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 3
Study Title: ICR RSSCT #1

Sample ID: 3.1.10.EFF.8 **S&H ID:** 9701-89 **Date Sampled:** 1/22/97 2:25:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
234	Cl2Dose	Chlorine Dose	1.60	mg/L as Cl2	SM 4500-Cl B	1	n/a	1/27/97		1/27/97	n/a
235	Cl2Res	Chlorine Residual	0.63	mg/L as Cl2	SM 4500-Cl F	1	0.10	1/27/97		1/28/97	n/a
236	HAA	Bromochloroacetic acid	3.0	µg/L	SM 6251 B	1	1.0	1/28/97	2/10/97	2/11/97	MW59564
237	HAA	Bromodichloroacetic acid	1.0	µg/L	SM 6251 B	1	1.0	1/28/97	2/10/97	2/11/97	MW59564
238	HAA	Chlorodibromoacetic acid	1.0	µg/L	SM 6251 B	1	1.0	1/28/97	2/10/97	2/11/97	MW59564
239	HAA	Dibromoacetic acid	2.0	µg/L	SM 6251 B	1	1.0	1/28/97	2/10/97	2/11/97	MW59564
240	HAA	Dichloroacetic acid	6.0	µg/L	SM 6251 B	1	1.0	1/28/97	2/10/97	2/11/97	MW59564
241	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	1/28/97	2/10/97	2/11/97	MW59564
242	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	1/28/97	2/10/97	2/11/97	MW59564
243	HAA	Tribromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	1/28/97	2/10/97	2/11/97	MW59564
244	HAA	Trichloroacetic acid	1.0	µg/L	SM 6251 B	1	1.0	1/28/97	2/10/97	2/11/97	MW59564
245	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	1/27/97		1/28/97	n/a
246	pH	Cl2 pH - Initial	9.1	Unit	SM 4500-H+ B	1	n/a	1/27/97		1/27/97	n/a
247	pH	pH	8.5	Unit	SM 4500-H+ B	1	n/a	1/21/97		1/22/97	n/a
248	TEMP	Cl2 Temperature	4.7	ºC	SM 2550 B	1	n/a	1/27/97		1/28/97	n/a
249	TEMP	Temperature	23.8	ºC	SM 2550 B	1	n/a	1/22/97		1/22/97	n/a
250	TIME	Cl2 Incubation Time	24.3	hrs	n/a	1	n/a	1/27/97		1/28/97	n/a
251	TOC-ICR	TOC	1.54	mg/L	SM 5310 C	1	0.50	1/22/97		1/22/97	7-0-12
252	TOC-ICR	TOC (Dupl)	1.57	mg/L	SM 5310 C	1	0.50	1/22/97		1/22/97	7-0-12
			1.56	**mg/L**	**1.9 % RPD**						
253	TOX-ICR	TOX	45	µg Cl-/L	SM 5320 B	1	25	1/28/97		2/7/97	MW59546
254	TOX-ICR	TOX (Dupl)	44	µg Cl-/L	SM 5320 B	1	25	1/28/97		2/7/97	MW59546
			45	**µg Cl-/L**	**2.2 % RPD**						
255	THM4	Bromodichloromethane	7.5	µg/L	EPA 551	1	0.5	1/28/97	2/5/97	2/12/97	MW59764
256	THM4	Bromoform	1.8	µg/L	EPA 551	1	0.5	1/28/97	2/5/97	2/12/97	MW59764
257	THM4	Chloroform	5.3	µg/L	EPA 551	1	0.5	1/28/97	2/5/97	2/12/97	MW59764
258	THM4	Dibromochloromethane	6.8	µg/L	EPA 551	1	0.5	1/28/97	2/5/97	2/12/97	MW59764
259	UV-ICR	UV	0.019	1/cm	SM 5910 B	1	0.009	1/22/97		1/23/97	8-0-14
260	UV-ICR	UV (Dupl)	0.019	1/cm	SM 5910 B	1	0.009	1/22/97		1/23/97	8-0-14
			0.019	**1/cm**	**0.0 % RPD**						

Sample ID: 3.1.10.EFF.9 **S&H ID:** 9701-91 **Date Sampled:** 1/22/97 10:00:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
261	Cl2Dose	Chlorine Dose	1.67	mg/L as Cl2	SM 4500-Cl B	1	n/a	1/27/97		1/27/97	n/a
262	Cl2Res	Chlorine Residual	0.71	mg/L as Cl2	SM 4500-Cl F	1	0.10	1/27/97		1/28/97	n/a
263	HAA	Bromochloroacetic acid	3.0	µg/L	SM 6251 B	1	1.0	1/28/97	2/10/97	2/11/97	MW59564
264	HAA	Bromodichloroacetic acid	1.0	µg/L	SM 6251 B	1	1.0	1/28/97	2/10/97	2/11/97	MW59564

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 3
Study Title: ICR RSSCT #1

265	HAA	Chlorodibromoacetic acid	1.0	µg/L	SM 6251 B	1	1.0	1/28/97	2/10/97	2/11/97	MW59564
266	HAA	Dibromoacetic acid	2.0	µg/L	SM 6251 B	1	1.0	1/28/97	2/10/97	2/11/97	MW59564
267	HAA	Dichloroacetic acid	8.0	µg/L	SM 6251 B	1	1.0	1/28/97	2/10/97	2/11/97	MW59564
268	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	1/28/97	2/10/97	2/11/97	MW59564
269	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	1/28/97	2/10/97	2/11/97	MW59564
270	HAA	Tribromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	1/28/97	2/10/97	2/11/97	MW59564
271	HAA	Trichloroacetic acid	1.0	µg/L	SM 6251 B	1	1.0	1/28/97	2/10/97	2/11/97	MW59564
272	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	1/27/97		1/28/97	n/a
273	pH	Cl2 pH - Initial	9.1	Unit	SM 4500-H+ B	1	n/a	1/27/97		1/27/97	n/a
274	pH	pH	8.4	Unit	SM 4500-H+ B	1	n/a	1/22/97		1/22/97	n/a
275	TEMP	Cl2 Temperature	4.7	ºC	SM 2550 B	1	n/a	1/27/97		1/28/97	n/a
276	TEMP	Temperature	23.8	ºC	SM 2550 B	1	n/a	1/22/97		1/22/97	n/a
277	TIME	Cl2 Incubation Time	24.3	hrs	n/a	1	n/a	1/27/97		1/28/97	n/a
278	TOC-ICR	TOC	1.74	mg/L	SM 5310 C	1	0.50	1/22/97		1/22/97	7-0-12
279	TOC-ICR	TOC (Dupl)	1.76	mg/L	SM 5310 C	1	0.50	1/22/97		1/22/97	7-0-12
			1.75	**mg/L**	**1.1 % RPD**						
280	TOX-ICR	TOX	56	µg Cl-/L	SM 5320 B	1	25	1/28/97		2/7/97	MW59546
281	TOX-ICR	TOX (Dupl)	55	µg Cl-/L	SM 5320 B	1	25	1/28/97		2/7/97	MW59546
			56	**µg Cl-/L**	**1.8 % RPD**						
282	THM4	Bromodichloromethane	8.3	µg/L	EPA 551	1	0.5	1/28/97	2/5/97	2/11/97	MW59763
283	THM4	Bromoform	1.4	µg/L	EPA 551	1	0.5	1/28/97	2/5/97	2/11/97	MW59763
284	THM4	Chloroform	7.6	µg/L	EPA 551	1	0.5	1/28/97	2/5/97	2/11/97	MW59763
285	THM4	Dibromochloromethane	6.5	µg/L	EPA 551	1	0.5	1/28/97	2/5/97	2/11/97	MW59763
286	UV-ICR	UV	0.022	1/cm	SM 5910 B	1	0.009	1/22/97		1/23/97	8-0-14
287	UV-ICR	UV (Dupl)	0.022	1/cm	SM 5910 B	1	0.009	1/22/97		1/23/97	8-0-14
			0.022	**1/cm**	**0.0 % RPD**						

Sample ID: 3.1.10.EFF.9d **S&H ID:** 9701-92 **Date Sampled:** 1/22/97 10:00:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
288	Cl2Dose	Chlorine Dose	1.67	mg/L as Cl2	SM 4500-Cl B	1	n/a	1/27/97		1/27/97	n/a
289	Cl2Res	Chlorine Residual	0.73	mg/L as Cl2	SM 4500-Cl F	1	0.10	1/27/97		1/28/97	n/a
290	HAA	Bromochloroacetic acid	3.0	µg/L	SM 6251 B	1	1.0	1/28/97	2/10/97	2/11/97	MW59564
291	HAA	Bromodichloroacetic acid	1.0	µg/L	SM 6251 B	1	1.0	1/28/97	2/10/97	2/11/97	MW59564
292	HAA	Chlorodibromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	1/28/97	2/10/97	2/11/97	MW59564
293	HAA	Dibromoacetic acid	2.0	µg/L	SM 6251 B	1	1.0	1/28/97	2/10/97	2/11/97	MW59564
294	HAA	Dichloroacetic acid	8.0	µg/L	SM 6251 B	1	1.0	1/28/97	2/10/97	2/11/97	MW59564
295	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	1/28/97	2/10/97	2/11/97	MW59564
296	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	1/28/97	2/10/97	2/11/97	MW59564
297	HAA	Tribromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	1/28/97	2/10/97	2/11/97	MW59564
298	HAA	Trichloroacetic acid	1.0	µg/L	SM 6251 B	1	1.0	1/28/97	2/10/97	2/11/97	MW59564

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 3
Study Title: ICR RSSCT #1

299	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	1/27/97		1/28/97	n/a
300	pH	Cl2 pH - Initial	9.1	Unit	SM 4500-H+ B	1	n/a	1/27/97		1/27/97	n/a
301	pH	pH	8.4	Unit	SM 4500-H+ B	1	n/a	1/22/97		1/22/97	n/a
302	TEMP	Cl2 Temperature	4.7	ºC	SM 2550 B	1	n/a	1/27/97		1/28/97	n/a
303	TEMP	Temperature	23.8	ºC	SM 2550 B	1	n/a	1/22/97		1/22/97	n/a
304	TIME	Cl2 Incubation Time	24.3	hrs	n/a	1	n/a	1/27/97		1/28/97	n/a
305	TOC-ICR	TOC	1.72	mg/L	SM 5310 C	1	0.50	1/22/97		1/23/97	7-0-13
306	TOC-ICR	TOC (Dupl)	1.75	mg/L	SM 5310 C	1	0.50	1/22/97		1/23/97	7-0-13
			1.73	**mg/L**	**1.7 % RPD**						
307	TOX-ICR	TOX	56	µg Cl-/L	SM 5320 B	1	25	1/28/97		2/7/97	MW59546
308	TOX-ICR	TOX (Dupl)	53	µg Cl-/L	SM 5320 B	1	25	1/28/97		2/7/97	MW59546
			55	**µg Cl-/L**	**5.5 % RPD**						
309	THM4	Bromodichloromethane	8.4	µg/L	EPA 551	1	0.5	1/28/97	2/5/97	2/11/97	MW59763
310	THM4	Bromoform	1.7	µg/L	EPA 551	1	0.5	1/28/97	2/5/97	2/11/97	MW59763
311	THM4	Chloroform	7.5	µg/L	EPA 551	1	0.5	1/28/97	2/5/97	2/11/97	MW59763
312	THM4	Dibromochloromethane	6.7	µg/L	EPA 551	1	0.5	1/28/97	2/5/97	2/11/97	MW59763
313	UV-ICR	UV	0.022	1/cm	SM 5910 B	1	0.009	1/22/97		1/23/97	8-0-14
314	UV-ICR	UV (Dupl)	0.022	1/cm	SM 5910 B	1	0.009	1/22/97		1/23/97	8-0-14
			0.022	**1/cm**	**0.0 % RPD**						

Sample ID: 3.1.20.EFF.9 **S&H ID:** 9701-93 **Date Sampled:** 1/22/97 10:00:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
315	Cl2Dose	Chlorine Dose	1.04	mg/L as Cl2	SM 4500-Cl B	1	n/a	1/27/97		1/27/97	n/a
316	Cl2Res	Chlorine Residual	0.51	mg/L as Cl2	SM 4500-Cl F	1	0.10	1/27/97		1/28/97	n/a
317	HAA	Bromochloroacetic acid	ND	µg/L	SM 6251 B	1	1.0	1/28/97	2/10/97	2/11/97	MW59564
318	HAA	Bromodichloroacetic acid	ND	µg/L	SM 6251 B	1	1.0	1/28/97	2/10/97	2/11/97	MW59564
319	HAA	Chlorodibromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	1/28/97	2/10/97	2/11/97	MW59564
320	HAA	Dibromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	1/28/97	2/10/97	2/11/97	MW59564
321	HAA	Dichloroacetic acid	1.0	µg/L	SM 6251 B	1	1.0	1/28/97	2/10/97	2/11/97	MW59564
322	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	1/28/97	2/10/97	2/11/97	MW59564
323	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	1/28/97	2/10/97	2/11/97	MW59564
324	HAA	Tribromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	1/28/97	2/10/97	2/11/97	MW59564
325	HAA	Trichloroacetic acid	ND	µg/L	SM 6251 B	1	1.0	1/28/97	2/10/97	2/11/97	MW59564
326	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	1/27/97		1/28/97	n/a
327	pH	Cl2 pH - Initial	9.1	Unit	SM 4500-H+ B	1	n/a	1/27/97		1/27/97	n/a
328	pH	pH	8.0	Unit	SM 4500-H+ B	1	n/a	1/22/97		1/22/97	n/a
329	TEMP	Cl2 Temperature	4.7	ºC	SM 2550 B	1	n/a	1/27/97		1/28/97	n/a
330	TEMP	Temperature	23.9	ºC	SM 2550 B	1	n/a	1/22/97		1/22/97	n/a
331	TIME	Cl2 Incubation Time	24.4	hrs	n/a	1	n/a	1/27/97		1/28/97	n/a

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 3
Study Title: ICR RSSCT #1

332	TOC-ICR	TOC	ND	mg/L	SM 5310 C	1	0.50	1/22/97		1/22/97	7-0-12
333	TOC-ICR	TOC (Dupl)	ND	mg/L	SM 5310 C	1	0.50	1/22/97		1/22/97	7-0-12
			ND	**mg/L**							
334	TOX-ICR	TOX	ND	µg Cl-/L	SM 5320 B	1	25	1/28/97		2/7/97	MW59546
335	TOX-ICR	TOX (Dupl)	ND	µg Cl-/L	SM 5320 B	1	25	1/28/97		2/7/97	MW59546
			ND	**µg Cl-/L**							
336	THM4	Bromodichloromethane	0.7	µg/L	EPA 551	1	0.5	1/28/97	2/5/97	2/12/97	MW59764
337	THM4	Bromoform	1.7	µg/L	EPA 551	1	0.5	1/28/97	2/5/97	2/12/97	MW59764
338	THM4	Chloroform	ND	µg/L	EPA 551	1	0.5	1/28/97	2/5/97	2/12/97	MW59764
339	THM4	Dibromochloromethane	1.7	µg/L	EPA 551	1	0.5	1/28/97	2/5/97	2/12/97	MW59764
340	UV-ICR	UV	ND	1/cm	SM 5910 B	1	0.009	1/22/97		1/23/97	8-0-14
341	UV-ICR	UV (Dupl)	ND	1/cm	SM 5910 B	1	0.009	1/22/97		1/23/97	8-0-14
			ND	**1/cm**							

Sample ID: 3.1.10.EFF.10 **S&H ID:** 9701-96 **Date Sampled:** 1/22/97 5:30:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
342	Cl2Dose	Chlorine Dose	1.80	mg/L as Cl2	SM 4500-Cl B	1	n/a	1/27/97		1/27/97	n/a
343	Cl2Res	Chlorine Residual	0.79	mg/L as Cl2	SM 4500-Cl F	1	0.10	1/27/97		1/28/97	n/a
344	HAA	Bromochloroacetic acid	3.0	µg/L	SM 6251 B	1	1.0	1/28/97	2/10/97	2/11/97	MW59564
345	HAA	Bromodichloroacetic acid	1.0	µg/L	SM 6251 B	1	1.0	1/28/97	2/10/97	2/11/97	MW59564
346	HAA	Chlorodibromoacetic acid	1.0	µg/L	SM 6251 B	1	1.0	1/28/97	2/10/97	2/11/97	MW59564
347	HAA	Dibromoacetic acid	1.0	µg/L	SM 6251 B	1	1.0	1/28/97	2/10/97	2/11/97	MW59564
348	HAA	Dichloroacetic acid	9.0	µg/L	SM 6251 B	1	1.0	1/28/97	2/10/97	2/11/97	MW59564
349	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	1/28/97	2/10/97	2/11/97	MW59564
350	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	1/28/97	2/10/97	2/11/97	MW59564
351	HAA	Tribromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	1/28/97	2/10/97	2/11/97	MW59564
352	HAA	Trichloroacetic acid	2.0	µg/L	SM 6251 B	1	1.0	1/28/97	2/10/97	2/11/97	MW59564
353	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	1/27/97		1/28/97	n/a
354	pH	Cl2 pH - Initial	9.1	Unit	SM 4500-H+ B	1	n/a	1/27/97		1/27/97	n/a
355	pH	pH	8.2	Unit	SM 4500-H+ B	1	n/a	1/22/97		1/22/97	n/a
356	TEMP	Cl2 Temperature	4.7	ºC	SM 2550 B	1	n/a	1/27/97		1/28/97	n/a
357	TEMP	Temperature	24.4	ºC	SM 2550 B	1	n/a	1/22/97		1/22/97	n/a
358	TIME	Cl2 Incubation Time	24.4	hrs	n/a	1	n/a	1/27/97		1/28/97	n/a
359	TOC-ICR	TOC	1.94	mg/L	SM 5310 C	1	0.50	1/22/97		1/23/97	7-0-13
360	TOC-ICR	TOC (Dupl)	2.04	mg/L	SM 5310 C	1	0.50	1/22/97		1/23/97	7-0-13
			1.99	**mg/L**	**5.0 % RPD**						
361	TOX-ICR	TOX	72	µg Cl-/L	SM 5320 B	1	25	1/28/97		2/10/97	MW59872
362	TOX-ICR	TOX (Dupl)	70	µg Cl-/L	SM 5320 B	1	25	1/28/97		2/10/97	MW59872
			71	**µg Cl-/L**	**2.8 % RPD**						
363	THM4	Bromodichloromethane	9.9	µg/L	EPA 551	1	0.5	1/28/97	2/5/97	2/12/97	MW59764

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 3
Study Title: ICR RSSCT #1

364	THM4	Bromoform	1.3	µg/L	EPA 551	1	0.5	1/28/97	2/5/97	2/12/97	MW59764
365	THM4	Chloroform	9.6	µg/L	EPA 551	1	0.5	1/28/97	2/5/97	2/12/97	MW59764
366	THM4	Dibromochloromethane	6.9	µg/L	EPA 551	1	0.5	1/28/97	2/5/97	2/12/97	MW59764
367	UV-ICR	UV	0.025	1/cm	SM 5910 B	1	0.009	1/22/97		1/23/97	8-0-14
368	UV-ICR	UV (Dupl)	0.025	1/cm	SM 5910 B	1	0.009	1/22/97		1/23/97	8-0-14
			0.025	**1/cm**	**0.0 % RPD**						

Sample ID: 3.1.20.EFF.12 **S&H ID:** 9701-106 **Date Sampled:** 1/23/97 9:20:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
369	Cl2Dose	Chlorine Dose	1.29	mg/L as Cl2	SM 4500-Cl B	1	n/a	1/27/97		1/27/97	n/a
370	Cl2Res	Chlorine Residual	0.74	mg/L as Cl2	SM 4500-Cl F	1	0.10	1/27/97		1/28/97	n/a
371	HAA	Bromochloroacetic acid	1.0	µg/L	SM 6251 B	1	1.0	1/28/97	2/10/97	2/11/97	MW59564
372	HAA	Bromodichloroacetic acid	ND	µg/L	SM 6251 B	1	1.0	1/28/97	2/10/97	2/11/97	MW59564
373	HAA	Chlorodibromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	1/28/97	2/10/97	2/11/97	MW59564
374	HAA	Dibromoacetic acid	1.0	µg/L	SM 6251 B	1	1.0	1/28/97	2/10/97	2/11/97	MW59564
375	HAA	Dichloroacetic acid	1.0	µg/L	SM 6251 B	1	1.0	1/28/97	2/10/97	2/11/97	MW59564
376	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	1/28/97	2/10/97	2/11/97	MW59564
377	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	1/28/97	2/10/97	2/11/97	MW59564
378	HAA	Tribromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	1/28/97	2/10/97	2/11/97	MW59564
379	HAA	Trichloroacetic acid	ND	µg/L	SM 6251 B	1	1.0	1/28/97	2/10/97	2/11/97	MW59564
380	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	1/27/97		1/28/97	n/a
381	pH	Cl2 pH - Initial	9.1	Unit	SM 4500-H+ B	1	n/a	1/27/97		1/27/97	n/a
382	pH	pH	8.2	Unit	SM 4500-H+ B	1	n/a	1/23/97		1/23/97	n/a
383	TEMP	Cl2 Temperature	4.7	ºC	SM 2550 B	1	n/a	1/27/97		1/28/97	n/a
384	TEMP	Temperature	20.8	ºC	SM 2550 B	1	n/a	1/23/97		1/23/97	n/a
385	TIME	Cl2 Incubation Time	24.5	hrs	n/a	1	n/a	1/27/97		1/28/97	n/a
386	TOC-ICR	TOC	0.66	mg/L	SM 5310 C	1	0.50	1/23/97		1/23/97	7-0-13
387	TOC-ICR	TOC (Dupl)	0.65	mg/L	SM 5310 C	1	0.50	1/23/97		1/23/97	7-0-13
			0.66	**mg/L**	**1.5 % RPD**						
388	TOX-ICR	TOX	ND	µg Cl-/L	SM 5320 B	1	25	1/28/97		2/8/97	MW59827
389	TOX-ICR	TOX (Dupl)	ND	µg Cl-/L	SM 5320 B	1	25	1/28/97		2/8/97	MW59827
			ND	**µg Cl-/L**							
390	THM4	Bromodichloromethane	2.1	µg/L	EPA 551	1	0.5	1/28/97	2/5/97	2/11/97	MW59763
391	THM4	Bromoform	2.8	µg/L	EPA 551	1	0.5	1/28/97	2/5/97	2/11/97	MW59763
392	THM4	Chloroform	0.8	µg/L	EPA 551	1	0.5	1/28/97	2/5/97	2/11/97	MW59763
393	THM4	Dibromochloromethane	3.9	µg/L	EPA 551	1	0.5	1/28/97	2/5/97	2/11/97	MW59763
394	UV-ICR	UV	ND	1/cm	SM 5910 B	1	0.009	1/23/97		1/24/97	8-0-15
395	UV-ICR	UV (Dupl)	ND	1/cm	SM 5910 B	1	0.009	1/23/97		1/24/97	8-0-15
			ND	**1/cm**							

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Summers & Hooper, Inc.
6 Knollcrest Drive
Cincinnati, OH 45237

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 3
Study Title: ICR RSSCT #1

Sample ID: 3.1.20.EFF.12d **S&H ID:** 9701-107 **Date Sampled:** 1/23/97 9:20:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
396	Cl2Dose	Chlorine Dose	1.29	mg/L as Cl2	SM 4500-Cl B	1	n/a	1/27/97		1/27/97	n/a
397	Cl2Res	Chlorine Residual	0.69	mg/L as Cl2	SM 4500-Cl F	1	0.10	1/27/97		1/28/97	n/a
398	HAA	Bromochloroacetic acid	1.0	µg/L	SM 6251 B	1	1.0	1/28/97	2/10/97	2/11/97	MW59564
399	HAA	Bromodichloroacetic acid	ND	µg/L	SM 6251 B	1	1.0	1/28/97	2/10/97	2/11/97	MW59564
400	HAA	Chlorodibromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	1/28/97	2/10/97	2/11/97	MW59564
401	HAA	Dibromoacetic acid	1.0	µg/L	SM 6251 B	1	1.0	1/28/97	2/10/97	2/11/97	MW59564
402	HAA	Dichloroacetic acid	1.0	µg/L	SM 6251 B	1	1.0	1/28/97	2/10/97	2/11/97	MW59564
403	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	1/28/97	2/10/97	2/11/97	MW59564
404	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	1/28/97	2/10/97	2/11/97	MW59564
405	HAA	Tribromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	1/28/97	2/10/97	2/11/97	MW59564
406	HAA	Trichloroacetic acid	ND	µg/L	SM 6251 B	1	1.0	1/28/97	2/10/97	2/11/97	MW59564
407	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	1/27/97		1/28/97	n/a
408	pH	Cl2 pH - Initial	9.1	Unit	SM 4500-H+ B	1	n/a	1/27/97		1/27/97	n/a
409	pH	pH	8.2	Unit	SM 4500-H+ B	1	n/a	1/23/97		1/23/97	n/a
410	TEMP	Cl2 Temperature	4.7	ºC	SM 2550 B	1	n/a	1/27/97		1/28/97	n/a
411	TEMP	Temperature	20.7	ºC	SM 2550 B	1	n/a	1/23/97		1/23/97	n/a
412	TIME	Cl2 Incubation Time	24.5	hrs	n/a	1	n/a	1/27/97		1/28/97	n/a
413	TOC-ICR	TOC	0.64	mg/L	SM 5310 C	1	0.50	1/23/97		1/23/97	7-0-13
414	TOC-ICR	TOC (Dupl)	0.62	mg/L	SM 5310 C	1	0.50	1/23/97		1/23/97	7-0-13
			0.63	**mg/L**	**3.2 % RPD**						
415	TOX-ICR	TOX	ND	µg Cl-/L	SM 5320 B	1	25	1/28/97		2/8/97	MW59827
416	TOX-ICR	TOX (Dupl)	ND	µg Cl-/L	SM 5320 B	1	25	1/28/97		2/8/97	MW59827
			ND	**µg Cl-/L**							
417	THM4	Bromodichloromethane	2.0	µg/L	EPA 551	1	0.5	1/28/97	2/5/97	2/12/97	MW59764
418	THM4	Bromoform	2.5	µg/L	EPA 551	1	0.5	1/28/97	2/5/97	2/12/97	MW59764
419	THM4	Chloroform	0.6	µg/L	EPA 551	1	0.5	1/28/97	2/5/97	2/12/97	MW59764
420	THM4	Dibromochloromethane	3.7	µg/L	EPA 551	1	0.5	1/28/97	2/5/97	2/12/97	MW59764
421	UV-ICR	UV	ND	1/cm	SM 5910 B	1	0.009	1/23/97		1/24/97	8-0-15
422	UV-ICR	UV (Dupl)	ND	1/cm	SM 5910 B	1	0.009	1/23/97		1/24/97	8-0-15
			ND	**1/cm**							

Sample ID: 3.1.10.EFF.13 **S&H ID:** 9701-109 **Date Sampled:** 1/23/97 4:50:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
423	Cl2Dose	Chlorine Dose	1.87	mg/L as Cl2	SM 4500-Cl B	1	n/a	1/27/97		1/27/97	n/a
424	Cl2Res	Chlorine Residual	0.73	mg/L as Cl2	SM 4500-Cl F	1	0.10	1/27/97		1/28/97	n/a
425	HAA	Bromochloroacetic acid	4.0	µg/L	SM 6251 B	1	1.0	1/28/97	2/10/97	2/11/97	MW59564

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 3
Study Title: ICR RSSCT #1

426	HAA	Bromodichloroacetic acid	2.0	µg/L	SM 6251 B	1	1.0	1/28/97	2/10/97	2/11/97	MW59564
427	HAA	Chlorodibromoacetic acid	2.0	µg/L	SM 6251 B	1	1.0	1/28/97	2/10/97	2/11/97	MW59564
428	HAA	Dibromoacetic acid	1.0	µg/L	SM 6251 B	1	1.0	1/28/97	2/10/97	2/11/97	MW59564
429	HAA	Dichloroacetic acid	8.0	µg/L	SM 6251 B	1	1.0	1/28/97	2/10/97	2/11/97	MW59564
430	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	1/28/97	2/10/97	2/11/97	MW59564
431	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	1/28/97	2/10/97	2/11/97	MW59564
432	HAA	Tribromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	1/28/97	2/10/97	2/11/97	MW59564
433	HAA	Trichloroacetic acid	3.0	µg/L	SM 6251 B	1	1.0	1/28/97	2/10/97	2/11/97	MW59564
434	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	1/27/97		1/28/97	n/a
435	pH	Cl2 pH - Initial	9.1	Unit	SM 4500-H+ B	1	n/a	1/27/97		1/27/97	n/a
436	pH	pH	8.2	Unit	SM 4500-H+ B	1	n/a	1/23/97		1/23/97	n/a
437	TEMP	Cl2 Temperature	4.7	ºC	SM 2550 B	1	n/a	1/27/97		1/28/97	n/a
438	TEMP	Temperature	21.6	ºC	SM 2550 B	1	n/a	1/23/97		1/23/97	n/a
439	TIME	Cl2 Incubation Time	24.3	hrs	n/a	1	n/a	1/27/97		1/28/97	n/a
440	TOC-ICR	TOC	2.24	mg/L	SM 5310 C	1	0.50	1/23/97		1/23/97	7-0-13
441	TOC-ICR	TOC (Dupl)	2.26	mg/L	SM 5310 C	1	0.50	1/23/97		1/23/97	7-0-13
			2.25	**mg/L**	**0.9 % RPD**						
442	TOX-ICR	TOX	99	µg Cl-/L	SM 5320 B	1	25	1/28/97		2/8/97	MW59827
443	TOX-ICR	TOX (Dupl)	98	µg Cl-/L	SM 5320 B	1	25	1/28/97		2/8/97	MW59827
			99	**µg Cl-/L**	**1.0 % RPD**						
444	THM4	Bromodichloromethane	10.8	µg/L	EPA 551	1	0.5	1/28/97	2/5/97	2/11/97	MW59763
445	THM4	Bromoform	1.1	µg/L	EPA 551	1	0.5	1/28/97	2/5/97	2/11/97	MW59763
446	THM4	Chloroform	15.2	µg/L	EPA 551	1	0.5	1/28/97	2/5/97	2/11/97	MW59763
447	THM4	Dibromochloromethane	5.9	µg/L	EPA 551	1	0.5	1/28/97	2/5/97	2/11/97	MW59763
448	UV-ICR	UV	0.034	1/cm	SM 5910 B	1	0.009	1/23/97		1/24/97	8-0-15
449	UV-ICR	UV (Dupl)	0.034	1/cm	SM 5910 B	1	0.009	1/23/97		1/24/97	8-0-15
			0.034	**1/cm**	**0.0 % RPD**						

Sample ID: 3.1.20.EFF.14 **S&H ID:** 9701-115 **Date Sampled:** 1/23/97 11:40:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
450	Cl2Dose	Chlorine Dose	1.42	mg/L as Cl2	SM 4500-Cl B	1	n/a	1/27/97		1/27/97	n/a
451	Cl2Res	Chlorine Residual	0.80	mg/L as Cl2	SM 4500-Cl F	1	0.10	1/27/97		1/28/97	n/a
452	HAA	Bromochloroacetic acid	1.0	µg/L	SM 6251 B	1	1.0	1/28/97	2/10/97	2/11/97	MW59564
453	HAA	Bromodichloroacetic acid	ND	µg/L	SM 6251 B	1	1.0	1/28/97	2/10/97	2/11/97	MW59564
454	HAA	Chlorodibromoacetic acid	1.0	µg/L	SM 6251 B	1	1.0	1/28/97	2/10/97	2/11/97	MW59564
455	HAA	Dibromoacetic acid	1.0	µg/L	SM 6251 B	1	1.0	1/28/97	2/10/97	2/11/97	MW59564
456	HAA	Dichloroacetic acid	1.0	µg/L	SM 6251 B	1	1.0	1/28/97	2/10/97	2/11/97	MW59564
457	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	1/28/97	2/10/97	2/11/97	MW59564
458	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	1/28/97	2/10/97	2/11/97	MW59564
459	HAA	Tribromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	1/28/97	2/10/97	2/11/97	MW59564

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 3
Study Title: ICR RSSCT #1

460	HAA	Trichloroacetic acid	ND	µg/L	SM 6251 B	1	1.0	1/28/97	2/10/97	2/11/97	MW59564
461	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	1/27/97		1/28/97	n/a
462	pH	Cl2 pH - Initial	9.1	Unit	SM 4500-H+ B	1	n/a	1/27/97		1/27/97	n/a
463	pH	pH	8.1	Unit	SM 4500-H+ B	1	n/a	1/23/97		1/23/97	n/a
464	TEMP	Cl2 Temperature	4.7	ºC	SM 2550 B	1	n/a	1/27/97		1/28/97	n/a
465	TEMP	Temperature	20.7	ºC	SM 2550 B	1	n/a	1/23/97		1/23/97	n/a
466	TIME	Cl2 Incubation Time	24.5	hrs	n/a	1	n/a	1/27/97		1/28/97	n/a
467	TOC-ICR	TOC	0.84	mg/L	SM 5310 C	1	0.50	1/23/97		1/24/97	7-0-14
468	TOC-ICR	TOC (Dupl)	0.84	mg/L	SM 5310 C	1	0.50	1/23/97		1/24/97	7-0-14
			0.84	**mg/L**	**0.0 % RPD**						
469	TOX-ICR	TOX	ND	µg Cl-/L	SM 5320 B	1	25	1/28/97		2/10/97	MW59872
470	TOX-ICR	TOX (Dupl)	ND	µg Cl-/L	SM 5320 B	1	25	1/28/97		2/10/97	MW59872
			ND	**µg Cl-/L**							
471	THM4	Bromodichloromethane	3.3	µg/L	EPA 551	1	0.5	1/28/97	2/5/97	2/12/97	MW59764
472	THM4	Bromoform	2.6	µg/L	EPA 551	1	0.5	1/28/97	2/5/97	2/12/97	MW59764
473	THM4	Chloroform	1.0	µg/L	EPA 551	1	0.5	1/28/97	2/5/97	2/12/97	MW59764
474	THM4	Dibromochloromethane	5.1	µg/L	EPA 551	1	0.5	1/28/97	2/5/97	2/12/97	MW59764
475	UV-ICR	UV	0.010	1/cm	SM 5910 B	1	0.009	1/23/97		1/25/97	8-0-16
476	UV-ICR	UV (Dupl)	0.010	1/cm	SM 5910 B	1	0.009	1/23/97		1/25/97	8-0-16
			0.010	**1/cm**	**0.0 % RPD**						

Sample ID: 3.1.10.EFF.15 **S&H ID:** 9701-117 **Date Sampled:** 1/24/97 7:15:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
477	Cl2Dose	Chlorine Dose	2.03	mg/L as Cl2	SM 4500-Cl B	1	n/a	1/28/97		1/28/97	n/a
478	Cl2Res	Chlorine Residual	0.88	mg/L as Cl2	SM 4500-Cl F	1	0.10	1/28/97		1/29/97	n/a
479	HAA	Bromochloroacetic acid	4.0	µg/L	SM 6251 B	1	1.0	1/29/97	2/10/97	2/11/97	MW59600
480	HAA	Bromodichloroacetic acid	2.0	µg/L	SM 6251 B	1	1.0	1/29/97	2/10/97	2/11/97	MW59600
481	HAA	Chlorodibromoacetic acid	2.0	µg/L	SM 6251 B	1	1.0	1/29/97	2/10/97	2/11/97	MW59600
482	HAA	Dibromoacetic acid	1.0	µg/L	SM 6251 B	1	1.0	1/29/97	2/10/97	2/11/97	MW59600
483	HAA	Dichloroacetic acid	7.0	µg/L	SM 6251 B	1	1.0	1/29/97	2/10/97	2/11/97	MW59600
484	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	1/29/97	2/10/97	2/11/97	MW59600
485	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	1/29/97	2/10/97	2/11/97	MW59600
486	HAA	Tribromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	1/29/97	2/10/97	2/11/97	MW59600
487	HAA	Trichloroacetic acid	4.0	µg/L	SM 6251 B	1	1.0	1/29/97	2/10/97	2/11/97	MW59600
488	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	1/28/97		1/29/97	n/a
489	pH	Cl2 pH - Initial	9.2	Unit	SM 4500-H+ B	1	n/a	1/28/97		1/28/97	n/a
490	pH	pH	8.2	Unit	SM 4500-H+ B	1	n/a	1/23/97		1/23/97	n/a
491	TEMP	Cl2 Temperature	4.7	ºC	SM 2550 B	1	n/a	1/28/97		1/29/97	n/a
492	TEMP	Temperature	22.0	ºC	SM 2550 B	1	n/a	1/24/97		1/24/97	n/a

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 3
Study Title: ICR RSSCT #1

493	TIME	Cl2 Incubation Time	24.0	hrs	n/a	1	n/a	1/28/97		1/29/97	n/a
494	TOC-ICR	TOC	2.47	mg/L	SM 5310 C	1	0.50	1/24/97		1/24/97	7-0-14
495	TOC-ICR	TOC (Dupl)	2.46	mg/L	SM 5310 C	1	0.50	1/24/97		1/24/97	7-0-14
			2.46	**mg/L**	**0.4 % RPD**						
496	TOX-ICR	TOX	105	µg Cl-/L	SM 5320 B	1	25	1/29/97		2/10/97	MW59872
497	TOX-ICR	TOX (Dupl)	97	µg Cl-/L	SM 5320 B	1	25	1/29/97		2/10/97	MW59872
			101	**µg Cl-/L**	**7.9 % RPD**						
498	THM4	Bromodichloromethane	12.4	µg/L	EPA 551	1	0.5	1/29/97	2/5/97	2/12/97	MW59764
499	THM4	Bromoform	0.5	µg/L	EPA 551	1	0.5	1/29/97	2/5/97	2/12/97	MW59764
500	THM4	Chloroform	21.0	µg/L	EPA 551	1	0.5	1/29/97	2/5/97	2/12/97	MW59764
501	THM4	Dibromochloromethane	5.6	µg/L	EPA 551	1	0.5	1/29/97	2/5/97	2/12/97	MW59764
502	UV-ICR	UV	0.040	1/cm	SM 5910 B	1	0.009	1/24/97		1/25/97	8-0-16
503	UV-ICR	UV (Dupl)	0.040	1/cm	SM 5910 B	1	0.009	1/24/97		1/25/97	8-0-16
			0.040	**1/cm**	**0.0 % RPD**						

Sample ID: 3.1.10.EFF.15d **S&H ID:** 9701-118 **Date Sampled:** 1/24/97 7:15:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
504	Cl2Dose	Chlorine Dose	2.03	mg/L as Cl2	SM 4500-Cl B	1	n/a	1/28/97		1/28/97	n/a
505	Cl2Res	Chlorine Residual	0.87	mg/L as Cl2	SM 4500-Cl F	1	0.10	1/28/97		1/29/97	n/a
506	HAA	Bromochloroacetic acid	4.0	µg/L	SM 6251 B	1	1.0	1/29/97	2/10/97	2/12/97	MW59600
507	HAA	Bromodichloroacetic acid	2.0	µg/L	SM 6251 B	1	1.0	1/29/97	2/10/97	2/12/97	MW59600
508	HAA	Chlorodibromoacetic acid	2.0	µg/L	SM 6251 B	1	1.0	1/29/97	2/10/97	2/12/97	MW59600
509	HAA	Dibromoacetic acid	1.0	µg/L	SM 6251 B	1	1.0	1/29/97	2/10/97	2/12/97	MW59600
510	HAA	Dichloroacetic acid	8.0	µg/L	SM 6251 B	1	1.0	1/29/97	2/10/97	2/12/97	MW59600
511	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	1/29/97	2/10/97	2/12/97	MW59600
512	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	1/29/97	2/10/97	2/12/97	MW59600
513	HAA	Tribromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	1/29/97	2/10/97	2/12/97	MW59600
514	HAA	Trichloroacetic acid	4.0	µg/L	SM 6251 B	1	1.0	1/29/97	2/10/97	2/12/97	MW59600
515	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	1/28/97		1/29/97	n/a
516	pH	Cl2 pH - Initial	9.1	Unit	SM 4500-H+ B	1	n/a	1/28/97		1/28/97	n/a
517	pH	pH	8.2	Unit	SM 4500-H+ B	1	n/a	1/23/97		1/23/97	n/a
518	TEMP	Cl2 Temperature	4.7	ºC	SM 2550 B	1	n/a	1/28/97		1/29/97	n/a
519	TEMP	Temperature	22.1	ºC	SM 2550 B	1	n/a	1/24/97		1/24/97	n/a
520	TIME	Cl2 Incubation Time	24.0	hrs	n/a	1	n/a	1/28/97		1/29/97	n/a
521	TOC-ICR	TOC	2.40	mg/L	SM 5310 C	1	0.50	1/24/97		1/25/97	7-0-15
522	TOC-ICR	TOC (Dupl)	2.51	mg/L	SM 5310 C	1	0.50	1/24/97		1/25/97	7-0-15
			2.46	**mg/L**	**4.5 % RPD**						
523	TOX-ICR	TOX	110	µg Cl-/L	SM 5320 B	1	25	1/29/97		2/10/97	MW59970
524	TOX-ICR	TOX (Dupl)	105	µg Cl-/L	SM 5320 B	1	25	1/29/97		2/10/97	MW59970
			108	**µg Cl-/L**	**4.6 % RPD**						

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 3
Study Title: ICR RSSCT #1

525	THM4	Bromodichloromethane	11.6	µg/L	EPA 551	1	0.5	1/29/97	2/5/97	2/11/97	MW59763
526	THM4	Bromoform	0.6	µg/L	EPA 551	1	0.5	1/29/97	2/5/97	2/11/97	MW59763
527	THM4	Chloroform	19.5	µg/L	EPA 551	1	0.5	1/29/97	2/5/97	2/11/97	MW59763
528	THM4	Dibromochloromethane	5.5	µg/L	EPA 551	1	0.5	1/29/97	2/5/97	2/11/97	MW59763
529	UV-ICR	UV	0.040	1/cm	SM 5910 B	1	0.009	1/24/97		1/25/97	8-0-16
530	UV-ICR	UV (Dupl)	0.040	1/cm	SM 5910 B	1	0.009	1/24/97		1/25/97	8-0-16
			0.040	**1/cm**	**0.0 % RPD**						

Sample ID: 3.1.20.EFF.16 **S&H ID:** 9701-122 **Date Sampled:** 1/24/97 3:45:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
531	Cl2Dose	Chlorine Dose	1.52	mg/L as Cl2	SM 4500-Cl B	1	n/a	1/28/97		1/28/97	n/a
532	Cl2Res	Chlorine Residual	0.87	mg/L as Cl2	SM 4500-Cl F	1	0.10	1/28/97		1/29/97	n/a
533	HAA	Bromochloroacetic acid	2.0	µg/L	SM 6251 B	1	1.0	1/29/97	2/10/97	2/12/97	MW59600
534	HAA	Bromodichloroacetic acid	1.0	µg/L	SM 6251 B	1	1.0	1/29/97	2/10/97	2/12/97	MW59600
535	HAA	Chlorodibromoacetic acid	1.0	µg/L	SM 6251 B	1	1.0	1/29/97	2/10/97	2/12/97	MW59600
536	HAA	Dibromoacetic acid	2.0	µg/L	SM 6251 B	1	1.0	1/29/97	2/10/97	2/12/97	MW59600
537	HAA	Dichloroacetic acid	2.0	µg/L	SM 6251 B	1	1.0	1/29/97	2/10/97	2/12/97	MW59600
538	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	1/29/97	2/10/97	2/12/97	MW59600
539	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	1/29/97	2/10/97	2/12/97	MW59600
540	HAA	Tribromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	1/29/97	2/10/97	2/12/97	MW59600
541	HAA	Trichloroacetic acid	ND	µg/L	SM 6251 B	1	1.0	1/29/97	2/10/97	2/12/97	MW59600
542	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	1/28/97		1/29/97	n/a
543	pH	Cl2 pH - Initial	9.1	Unit	SM 4500-H+ B	1	n/a	1/28/97		1/28/97	n/a
544	pH	pH	8.0	Unit	SM 4500-H+ B	1	n/a	1/23/97		1/23/97	n/a
545	TEMP	Cl2 Temperature	4.7	ºC	SM 2550 B	1	n/a	1/28/97		1/29/97	n/a
546	TEMP	Temperature	21.2	ºC	SM 2550 B	1	n/a	1/24/97		1/24/97	n/a
547	TIME	Cl2 Incubation Time	24.0	hrs	n/a	1	n/a	1/28/97		1/29/97	n/a
548	TOC-ICR	TOC	1.12	mg/L	SM 5310 C	1	0.50	1/24/97		1/24/97	7-0-14
549	TOC-ICR	TOC (Dupl)	1.07	mg/L	SM 5310 C	1	0.50	1/24/97		1/24/97	7-0-14
			1.10	**mg/L**	**4.5 % RPD**						
550	TOX-ICR	TOX	ND	µg Cl-/L	SM 5320 B	1	25	1/29/97		2/10/97	MW59872
551	TOX-ICR	TOX (Dupl)	ND	µg Cl-/L	SM 5320 B	1	25	1/29/97		2/10/97	MW59872
			ND	**µg Cl-/L**							
552	THM4	Bromodichloromethane	5.1	µg/L	EPA 551	1	0.5	1/29/97	2/5/97	2/11/97	MW59763
553	THM4	Bromoform	2.4	µg/L	EPA 551	1	0.5	1/29/97	2/5/97	2/11/97	MW59763
554	THM4	Chloroform	2.6	µg/L	EPA 551	1	0.5	1/29/97	2/5/97	2/11/97	MW59763
555	THM4	Dibromochloromethane	6.6	µg/L	EPA 551	1	0.5	1/29/97	2/5/97	2/11/97	MW59763
556	UV-ICR	UV	0.013	1/cm	SM 5910 B	1	0.009	1/24/97		1/25/97	8-0-16
557	UV-ICR	UV (Dupl)	0.013	1/cm	SM 5910 B	1	0.009	1/24/97		1/25/97	8-0-16
			0.013	**1/cm**	**0.0 % RPD**						

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Summers & Hooper, Inc.
6 Knollcrest Drive
Cincinnati, OH 45237

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 3
Study Title: ICR RSSCT #1

Sample ID: 3.1.20.EFF.17 **S&H ID:** 9701-126 **Date Sampled:** 1/24/97 11:40:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
558	Cl2Dose	Chlorine Dose	1.48	mg/L as Cl2	SM 4500-Cl B	1	n/a	1/28/97		1/28/97	n/a
559	Cl2Res	Chlorine Residual	0.74	mg/L as Cl2	SM 4500-Cl F	1	0.10	1/28/97		1/29/97	n/a
560	HAA	Bromochloroacetic acid	2.0	µg/L	SM 6251 B	1	1.0	1/29/97	2/10/97	2/12/97	MW59600
561	HAA	Bromodichloroacetic acid	1.0	µg/L	SM 6251 B	1	1.0	1/29/97	2/10/97	2/12/97	MW59600
562	HAA	Chlorodibromoacetic acid	1.0	µg/L	SM 6251 B	1	1.0	1/29/97	2/10/97	2/12/97	MW59600
563	HAA	Dibromoacetic acid	2.0	µg/L	SM 6251 B	1	1.0	1/29/97	2/10/97	2/12/97	MW59600
564	HAA	Dichloroacetic acid	2.0	µg/L	SM 6251 B	1	1.0	1/29/97	2/10/97	2/12/97	MW59600
565	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	1/29/97	2/10/97	2/12/97	MW59600
566	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	1/29/97	2/10/97	2/12/97	MW59600
567	HAA	Tribromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	1/29/97	2/10/97	2/12/97	MW59600
568	HAA	Trichloroacetic acid	1.0	µg/L	SM 6251 B	1	1.0	1/29/97	2/10/97	2/12/97	MW59600
569	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	1/28/97		1/29/97	n/a
570	pH	Cl2 pH - Initial	9.1	Unit	SM 4500-H+ B	1	n/a	1/28/97		1/28/97	n/a
571	pH	pH	8.4	Unit	SM 4500-H+ B	1	n/a	1/23/97		1/23/97	n/a
572	TEMP	Cl2 Temperature	4.7	ºC	SM 2550 B	1	n/a	1/28/97		1/29/97	n/a
573	TEMP	Temperature	21.2	ºC	SM 2550 B	1	n/a	1/24/97		1/24/97	n/a
574	TIME	Cl2 Incubation Time	24.0	hrs	n/a	1	n/a	1/28/97		1/29/97	n/a
575	TOC-ICR	TOC	1.33	mg/L	SM 5310 C	1	0.50	1/24/97		1/25/97	7-0-15
576	TOC-ICR	TOC (Dupl)	1.35	mg/L	SM 5310 C	1	0.50	1/24/97		1/25/97	7-0-15
			1.34	**mg/L**	**1.5 % RPD**						
577	TOX-ICR	TOX	ND	µg Cl-/L	SM 5320 B	1	25	1/29/97		2/10/97	MW59872
578	TOX-ICR	TOX (Dupl)	ND	µg Cl-/L	SM 5320 B	1	25	1/29/97		2/10/97	MW59872
			ND	**µg Cl-/L**							
579	THM4	Bromodichloromethane	6.3	µg/L	EPA 551	1	0.5	1/29/97	2/5/97	2/12/97	MW59764
580	THM4	Bromoform	1.9	µg/L	EPA 551	1	0.5	1/29/97	2/5/97	2/12/97	MW59764
581	THM4	Chloroform	3.7	µg/L	EPA 551	1	0.5	1/29/97	2/5/97	2/12/97	MW59764
582	THM4	Dibromochloromethane	6.9	µg/L	EPA 551	1	0.5	1/29/97	2/5/97	2/12/97	MW59764
583	UV-ICR	UV	0.017	1/cm	SM 5910 B	1	0.009	1/24/97		1/25/97	8-0-16
584	UV-ICR	UV (Dupl)	0.017	1/cm	SM 5910 B	1	0.009	1/24/97		1/25/97	8-0-16
			0.017	**1/cm**	**0.0 % RPD**						

Sample ID: 3.1.10.EFF.19 **S&H ID:** 9701-131 **Date Sampled:** 1/25/97 4:00:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
585	Cl2Dose	Chlorine Dose	2.29	mg/L as Cl2	SM 4500-Cl B	1	n/a	1/28/97		1/28/97	n/a
586	Cl2Res	Chlorine Residual	0.89	mg/L as Cl2	SM 4500-Cl F	1	0.10	1/28/97		1/29/97	n/a
587	HAA	Bromochloroacetic acid	4.0	µg/L	SM 6251 B	1	1.0	1/29/97	2/10/97	2/12/97	MW59600

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 3
Study Title: ICR RSSCT #1

588	HAA	Bromodichloroacetic acid	2.0	µg/L	SM 6251 B	1	1.0	1/29/97	2/10/97	2/12/97	MW59600
589	HAA	Chlorodibromoacetic acid	2.0	µg/L	SM 6251 B	1	1.0	1/29/97	2/10/97	2/12/97	MW59600
590	HAA	Dibromoacetic acid	1.0	µg/L	SM 6251 B	1	1.0	1/29/97	2/10/97	2/12/97	MW59600
591	HAA	Dichloroacetic acid	9.0	µg/L	SM 6251 B	1	1.0	1/29/97	2/10/97	2/12/97	MW59600
592	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	1/29/97	2/10/97	2/12/97	MW59600
593	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	1/29/97	2/10/97	2/12/97	MW59600
594	HAA	Tribromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	1/29/97	2/10/97	2/12/97	MW59600
595	HAA	Trichloroacetic acid	6.0	µg/L	SM 6251 B	1	1.0	1/29/97	2/10/97	2/12/97	MW59600
596	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	1/28/97		1/29/97	n/a
597	pH	Cl2 pH - Initial	9.1	Unit	SM 4500-H+ B	1	n/a	1/28/97		1/28/97	n/a
598	pH	pH	8.3	Unit	SM 4500-H+ B	1	n/a	1/23/97		1/23/97	n/a
599	TEMP	Cl2 Temperature	4.7	ºC	SM 2550 B	1	n/a	1/28/97		1/29/97	n/a
600	TEMP	Temperature	21.0	ºC	SM 2550 B	1	n/a	1/25/97		1/25/97	n/a
601	TIME	Cl2 Incubation Time	24.1	hrs	n/a	1	n/a	1/28/97		1/29/97	n/a
602	TOC-ICR	TOC	2.75	mg/L	SM 5310 C	1	0.50	1/25/97		1/25/97	7-0-15
603	TOC-ICR	TOC (Dupl)	2.73	mg/L	SM 5310 C	1	0.50	1/25/97		1/25/97	7-0-15
			2.74	**mg/L**	**0.7 % RPD**						
604	TOX-ICR	TOX	130	µg Cl-/L	SM 5320 B	1	25	1/29/97		2/10/97	MW59872
605	TOX-ICR	TOX (Dupl)	125	µg Cl-/L	SM 5320 B	1	25	1/29/97		2/10/97	MW59872
			128	**µg Cl-/L**	**3.9 % RPD**						
606	THM4	Bromodichloromethane	13.7	µg/L	EPA 551	1	0.5	1/29/97	2/5/97	2/11/97	MW59763
607	THM4	Bromoform	ND	µg/L	EPA 551	1	0.5	1/29/97	2/5/97	2/11/97	MW59763
608	THM4	Chloroform	27.8	µg/L	EPA 551	1	0.5	1/29/97	2/5/97	2/11/97	MW59763
609	THM4	Dibromochloromethane	5.3	µg/L	EPA 551	1	0.5	1/29/97	2/5/97	2/11/97	MW59763
610	UV-ICR	UV	0.046	1/cm	SM 5910 B	1	0.009	1/25/97		1/25/97	8-0-16
611	UV-ICR	UV (Dupl)	0.046	1/cm	SM 5910 B	1	0.009	1/25/97		1/25/97	8-0-16
			0.046	**1/cm**	**0.0 % RPD**						

Sample ID: 3.1.20.EFF.20 **S&H ID:** 9701-135 **Date Sampled:** 1/26/97

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
612	Cl2Dose	Chlorine Dose	1.83	mg/L as Cl2	SM 4500-Cl B	1	n/a	1/29/97		1/29/97	n/a
613	Cl2Res	Chlorine Residual	0.88	mg/L as Cl2	SM 4500-Cl F	1	0.10	1/29/97		1/30/97	n/a
614	HAA	Bromochloroacetic acid	3.0	µg/L	SM 6251 B	1	1.0	1/30/97	2/10/97	2/12/97	MW59600
615	HAA	Bromodichloroacetic acid	1.0	µg/L	SM 6251 B	1	1.0	1/30/97	2/10/97	2/12/97	MW59600
616	HAA	Chlorodibromoacetic acid	1.0	µg/L	SM 6251 B	1	1.0	1/30/97	2/10/97	2/12/97	MW59600
617	HAA	Dibromoacetic acid	2.0	µg/L	SM 6251 B	1	1.0	1/30/97	2/10/97	2/12/97	MW59600
618	HAA	Dichloroacetic acid	4.0	µg/L	SM 6251 B	1	1.0	1/30/97	2/10/97	2/12/97	MW59600
619	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	1/30/97	2/10/97	2/12/97	MW59600
620	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	1/30/97	2/10/97	2/12/97	MW59600
621	HAA	Tribromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	1/30/97	2/10/97	2/12/97	MW59600

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 3
Study Title: ICR RSSCT #1

622	HAA	Trichloroacetic acid	2.0	µg/L	SM 6251 B	1	1.0	1/30/97	2/10/97	2/12/97	MW59600
623	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	1/29/97		1/30/97	n/a
624	pH	Cl2 pH - Initial	9.0	Unit	SM 4500-H+ B	1	n/a	1/29/97		1/29/97	n/a
625	pH	pH	8.4	Unit	SM 4500-H+ B	1	n/a	1/23/97		1/23/97	n/a
626	TEMP	Cl2 Temperature	5.1	ºC	SM 2550 B	1	n/a	1/29/97		1/30/97	n/a
627	TEMP	Temperature	20.8	ºC	SM 2550 B	1	n/a	1/26/97		1/25/97	n/a
628	TIME	Cl2 Incubation Time	23.9	hrs	n/a	1	n/a	1/29/97		1/30/97	n/a
629	TOC-ICR	TOC	1.63	mg/L	SM 5310 C	1	0.50	1/26/97		1/26/97	7-0-16
630	TOC-ICR	TOC (Dupl)	1.73	mg/L	SM 5310 C	1	0.50	1/26/97		1/26/97	7-0-16
			1.68	**mg/L**	**6.0 % RPD**						
631	TOX-ICR	TOX	ND	µg Cl-/L	SM 5320 B	1	25	1/30/97		2/12/97	MW59875
632	TOX-ICR	TOX (Dupl)	ND	µg Cl-/L	SM 5320 B	1	25	1/30/97		2/12/97	MW59875
			ND	**µg Cl-/L**							
633	THM4	Bromodichloromethane	9.1	µg/L	EPA 551	1	0.5	1/30/97	2/11/97	2/14/97	MW60011
634	THM4	Bromoform	1.2	µg/L	EPA 551	1	0.5	1/30/97	2/11/97	2/14/97	MW60011
635	THM4	Chloroform	8.0	µg/L	EPA 551	1	0.5	1/30/97	2/11/97	2/14/97	MW60011
636	THM4	Dibromochloromethane	7.2	µg/L	EPA 551	1	0.5	1/30/97	2/11/97	2/14/97	MW60011
637	UV-ICR	UV	0.023	1/cm	SM 5910 B	1	0.009	1/26/97		1/26/97	8-0-17
638	UV-ICR	UV (Dupl)	0.023	1/cm	SM 5910 B	1	0.009	1/26/97		1/26/97	8-0-17
			0.023	**1/cm**	**0.0 % RPD**						

Sample ID: 3.1.20.EFF.20d **S&H ID:** 9701-136 **Date Sampled:** 1/26/97

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
639	Cl2Dose	Chlorine Dose	1.83	mg/L as Cl2	SM 4500-Cl B	1	n/a	1/29/97		1/29/97	n/a
640	Cl2Res	Chlorine Residual	0.72	mg/L as Cl2	SM 4500-Cl F	1	0.10	1/29/97		1/30/97	n/a
641	HAA	Bromochloroacetic acid	3.0	µg/L	SM 6251 B	1	1.0	1/30/97	2/10/97	2/12/97	MW59600
642	HAA	Bromodichloroacetic acid	1.0	µg/L	SM 6251 B	1	1.0	1/30/97	2/10/97	2/12/97	MW59600
643	HAA	Chlorodibromoacetic acid	1.0	µg/L	SM 6251 B	1	1.0	1/30/97	2/10/97	2/12/97	MW59600
644	HAA	Dibromoacetic acid	2.0	µg/L	SM 6251 B	1	1.0	1/30/97	2/10/97	2/12/97	MW59600
645	HAA	Dichloroacetic acid	4.0	µg/L	SM 6251 B	1	1.0	1/30/97	2/10/97	2/12/97	MW59600
646	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	1/30/97	2/10/97	2/12/97	MW59600
647	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	1/30/97	2/10/97	2/12/97	MW59600
648	HAA	Tribromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	1/30/97	2/10/97	2/12/97	MW59600
649	HAA	Trichloroacetic acid	1.0	µg/L	SM 6251 B	1	1.0	1/30/97	2/10/97	2/12/97	MW59600
650	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	1/29/97		1/30/97	n/a
651	pH	Cl2 pH - Initial	9.0	Unit	SM 4500-H+ B	1	n/a	1/29/97		1/29/97	n/a
652	pH	pH	8.4	Unit	SM 4500-H+ B	1	n/a	1/23/97		1/23/97	n/a
653	TEMP	Cl2 Temperature	5.1	ºC	SM 2550 B	1	n/a	1/29/97		1/30/97	n/a
654	TEMP	Temperature	20.8	ºC	SM 2550 B	1	n/a	1/26/97		1/25/97	n/a

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 3
Study Title: ICR RSSCT #1

655	TIME	Cl2 Incubation Time	23.9	hrs	n/a	1	n/a	1/29/97		1/30/97	n/a
656	TOC-ICR	TOC	1.65	mg/L	SM 5310 C	1	0.50	1/26/97		1/27/97	7-0-20
657	TOC-ICR	TOC (Dupl)	1.62	mg/L	SM 5310 C	1	0.50	1/26/97		1/27/97	7-0-20
			1.64	**mg/L**	**1.8 % RPD**						
658	TOX-ICR	TOX	50	µg Cl-/L	SM 5320 B	1	25	1/30/97		2/12/97	MW59875
659	TOX-ICR	TOX (Dupl)	52	µg Cl-/L	SM 5320 B	1	25	1/30/97		2/12/97	MW59875
			51	**µg Cl-/L**	**3.9 % RPD**						
660	THM4	Bromodichloromethane	8.5	µg/L	EPA 551	1	0.5	1/30/97	2/11/97	2/15/97	MW60011
661	THM4	Bromoform	1.2	µg/L	EPA 551	1	0.5	1/30/97	2/11/97	2/15/97	MW60011
662	THM4	Chloroform	7.3	µg/L	EPA 551	1	0.5	1/30/97	2/11/97	2/15/97	MW60011
663	THM4	Dibromochloromethane	6.8	µg/L	EPA 551	1	0.5	1/30/97	2/11/97	2/15/97	MW60011
664	UV-ICR	UV	0.023	1/cm	SM 5910 B	1	0.009	1/26/97		1/26/97	8-0-17
665	UV-ICR	UV (Dupl)	0.023	1/cm	SM 5910 B	1	0.009	1/26/97		1/26/97	8-0-17
			0.023	**1/cm**	**0.0 % RPD**						

Sample ID: 3.1.10.20.INF.A-2 **S&H ID:** 9701-140 **Date Sampled:** 1/26/97 1:30:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
666	ALK	Alkalinity	23	mg/L	SM 2320 B	1	5	1/26/97		1/26/97	1-0-1
667	NH3	Ammonia Nitrogen	ND	mg/L	EPA 350.1	1	0.05	1/26/97		2/12/97	MW59746
668	BR	Bromide	0.034	mg/L	EPA 300.0 A	1	0.020	1/26/97		2/3/97	MW59282
669	CaHard	Calcium Hardness	72	mg/L CaCO3	SM 3500-Ca D	1	5	1/26/97		1/26/97	33-0-1
670	TotHard	Total Hardness	94	mg/L CaCO3	SM 2340 C	1	5	1/26/97		1/26/97	3-0-1

Sample ID: 3.1.10.20.INF.B-2 **S&H ID:** 9701-141 **Date Sampled:** 1/26/97 1:30:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
671	Cl2Dose	Chlorine Dose	2.83	mg/L as Cl2	SM 4500-Cl B	1	n/a	1/29/97		1/29/97	n/a
672	Cl2Res	Chlorine Residual	0.80	mg/L as Cl2	SM 4500-Cl F	1	0.10	1/29/97		1/30/97	n/a
673	HAA	Bromochloroacetic acid	4.0	µg/L	SM 6251 B	1	1.0	1/30/97	2/10/97	2/12/97	MW59600
674	HAA	Bromodichloroacetic acid	2.0	µg/L	SM 6251 B	1	1.0	1/30/97	2/10/97	2/12/97	MW59600
675	HAA	Chlorodibromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	1/30/97	2/10/97	2/12/97	MW59600
676	HAA	Dibromoacetic acid	1.0	µg/L	SM 6251 B	1	1.0	1/30/97	2/10/97	2/12/97	MW59600
677	HAA	Dichloroacetic acid	17.0	µg/L	SM 6251 B	1	1.0	1/30/97	2/10/97	2/12/97	MW59600
678	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	1/30/97	2/10/97	2/12/97	MW59600
679	HAA	Monochloroacetic acid	3.0	µg/L	SM 6251 B	1	2.0	1/30/97	2/10/97	2/12/97	MW59600
680	HAA	Tribromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	1/30/97	2/10/97	2/12/97	MW59600
681	HAA	Trichloroacetic acid	12.0	µg/L	SM 6251 B	1	1.0	1/30/97	2/10/97	2/12/97	MW59600
682	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	1/29/97		1/30/97	n/a
683	pH	Cl2 pH - Initial	9.0	Unit	SM 4500-H+ B	1	n/a	1/29/97		1/29/97	n/a
684	pH	pH	9.0	Unit	SM 4500-H+ B	1	n/a	1/26/97		1/26/97	n/a

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 3
Study Title: ICR RSSCT #1

685	TEMP	Cl2 Temperature	5.1	ºC	SM 2550 B	1	n/a	1/29/97		1/30/97	n/a
686	TEMP	Temperature	21.8	ºC	SM 2550 B	1	n/a	1/26/97		1/26/97	n/a
687	TIME	Cl2 Incubation Time	24.0	hrs	n/a	1	n/a	1/29/97		1/30/97	n/a
688	TOC-ICR	TOC	3.76	mg/L	SM 5310 C	1	0.50	1/26/97		1/26/97	7-0-16
689	TOC-ICR	TOC (Dupl)	3.95	mg/L	SM 5310 C	1	0.50	1/26/97		1/26/97	7-0-16
			3.86	**mg/L**	**4.9 % RPD**						
690	TOX-ICR	TOX	180	µg Cl-/L	SM 5320 B	1	25	1/30/97		2/12/97	MW59875
691	TOX-ICR	TOX (Dupl)	185	µg Cl-/L	SM 5320 B	1	25	1/30/97		2/12/97	MW59875
			183	**µg Cl-/L**	**2.7 % RPD**						
692	THM4	Bromodichloromethane	13.5	µg/L	EPA 551	1	0.5	1/30/97	2/11/97	2/15/97	MW60011
693	THM4	Bromoform	ND	µg/L	EPA 551	1	0.5	1/30/97	2/11/97	2/15/97	MW60011
694	THM4	Chloroform	50.2	µg/L	EPA 551	1	2.5	1/30/97	2/11/97	2/15/97	MW60011
695	THM4	Dibromochloromethane	3.2	µg/L	EPA 551	1	0.5	1/30/97	2/11/97	2/15/97	MW60011
696	TURB	Turbidity	0.10	ntu	SM 2130 B	1	0.05	1/26/97		1/26/97	9-0-1
697	UV-ICR	UV	0.079	1/cm	SM 5910 B	1	0.009	1/26/97		1/26/97	8-0-17
698	UV-ICR	UV (Dupl)	0.079	1/cm	SM 5910 B	1	0.009	1/26/97		1/26/97	8-0-17
			0.079	**1/cm**	**0.0 % RPD**						

Sample ID: 3.1.10.EFF.26 **S&H ID:** 9701-151 **Date Sampled:** 1/28/97 3:40:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
699	Cl2Dose	Chlorine Dose	2.31	mg/L as Cl2	SM 4500-Cl B	1	n/a	1/30/97		1/30/97	n/a
700	Cl2Res	Chlorine Residual	0.83	mg/L as Cl2	SM 4500-Cl F	1	0.10	1/30/97		1/31/97	n/a
701	HAA	Bromochloroacetic acid	4.0	µg/L	SM 6251 B	1	1.0	1/31/97	2/18/97	2/18/97	MW59759
702	HAA	Bromodichloroacetic acid	NR	µg/L	SM 6251 B	1	1.0	1/31/97	2/18/97	2/18/97	MW59759
703	HAA	Chlorodibromoacetic acid	NR	µg/L	SM 6251 B	1	1.0	1/31/97	2/18/97	2/18/97	MW59759
704	HAA	Dibromoacetic acid	1.0	µg/L	SM 6251 B	1	1.0	1/31/97	2/18/97	2/18/97	MW59759
705	HAA	Dichloroacetic acid	12.0	µg/L	SM 6251 B	1	1.0	1/31/97	2/18/97	2/18/97	MW59759
706	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	1/31/97	2/18/97	2/18/97	MW59759
707	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	1/31/97	2/18/97	2/18/97	MW59759
708	HAA	Tribromoacetic acid	NR	µg/L	SM 6251 B	1	1.0	1/31/97	2/18/97	2/18/97	MW59759
709	HAA	Trichloroacetic acid	7.0	µg/L	SM 6251 B	1	1.0	1/31/97	2/18/97	2/18/97	MW59759
710	pH	Cl2 pH - Final	8.9	Unit	SM 4500-H+ B	1	n/a	1/30/97		1/31/97	n/a
711	pH	Cl2 pH - Initial	8.9	Unit	SM 4500-H+ B	1	n/a	1/30/97		1/30/97	n/a
712	pH	pH	8.0	Unit	SM 4500-H+ B	1	n/a	1/28/97		1/28/97	n/a
713	TEMP	Cl2 Temperature	5.0	ºC	SM 2550 B	1	n/a	1/30/97		1/31/97	n/a
714	TEMP	Temperature	20.9	ºC	SM 2550 B	1	n/a	1/28/97		1/27/97	n/a
715	TIME	Cl2 Incubation Time	24.3	hrs	n/a	1	n/a	1/30/97		1/31/97	n/a
716	TOC-ICR	TOC	3.06	mg/L	SM 5310 C	1	0.50	1/28/97		1/28/97	7-0-17
717	TOC-ICR	TOC (Dupl)	3.09	mg/L	SM 5310 C	1	0.50	1/28/97		1/28/97	7-0-17

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 3
Study Title: ICR RSSCT #1

			3.08	**mg/L**	**1.0 % RPD**						
718	THM4	Bromodichloromethane	11.5	µg/L	EPA 551	1	0.5	1/31/97	2/11/97	2/15/97	MW60011
719	THM4	Bromoform	ND	µg/L	EPA 551	1	0.5	1/31/97	2/11/97	2/15/97	MW60011
720	THM4	Chloroform	26.6	µg/L	EPA 551	1	0.5	1/31/97	2/11/97	2/15/97	MW60011
721	THM4	Dibromochloromethane	3.8	µg/L	EPA 551	1	0.5	1/31/97	2/11/97	2/15/97	MW60011
722	UV-ICR	UV	0.054	1/cm	SM 5910 B	1	0.009	1/28/97		1/29/97	8-0-19
723	UV-ICR	UV (Dupl)	0.054	1/cm	SM 5910 B	1	0.009	1/28/97		1/29/97	8-0-19
			0.054	**1/cm**	**0.0 % RPD**						

Sample ID: 3.1.20.EFF.26 **S&H ID:** 9701-152 **Date Sampled:** 1/28/97 2:15:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
724	Cl2Dose	Chlorine Dose	1.86	mg/L as Cl2	SM 4500-Cl B	1	n/a	1/30/97		1/30/97	n/a
725	Cl2Res	Chlorine Residual	0.82	mg/L as Cl2	SM 4500-Cl F	1	0.10	1/30/97		1/31/97	n/a
726	HAA	Bromochloroacetic acid	4.0	µg/L	SM 6251 B	1	1.0	1/31/97	2/18/97	2/18/97	MW59759
727	HAA	Bromodichloroacetic acid	NR	µg/L	SM 6251 B	1	1.0	1/31/97	2/18/97	2/18/97	MW59759
728	HAA	Chlorodibromoacetic acid	NR	µg/L	SM 6251 B	1	1.0	1/31/97	2/18/97	2/18/97	MW59759
729	HAA	Dibromoacetic acid	1.0	µg/L	SM 6251 B	1	1.0	1/31/97	2/18/97	2/18/97	MW59759
730	HAA	Dichloroacetic acid	6.0	µg/L	SM 6251 B	1	1.0	1/31/97	2/18/97	2/18/97	MW59759
731	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	1/31/97	2/18/97	2/18/97	MW59759
732	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	1/31/97	2/18/97	2/18/97	MW59759
733	HAA	Tribromoacetic acid	NR	µg/L	SM 6251 B	1	1.0	1/31/97	2/18/97	2/18/97	MW59759
734	HAA	Trichloroacetic acid	3.0	µg/L	SM 6251 B	1	1.0	1/31/97	2/18/97	2/18/97	MW59759
735	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	1/30/97		1/31/97	n/a
736	pH	Cl2 pH - Initial	9.0	Unit	SM 4500-H+ B	1	n/a	1/30/97		1/30/97	n/a
737	pH	pH	8.3	Unit	SM 4500-H+ B	1	n/a	1/28/97		1/28/97	n/a
738	TEMP	Cl2 Temperature	5.0	ºC	SM 2550 B	1	n/a	1/30/97		1/31/97	n/a
739	TEMP	Temperature	21.3	ºC	SM 2550 B	1	n/a	1/28/97		1/27/97	n/a
740	TIME	Cl2 Incubation Time	24.4	hrs	n/a	1	n/a	1/30/97		1/31/97	n/a
741	TOC-ICR	TOC	2.01	mg/L	SM 5310 C	1	0.50	1/28/97		1/28/97	7-0-17
742	TOC-ICR	TOC (Dupl)	2.04	mg/L	SM 5310 C	1	0.50	1/28/97		1/28/97	7-0-17
			2.02	**mg/L**	**1.5 % RPD**						
743	THM4	Bromodichloromethane	9.8	µg/L	EPA 551	1	0.5	1/31/97	2/11/97	2/15/97	MW60011
744	THM4	Bromoform	0.8	µg/L	EPA 551	1	0.5	1/31/97	2/11/97	2/15/97	MW60011
745	THM4	Chloroform	11.9	µg/L	EPA 551	1	0.5	1/31/97	2/11/97	2/15/97	MW60011
746	THM4	Dibromochloromethane	6.1	µg/L	EPA 551	1	0.5	1/31/97	2/11/97	2/15/97	MW60011
747	UV-ICR	UV	0.029	1/cm	SM 5910 B	1	0.009	1/28/97		1/29/97	8-0-19
748	UV-ICR	UV (Dupl)	0.029	1/cm	SM 5910 B	1	0.009	1/28/97		1/29/97	8-0-19
			0.029	**1/cm**	**0.0 % RPD**						

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Summers & Hooper, Inc.
6 Knollcrest Drive
Cincinnati, OH 45237

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 3
Study Title: ICR RSSCT #1

Sample ID: 3.1.20.EFF.27 **S&H ID:** 9701-154 **Date Sampled:** 1/29/97 1:30:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
749	Cl2Dose	Chlorine Dose	1.93	mg/L as Cl2	SM 4500-Cl B	1	n/a	2/1/97		2/1/97	n/a
750	Cl2Res	Chlorine Residual	0.81	mg/L as Cl2	SM 4500-Cl F	1	0.10	2/1/97		2/2/97	n/a
751	HAA	Bromochloroacetic acid	4.0	µg/L	SM 6251 B	1	1.0	2/2/97	2/18/97	2/18/97	MW59759
752	HAA	Bromodichloroacetic acid	NR	µg/L	SM 6251 B	1	1.0	2/2/97	2/18/97	2/18/97	MW59759
753	HAA	Chlorodibromoacetic acid	NR	µg/L	SM 6251 B	1	1.0	2/2/97	2/18/97	2/18/97	MW59759
754	HAA	Dibromoacetic acid	1.0	µg/L	SM 6251 B	1	1.0	2/2/97	2/18/97	2/18/97	MW59759
755	HAA	Dichloroacetic acid	7.0	µg/L	SM 6251 B	1	1.0	2/2/97	2/18/97	2/18/97	MW59759
756	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	2/2/97	2/18/97	2/18/97	MW59759
757	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	2/2/97	2/18/97	2/18/97	MW59759
758	HAA	Tribromoacetic acid	NR	µg/L	SM 6251 B	1	1.0	2/2/97	2/18/97	2/18/97	MW59759
759	HAA	Trichloroacetic acid	4.0	µg/L	SM 6251 B	1	1.0	2/2/97	2/18/97	2/18/97	MW59759
760	pH	Cl2 pH - Final	8.9	Unit	SM 4500-H+ B	1	n/a	2/1/97		2/2/97	n/a
761	pH	Cl2 pH - Initial	8.9	Unit	SM 4500-H+ B	1	n/a	2/1/97		2/1/97	n/a
762	pH	pH	8.4	Unit	SM 4500-H+ B	1	n/a	1/29/97		1/29/97	n/a
763	TEMP	Cl2 Temperature	5.0	ºC	SM 2550 B	1	n/a	2/1/97		2/2/97	n/a
764	TEMP	Temperature	21.3	ºC	SM 2550 B	1	n/a	1/29/97		1/29/97	n/a
765	TIME	Cl2 Incubation Time	24.5	hrs	n/a	1	n/a	2/1/97		2/2/97	n/a
766	TOC-ICR	TOC	2.28	mg/L	SM 5310 C	1	0.50	1/29/97		1/29/97	7-0-18
767	TOC-ICR	TOC (Dupl)	2.26	mg/L	SM 5310 C	1	0.50	1/29/97		1/29/97	7-0-18
			2.27	**mg/L**	**0.9 % RPD**						
768	THM4	Bromodichloromethane	10.6	µg/L	EPA 551	1	0.5	2/2/97	2/11/97	2/15/97	MW60011
769	THM4	Bromoform	0.6	µg/L	EPA 551	1	0.5	2/2/97	2/11/97	2/15/97	MW60011
770	THM4	Chloroform	14.7	µg/L	EPA 551	1	0.5	2/2/97	2/11/97	2/15/97	MW60011
771	THM4	Dibromochloromethane	5.7	µg/L	EPA 551	1	0.5	2/2/97	2/11/97	2/15/97	MW60011
772	UV-ICR	UV	0.034	1/cm	SM 5910 B	1	0.009	1/29/97		1/30/97	8-0-20
773	UV-ICR	UV (Dupl)	0.034	1/cm	SM 5910 B	1	0.009	1/29/97		1/30/97	8-0-20
			0.034	**1/cm**	**0.0 % RPD**						

Sample ID: 3.1.20.EFF.31 **S&H ID:** 9701-165 **Date Sampled:** 1/31/97 3:40:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
774	Cl2Dose	Chlorine Dose	1.99	mg/L as Cl2	SM 4500-Cl B	1	n/a	2/3/97		2/3/97	n/a
775	Cl2Res	Chlorine Residual	0.76	mg/L as Cl2	SM 4500-Cl F	1	0.10	2/3/97		2/4/97	n/a
776	HAA	Bromochloroacetic acid	4.0	µg/L	SM 6251 B	1	1.0	2/4/97	2/21/97	2/22/97	MW60014
777	HAA	Bromodichloroacetic acid	NR	µg/L	SM 6251 B	1	1.0	2/4/97	2/21/97	2/22/97	MW60014
778	HAA	Chlorodibromoacetic acid	NR	µg/L	SM 6251 B	1	1.0	2/4/97	2/21/97	2/22/97	MW60014
779	HAA	Dibromoacetic acid	1.0	µg/L	SM 6251 B	1	1.0	2/4/97	2/21/97	2/22/97	MW60014
780	HAA	Dichloroacetic acid	9.0	µg/L	SM 6251 B	1	1.0	2/4/97	2/21/97	2/22/97	MW60014

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 3
Study Title: ICR RSSCT #1

781	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	2/4/97	2/21/97	2/22/97	MW60014
782	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	2/4/97	2/21/97	2/22/97	MW60014
783	HAA	Tribromoacetic acid	NR	µg/L	SM 6251 B	1	1.0	2/4/97	2/21/97	2/22/97	MW60014
784	HAA	Trichloroacetic acid	5.0	µg/L	SM 6251 B	1	1.0	2/4/97	2/21/97	2/22/97	MW60014
785	pH	Cl2 pH - Final	8.9	Unit	SM 4500-H+ B	1	n/a	2/3/97		2/4/97	n/a
786	pH	Cl2 pH - Initial	8.9	Unit	SM 4500-H+ B	1	n/a	2/3/97		2/3/97	n/a
787	pH	pH	8.4	Unit	SM 4500-H+ B	1	n/a	1/31/97		1/31/97	n/a
788	TEMP	Cl2 Temperature	4.9	ºC	SM 2550 B	1	n/a	2/3/97		2/4/97	n/a
789	TEMP	Temperature	22.6	ºC	SM 2550 B	1	n/a	1/31/97		1/31/97	n/a
790	TIME	Cl2 Incubation Time	24.1	hrs	n/a	1	n/a	2/3/97		2/4/97	n/a
791	TOC-ICR	TOC	2.48	mg/L	SM 5310 C	1	0.50	1/31/97		2/1/97	7-0-22
792	TOC-ICR	TOC (Dupl)	2.51	mg/L	SM 5310 C	1	0.50	1/31/97		2/1/97	7-0-22
			2.50	**mg/L**	**1.2 % RPD**						
793	TOX-ICR	TOX	105	µg Cl-/L	SM 5320 B	1	50	2/4/97		2/18/97	MW59881
794	TOX-ICR	TOX (Dupl)	110	µg Cl-/L	SM 5320 B	1	50	2/4/97		2/18/97	MW59881
			108	**µg Cl-/L**	**4.6 % RPD**						
795	THM4	Bromodichloromethane	NR	µg/L	EPA 551	1	0.5	2/4/97	2/14/97	2/17/97	MW61826
796	THM4	Bromoform	ND	µg/L	EPA 551	1	0.5	2/4/97	2/14/97	2/17/97	MW61826
797	THM4	Chloroform	NR	µg/L	EPA 551	1	0.5	2/4/97	2/14/97	2/17/97	MW61826
798	THM4	Dibromochloromethane	4.6	µg/L	EPA 551	1	0.5	2/4/97	2/14/97	2/17/97	MW61826
799	UV-ICR	UV	0.042	1/cm	SM 5910 B	1	0.009	1/31/97		2/1/97	8-0-21
800	UV-ICR	UV (Dupl)	0.042	1/cm	SM 5910 B	1	0.009	1/31/97		2/1/97	8-0-21
			0.042	**1/cm**	**0.0 % RPD**						

Sample ID: 3.1.20.EFF.31d **S&H ID:** 9701-166 **Date Sampled:** 1/31/97 3:40:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
801	Cl2Dose	Chlorine Dose	1.99	mg/L as Cl2	SM 4500-Cl B	1	n/a	2/3/97		2/3/97	n/a
802	Cl2Res	Chlorine Residual	0.75	mg/L as Cl2	SM 4500-Cl F	1	0.10	2/3/97		2/4/97	n/a
803	HAA	Bromochloroacetic acid	4.0	µg/L	SM 6251 B	1	1.0	2/4/97	2/21/97	2/22/97	MW60014
804	HAA	Bromodichloroacetic acid	NR	µg/L	SM 6251 B	1	1.0	2/4/97	2/21/97	2/22/97	MW60014
805	HAA	Chlorodibromoacetic acid	NR	µg/L	SM 6251 B	1	1.0	2/4/97	2/21/97	2/22/97	MW60014
806	HAA	Dibromoacetic acid	1.0	µg/L	SM 6251 B	1	1.0	2/4/97	2/21/97	2/22/97	MW60014
807	HAA	Dichloroacetic acid	8.0	µg/L	SM 6251 B	1	1.0	2/4/97	2/21/97	2/22/97	MW60014
808	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	2/4/97	2/21/97	2/22/97	MW60014
809	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	2/4/97	2/21/97	2/22/97	MW60014
810	HAA	Tribromoacetic acid	NR	µg/L	SM 6251 B	1	1.0	2/4/97	2/21/97	2/22/97	MW60014
811	HAA	Trichloroacetic acid	5.0	µg/L	SM 6251 B	1	1.0	2/4/97	2/21/97	2/22/97	MW60014
812	pH	Cl2 pH - Final	8.9	Unit	SM 4500-H+ B	1	n/a	2/3/97		2/4/97	n/a
813	pH	Cl2 pH - Initial	8.9	Unit	SM 4500-H+ B	1	n/a	2/3/97		2/3/97	n/a

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 3
Study Title: ICR RSSCT #1

814	pH	pH	8.4	Unit	SM 4500-H+ B	1	n/a	1/31/97		1/31/97	n/a
815	TEMP	Cl2 Temperature	4.9	ºC	SM 2550 B	1	n/a	2/3/97		2/4/97	n/a
816	TEMP	Temperature	22.6	ºC	SM 2550 B	1	n/a	1/31/97		1/31/97	n/a
817	TIME	Cl2 Incubation Time	24.1	hrs	n/a	1	n/a	2/3/97		2/4/97	n/a
818	TOC-ICR	TOC	2.52	mg/L	SM 5310 C	1	0.50	1/31/97		2/1/97	7-0-22
819	TOC-ICR	TOC (Dupl)	2.52	mg/L	SM 5310 C	1	0.50	1/31/97		2/1/97	7-0-22
			2.52	**mg/L**	**0.0 % RPD**						
820	TOX-ICR	TOX	110	µg Cl-/L	SM 5320 B	1	50	2/4/97		2/18/97	MW59881
821	TOX-ICR	TOX (Dupl)	105	µg Cl-/L	SM 5320 B	1	50	2/4/97		2/18/97	MW59881
			108	**µg Cl-/L**	**4.6 % RPD**						
822	THM4	Bromodichloromethane	NR	µg/L	EPA 551	1	0.5	2/4/97	2/14/97	2/17/97	MW61826
823	THM4	Bromoform	0.5	µg/L	EPA 551	1	0.5	2/4/97	2/14/97	2/17/97	MW61826
824	THM4	Chloroform	NR	µg/L	EPA 551	1	0.5	2/4/97	2/14/97	2/17/97	MW61826
825	THM4	Dibromochloromethane	5.1	µg/L	EPA 551	1	0.5	2/4/97	2/14/97	2/17/97	MW61826
826	UV-ICR	UV	0.042	1/cm	SM 5910 B	1	0.009	1/31/97		2/1/97	8-0-21
827	UV-ICR	UV (Dupl)	0.042	1/cm	SM 5910 B	1	0.009	1/31/97		2/1/97	8-0-21
			0.042	**1/cm**	**0.0 % RPD**						

Sample ID: 3.1.20.EFF.38 **S&H ID:** 9702-11 **Date Sampled:** 2/3/97 1:10:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
828	Cl2Dose	Chlorine Dose	2.00	mg/L as Cl2	SM 4500-Cl B	1	n/a	2/6/97		2/6/97	n/a
829	Cl2Res	Chlorine Residual	0.72	mg/L as Cl2	SM 4500-Cl F	1	0.10	2/6/97		2/7/97	n/a
830	HAA	Bromochloroacetic acid	4.0	µg/L	SM 6251 B	1	1.0	2/7/97	2/21/97	2/22/97	MW60014
831	HAA	Bromodichloroacetic acid	NR	µg/L	SM 6251 B	1	1.0	2/7/97	2/21/97	2/22/97	MW60014
832	HAA	Chlorodibromoacetic acid	NR	µg/L	SM 6251 B	1	1.0	2/7/97	2/21/97	2/22/97	MW60014
833	HAA	Dibromoacetic acid	1.0	µg/L	SM 6251 B	1	1.0	2/7/97	2/21/97	2/22/97	MW60014
834	HAA	Dichloroacetic acid	10.0	µg/L	SM 6251 B	1	1.0	2/7/97	2/21/97	2/22/97	MW60014
835	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	2/7/97	2/21/97	2/22/97	MW60014
836	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	2/7/97	2/21/97	2/22/97	MW60014
837	HAA	Tribromoacetic acid	NR	µg/L	SM 6251 B	1	1.0	2/7/97	2/21/97	2/22/97	MW60014
838	HAA	Trichloroacetic acid	6.0	µg/L	SM 6251 B	1	1.0	2/7/97	2/21/97	2/22/97	MW60014
839	pH	Cl2 pH - Final	8.9	Unit	SM 4500-H+ B	1	n/a	2/6/97		2/7/97	n/a
840	pH	Cl2 pH - Initial	8.9	Unit	SM 4500-H+ B	1	n/a	2/6/97		2/6/97	n/a
841	pH	pH	8.6	Unit	SM 4500-H+ B	1	n/a	2/3/97		2/3/97	n/a
842	TEMP	Cl2 Temperature	5.0	ºC	SM 2550 B	1	n/a	2/6/97		2/7/97	n/a
843	TEMP	Temperature	21.7	ºC	SM 2550 B	1	n/a	2/3/97		2/3/97	n/a
844	TIME	Cl2 Incubation Time	24.2	hrs	n/a	1	n/a	2/6/97		2/7/97	n/a
845	TOC-ICR	TOC	2.72	mg/L	SM 5310 C	1	0.50	2/3/97		2/3/97	7-0-24
846	TOC-ICR	TOC (Dupl)	2.68	mg/L	SM 5310 C	1	0.50	2/3/97		2/3/97	7-0-24

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

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			2.70	**mg/L**	**1.5 % RPD**						
847	TOX-ICR	TOX	130	µg Cl-/L	SM 5320 B	1	50	2/7/97		2/19/97	MW59878
848	TOX-ICR	TOX (Dupl)	130	µg Cl-/L	SM 5320 B	1	50	2/7/97		2/19/97	MW59878
			130	**µg Cl-/L**	**0.0 % RPD**						
849	THM4	Bromodichloromethane	NR	µg/L	EPA 551	1	0.5	2/7/97	2/14/97	2/17/97	MW61826
850	THM4	Bromoform	ND	µg/L	EPA 551	1	0.5	2/7/97	2/14/97	2/17/97	MW61826
851	THM4	Chloroform	NR	µg/L	EPA 551	1	0.5	2/7/97	2/14/97	2/17/97	MW61826
852	THM4	Dibromochloromethane	3.8	µg/L	EPA 551	1	0.5	2/7/97	2/14/97	2/17/97	MW61826
853	UV-ICR	UV	0.047	1/cm	SM 5910 B	1	0.009	2/3/97		2/5/97	8-0-23
854	UV-ICR	UV (Dupl)	0.047	1/cm	SM 5910 B	1	0.009	2/3/97		2/5/97	8-0-23
			0.047	**1/cm**	**0.0 % RPD**						

Sample ID: 3.1.20.EFF.39 **S&H ID:** 9702-20 **Date Sampled:** 2/5/97 2:15:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
855	Cl2Dose	Chlorine Dose	2.15	mg/L as Cl2	SM 4500-Cl B	1	n/a	2/6/97		2/6/97	n/a
856	Cl2Res	Chlorine Residual	0.75	mg/L as Cl2	SM 4500-Cl F	1	0.10	2/6/97		2/7/97	n/a
857	HAA	Bromochloroacetic acid	4.0	µg/L	SM 6251 B	1	1.0	2/7/97	2/21/97	2/22/97	MW60014
858	HAA	Bromodichloroacetic acid	NR	µg/L	SM 6251 B	1	1.0	2/7/97	2/21/97	2/22/97	MW60014
859	HAA	Chlorodibromoacetic acid	NR	µg/L	SM 6251 B	1	1.0	2/7/97	2/21/97	2/22/97	MW60014
860	HAA	Dibromoacetic acid	1.0	µg/L	SM 6251 B	1	1.0	2/7/97	2/21/97	2/22/97	MW60014
861	HAA	Dichloroacetic acid	11.0	µg/L	SM 6251 B	1	1.0	2/7/97	2/21/97	2/22/97	MW60014
862	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	2/7/97	2/21/97	2/22/97	MW60014
863	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	2/7/97	2/21/97	2/22/97	MW60014
864	HAA	Tribromoacetic acid	NR	µg/L	SM 6251 B	1	1.0	2/7/97	2/21/97	2/22/97	MW60014
865	HAA	Trichloroacetic acid	6.0	µg/L	SM 6251 B	1	1.0	2/7/97	2/21/97	2/22/97	MW60014
866	pH	Cl2 pH - Final	8.9	Unit	SM 4500-H+ B	1	n/a	2/6/97		2/7/97	n/a
867	pH	Cl2 pH - Initial	9.0	Unit	SM 4500-H+ B	1	n/a	2/6/97		2/6/97	n/a
868	pH	pH	8.1	Unit	SM 4500-H+ B	1	n/a	2/5/97		2/5/97	n/a
869	TEMP	Cl2 Temperature	5.0	ºC	SM 2550 B	1	n/a	2/6/97		2/7/97	n/a
870	TEMP	Temperature	22.6	ºC	SM 2550 B	1	n/a	2/5/97		2/5/97	n/a
871	TIME	Cl2 Incubation Time	24.2	hrs	n/a	1	n/a	2/6/97		2/7/97	n/a
872	TOC-ICR	TOC	2.83	mg/L	SM 5310 C	1	0.50	2/5/97		2/5/97	7-0-26
873	TOC-ICR	TOC (Dupl)	2.89	mg/L	SM 5310 C	1	0.50	2/5/97		2/5/97	7-0-26
			2.86	**mg/L**	**2.1 % RPD**						
874	TOX-ICR	TOX	140	µg Cl-/L	SM 5320 B	1	50	2/7/97		2/19/97	MW59878
875	TOX-ICR	TOX (Dupl)	140	µg Cl-/L	SM 5320 B	1	50	2/7/97		2/19/97	MW59878
			140	**µg Cl-/L**	**0.0 % RPD**						
876	THM4	Bromodichloromethane	NR	µg/L	EPA 551	1	0.5	2/7/97	2/14/97	2/17/97	MW61826
877	THM4	Bromoform	2.1	µg/L	EPA 551	1	0.5	2/7/97	2/14/97	2/17/97	MW61826
878	THM4	Chloroform	NR	µg/L	EPA 551	1	0.5	2/7/97	2/14/97	2/17/97	MW61826

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 3
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879	THM4	Dibromochloromethane	4.2	µg/L	EPA 551	1	0.5	2/7/97	2/14/97	2/17/97	MW61826
880	UV-ICR	UV	0.049	1/cm	SM 5910 B	1	0.009	2/5/97		2/5/97	8-0-23
881	UV-ICR	UV (Dupl)	0.049	1/cm	SM 5910 B	1	0.009	2/5/97		2/5/97	8-0-23
			0.049	**1/cm**	**0.0 % RPD**						

Sample ID: 3.1.10.20.INFB-3 **S&H ID:** 9702-21 **Date Sampled:** 2/5/97 1:00:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
882	Cl2Dose	Chlorine Dose	2.78	mg/L as Cl2	SM 4500-Cl B	1	n/a	2/6/97		2/6/97	n/a
883	Cl2Res	Chlorine Residual	0.76	mg/L as Cl2	SM 4500-Cl F	1	0.10	2/6/97		2/7/97	n/a
884	HAA	Bromochloroacetic acid	4.0	µg/L	SM 6251 B	1	1.0	2/7/97	2/21/97	2/22/97	MW60014
885	HAA	Bromodichloroacetic acid	NR	µg/L	SM 6251 B	1	1.0	2/7/97	2/21/97	2/22/97	MW60014
886	HAA	Chlorodibromoacetic acid	NR	µg/L	SM 6251 B	1	1.0	2/7/97	2/21/97	2/22/97	MW60014
887	HAA	Dibromoacetic acid	1.0	µg/L	SM 6251 B	1	1.0	2/7/97	2/21/97	2/22/97	MW60014
888	HAA	Dichloroacetic acid	18.0	µg/L	SM 6251 B	1	1.0	2/7/97	2/21/97	2/22/97	MW60014
889	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	2/7/97	2/21/97	2/22/97	MW60014
890	HAA	Monochloroacetic acid	4.0	µg/L	SM 6251 B	1	2.0	2/7/97	2/21/97	2/22/97	MW60014
891	HAA	Tribromoacetic acid	NR	µg/L	SM 6251 B	1	1.0	2/7/97	2/21/97	2/22/97	MW60014
892	HAA	Trichloroacetic acid	12.0	µg/L	SM 6251 B	1	1.0	2/7/97	2/21/97	2/22/97	MW60014
893	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	2/6/97		2/7/97	n/a
894	pH	Cl2 pH - Initial	9.0	Unit	SM 4500-H+ B	1	n/a	2/6/97		2/6/97	n/a
895	pH	pH	8.9	Unit	SM 4500-H+ B	1	n/a	2/5/97		2/5/97	n/a
896	TEMP	Cl2 Temperature	5.0	ºC	SM 2550 B	1	n/a	2/6/97		2/7/97	n/a
897	TEMP	Temperature	22.7	ºC	SM 2550 B	1	n/a	2/5/97		2/5/97	n/a
898	TIME	Cl2 Incubation Time	24.3	hrs	n/a	1	n/a	2/6/97		2/7/97	n/a
899	TOC-ICR	TOC	3.85	mg/L	SM 5310 C	1	0.50	2/5/97		2/5/97	7-0-26
900	TOC-ICR	TOC (Dupl)	3.88	mg/L	SM 5310 C	1	0.50	2/5/97		2/5/97	7-0-26
			3.87	**mg/L**	**0.8 % RPD**						
901	TOX-ICR	TOX	225	µg Cl-/L	SM 5320 B	1	50	2/7/97		2/19/97	MW59878
902	TOX-ICR	TOX (Dupl)	225	µg Cl-/L	SM 5320 B	1	50	2/7/97		2/19/97	MW59878
			225	**µg Cl-/L**	**0.0 % RPD**						
903	THM4	Bromodichloromethane	NR	µg/L	EPA 551	1	0.5	2/7/97	2/14/97	2/17/97	MW61826
904	THM4	Bromoform	3.4	µg/L	EPA 551	1	0.5	2/7/97	2/14/97	2/17/97	MW61826
905	THM4	Chloroform	NR	µg/L	EPA 551	1	0.5	2/7/97	2/14/97	2/17/97	MW61826
906	THM4	Dibromochloromethane	3.1	µg/L	EPA 551	1	0.5	2/7/97	2/14/97	2/17/97	MW61826
907	TURB	Turbidity	0.10	ntu	SM 2130 B	1	0.05	2/5/97		2/5/97	9-0-1
908	UV-ICR	UV	0.080	1/cm	SM 5910 B	1	0.009	2/5/97		2/5/97	8-0-23
909	UV-ICR	UV (Dupl)	0.080	1/cm	SM 5910 B	1	0.009	2/5/97		2/5/97	8-0-23
			0.080	**1/cm**	**0.0 % RPD**						

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 3
Study Title: ICR RSSCT #1

End of laboratory test results

Summers & Hooper, Inc.
6 Knollcrest Drive
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Quality Control Report

Mr. John Zackasee
Superintendent-Purification
Mahoning Valley Sanitary District
P.O. Box 4119
Youngstown, OH 44515

Phone: 330-652-3614 Fax: 330-652-6293

Study#: 3
Study Title: ICR RSSCT #1

Analysis: TOC-ICR (Total Organic Carbon) **Method:** SM 5310 C

QC Batch ID: 7-0-10

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	Acceptance Criteria RPD
Matrix Spike	Matrix Spike	4.00	4.06	mg/L	101%		9701-57	0.5		
Matrix Spike (Dupl)	Matrix Spike	4.00	4.03	mg/L	101%		9701-57	0.5		
		4.00	**4.05**	**mg/L**	**101%**	**0.7 %**				
Method Blank	Method Blank		ND*	mg/L			9701-63	0.5		
Method Blank (Dupl)	Method Blank		ND*	mg/L			9701-63	0.5		
			ND*	**mg/L**						
Standard	Standard	0.50	0.58	mg/L	116%		9701-18	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.56	mg/L	112%		9701-18	0.5	50-150%	
		0.50	**0.57**	**mg/L**	**114%**	**3.5 %**			50-150%	20%
Standard	Standard	4.00	4.10	mg/L	102%		9701-19	0.5	90-110%	
Standard (Dupl)	Standard	4.00	4.08	mg/L	102%		9701-19	0.5	90-110%	
		4.00	**4.09**	**mg/L**	**102%**	**0.5 %**			90-110%	10%
Standard	Standard	10.00	10.01	mg/L	100%		9701-20	0.5	90-110%	
Standard (Dupl)	Standard	10.00	9.98	mg/L	100%		9701-20	0.5	90-110%	
		10.00	**9.99**	**mg/L**	**100%**	**0.3 %**			90-110%	10%

Analysis: TOC-ICR (Total Organic Carbon) **Method:** SM 5310 C

QC Batch ID: 7-0-11

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	Acceptance Criteria RPD
Matrix Spike	Matrix Spike	4.00	4.05	mg/L	101%		9701-77	0.5		
Matrix Spike (Dupl)	Matrix Spike	4.00	4.07	mg/L	102%		9701-77	0.5		
		4.00	**4.06**	**mg/L**	**101%**	**0.2 %**				
Method Blank	Method Blank		ND*	mg/L			9701-76	0.5		
Method Blank (Dupl)	Method Blank		ND*	mg/L			9701-76	0.5		
			ND*	**mg/L**						
Standard	Standard	0.50	0.55	mg/L	110%		9701-18	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.55	mg/L	110%		9701-18	0.5	50-150%	
		0.50	**0.55**	**mg/L**	**110%**	**0.0 %**			50-150%	20%
Standard	Standard	4.00	4.22	mg/L	105%		9701-19	0.5	90-110%	
Standard (Dupl)	Standard	4.00	4.18	mg/L	104%		9701-19	0.5	90-110%	
		4.00	**4.20**	**mg/L**	**105%**	**1.0 %**			90-110%	10%
Standard	Standard	10.00	10.24	mg/L	102%		9701-20	0.5	90-110%	
Standard (Dupl)	Standard	10.00	10.24	mg/L	102%		9701-20	0.5	90-110%	
		10.00	**10.24**	**mg/L**	**102%**	**0.0 %**			90-110%	10%

ND: non-detect. *Recovery is below 1/2 minimum reporting level (MRL). NA (not applicable): RPD calculation is not applicable.

Summers & Hooper, Inc.
6 Knollcrest Drive
Cincinnati, OH 45237

Quality Control Report

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 3
Study Title: ICR RSSCT #1

Analysis: TOC-ICR (Total Organic Carbon) **Method:** SM 5310 C

QC Batch ID: 7-0-12

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	Acceptance Criteria RPD
Matrix Spike	Matrix Spike	4.00	3.93	mg/L	98%		9701-82	0.5		
Matrix Spike (Dupl)	Matrix Spike	4.00	3.96	mg/L	99%		9701-82	0.5		
		4.00	**3.94**	**mg/L**	**98%**	**0.8 %**				
Method Blank	Method Blank		ND*	mg/L			9701-95	0.5		
Method Blank (Dupl)	Method Blank		ND*	mg/L			9701-95	0.5		
			ND*	**mg/L**						
Standard	Standard	0.50	0.56	mg/L	112%		9701-18	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.57	mg/L	114%		9701-18	0.5	50-150%	
		0.50	**0.56**	**mg/L**	**112%**	**1.8 %**			50-150%	20%
Standard	Standard	4.00	4.02	mg/L	100%		9701-19	0.5	90-110%	
Standard (Dupl)	Standard	4.00	4.04	mg/L	101%		9701-19	0.5	90-110%	
		4.00	**4.03**	**mg/L**	**101%**	**0.5 %**			90-110%	10%

Analysis: TOC-ICR (Total Organic Carbon) **Method:** SM 5310 C

QC Batch ID: 7-0-13

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	Acceptance Criteria RPD
Matrix Spike	Matrix Spike	4.00	3.74	mg/L	94%		9701-96	0.5		
Matrix Spike (Dupl)	Matrix Spike	4.00	3.90	mg/L	97%		9701-96	0.5		
		4.00	**3.82**	**mg/L**	**95%**	**4.2 %**				
Method Blank	Method Blank		ND*	mg/L			9701-108	0.5		
Method Blank (Dupl)	Method Blank		ND*	mg/L			9701-108	0.5		
			ND*	**mg/L**						
Standard	Standard	0.50	0.65	mg/L	130%		9701-18	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.58	mg/L	116%		9701-18	0.5	50-150%	
		0.50	**0.62**	**mg/L**	**124%**	**11.3 %**			50-150%	20%
Standard	Standard	4.00	4.01	mg/L	100%		9701-19	0.5	90-110%	
Standard (Dupl)	Standard	4.00	4.01	mg/L	100%		9701-19	0.5	90-110%	
		4.00	**4.01**	**mg/L**	**100%**	**0.0 %**			90-110%	10%
Standard	Standard	10.00	10.36	mg/L	104%		9701-20	0.5	90-110%	
Standard (Dupl)	Standard	10.00	10.07	mg/L	101%		9701-20	0.5	90-110%	
		10.00	**10.22**	**mg/L**	**102%**	**2.8 %**			90-110%	10%

Analysis: TOC-ICR (Total Organic Carbon) **Method:** SM 5310 C

QC Batch ID: 7-0-14

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	Acceptance Criteria RPD
Matrix Spike	Matrix Spike	4.00	3.91	mg/L	98%		9701-115	0.5		
Matrix Spike (Dupl)	Matrix Spike	4.00	3.88	mg/L	97%		9701-115	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%**	**0.8 %**				
Method Blank	Method Blank		ND*	mg/L			9701-124	0.5		
Method Blank (Dupl)	Method Blank		ND*	mg/L			9701-124	0.5		
			ND*	**mg/L**						
Standard	Standard	0.50	0.57	mg/L	114%		9701-18	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.55	mg/L	110%		9701-18	0.5	50-150%	
		0.50	**0.56**	**mg/L**	**112%**	**3.6 %**			50-150%	20%
Standard	Standard	4.00	3.91	mg/L	98%		9701-19	0.5	90-110%	
Standard (Dupl)	Standard	4.00	3.90	mg/L	97%		9701-19	0.5	90-110%	
		4.00	**3.91**	**mg/L**	**98%**	**0.3 %**			90-110%	10%

Analysis: TOC-ICR (Total Organic Carbon) **Method:** SM 5310 C

QC Batch ID: 7-0-15

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	RPD
Matrix Spike	Matrix Spike	4.00	3.91	mg/L	98%		9701-118	0.5		
Matrix Spike (Dupl)	Matrix Spike	4.00	4.01	mg/L	100%		9701-118	0.5		
		4.00	**3.96**	**mg/L**	**99%**	**2.8 %**				
Method Blank	Method Blank		ND*	mg/L			9701-130	0.5		
Method Blank (Dupl)	Method Blank		ND*	mg/L			9701-130	0.5		
			ND*	**mg/L**						
Standard	Standard	0.50	0.56	mg/L	112%		9701-18	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.58	mg/L	116%		9701-18	0.5	50-150%	
		0.50	**0.57**	**mg/L**	**114%**	**3.5 %**			50-150%	20%
Standard	Standard	4.00	4.08	mg/L	102%		9701-19	0.5	90-110%	
Standard (Dupl)	Standard	4.00	4.03	mg/L	101%		9701-19	0.5	90-110%	
		4.00	**4.06**	**mg/L**	**101%**	**1.2 %**			90-110%	10%

Analysis: TOC-ICR (Total Organic Carbon) **Method:** SM 5310 C

QC Batch ID: 7-0-16

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	RPD
Matrix Spike	Matrix Spike	4.00	3.92	mg/L	98%		9701-141	0.5		
Matrix Spike (Dupl)	Matrix Spike	4.00	3.90	mg/L	97%		9701-141	0.5		
		4.00	**3.91**	**mg/L**	**98%**	**0.5 %**				
Method Blank	Method Blank		ND*	mg/L			9701-139	0.5		
Method Blank (Dupl)	Method Blank		ND*	mg/L			9701-139	0.5		
			ND*	**mg/L**						
Standard	Standard	0.50	0.56	mg/L	112%		9701-18	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.55	mg/L	110%		9701-18	0.5	50-150%	
		0.50	**0.56**	**mg/L**	**112%**	**1.8 %**			50-150%	20%
Standard	Standard	4.00	4.00	mg/L	100%		9701-19	0.5	90-110%	
Standard (Dupl)	Standard	4.00	4.00	mg/L	100%		9701-19	0.5	90-110%	
		4.00	**4.00**	**mg/L**	**100%**	**0.0 %**			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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Mr. John Zackasee
Mahoning Valley Sanitary District

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Analysis: TOC-ICR (Total Organic Carbon) **Method:** SM 5310 C

QC Batch ID: 7-0-17

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	Acceptance Criteria RPD
Matrix Spike	Matrix Spike	4.00	4.07	mg/L	102%		9701-151	0.5		
Matrix Spike (Dupl)	Matrix Spike	4.00	4.08	mg/L	102%		9701-151	0.5		
		4.00	**4.08**	**mg/L**	**102%**	**0.2 %**				
Method Blank	Method Blank		ND*	mg/L			9701-153	0.5		
Method Blank (Dupl)	Method Blank		ND*	mg/L			9701-153	0.5		
			ND*	**mg/L**						
Standard	Standard	0.50	0.57	mg/L	114%		9701-18	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.57	mg/L	114%		9701-18	0.5	50-150%	
		0.50	**0.57**	**mg/L**	**114%**	**0.0 %**			50-150%	20%
Standard	Standard	4.00	4.07	mg/L	102%		9701-19	0.5	90-110%	
Standard (Dupl)	Standard	4.00	3.99	mg/L	100%		9701-19	0.5	90-110%	
		4.00	**4.03**	**mg/L**	**101%**	**2.0 %**			90-110%	10%
Standard	Standard	4.00	4.15	mg/L	104%		9701-148	0.5	90-110%	
Standard (Dupl)	Standard	4.00	4.09	mg/L	102%		9701-148	0.5	90-110%	
		4.00	**4.12**	**mg/L**	**103%**	**1.5 %**			90-110%	10%
Standard	Standard	10.00	10.04	mg/L	100%		9701-20	0.5	90-110%	
Standard (Dupl)	Standard	10.00	10.07	mg/L	101%		9701-20	0.5	90-110%	
		10.00	**10.06**	**mg/L**	**101%**	**0.3 %**			90-110%	10%
Standard	Standard	10.00	10.12	mg/L	101%		9701-149	0.5	90-110%	
Standard (Dupl)	Standard	10.00	10.20	mg/L	102%		9701-149	0.5	90-110%	
		10.00	**10.16**	**mg/L**	**102%**	**0.8 %**			90-110%	10%

Analysis: TOC-ICR (Total Organic Carbon) **Method:** SM 5310 C

QC Batch ID: 7-0-18

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	Acceptance Criteria RPD
Matrix Spike	Matrix Spike	4.00	4.01	mg/L	100%		9701-154	0.5		
Matrix Spike (Dupl)	Matrix Spike	4.00	4.01	mg/L	100%		9701-154	0.5		
		4.00	**4.01**	**mg/L**	**100%**	**0.0 %**				
Method Blank	Method Blank		ND*	mg/L			9701-155	0.5		
Method Blank (Dupl)	Method Blank		ND*	mg/L			9701-155	0.5		
			ND*	**mg/L**						
Standard	Standard	0.50	0.56	mg/L	112%		9701-18	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.56	mg/L	112%		9701-18	0.5	50-150%	
		0.50	**0.56**	**mg/L**	**112%**	**0.0 %**			50-150%	20%
Standard	Standard	10.00	10.12	mg/L	101%		9701-149	0.5	90-110%	
Standard (Dupl)	Standard	10.00	10.19	mg/L	102%		9701-149	0.5	90-110%	
		10.00	**10.16**	**mg/L**	**102%**	**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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Analysis: TOC-ICR (Total Organic Carbon) **Method:** SM 5310 C

QC Batch ID: 7-0-20

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	Acceptance Criteria RPD
Matrix Spike	Matrix Spike	4.00	3.82	mg/L	95%		9701-136	0.5		
Matrix Spike (Dupl)	Matrix Spike	4.00	3.88	mg/L	97%		9701-136	0.5		
		4.00	**3.85**	**mg/L**	**96%**	**1.6 %**				
Method Blank	Method Blank		ND*	mg/L			9701-146	0.5		
Method Blank (Dupl)	Method Blank		ND*	mg/L			9701-146	0.5		
			ND*	**mg/L**						
Standard	Standard	0.50	0.55	mg/L	110%		9701-18	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.56	mg/L	112%		9701-18	0.5	50-150%	
		0.50	**0.55**	**mg/L**	**110%**	**1.8 %**			50-150%	20%
Standard	Standard	10.00	9.87	mg/L	99%		9701-20	0.5	90-110%	
Standard (Dupl)	Standard	10.00	9.94	mg/L	99%		9701-20	0.5	90-110%	
		10.00	**9.90**	**mg/L**	**99%**	**0.7 %**			90-110%	10%

Analysis: TOC-ICR (Total Organic Carbon) **Method:** SM 5310 C

QC Batch ID: 7-0-22

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	Acceptance Criteria RPD
Matrix Spike	Matrix Spike	4.00	3.85	mg/L	96%		9701-166	0.5		
Matrix Spike (Dupl)	Matrix Spike	4.00	3.85	mg/L	96%		9701-166	0.5		
		4.00	**3.85**	**mg/L**	**96%**	**0.3 %**				
Method Blank	Method Blank		ND*	mg/L			9702-1	0.5		
Method Blank (Dupl)	Method Blank		ND*	mg/L			9702-1	0.5		
			ND*	**mg/L**						
Standard	Standard	0.50	0.52	mg/L	104%		9701-18	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.53	mg/L	106%		9701-18	0.5	50-150%	
		0.50	**0.53**	**mg/L**	**106%**	**1.9 %**			50-150%	20%
Standard	Standard	10.00	10.05	mg/L	101%		9701-149	0.5	90-110%	
Standard (Dupl)	Standard	10.00	10.12	mg/L	101%		9701-149	0.5	90-110%	
		10.00	**10.09**	**mg/L**	**101%**	**0.7 %**			90-110%	10%

Analysis: TOC-ICR (Total Organic Carbon) **Method:** SM 5310 C

QC Batch ID: 7-0-24

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	Acceptance Criteria RPD
Matrix Spike	Matrix Spike	4.00	3.82	mg/L	95%		9702-11	0.5		
Matrix Spike (Dupl)	Matrix Spike	4.00	3.79	mg/L	95%		9702-11	0.5		
		4.00	**3.81**	**mg/L**	**95%**	**0.8 %**				
Method Blank	Method Blank		ND*	mg/L			9702-9	0.5		
Method Blank (Dupl)	Method Blank		ND*	mg/L			9702-9	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.

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Standard	Standard	0.50	0.54	mg/L	108%		9701-18	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.55	mg/L	110%		9701-18	0.5	50-150%	
		0.50	**0.54**	**mg/L**	**108%**	**1.9 %**			50-150%	20%
Standard	Standard	10.00	9.51	mg/L	95%		9701-149	0.5	90-110%	
Standard (Dupl)	Standard	10.00	9.69	mg/L	97%		9701-149	0.5	90-110%	
		10.00	**9.60**	**mg/L**	**96%**	**1.9 %**			90-110%	10%

Analysis: TOC-ICR (Total Organic Carbon) **Method:** SM 5310 C

QC Batch ID: 7-0-26

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	RPD
Matrix Spike	Matrix Spike	4.00	3.87	mg/L	97%		9702-21	0.5		
Matrix Spike (Dupl)	Matrix Spike	4.00	3.95	mg/L	99%		9702-21	0.5		
		4.00	**3.91**	**mg/L**	**98%**	**2.3 %**				
Method Blank	Method Blank		ND*	mg/L			9702-23	0.5		
Method Blank (Dupl)	Method Blank		ND*	mg/L			9702-23	0.5		
			ND*	**mg/L**						
Standard	Standard	0.50	0.53	mg/L	106%		9701-18	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.55	mg/L	110%		9701-18	0.5	50-150%	
		0.50	**0.54**	**mg/L**	**108%**	**3.7 %**			50-150%	20%
Standard	Standard	4.00	3.92	mg/L	98%		9701-148	0.5	90-110%	
Standard (Dupl)	Standard	4.00	3.99	mg/L	100%		9701-148	0.5	90-110%	
		4.00	**3.95**	**mg/L**	**99%**	**1.8 %**			90-110%	10%

Analysis: TOC-ICR (Total Organic Carbon) **Method:** SM 5310 C

QC Batch ID: 7-0-8

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	RPD
Standard	Standard	0.05	0.57	mg/L	1140		9701-18	0.5		
Standard	Standard	0.20	0.28	mg/L	140%		9701-28	0.5	50-150%	
Standard (Dupl)	Standard	0.20	0.28	mg/L	140%		9701-28	0.5	50-150%	
		0.20	**0.28**	**mg/L**	**140%**	**0.0 %**			50-150%	20%
Standard (Dupl)	Standard	0.50	0.56	mg/L	112%		9701-18	0.5	50-150%	
Standard	Standard	4.00	3.94	mg/L	98%		9701-19	0.5	90-110%	
Standard (Dupl)	Standard	4.00	3.95	mg/L	99%		9701-19	0.5	90-110%	
		4.00	**3.94**	**mg/L**	**98%**	**0.3 %**			90-110%	10%
Standard	Standard	4.00	3.97	mg/L	99%		9701-19	0.5	90-110%	
Standard	Standard	4.00	3.97	mg/L	99%		9701-19	0.5	90-110%	
Standard (Dupl)	Standard	4.00	3.98	mg/L	100%		9701-19	0.5	90-110%	
		4.00	**3.97**	**mg/L**	**99%**	**0.3 %**			90-110%	10%
Standard	Standard	10.00	9.95	mg/L	99%		9701-20	0.5	90-110%	
Standard (Dupl)	Standard	10.00	9.84	mg/L	98%		9701-20	0.5	90-110%	
		10.00	**9.90**	**mg/L**	**99%**	**1.1 %**			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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Standard	Standard	10.00	9.74	mg/L	97%		9701-27	0.5	90-110%	
Standard (Dupl)	Standard	10.00	9.81	mg/L	98%		9701-27	0.5	90-110%	
		10.00	**9.77**	**mg/L**	**98%**	**0.7 %**			90-110%	10%

Analysis: TOC-ICR (Total Organic Carbon) **Method:** SM 5310 C

QC Batch ID: 7-0-9

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	RPD
Standard	Standard	0.20	0.29	mg/L	145%		9701-28	0.5	50-150%	
Standard (Dupl)	Standard	0.20	0.30	mg/L	150%		9701-28	0.5	50-150%	
		0.20	**0.29**	**mg/L**	**145%**	**3.4 %**			50-150%	20%
Standard	Standard	0.50	0.53	mg/L	106%		9701-18	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.52	mg/L	104%		9701-18	0.5	50-150%	
		0.50	**0.53**	**mg/L**	**106%**	**1.9 %**			50-150%	20%
Standard	Standard	4.00	3.86	mg/L	96%		9701-19	0.5	90-110%	
Standard (Dupl)	Standard	4.00	4.04	mg/L	101%		9701-19	0.5	90-110%	
		4.00	**3.95**	**mg/L**	**99%**	**4.6 %**			90-110%	10%
Standard	Standard	10.00	10.47	mg/L	105%		9701-20	0.5	90-110%	
Standard (Dupl)	Standard	10.00	10.38	mg/L	104%		9701-20	0.5	90-110%	
		10.00	**10.42**	**mg/L**	**104%**	**0.9 %**			90-110%	10%

Analysis: UV-ICR (UV-254) **Method:** SM 5910 B

QC Batch ID: 8-0-12

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	RPD
Method Blank	Method Blank		ND*	1/cm			0000-2	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			0000-2	0.009		
			ND*	**1/cm**						
Method Blank	Method Blank		ND*	1/cm			0000-2	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			0000-2	0.009		
			ND*	**1/cm**						
Standard	Standard	0.009	0.008	1/cm	89%		9701-10	0.009	75-125%	
Standard (Dupl)	Standard	0.009	0.008	1/cm	89%		9701-10	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%		0008-1	0.009	85-115%	
Standard (Dupl)	Standard	0.088	0.088	1/cm	100%		0008-1	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: 8-0-13

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	RPD
Method Blank	Method Blank		ND*	1/cm			0008-2	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			0008-2	0.009		

ND: non-detect. *Recovery is below 1/2 minimum reporting level (MRL). NA (not applicable): RPD calculation is not applicable.

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			ND*	**1/cm**						
Method Blank	Method Blank		ND*	1/cm			0008-2	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			0008-2	0.009		
			ND*	**1/cm**						
Standard	Standard	0.009	0.008	1/cm	89%		9701-87	0.009	75-125%	
Standard (Dupl)	Standard	0.009	0.007	1/cm	78%		9701-87	0.009	75-125%	
		0.009	**0.007**	**1/cm**	**78%**	**14.3 %**			75-125%	20%
Standard	Standard	0.088	0.087	1/cm	99%		9701-86	0.009	85-115%	
Standard (Dupl)	Standard	0.088	0.087	1/cm	99%		9701-86	0.009	85-115%	
		0.088	**0.087**	**1/cm**	**99%**	**0.0 %**			85-115%	10%

Analysis: UV-ICR (UV-254) **Method:** SM 5910 B

QC Batch ID: 8-0-14

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	RPD
Method Blank	Method Blank		ND*	1/cm			0008-2	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			0008-2	0.009		
			ND*	**1/cm**						
Method Blank	Method Blank		ND*	1/cm			0008-2	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			0008-2	0.009		
			ND*	**1/cm**						
Standard	Standard	0.009	0.007	1/cm	78%		9701-87	0.009	75-125%	
Standard (Dupl)	Standard	0.009	0.007	1/cm	78%		9701-87	0.009	75-125%	
		0.009	**0.007**	**1/cm**	**78%**	**0.0 %**			75-125%	20%
Standard	Standard	0.088	0.087	1/cm	99%		9701-86	0.009	85-115%	
Standard (Dupl)	Standard	0.088	0.088	1/cm	100%		9701-86	0.009	85-115%	
		0.088	**0.087**	**1/cm**	**99%**	**1.1 %**			85-115%	10%

Analysis: UV-ICR (UV-254) **Method:** SM 5910 B

QC Batch ID: 8-0-15

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	RPD
Method Blank	Method Blank		ND*	1/cm			0008-2	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			0008-2	0.009		
			ND*	**1/cm**						
Method Blank	Method Blank		ND*	1/cm			0008-2	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			0008-2	0.009		
			ND*	**1/cm**						
Standard	Standard	0.009	0.008	1/cm	89%		9701-87	0.009	75-125%	
Standard (Dupl)	Standard	0.009	0.008	1/cm	89%		9701-87	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%		9701-86	0.009	85-115%	
Standard (Dupl)	Standard	0.088	0.088	1/cm	100%		9701-86	0.009	85-115%	
		0.088	**0.088**	**1/cm**	**100%**	**0.0 %**			85-115%	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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Cincinnati, OH 45237

Quality Control Report

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 3
Study Title: ICR RSSCT #1

Analysis: UV-ICR (UV-254) **Method:** SM 5910 B

QC Batch ID: 8-0-16

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	Acceptance Criteria RPD
Method Blank	Method Blank		ND*	1/cm			0008-2	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			0008-2	0.009		
			ND*	**1/cm**						
Method Blank	Method Blank		ND*	1/cm			0008-2	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			0008-2	0.009		
			ND*	**1/cm**						
Standard	Standard	0.009	0.008	1/cm	89%		9701-87	0.009	75-125%	
Standard (Dupl)	Standard	0.009	0.008	1/cm	89%		9701-87	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%		9701-134	0.009	85-115%	
Standard (Dupl)	Standard	0.088	0.087	1/cm	99%		9701-134	0.009	85-115%	
		0.088	**0.087**	**1/cm**	**99%**	**0.0 %**			85-115%	10%

Analysis: UV-ICR (UV-254) **Method:** SM 5910 B

QC Batch ID: 8-0-17

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	Acceptance Criteria RPD
Method Blank	Method Blank		ND*	1/cm			0008-2	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			0008-2	0.009		
			ND*	**1/cm**						
Method Blank	Method Blank		ND*	1/cm			0008-2	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			0008-2	0.009		
			ND*	**1/cm**						
Standard	Standard	0.009	0.008	1/cm	89%		9701-87	0.009	75-125%	
Standard (Dupl)	Standard	0.009	0.008	1/cm	89%		9701-87	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%		9701-134	0.009	85-115%	
Standard (Dupl)	Standard	0.088	0.087	1/cm	99%		9701-134	0.009	85-115%	
		0.088	**0.087**	**1/cm**	**99%**	**0.0 %**			85-115%	10%

Analysis: UV-ICR (UV-254) **Method:** SM 5910 B

QC Batch ID: 8-0-19

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	Acceptance Criteria RPD
Method Blank	Method Blank		ND*	1/cm			0008-2	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			0008-2	0.009		
			ND*	**1/cm**						
Method Blank	Method Blank		ND*	1/cm			0008-2	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			0008-2	0.009		

ND: non-detect. *Recovery is below 1/2 minimum reporting level (MRL). NA (not applicable): RPD calculation is not applicable.

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Mr. John Zackasee
Mahoning Valley Sanitary District

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Study Title: ICR RSSCT #1

			ND*	**1/cm**						
Standard	Standard	0.009	0.008	1/cm	89%		9701-87	0.009	75-125%	
Standard (Dupl)	Standard	0.009	0.008	1/cm	89%		9701-87	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%		9701-134	0.009	85-115%	
Standard (Dupl)	Standard	0.088	0.086	1/cm	98%		9701-134	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: 8-0-20

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	RPD
Method Blank	Method Blank		ND*	1/cm			0008-2	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			0008-2	0.009		
			ND*	**1/cm**						
Method Blank	Method Blank		ND*	1/cm			0008-2	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			0008-2	0.009		
			ND*	**1/cm**						
Standard	Standard	0.009	0.008	1/cm	89%		9701-87	0.009	75-125%	
Standard (Dupl)	Standard	0.009	0.008	1/cm	89%		9701-87	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%		9701-134	0.009	85-115%	
Standard (Dupl)	Standard	0.088	0.086	1/cm	98%		9701-134	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: 8-0-21

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	RPD
Method Blank	Method Blank		ND*	1/cm			0008-2	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			0008-2	0.009		
			ND*	**1/cm**						
Method Blank	Method Blank		ND*	1/cm			0008-2	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			0008-2	0.009		
			ND*	**1/cm**						
Standard	Standard	0.009	0.008	1/cm	89%		9701-87	0.009	75-125%	
Standard (Dupl)	Standard	0.009	0.008	1/cm	89%		9701-87	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%		9701-134	0.009	85-115%	
Standard (Dupl)	Standard	0.088	0.086	1/cm	98%		9701-134	0.009	85-115%	
		0.088	**0.086**	**1/cm**	**98%**	**0.0 %**			85-115%	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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Quality Control Report

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 3
Study Title: ICR RSSCT #1

Analysis: UV-ICR (UV-254) **Method:** SM 5910 B

QC Batch ID: 8-0-23

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	Acceptance Criteria RPD
Method Blank	Method Blank		ND*	1/cm			0008-2	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			0008-2	0.009		
			ND*	**1/cm**						
Method Blank	Method Blank		ND*	1/cm			0008-2	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			0008-2	0.009		
			ND*	**1/cm**						
Standard	Standard	0.009	0.008	1/cm	89%		9702-19	0.009	75-125%	
Standard (Dupl)	Standard	0.009	0.008	1/cm	89%		9702-19	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%		9701-134	0.009	85-115%	
Standard (Dupl)	Standard	0.088	0.087	1/cm	99%		9701-134	0.009	85-115%	
		0.088	**0.087**	**1/cm**	**99%**	**1.1 %**			85-115%	10%

End of quality control report

ND: non-detect. *Recovery is below 1/2 minimum reporting level (MRL). NA (not applicable): RPD calculation is not applicable.

Summers & Hooper, Inc.
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QC Results from Montgomery Watson Laboratories

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Mr. John Zackasee
Superintendent-Purification
Mahoning Valley Sanitary District
P.O. Box 4119
Youngstown, OH 44515

Phone: 330-652-3614 Fax: 330-652-6293

Study#: 3
Study Title: ICR RSSCT #1

QC Batch ID: 59282 **Report #:** 31999r2

Analysis: BR **Method:** ML/EPA 300

QC	Analyte	Spike	Recovery	Yield	RPD	Acceptance Criteria Range
LCS1	Bromide	0.1	0.097	97.0%		(90 - 110)
LCS2	Bromide	0.1	0.104	104.0%		(90 - 110)
MBLK	Bromide	ND	ND			(70 - 130)
MS	Bromide	0.1	0.094	94.0%		(80 - 120)
MSD	Bromide	0.1	0.101	101.0%		(80 - 120)

QC Batch ID: 59396 **Report #:** 31999r2

Analysis: @THM551 **Method:** ML/EPA 551

QC	Analyte	Spike	Recovery	Yield	RPD	Acceptance Criteria Range
LCS1	Bromodichloromethane	5.0	5.6	112.0%		(80 - 120)
LCS2	Bromodichloromethane	5.0	4.9	98.0%		(80 - 120)
MBLK	Bromodichloromethane	ND	ND			
MS2	Bromodichloromethane	5.0	4.9	98.0%		(80 - 120)
LCS1	Bromoform	5.0	5.5	110.0%		(80 - 120)
LCS2	Bromoform	5.0	4.6	92.0%		(80 - 120)
MBLK	Bromoform	ND	ND			
MS1	Bromoform	5.0	5.1	102.0%		(80 - 120)
MS2	Bromoform	5.0	4.4	88.0%		(80 - 120)
LCS1	Chloroform	5.0	5.7	114.0%		(80 - 120)
LCS2	Chloroform	5.0	5.1	102.0%		(80 - 120)
MBLK	Chloroform	ND	ND			
MS1	Chloroform	5.0	8.9	178.0%		(80 - 120)
MS2	Chloroform	5.0	5.4	108.0%		(80 - 120)
LCS1	Dibromochloromethane	5.0	5.4	108.0%		(80 - 120)
LCS2	Dibromochloromethane	5.0	4.6	92.0%		(80 - 120)
MBLK	Dibromochloromethane	ND	ND			
MS1	Dibromochloromethane	5.0	5.9	118.0%		(80 - 120)
MS2	Dibromochloromethane	5.0	4.5	90.0%		(80 - 120)

ND (non-detect): Result is below 1/2 minimum reporting level (MRL).

QC Results from Montgomery Watson Laboratories

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 3
Study Title: ICR RSSCT #1

QC Batch ID: 59545 **Report #:** 31999r2

Analysis: @TOX-ICR **Method:** ML/S4500H-B

QC	Analyte	Spike	Recovery	Yield	RPD	Acceptance Criteria Range
LCS1	Total Organic Halogen (Init)	25	22.6	90.0%		(85 - 115)
LCS2	Total Organic Halogen (Init)	200	205	102.0%		(85 - 115)
LCS3	Total Organic Halogen (Init)	500	447	89.0%		(75 - 125)
MBLK	Total Organic Halogen (Init)	ND	ND			
MSD	Total Organic Halogen (Init)	200	231	116.0%		(50 - 150)
MS	Total Organic Halogen (Init)	200	224	112.0%		(50 - 150)

QC Batch ID: 59546 **Report #:** 31999r2

Analysis: @TOX-ICR **Method:** ML/S4500H-B

QC	Analyte	Spike	Recovery	Yield	RPD	Acceptance Criteria Range
LCS2	Total Organic Halogen (Init)	200	173	86.0%		(85 - 115)
LCS3	Total Organic Halogen (Init)	25	20.4	82.0%		(75 - 125)
MBLK	Total Organic Halogen (Init)	ND	ND			
MSD	Total Organic Halogen (Init)	200	231	116.0%		(50 - 150)
MS	Total Organic Halogen (Init)	200	225	112.0%		(50 - 150)

QC Batch ID: 59564 **Report #:** 31999r2

Analysis: @HALOAC **Method:** ML/S6251B

QC	Analyte	Spike	Recovery	Yield	RPD	Acceptance Criteria Range
DUP	Bromochloroacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Bromochloroacetic acid	10	10	100.0%		(70 - 130)
LCS2	Bromochloroacetic acid	10	11	110.0%		(70 - 130)
MBLK	Bromochloroacetic acid	ND	ND			
MS	Bromochloroacetic acid	10	11	110.0%		(70 - 130)
DUP	Bromodichloroacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Bromodichloroacetic acid	10	10	100.0%		(70 - 130)
LCS2	Bromodichloroacetic acid	10	10	100.0%		(70 - 130)
MBLK	Bromodichloroacetic acid	ND	ND			
MS	Bromodichloroacetic acid	10	13	130.0%		(70 - 130)
DUP	Chlorodibromoacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Chlorodibromoacetic acid	10	9	90.0%		(70 - 130)
LCS2	Chlorodibromoacetic acid	10	9	90.0%		(70 - 130)
MBLK	Chlorodibromoacetic acid	ND	ND			
MS	Chlorodibromoacetic acid	10	13	130.0%		(70 - 130)

ND (non-detect): Result is below 1/2 minimum reporting level (MRL).

QC Results from Montgomery Watson Laboratories

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 3
Study Title: ICR RSSCT #1

DUP	Dibromoacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Dibromoacetic acid	10	10	100.0%		(70 - 130)
LCS2	Dibromoacetic acid	10	11	110.0%		(70 - 130)
MBLK	Dibromoacetic acid	ND	ND			
MS	Dibromoacetic acid	10	11	110.0%		(70 - 130)
DUP	Dichloroacetic acid	1	1		0.0%	(0 - 20)
LCS1	Dichloroacetic acid	10	10	100.0%		(70 - 130)
LCS2	Dichloroacetic acid	10	10	100.0%		(70 - 130)
MBLK	Dichloroacetic acid	ND	ND			
MS	Dichloroacetic acid	10	7	70.0%		(70 - 130)
DUP	Monobromoacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Monobromoacetic acid	10	10	100.0%		(70 - 130)
LCS2	Monobromoacetic acid	10	10	100.0%		(70 - 130)
MBLK	Monobromoacetic acid	ND	ND			
MS	Monobromoacetic acid	10	11	110.0%		(70 - 130)
DUP	Monochloroacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Monochloroacetic acid	20	21	105.0%		(70 - 130)
LCS2	Monochloroacetic acid	20	22	110.0%		(70 - 130)
MBLK	Monochloroacetic acid	ND	ND			
MS	Monochloroacetic acid	20	24	120.0%		(70 - 130)
DUP	Tribromoacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Tribromoacetic acid	10	9	90.0%		(70 - 130)
LCS2	Tribromoacetic acid	10	9	90.0%		(70 - 130)
MBLK	Tribromoacetic acid	ND	ND			
MS	Tribromoacetic acid	10	13	130.0%		(70 - 130)
DUP	Trichloroacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Trichloroacetic acid	10	10	100.0%		(70 - 130)
LCS2	Trichloroacetic acid	10	10	100.0%		(70 - 130)
MBLK	Trichloroacetic acid	ND	ND			
MS	Trichloroacetic acid	10	12	120.0%		(70 - 130)

QC Batch ID: 59600 **Report #:** 32060r1

Analysis: @HALOAC **Method:** ML/S6251B

QC	Analyte	Spike	Recovery	Yield	RPD	Acceptance Criteria Range
DUP	Bromochloroacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Bromochloroacetic acid	10	11	110.0%		(70 - 130)
LCS2	Bromochloroacetic acid	10	11	110.0%		(70 - 130)
MBLK	Bromochloroacetic acid	ND	ND			

ND (non-detect): Result is below 1/2 minimum reporting level (MRL).

QC Results from Montgomery Watson Laboratories

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 3
Study Title: ICR RSSCT #1

MS	Bromochloroacetic acid	10	11	110.0%		(70 - 130)
DUP	Bromodichloroacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Bromodichloroacetic acid	10	11	110.0%		(70 - 130)
LCS2	Bromodichloroacetic acid	10	11	110.0%		(70 - 130)
MBLK	Bromodichloroacetic acid	ND	ND			
MS	Bromodichloroacetic acid	10	13	130.0%		(70 - 130)
DUP	Chlorodibromoacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Chlorodibromoacetic acid	10	10	100.0%		(70 - 130)
LCS2	Chlorodibromoacetic acid	10	11	110.0%		(70 - 130)
MBLK	Chlorodibromoacetic acid	ND	ND			
MS	Chlorodibromoacetic acid	10	13	130.0%		(70 - 130)
DUP	Dibromoacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Dibromoacetic acid	10	10	100.0%		(70 - 130)
LCS2	Dibromoacetic acid	10	11	110.0%		(70 - 130)
MBLK	Dibromoacetic acid	ND	ND			
MS	Dibromoacetic acid	10	11	110.0%		(70 - 130)
DUP	Dichloroacetic acid	1	1		0.0%	(0 - 20)
LCS1	Dichloroacetic acid	10	10	100.0%		(70 - 130)
LCS2	Dichloroacetic acid	10	10	100.0%		(70 - 130)
MBLK	Dichloroacetic acid	ND	ND			
MS	Dichloroacetic acid	10	9	90.0%		(70 - 130)
DUP	Monobromoacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Monobromoacetic acid	10	10	100.0%		(70 - 130)
LCS2	Monobromoacetic acid	10	10	100.0%		(70 - 130)
MBLK	Monobromoacetic acid	ND	ND			
MS	Monobromoacetic acid	10	10	100.0%		(70 - 130)
DUP	Monochloroacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Monochloroacetic acid	20	21	105.0%		(70 - 130)
LCS2	Monochloroacetic acid	20	20	100.0%		(70 - 130)
MBLK	Monochloroacetic acid	ND	ND			
MS	Monochloroacetic acid	20	22	110.0%		(70 - 130)
DUP	Tribromoacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Tribromoacetic acid	10	9	90.0%		(70 - 130)
LCS2	Tribromoacetic acid	10	10	100.0%		(70 - 130)
MBLK	Tribromoacetic acid	ND	ND			
MS	Tribromoacetic acid	10	12	120.0%		(70 - 130)
DUP	Trichloroacetic acid	ND	ND		0.0%	(0 - 20)

ND (non-detect): Result is below 1/2 minimum reporting level (MRL).

QC Results from Montgomery Watson Laboratories

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 3
Study Title: ICR RSSCT #1

LCS1	Trichloroacetic acid	10	11	110.0%		(70 - 130)
LCS2	Trichloroacetic acid	10	11	110.0%		(70 - 130)
MBLK	Trichloroacetic acid	ND	ND			
MS	Trichloroacetic acid	10	11	110.0%		(70 - 130)

QC Batch ID: 59746 **Report #:** 31999r2

Analysis: NH3 **Method:** ML/EPA 350.1

QC	Analyte	Spike	Recovery	Yield	RPD	Acceptance Criteria Range
LCS1	Ammonia Nitrogen	1.00	1.02	102.0%		(80 - 120)
LCS2	Ammonia Nitrogen	1.00	1.01	101.0%		(80 - 120)
MBLK	Ammonia Nitrogen	ND	ND			
MS	Ammonia Nitrogen	1.00	1.07	107.0%		(80 - 120)
MSD	Ammonia Nitrogen	1.00	1.06	106.0%		(80 - 120)

QC Batch ID: 59759 **Report #:** 32173

Analysis: @HALOAC **Method:** ML/S6251B

QC	Analyte	Spike	Recovery	Yield	RPD	Acceptance Criteria Range
DUP	Bromochloroacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Bromochloroacetic acid	10	10	100.0%		(70 - 130)
LCS2	Bromochloroacetic acid	10	10	100.0%		(70 - 130)
MBLK	Bromochloroacetic acid	ND	ND			
MS	Bromochloroacetic acid	10	10	100.0%		(70 - 130)
DUP	Bromodichloroacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Bromodichloroacetic acid	10	11	110.0%		(70 - 130)
LCS2	Bromodichloroacetic acid	10	12	120.0%		(70 - 130)
MBLK	Bromodichloroacetic acid	ND	ND			
MS	Bromodichloroacetic acid	10	11	110.0%		(70 - 130)
DUP	Chlorodibromoacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Chlorodibromoacetic acid	10	11	110.0%		(70 - 130)
LCS2	Chlorodibromoacetic acid	10	11	110.0%		(70 - 130)
MBLK	Chlorodibromoacetic acid	ND	ND			
MS	Chlorodibromoacetic acid	10	11	110.0%		(70 - 130)
DUP	Dibromoacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Dibromoacetic acid	10	10	100.0%		(70 - 130)
LCS2	Dibromoacetic acid	10	11	110.0%		(70 - 130)
MBLK	Dibromoacetic acid	ND	ND			
MS	Dibromoacetic acid	10	11	110.0%		(70 - 130)
DUP	Dichloroacetic acid	ND	ND		0.0%	(0 - 20)

ND (non-detect): Result is below 1/2 minimum reporting level (MRL).

QC Results from Montgomery Watson Laboratories

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 3
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LCS1	Dichloroacetic acid	10	10	100.0%		(70 - 130)
LCS2	Dichloroacetic acid	10	10	100.0%		(70 - 130)
MBLK	Dichloroacetic acid	ND	ND			
MS	Dichloroacetic acid	10	10	100.0%		(70 - 130)
DUP	Monobromoacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Monobromoacetic acid	10	10	100.0%		(70 - 130)
LCS2	Monobromoacetic acid	10	10	100.0%		(70 - 130)
MBLK	Monobromoacetic acid	ND	ND			
MS	Monobromoacetic acid	10	10	100.0%		(70 - 130)
DUP	Monochloroacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Monochloroacetic acid	20	20	100.0%		(70 - 130)
LCS2	Monochloroacetic acid	20	21	105.0%		(70 - 130)
MBLK	Monochloroacetic acid	ND	ND			
MS	Monochloroacetic acid	20	21	105.0%		(70 - 130)
DUP	Tribromoacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Tribromoacetic acid	10	10	100.0%		(70 - 130)
LCS2	Tribromoacetic acid	10	10	100.0%		(70 - 130)
MBLK	Tribromoacetic acid	ND	ND			
MS	Tribromoacetic acid	10	11	110.0%		(70 - 130)
DUP	Trichloroacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Trichloroacetic acid	10	10	100.0%		(70 - 130)
LCS2	Trichloroacetic acid	10	11	110.0%		(70 - 130)
MBLK	Trichloroacetic acid	ND	ND			
MS	Trichloroacetic acid	10	11	110.0%		(70 - 130)

QC Batch ID: 59763 **Report #:** 31999r2
32060r1

Analysis: @THM551 **Method:** ML/EPA 551

QC	Analyte	Spike	Recovery	Yield	RPD	Acceptance Criteria Range
LCS1	Bromodichloromethane	5.0	5.6	112.0%		(80 - 120)
LCS2	Bromodichloromethane	5.0	5.3	106.0%		(80 - 120)
MBLK	Bromodichloromethane	ND	ND			
MS2	Bromodichloromethane	5.0	5.1	102.0%		(80 - 120)
LCS1	Bromoform	5.0	5.7	114.0%		(80 - 120)
LCS2	Bromoform	5.0	5.4	108.0%		(80 - 120)
MBLK	Bromoform	ND	ND			
MS1	Bromoform	5.0	5.8	116.0%		(80 - 120)
MS2	Bromoform	5.0	5.1	102.0%		(80 - 120)

ND (non-detect): Result is below 1/2 minimum reporting level (MRL).

QC Results from Montgomery Watson Laboratories

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 3
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LCS1	Chloroform	5.0	5.6	112.0%	(80 - 120)
LCS2	Chloroform	5.0	5.3	106.0%	(80 - 120)
MBLK	Chloroform	ND	ND		
MS1	Chloroform	5.0	5.4	108.0%	(80 - 120)
MS2	Chloroform	5.0	5.1	102.0%	(80 - 120)
LCS1	Dibromochloromethane	5.0	5.7	114.0%	(80 - 120)
LCS2	Dibromochloromethane	5.0	5.4	108.0%	(80 - 120)
MBLK	Dibromochloromethane	ND	ND		
MS1	Dibromochloromethane	5.0	6.2	124.0%	(80 - 120)
MS2	Dibromochloromethane	5.0	4.6	92.0%	(80 - 120)

QC Batch ID: 59764 **Report #:** 31999r2
32060r1

Analysis: @THM551 **Method:** ML/EPA 551

QC	Analyte	Spike	Recovery	Yield	RPD	Acceptance Criteria Range
LCS1	Bromodichloromethane	5.0	4.8	96.0%		(80 - 120)
LCS2	Bromodichloromethane	5.0	5.1	102.0%		(80 - 120)
MBLK	Bromodichloromethane	ND	ND			
MS2	Bromodichloromethane	5.0	5.1	102.0%		(80 - 120)
LCS1	Bromoform	5.0	4.9	98.0%		(80 - 120)
LCS2	Bromoform	5.0	5.0	100.0%		(80 - 120)
MBLK	Bromoform	ND	ND			
MS1	Bromoform	5.0	5.8	116.0%		(80 - 120)
MS2	Bromoform	5.0	5.1	102.0%		(80 - 120)
LCS1	Chloroform	5.0	4.7	94.0%		(80 - 120)
LCS2	Chloroform	5.0	5.1	102.0%		(80 - 120)
MBLK	Chloroform	ND	ND			
MS1	Chloroform	5.0	5.4	108.0%		(80 - 120)
MS2	Chloroform	5.0	5.1	102.0%		(80 - 120)
LCS1	Dibromochloromethane	5.0	4.9	98.0%		(80 - 120)
LCS2	Dibromochloromethane	5.0	5.1	102.0%		(80 - 120)
MBLK	Dibromochloromethane	ND	ND			
MS1	Dibromochloromethane	5.0	6.2	124.0%		(80 - 120)
MS2	Dibromochloromethane	5.0	4.6	92.0%		(80 - 120)

QC Batch ID: 59827 **Report #:** 31999r2

Analysis: @TOX-ICR **Method:** ML/S4500H-B

QC	Analyte	Spike	Recovery	Yield	RPD	Acceptance Criteria Range

ND (non-detect): Result is below 1/2 minimum reporting level (MRL).

QC Results from Montgomery Watson Laboratories

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 3
Study Title: ICR RSSCT #1

LCS1	Total Organic Halogen (Init)	50	43.2	86.0%	(85 - 115)
LCS2	Total Organic Halogen (Init)	200	173	86.0%	(85 - 115)
MBLK	Total Organic Halogen (Init)	ND	ND		
MSD	Total Organic Halogen (Init)	200	253	126.0%	(50 - 150)
MS	Total Organic Halogen (Init)	200	249	124.0%	(50 - 150)

QC Batch ID: 59872 **Report #:** 31999r2
32060r1

Analysis: @TOX-ICR **Method:** ML/S4500H-B

QC	Analyte	Spike	Recovery	Yield	RPD	Acceptance Criteria Range
LCS1	Total Organic Halogen (Init)	25	30	120.0%		(85 - 115)
LCS2	Total Organic Halogen (Init)	200	189	94.0%		(85 - 115)
MBLK	Total Organic Halogen (Init)	ND	ND			
MSD	Total Organic Halogen (Init)	200	253	126.0%		(50 - 150)
MS	Total Organic Halogen (Init)	200	249	124.0%		(50 - 150)

QC Batch ID: 59875 **Report #:** 32060r1

Analysis: @TOX-ICR **Method:** ML/S4500H-B

QC	Analyte	Spike	Recovery	Yield	RPD	Acceptance Criteria Range
LCS1	Total Organic Halogen (Init)	25	21	84.0%		(85 - 115)
LCS2	Total Organic Halogen (Init)	200	188	94.0%		(85 - 115)
MBLK	Total Organic Halogen (Init)	ND	ND			
MSD	Total Organic Halogen (Init)	200	183	92.0%		(50 - 150)
MS	Total Organic Halogen (Init)	200	178	89.0%		(50 - 150)

QC Batch ID: 59878 **Report #:** 32173
32276r1

Analysis: @TOX-ICR **Method:** ML/S4500H-B

QC	Analyte	Spike	Recovery	Yield	RPD	Acceptance Criteria Range
LCS1	Total Organic Halogen (Init)	50	50.4	101.0%		(85 - 115)
LCS2	Total Organic Halogen (Init)	200	180	90.0%		(85 - 115)
MBLK	Total Organic Halogen (Init)	ND	ND			
MSD	Total Organic Halogen (Init)	200	253	126.0%		(50 - 150)
MS	Total Organic Halogen (Init)	200	249	124.0%		(50 - 150)

QC Batch ID: 59881 **Report #:** 32276r1

Analysis: @TOX-ICR **Method:** ML/S4500H-B

QC	Analyte	Spike	Recovery	Yield	RPD	Acceptance Criteria Range
LCS1	Total Organic Halogen (Init)	25	22.3	89.0%		(85 - 115)

ND (non-detect): Result is below 1/2 minimum reporting level (MRL).

QC Results from Montgomery Watson Laboratories

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 3
Study Title: ICR RSSCT #1

LCS2	Total Organic Halogen (Init)	200	192	96.0%		(85 - 115)
MBLK	Total Organic Halogen (Init)	ND	ND			
MSD	Total Organic Halogen (Init)	200	230	115.0%		(50 - 150)
MS	Total Organic Halogen (Init)	200	226	113.0%		(50 - 150)

QC Batch ID: 59970 **Report #:** 32060r1

Analysis: @TOX-ICR **Method:** ML/S4500H-B

QC	Analyte	Spike	Recovery	Yield	RPD	Acceptance Criteria Range
LCS1	Total Organic Halogen (Init)	25	30.4	122.0%		(85 - 115)
LCS2	Total Organic Halogen (Init)	200	189	94.0%		(85 - 115)
MBLK	Total Organic Halogen (Init)	ND	ND			
MSD	Total Organic Halogen (Init)	200	253	126.0%		(50 - 150)
MS	Total Organic Halogen (Init)	200	249	124.0%		(50 - 150)

QC Batch ID: 60011 **Report #:** 32060r1
32173

Analysis: @THM551 **Method:** ML/EPA 551

QC	Analyte	Spike	Recovery	Yield	RPD	Acceptance Criteria Range
LCS1	Bromodichloromethane	5.0	5.3	106.0%		(80 - 120)
LCS2	Bromodichloromethane	5.0	5.3	106.0%		(80 - 120)
MBLK	Bromodichloromethane	ND	ND			
MS2	Bromodichloromethane	5.0	5.4	108.0%		(80 - 120)
LCS1	Bromoform	5.0	5.2	104.0%		(80 - 120)
LCS2	Bromoform	5.0	5.2	104.0%		(80 - 120)
MBLK	Bromoform	ND	ND			
MS1	Bromoform	5.0	5.0	100.0%		(80 - 120)
MS2	Bromoform	5.0	8.3	166.0%		(80 - 120)
LCS1	Chloroform	5.0	5.2	104.0%		(80 - 120)
LCS2	Chloroform	5.0	5.3	106.0%		(80 - 120)
MBLK	Chloroform	ND	ND			
MS1	Chloroform	5.0	2.1	42.0%		(80 - 120)
MS2	Chloroform	5.0	4.9	98.0%		(80 - 120)
LCS1	Dibromochloromethane	5.0	5.3	106.0%		(80 - 120)
LCS2	Dibromochloromethane	5.0	5.3	106.0%		(80 - 120)
MBLK	Dibromochloromethane	ND	ND			
MS1	Dibromochloromethane	5.0	4.8	96.0%		(80 - 120)
MS2	Dibromochloromethane	5.0	6.3	126.0%		(80 - 120)

ND (non-detect): Result is below 1/2 minimum reporting level (MRL).

QC Results from Montgomery Watson Laboratories

Mr. John Zackasee
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Study#: 3
Study Title: ICR RSSCT #1

QC Batch ID: 60014 **Report #:** 32276r1

Analysis: @HALOAC **Method:** ML/S6251B

QC	Analyte	Spike	Recovery	Yield	RPD	Acceptance Criteria Range
DUP	Bromochloroacetic acid	2	2		0.0%	(0 - 20)
LCS1	Bromochloroacetic acid	10	10	100.0%		(70 - 130)
LCS2	Bromochloroacetic acid	10	11	110.0%		(70 - 130)
MBLK	Bromochloroacetic acid	ND	ND			
MS	Bromochloroacetic acid	10	10	100.0%		(70 - 130)
DUP	Bromodichloroacetic acid	2	2		0.0%	(0 - 20)
LCS1	Bromodichloroacetic acid	10	11	110.0%		(70 - 130)
LCS2	Bromodichloroacetic acid	10	12	120.0%		(70 - 130)
MBLK	Bromodichloroacetic acid	ND	ND			
MS	Bromodichloroacetic acid	10	13	130.0%		(70 - 130)
DUP	Chlorodibromoacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Chlorodibromoacetic acid	10	11	110.0%		(70 - 130)
LCS2	Chlorodibromoacetic acid	10	11	110.0%		(70 - 130)
MBLK	Chlorodibromoacetic acid	ND	ND			
MS	Chlorodibromoacetic acid	10	11	110.0%		(70 - 130)
DUP	Dibromoacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Dibromoacetic acid	10	10	100.0%		(70 - 130)
LCS2	Dibromoacetic acid	10	11	110.0%		(70 - 130)
MBLK	Dibromoacetic acid	ND	ND			
MS	Dibromoacetic acid	10	11	110.0%		(70 - 130)
DUP	Dichloroacetic acid	28	29		4.0%	(0 - 20)
LCS1	Dichloroacetic acid	10	10	100.0%		(70 - 130)
LCS2	Dichloroacetic acid	10	11	110.0%		(70 - 130)
MBLK	Dichloroacetic acid	ND	ND			
MS	Dichloroacetic acid	10	9	90.0%		(70 - 130)
DUP	Monobromoacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Monobromoacetic acid	10	10	100.0%		(70 - 130)
LCS2	Monobromoacetic acid	10	10	100.0%		(70 - 130)
MBLK	Monobromoacetic acid	ND	ND			
MS	Monobromoacetic acid	10	9	90.0%		(70 - 130)
DUP	Monochloroacetic acid	3	3		0.0%	(0 - 20)
LCS1	Monochloroacetic acid	20	19	95.0%		(70 - 130)
LCS2	Monochloroacetic acid	20	21	105.0%		(70 - 130)
MBLK	Monochloroacetic acid	ND	ND			

ND (non-detect): Result is below 1/2 minimum reporting level (MRL).

QC Results from Montgomery Watson Laboratories

Mr. John Zackasee
Mahoning Valley Sanitary District

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MS	Monochloroacetic acid	20	20	100.0%		(70 - 130)
DUP	Tribromoacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Tribromoacetic acid	10	11	110.0%		(70 - 130)
LCS2	Tribromoacetic acid	10	12	120.0%		(70 - 130)
MBLK	Tribromoacetic acid	ND	ND			
MS	Tribromoacetic acid	10	11	110.0%		(70 - 130)
DUP	Trichloroacetic acid	27	27		0.0%	(0 - 20)
LCS1	Trichloroacetic acid	10	10	100.0%		(70 - 130)
LCS2	Trichloroacetic acid	10	11	110.0%		(70 - 130)
MBLK	Trichloroacetic acid	ND	ND			
MS	Trichloroacetic acid	10	11	110.0%		(70 - 130)

QC Batch ID: 61826 **Report #:** 32276r1

Analysis: @THM551 **Method:** ML/EPA 551

QC	Analyte	Spike	Recovery	Yield	RPD	Acceptance Criteria Range
LCS1	Bromodichloromethane	5.0	4.8	96.0%		(80 - 120)
LCS2	Bromodichloromethane	5.0	4.6	92.0%		(80 - 120)
MBLK	Bromodichloromethane	ND	ND			
MS1	Bromodichloromethane	5.0	7.6	152.0%		(80 - 120)
MS2	Bromodichloromethane	5.0	4.6	92.0%		(80 - 120)
LCS1	Bromoform	5.0	4.3	86.0%		(80 - 120)
LCS2	Bromoform	5.0	4.6	92.0%		(80 - 120)
MBLK	Bromoform	ND	ND			
MS1	Bromoform	5.0	5.4	108.0%		(80 - 120)
MS2	Bromoform	5.0	6.2	124.0%		(80 - 120)
LCS1	Chloroform	5.0	4.6	92.0%		(80 - 120)
LCS2	Chloroform	5.0	4.4	88.0%		(80 - 120)
MBLK	Chloroform	ND	ND			
MS1	Chloroform	5.0	12.1	242.0%		(80 - 120)
MS2	Chloroform	5.0	2.0	40.0%		(80 - 120)
LCS1	Dibromochloromethane	5.0	4.8	96.0%		(80 - 120)
LCS2	Dibromochloromethane	5.0	4.7	94.0%		(80 - 120)
MBLK	Dibromochloromethane	ND	ND			
MS1	Dibromochloromethane	5.0	5.7	114.0%		(80 - 120)
MS2	Dibromochloromethane	5.0	6.2	124.0%		(80 - 120)

End of MW QC report

ND (non-detect): Result is below 1/2 minimum reporting level (MRL).

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Comments

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Phone: 330-652-3614 Fax: 330-652-6293

Study#: 3
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.

Turbidity Range	Report to Nearest
0-1.0	0.05
1-10	0.1
10-40	1
40-100	5
100-400	10
400-1000	50
> 1000	100

QC comments

QCBatch: 0-10-0 **Description:** MW Labs Report # 31999r2

HAA TBAA, BDCAA, and CDBAA results not analyzed for samples 9701-56, 9701-57, 9701-58,9701-68,9701-72,9701-77, 9701-78, and 9701-82.

From MW Labs: "THM551 - Chloroform recovery fails high on [QC Batch MW59396], spike amount low compared to amount in native unspiked sample."

From MW Labs: "THM551 - Surrogate recoveries fail high on samples 9701-89, 9701-92, 9701-93, 9701-96; recoveries of traget analytes may be biased high."

TOX samples analyzed under QC batch MW59827 were reported "ND" if result was below 50ug/L (9701-106, 9701-107, and 9701-109) because low-level calibration check standard was 50ug/L instead of 25ug/L.

QCBatch: 0-11-0 **Description:** MW Labs Report # 32276r1

From MW Labs in reference to THM4 QC Batch MW61826 : "THM551 - Revised report 4/28/97. Sample results reported as NR for chloroform and bromodichloromethande due to QC failure on matrix spikes."

QCBatch: 0-12-0 **Description:** MW Labs Report # 32060r1

From MW Labs: "THM551 - Surrogate recoveries fail high on samples 9701-117, 9701-122, 9701-126; recoveries of traget analytes may be biased high."

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Comments

Mr. John Zackasee
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Study#: 3
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QCBatch: 0-13-0 **Description:** MW Labs Report # 32173

From MW Labs: TOX samples 9701-151, 9701-152, and 9701-154 were "analyzed past hold time due to instrument problems."

TBAA, CDBAA, and BDCAA analyzed past hold time (14 days).

End of comments

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Laboratory Report

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Study Title: ICR RSSCT #2

Study #: 39

Reviewed By: _____
Stuart M. Hooper

Date Reviewed: 7/12/99

Electronic copies of the results and quality control data are available upon request.

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Laboratory Test Results

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Study#: 39
Study Title: ICR RSSCT #2

Sample ID: Representative Sample analysis **S&H ID:** 9704-16 **Date Sampled:** 4/8/97

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
1	TOC-ICR	TOC	3.66	mg/L	SM 5310 C	1	0.50	4/8/97		4/9/97	7-0-31
2	TOC-ICR	TOC (Dupl)	3.67	mg/L	SM 5310 C	1	0.50	4/8/97		4/9/97	7-0-31
			3.67	**mg/L**	**0.3 % RPD**						

Sample ID: Representative Sample analysis **S&H ID:** 9704-17 **Date Sampled:** 4/8/97

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
3	ALK	Alkalinity	48	mg/L	SM 2320 B	1	5	2/4/97		4/9/97	1-0-2
4	CaHard	Calcium Hardness	87	mg/L CaCO3	SM 3500-Ca D	1	5	4/8/97		4/9/97	33-0-2
5	TotHard	Total Hardness	102	mg/L CaCO3	SM 2340 C	1	5	4/8/97		4/9/97	3-0-2
6	TURB	Turbidity	2.00	ntu	SM 2130 B	1	0.05	4/8/97		4/9/97	9-0-2

Sample ID: MVSD Settled Water **S&H ID:** 9704-23 **Date Sampled:** 4/8/97

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
7	HAA	Bromochloroacetic acid	ND	µg/L	SM 6251 B	1	1.0	4/8/97	4/18/97	4/19/97	MW61759
8	HAA	Bromodichloroacetic acid	1.0	µg/L	SM 6251 B	1	1.0	4/8/97	4/18/97	4/19/97	MW61759
9	HAA	Chlorodibromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	4/8/97	4/18/97	4/19/97	MW61759
10	HAA	Dibromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	4/8/97	4/18/97	4/19/97	MW61759
11	HAA	Dichloroacetic acid	3.0	µg/L	SM 6251 B	1	1.0	4/8/97	4/18/97	4/19/97	MW61759
12	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	4/8/97	4/18/97	4/19/97	MW61759
13	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	4/8/97	4/18/97	4/19/97	MW61759
14	HAA	Tribromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	4/8/97	4/18/97	4/19/97	MW61759
15	HAA	Trichloroacetic acid	1.0	µg/L	SM 6251 B	1	1.0	4/8/97	4/18/97	4/19/97	MW61759
16	TOX-ICR	TOX	26	µg Cl-/L	SM 5320 B	1	25	4/8/97		4/16/97	12-0-4
17	TOX-ICR	TOX (Dupl)	26	µg Cl-/L	SM 5320 B	1	25	4/8/97		4/16/97	12-0-4
			26	**µg Cl-/L**	**0.0 % RPD**						
18	THM4	Bromodichloromethane	ND	µg/L	EPA 551	1	0.5	4/8/97	4/11/97	4/11/97	MW61509
19	THM4	Bromoform	ND	µg/L	EPA 551	1	0.5	4/8/97	4/11/97	4/11/97	MW61509
20	THM4	Chloroform	3.2	µg/L	EPA 551	1	0.5	4/8/97	4/11/97	4/11/97	MW61509
21	THM4	Dibromochloromethane	ND	µg/L	EPA 551	1	0.5	4/8/97	4/11/97	4/11/97	MW61509

Note: Other - see comments.

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

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

Summers & Hooper, Inc.
6 Knollcrest Drive
Cincinnati, OH 45237

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 39
Study Title: ICR RSSCT #2

Sample ID: Settled Water on arrival (barrel #1) **S&H ID:** 9704-24 **Date Sampled:** 4/8/97

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
22	TOC-ICR	TOC	3.43	mg/L	SM 5310 C	1	0.50	4/8/97		4/10/97	7-0-32
23	TOC-ICR	TOC (Dupl)	3.47	mg/L	SM 5310 C	1	0.50	4/8/97		4/10/97	7-0-32
			3.45	**mg/L**	**1.2 % RPD**						

Sample ID: Settled water post 1.0 uw Filter (~3L) **S&H ID:** 9704-25 **Date Sampled:** 4/10/97

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
24	TOC-ICR	TOC	3.25	mg/L	SM 5310 C	1	0.50	4/10/97		4/10/97	7-0-32
25	TOC-ICR	TOC (Dupl)	3.31	mg/L	SM 5310 C	1	0.50	4/10/97		4/10/97	7-0-32
			3.28	**mg/L**	**1.8 % RPD**						

Sample ID: 39.10.Eff.1 **S&H ID:** 9704-76 **Date Sampled:** 4/15/97 6:15:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
26	Cl2Dose	Chlorine Dose	1.08	mg/L as Cl2	SM 4500-Cl B	1	n/a	4/19/97		4/19/97	n/a
27	Cl2Res	Chlorine Residual	0.73	mg/L as Cl2	SM 4500-Cl F	1	0.10	4/19/97		4/20/97	n/a
28	HAA	Bromochloroacetic acid	1.0	µg/L	SM 6251 B	1	1.0	4/20/97	4/30/97	5/2/97	MW62039
29	HAA	Bromodichloroacetic acid	ND	µg/L	SM 6251 B	1	1.0	4/20/97	4/30/97	5/2/97	MW62039
30	HAA	Chlorodibromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	4/20/97	4/30/97	5/2/97	MW62039
31	HAA	Dibromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	4/20/97	4/30/97	5/2/97	MW62039
32	HAA	Dichloroacetic acid	ND	µg/L	SM 6251 B	1	1.0	4/20/97	4/30/97	5/2/97	MW62039
33	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	4/20/97	4/30/97	5/2/97	MW62039
34	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	4/20/97	4/30/97	5/2/97	MW62039
35	HAA	Tribromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	4/20/97	4/30/97	5/2/97	MW62039
36	HAA	Trichloroacetic acid	ND	µg/L	SM 6251 B	1	1.0	4/20/97	4/30/97	5/2/97	MW62039
37	pH	Cl2 pH - Final	8.9	Unit	SM 4500-H+ B	1	n/a	4/19/97		4/20/97	n/a
38	pH	Cl2 pH - Initial	9.0	Unit	SM 4500-H+ B	1	n/a	4/19/97		4/19/97	n/a
39	pH	pH	8.9	Unit	SM 4500-H+ B	1	n/a	4/15/97		4/15/97	n/a
40	TEMP	Cl2 Temperature	10.0	ºC	SM 2550 B	1	n/a	4/19/97		4/20/97	n/a
41	TEMP	Temperature	22.5	ºC	SM 2550 B	1	n/a	4/15/97		4/15/97	n/a
42	TIME	Cl2 Incubation Time	23.9	hrs	n/a	1	n/a	4/19/97		4/20/97	n/a
43	TOC-ICR	TOC	ND	mg/L	SM 5310 C	1	0.50	4/15/97		4/17/97	7-0-34
44	TOC-ICR	TOC (Dupl)	ND	mg/L	SM 5310 C	1	0.50	4/15/97		4/17/97	7-0-34
			ND	**mg/L**							
45	TOX-ICR	TOX	ND	µg Cl-/L	SM 5320 B	1	25	4/20/97		4/26/97	12-0-6
46	TOX-ICR	TOX (Dupl)	ND	µg Cl-/L	SM 5320 B	1	25	4/20/97		4/26/97	12-0-6
			ND	**µg Cl-/L**							
47	THM4	Bromodichloromethane	ND	µg/L	EPA 551	1	1.0	4/20/97	4/30/97	5/1/97	MW61995

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 39
Study Title: ICR RSSCT #2

48	THM4	Bromoform	ND	µg/L	EPA 551	1	1.0	4/20/97	4/30/97	5/1/97	MW61995
49	THM4	Chloroform	ND	µg/L	EPA 551	1	1.0	4/20/97	4/30/97	5/1/97	MW61995
50	THM4	Dibromochloromethane	ND	µg/L	EPA 551	1	1.0	4/20/97	4/30/97	5/1/97	MW61995
51	UV-ICR	UV	ND	1/cm	SM 5910 B	1	0.009	4/15/97		4/16/97	8-0-25
52	UV-ICR	UV (Dupl)	ND	1/cm	SM 5910 B	1	0.009	4/15/97		4/16/97	8-0-25
			ND	**1/cm**							

Sample ID: 39.20.Eff.1 **S&H ID:** 9704-77 **Date Sampled:** 4/15/97 6:15:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
53	Cl2Dose	Chlorine Dose	1.23	mg/L as Cl2	SM 4500-Cl B	1	n/a	4/19/97		4/19/97	n/a
54	Cl2Res	Chlorine Residual	0.87	mg/L as Cl2	SM 4500-Cl F	1	0.10	4/19/97		4/20/97	n/a
55	HAA	Bromochloroacetic acid	ND	µg/L	SM 6251 B	1	1.0	4/20/97	4/30/97	5/2/97	MW62039
56	HAA	Bromodichloroacetic acid	1.0	µg/L	SM 6251 B	1	1.0	4/20/97	4/30/97	5/2/97	MW62039
57	HAA	Chlorodibromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	4/20/97	4/30/97	5/2/97	MW62039
58	HAA	Dibromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	4/20/97	4/30/97	5/2/97	MW62039
59	HAA	Dichloroacetic acid	ND	µg/L	SM 6251 B	1	1.0	4/20/97	4/30/97	5/2/97	MW62039
60	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	4/20/97	4/30/97	5/2/97	MW62039
61	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	4/20/97	4/30/97	5/2/97	MW62039
62	HAA	Tribromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	4/20/97	4/30/97	5/2/97	MW62039
63	HAA	Trichloroacetic acid	ND	µg/L	SM 6251 B	1	1.0	4/20/97	4/30/97	5/2/97	MW62039
64	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	4/19/97		4/20/97	n/a
65	pH	Cl2 pH - Initial	9.0	Unit	SM 4500-H+ B	1	n/a	4/19/97		4/19/97	n/a
66	pH	pH	9.2	Unit	SM 4500-H+ B	1	n/a	4/15/97		4/15/97	n/a
67	TEMP	Cl2 Temperature	10.0	ºC	SM 2550 B	1	n/a	4/19/97		4/20/97	n/a
68	TEMP	Temperature	22.6	ºC	SM 2550 B	1	n/a	4/15/97		4/15/97	n/a
69	TIME	Cl2 Incubation Time	24.1	hrs	n/a	1	n/a	4/19/97		4/20/97	n/a
70	TOC-ICR	TOC	ND	mg/L	SM 5310 C	1	0.50	4/15/97		4/17/97	7-0-34
71	TOC-ICR	TOC (Dupl)	ND	mg/L	SM 5310 C	1	0.50	4/15/97		4/17/97	7-0-34
			ND	**mg/L**							
72	TOX-ICR	TOX	ND	µg Cl-/L	SM 5320 B	1	25	4/20/97		4/26/97	12-0-6
73	TOX-ICR	TOX (Dupl)	ND	µg Cl-/L	SM 5320 B	1	25	4/20/97		4/26/97	12-0-6
			ND	**µg Cl-/L**							
74	THM4	Bromodichloromethane	ND	µg/L	EPA 551	1	1.0	4/20/97	4/30/97	5/1/97	MW61995
75	THM4	Bromoform	ND	µg/L	EPA 551	1	1.0	4/20/97	4/30/97	5/1/97	MW61995
76	THM4	Chloroform	ND	µg/L	EPA 551	1	1.0	4/20/97	4/30/97	5/1/97	MW61995
77	THM4	Dibromochloromethane	ND	µg/L	EPA 551	1	1.0	4/20/97	4/30/97	5/1/97	MW61995
78	UV-ICR	UV	ND	1/cm	SM 5910 B	1	0.009	4/15/97		4/16/97	8-0-25
79	UV-ICR	UV (Dupl)	ND	1/cm	SM 5910 B	1	0.009	4/15/97		4/16/97	8-0-25
			ND	**1/cm**							

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Summers & Hooper, Inc.
6 Knollcrest Drive
Cincinnati, OH 45237

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 39
Study Title: ICR RSSCT #2

Sample ID: 39.10.Eff.3 **S&H ID:** 9704-83 **Date Sampled:** 4/17/97 12:45:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
80	Cl2Dose	Chlorine Dose	1.31	mg/L as Cl2	SM 4500-Cl B	1	n/a	4/19/97		4/19/97	n/a
81	Cl2Res	Chlorine Residual	0.98	mg/L as Cl2	SM 4500-Cl F	1	0.10	4/19/97		4/20/97	n/a
82	HAA	Bromochloroacetic acid	1.0	µg/L	SM 6251 B	1	1.0	4/20/97	4/30/97	5/2/97	MW62039
83	HAA	Bromodichloroacetic acid	1.0	µg/L	SM 6251 B	1	1.0	4/20/97	4/30/97	5/2/97	MW62039
84	HAA	Chlorodibromoacetic acid	1.0	µg/L	SM 6251 B	1	1.0	4/20/97	4/30/97	5/2/97	MW62039
85	HAA	Dibromoacetic acid	1.0	µg/L	SM 6251 B	1	1.0	4/20/97	4/30/97	5/2/97	MW62039
86	HAA	Dichloroacetic acid	ND	µg/L	SM 6251 B	1	1.0	4/20/97	4/30/97	5/2/97	MW62039
87	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	4/20/97	4/30/97	5/2/97	MW62039
88	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	4/20/97	4/30/97	5/2/97	MW62039
89	HAA	Tribromoacetic acid	1.0	µg/L	SM 6251 B	1	1.0	4/20/97	4/30/97	5/2/97	MW62039
90	HAA	Trichloroacetic acid	ND	µg/L	SM 6251 B	1	1.0	4/20/97	4/30/97	5/2/97	MW62039
91	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	4/19/97		4/20/97	n/a
92	pH	Cl2 pH - Initial	9.0	Unit	SM 4500-H+ B	1	n/a	4/19/97		4/19/97	n/a
93	pH	pH	8.7	Unit	SM 4500-H+ B	1	n/a	4/17/97		4/17/97	n/a
94	TEMP	Cl2 Temperature	10.0	ºC	SM 2550 B	1	n/a	4/19/97		4/20/97	n/a
95	TEMP	Temperature	21.3	ºC	SM 2550 B	1	n/a	4/17/97		4/17/97	n/a
96	TIME	Cl2 Incubation Time	24.0	hrs	n/a	1	n/a	4/19/97		4/20/97	n/a
97	TOC-ICR	TOC	ND	mg/L	SM 5310 C	1	0.50	4/17/97		4/17/97	7-0-34
98	TOC-ICR	TOC (Dupl)	ND	mg/L	SM 5310 C	1	0.50	4/17/97		4/17/97	7-0-34
			ND	**mg/L**							
99	TOX-ICR	TOX	ND	µg Cl-/L	SM 5320 B	1	25	4/20/97		4/26/97	12-0-6
100	TOX-ICR	TOX (Dupl)	ND	µg Cl-/L	SM 5320 B	1	25	4/20/97		4/26/97	12-0-6
			ND	**µg Cl-/L**							
101	THM4	Bromodichloromethane	ND	µg/L	EPA 551	1	1.0	4/20/97	4/30/97	5/1/97	MW61995
102	THM4	Bromoform	1.5	µg/L	EPA 551	1	1.0	4/20/97	4/30/97	5/1/97	MW61995
103	THM4	Chloroform	ND	µg/L	EPA 551	1	1.0	4/20/97	4/30/97	5/1/97	MW61995
104	THM4	Dibromochloromethane	2.3	µg/L	EPA 551	1	1.0	4/20/97	4/30/97	5/1/97	MW61995
105	UV-ICR	UV	ND	1/cm	SM 5910 B	1	0.009	4/17/97		4/17/97	8-0-26
106	UV-ICR	UV (Dupl)	ND	1/cm	SM 5910 B	1	0.009	4/17/97		4/17/97	8-0-26
			ND	**1/cm**							

Sample ID: 39.10.20.Inf.A-1 **S&H ID:** 9704-86 **Date Sampled:** 4/16/97 3:30:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
107	ALK	Alkalinity	19	mg/L	SM 2320 B	1	5	4/16/97		4/17/97	1-0-2
108	NH3	Ammonia Nitrogen	0.08	mg/L	EPA 350.1	1	0.05	4/16/97		4/29/97	MW61943
109	BR	Bromide	0.040	mg/L	EPA 300.0 A	1	0.020	4/16/97		4/25/97	MW61852

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 39
Study Title: ICR RSSCT #2

110	CaHard	Calcium Hardness	78	mg/L CaCO3	SM 3500-Ca D	1	5	4/16/97		4/17/97	33-0-2
111	TotHard	Total Hardness	93	mg/L CaCO3	SM 2340 C	1	5	4/16/97		4/17/97	3-0-2

Sample ID: 39.10.20.Inf.B-1 **S&H ID:** 9704-88 **Date Sampled:** 4/16/97 3:30:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
112	Cl2Dose	Chlorine Dose	2.46	mg/L as Cl2	SM 4500-Cl B	1	n/a	4/19/97		4/19/97	n/a
113	Cl2Res	Chlorine Residual	0.77	mg/L as Cl2	SM 4500-Cl F	1	0.10	4/19/97		4/20/97	n/a
114	HAA	Bromochloroacetic acid	5.0	µg/L	SM 6251 B	1	1.0	4/20/97	5/3/97	5/4/97	MW62080
115	HAA	Bromodichloroacetic acid	NR	µg/L	SM 6251 B	1	1.0	4/20/97	5/3/97	5/4/97	MW62080
116	HAA	Chlorodibromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	4/20/97	5/3/97	5/4/97	MW62080
117	HAA	Dibromoacetic acid	1.0	µg/L	SM 6251 B	1	1.0	4/20/97	5/3/97	5/4/97	MW62080
118	HAA	Dichloroacetic acid	20.0	µg/L	SM 6251 B	1	1.0	4/20/97	5/3/97	5/4/97	MW62080
119	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	4/20/97	5/3/97	5/4/97	MW62080
120	HAA	Monochloroacetic acid	3.0	µg/L	SM 6251 B	1	2.0	4/20/97	5/3/97	5/4/97	MW62080
121	HAA	Tribromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	4/20/97	5/3/97	5/4/97	MW62080
122	HAA	Trichloroacetic acid	10.0	µg/L	SM 6251 B	1	1.0	4/20/97	5/3/97	5/4/97	MW62080
123	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	4/19/97		4/20/97	n/a
124	pH	Cl2 pH - Initial	9.0	Unit	SM 4500-H+ B	1	n/a	4/19/97		4/19/97	n/a
125	pH	pH	8.9	Unit	SM 4500-H+ B	1	n/a	4/16/97		4/16/97	n/a
126	TEMP	Cl2 Temperature	10.0	ºC	SM 2550 B	1	n/a	4/19/97		4/20/97	n/a
127	TEMP	Temperature	18.3	ºC	SM 2550 B	1	n/a	4/16/97		4/16/97	n/a
128	TIME	Cl2 Incubation Time	24.1	hrs	n/a	1	n/a	4/19/97		4/20/97	n/a
129	TOC-ICR	TOC	3.14	mg/L	SM 5310 C	1	0.50	4/16/97		4/17/97	7-0-34
130	TOC-ICR	TOC (Dupl)	3.14	mg/L	SM 5310 C	1	0.50	4/16/97		4/17/97	7-0-34
			3.14	**mg/L**	**0.0 % RPD**						
131	TOX-ICR	TOX	229	µg Cl-/L	SM 5320 B	1	25	4/20/97		4/26/97	12-0-6
132	TOX-ICR	TOX (Dupl)	230	µg Cl-/L	SM 5320 B	1	25	4/20/97		4/26/97	12-0-6
			230	**µg Cl-/L**	**0.4 % RPD**						
133	THM4	Bromodichloromethane	12.5	µg/L	EPA 551	1	1.0	4/20/97	4/30/97	5/1/97	MW61995
134	THM4	Bromoform	ND	µg/L	EPA 551	1	1.0	4/20/97	4/30/97	5/1/97	MW61995
135	THM4	Chloroform	44.2	µg/L	EPA 551	1	1.0	4/20/97	4/30/97	5/1/97	MW61995
136	THM4	Dibromochloromethane	3.3	µg/L	EPA 551	1	1.0	4/20/97	4/30/97	5/1/97	MW61995
137	TURB	Turbidity	0.10	ntu	SM 2130 B	1	0.05	4/16/97		4/17/97	9-0-2
138	UV-ICR	UV	0.065	1/cm	SM 5910 B	1	0.009	4/16/97		4/16/97	8-0-25
139	UV-ICR	UV (Dupl)	0.065	1/cm	SM 5910 B	1	0.009	4/16/97		4/16/97	8-0-25
			0.065	**1/cm**	**0.0 % RPD**						

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Summers & Hooper, Inc.
6 Knollcrest Drive
Cincinnati, OH 45237

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 39
Study Title: ICR RSSCT #2

Sample ID: 39.10.Eff.4 **S&H ID:** 9704-95 **Date Sampled:** 4/17/97 9:53:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
140	Cl2Dose	Chlorine Dose	1.33	mg/L as Cl2	SM 4500-Cl B	1	n/a	4/19/97		4/19/97	n/a
141	Cl2Res	Chlorine Residual	0.84	mg/L as Cl2	SM 4500-Cl F	1	0.10	4/19/97		4/20/97	n/a
142	HAA	Bromochloroacetic acid	2.0	µg/L	SM 6251 B	1	1.0	4/20/97	4/30/97	5/2/97	MW62039
143	HAA	Bromodichloroacetic acid	1.0	µg/L	SM 6251 B	1	1.0	4/20/97	4/30/97	5/2/97	MW62039
144	HAA	Chlorodibromoacetic acid	1.0	µg/L	SM 6251 B	1	1.0	4/20/97	4/30/97	5/2/97	MW62039
145	HAA	Dibromoacetic acid	2.0	µg/L	SM 6251 B	1	1.0	4/20/97	4/30/97	5/2/97	MW62039
146	HAA	Dichloroacetic acid	1.0	µg/L	SM 6251 B	1	1.0	4/20/97	4/30/97	5/2/97	MW62039
147	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	4/20/97	4/30/97	5/2/97	MW62039
148	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	4/20/97	4/30/97	5/2/97	MW62039
149	HAA	Tribromoacetic acid	1.0	µg/L	SM 6251 B	1	1.0	4/20/97	4/30/97	5/2/97	MW62039
150	HAA	Trichloroacetic acid	ND	µg/L	SM 6251 B	1	1.0	4/20/97	4/30/97	5/2/97	MW62039
151	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	4/19/97		4/20/97	n/a
152	pH	Cl2 pH - Initial	9.0	Unit	SM 4500-H+ B	1	n/a	4/19/97		4/19/97	n/a
153	pH	pH	9.2	Unit	SM 4500-H+ B	1	n/a	4/17/97		4/17/97	n/a
154	TEMP	Cl2 Temperature	10.0	ºC	SM 2550 B	1	n/a	4/19/97		4/20/97	n/a
155	TEMP	Temperature	21.1	ºC	SM 2550 B	1	n/a	4/17/97		4/17/97	n/a
156	TIME	Cl2 Incubation Time	24.0	hrs	n/a	1	n/a	4/19/97		4/20/97	n/a
157	TOC-ICR	TOC	0.69	mg/L	SM 5310 C	1	0.50	4/17/97		4/17/97	7-0-34
158	TOC-ICR	TOC (Dupl)	0.70	mg/L	SM 5310 C	1	0.50	4/17/97		4/17/97	7-0-34
			0.69	**mg/L**	**1.4 % RPD**						
159	TOX-ICR	TOX	27	µg Cl-/L	SM 5320 B	1	25	4/20/97		4/26/97	12-0-6
160	TOX-ICR	TOX (Dupl)	28	µg Cl-/L	SM 5320 B	1	25	4/20/97		4/26/97	12-0-6
			28	**µg Cl-/L**	**3.6 % RPD**						
161	THM4	Bromodichloromethane	4.6	µg/L	EPA 551	1	1.0	4/20/97	4/30/97	5/1/97	MW61995
162	THM4	Bromoform	2.1	µg/L	EPA 551	1	1.0	4/20/97	4/30/97	5/1/97	MW61995
163	THM4	Chloroform	1.5	µg/L	EPA 551	1	1.0	4/20/97	4/30/97	5/1/97	MW61995
164	THM4	Dibromochloromethane	6.2	µg/L	EPA 551	1	1.0	4/20/97	4/30/97	5/1/97	MW61995
165	UV-ICR	UV	0.010	1/cm	SM 5910 B	1	0.009	4/17/97		4/17/97	8-0-26
166	UV-ICR	UV (Dupl)	0.010	1/cm	SM 5910 B	1	0.009	4/17/97		4/17/97	8-0-26
			0.010	**1/cm**	**0.0 % RPD**						

Sample ID: 39.10.Eff.4d **S&H ID:** 9704-96 **Date Sampled:** 4/17/97 9:53:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
167	Cl2Dose	Chlorine Dose	1.33	mg/L as Cl2	SM 4500-Cl B	1	n/a	4/19/97		4/19/97	n/a
168	Cl2Res	Chlorine Residual	0.85	mg/L as Cl2	SM 4500-Cl F	1	0.10	4/19/97		4/20/97	n/a
169	HAA	Bromochloroacetic acid	2.0	µg/L	SM 6251 B	1	1.0	4/20/97	4/30/97	5/2/97	MW62039
170	HAA	Bromodichloroacetic acid	1.0	µg/L	SM 6251 B	1	1.0	4/20/97	4/30/97	5/2/97	MW62039

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 39
Study Title: ICR RSSCT #2

171	HAA	Chlorodibromoacetic acid	1.0	µg/L	SM 6251 B	1	1.0	4/20/97	4/30/97	5/2/97	MW62039
172	HAA	Dibromoacetic acid	2.0	µg/L	SM 6251 B	1	1.0	4/20/97	4/30/97	5/2/97	MW62039
173	HAA	Dichloroacetic acid	1.0	µg/L	SM 6251 B	1	1.0	4/20/97	4/30/97	5/2/97	MW62039
174	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	4/20/97	4/30/97	5/2/97	MW62039
175	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	4/20/97	4/30/97	5/2/97	MW62039
176	HAA	Tribromoacetic acid	1.0	µg/L	SM 6251 B	1	1.0	4/20/97	4/30/97	5/2/97	MW62039
177	HAA	Trichloroacetic acid	ND	µg/L	SM 6251 B	1	1.0	4/20/97	4/30/97	5/2/97	MW62039
178	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	4/19/97		4/20/97	n/a
179	pH	Cl2 pH - Initial	9.1	Unit	SM 4500-H+ B	1	n/a	4/19/97		4/19/97	n/a
180	pH	pH	9.2	Unit	SM 4500-H+ B	1	n/a	4/17/97		4/17/97	n/a
181	TEMP	Cl2 Temperature	10.0	ºC	SM 2550 B	1	n/a	4/19/97		4/20/97	n/a
182	TEMP	Temperature	21.2	ºC	SM 2550 B	1	n/a	4/17/97		4/17/97	n/a
183	TIME	Cl2 Incubation Time	24.1	hrs	n/a	1	n/a	4/19/97		4/20/97	n/a
184	TOC-ICR	TOC	0.70	mg/L	SM 5310 C	1	0.50	4/17/97		4/17/97	7-0-34
185	TOC-ICR	TOC (Dupl)	0.72	mg/L	SM 5310 C	1	0.50	4/17/97		4/17/97	7-0-34
			0.71	**mg/L**	**2.8 % RPD**						
186	TOX-ICR	TOX	32	µg Cl-/L	SM 5320 B	1	25	4/20/97		4/26/97	12-0-6
187	TOX-ICR	TOX (Dupl)	32	µg Cl-/L	SM 5320 B	1	25	4/20/97		4/26/97	12-0-6
			32	**µg Cl-/L**	**0.0 % RPD**						
188	THM4	Bromodichloromethane	4.7	µg/L	EPA 551	1	1.0	4/20/97	4/30/97	5/1/97	MW61995
189	THM4	Bromoform	2.3	µg/L	EPA 551	1	1.0	4/20/97	4/30/97	5/1/97	MW61995
190	THM4	Chloroform	2.1	µg/L	EPA 551	1	1.0	4/20/97	4/30/97	5/1/97	MW61995
191	THM4	Dibromochloromethane	6.4	µg/L	EPA 551	1	1.0	4/20/97	4/30/97	5/1/97	MW61995
192	UV-ICR	UV	0.010	1/cm	SM 5910 B	1	0.009	4/17/97		4/17/97	8-0-26
193	UV-ICR	UV (Dupl)	0.010	1/cm	SM 5910 B	1	0.009	4/17/97		4/17/97	8-0-26
			0.010	**1/cm**	**0.0 % RPD**						

Sample ID: 39.10.Eff.6 **S&H ID:** 9704-103 **Date Sampled:** 4/17/97 7:05:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
194	Cl2Dose	Chlorine Dose	1.24	mg/L as Cl2	SM 4500-Cl B	1	n/a	4/22/97		4/22/97	n/a
195	Cl2Res	Chlorine Residual	0.72	mg/L as Cl2	SM 4500-Cl F	1	0.10	4/22/97		4/23/97	n/a
196	HAA	Bromochloroacetic acid	2.0	µg/L	SM 6251 B	1	1.0	4/23/97	5/3/97	5/4/97	MW62080
197	HAA	Bromodichloroacetic acid	NR	µg/L	SM 6251 B	1	1.0	4/23/97	5/3/97	5/4/97	MW62080
198	HAA	Chlorodibromoacetic acid	1.0	µg/L	SM 6251 B	1	1.0	4/23/97	5/3/97	5/4/97	MW62080
199	HAA	Dibromoacetic acid	2.0	µg/L	SM 6251 B	1	1.0	4/23/97	5/3/97	5/4/97	MW62080
200	HAA	Dichloroacetic acid	3.0	µg/L	SM 6251 B	1	1.0	4/23/97	5/3/97	5/4/97	MW62080
201	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	4/23/97	5/3/97	5/4/97	MW62080
202	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	4/23/97	5/3/97	5/4/97	MW62080
203	HAA	Tribromoacetic acid	1.0	µg/L	SM 6251 B	1	1.0	4/23/97	5/3/97	5/4/97	MW62080
204	HAA	Trichloroacetic acid	ND	µg/L	SM 6251 B	1	1.0	4/23/97	5/3/97	5/4/97	MW62080

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 39
Study Title: ICR RSSCT #2

205	pH	Cl2 pH - Final	8.9	Unit	SM 4500-H+ B	1	n/a	4/22/97		4/23/97	n/a
206	pH	Cl2 pH - Initial	9.0	Unit	SM 4500-H+ B	1	n/a	4/22/97		4/22/97	n/a
207	pH	pH	8.5	Unit	SM 4500-H+ B	1	n/a	4/17/97		4/17/97	n/a
208	TEMP	Cl2 Temperature	10.1	ºC	SM 2550 B	1	n/a	4/22/97		4/23/97	n/a
209	TEMP	Temperature	21.3	ºC	SM 2550 B	1	n/a	4/17/97		4/17/97	n/a
210	TIME	Cl2 Incubation Time	24.0	hrs	n/a	1	n/a	4/22/97		4/23/97	n/a
211	TOC-ICR	TOC	0.78	mg/L	SM 5310 C	1	0.50	4/17/97		4/17/97	7-0-34
212	TOC-ICR	TOC (Dupl)	0.79	mg/L	SM 5310 C	1	0.50	4/17/97		4/17/97	7-0-34
			0.79	**mg/L**	**1.3 % RPD**						
213	TOX-ICR	TOX	28	µg Cl-/L	SM 5320 B	1	25	4/23/97		4/27/97	12-0-7
214	TOX-ICR	TOX (Dupl)	29	µg Cl-/L	SM 5320 B	1	25	4/23/97		4/27/97	12-0-7
			29	**µg Cl-/L**	**3.4 % RPD**						
215	THM4	Bromodichloromethane	4.8	µg/L	EPA 551	1	1.0	4/23/97	4/30/97	5/1/97	MW61995
216	THM4	Bromoform	2.1	µg/L	EPA 551	1	1.0	4/23/97	4/30/97	5/1/97	MW61995
217	THM4	Chloroform	2.0	µg/L	EPA 551	1	1.0	4/23/97	4/30/97	5/1/97	MW61995
218	THM4	Dibromochloromethane	6.4	µg/L	EPA 551	1	1.0	4/23/97	4/30/97	5/1/97	MW61995
219	UV-ICR	UV	0.011	1/cm	SM 5910 B	1	0.009	4/17/97		4/17/97	8-0-26
220	UV-ICR	UV (Dupl)	0.011	1/cm	SM 5910 B	1	0.009	4/17/97		4/17/97	8-0-26
			0.011	**1/cm**	**0.0 % RPD**						

Sample ID: 39.10.Eff.7 **S&H ID:** 9704-104 **Date Sampled:** 4/17/97 11:12:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
221	Cl2Dose	Chlorine Dose	1.42	mg/L as Cl2	SM 4500-Cl B	1	n/a	4/22/97		4/22/97	n/a
222	Cl2Res	Chlorine Residual	0.84	mg/L as Cl2	SM 4500-Cl F	1	0.10	4/22/97		4/23/97	n/a
223	HAA	Bromochloroacetic acid	2.0	µg/L	SM 6251 B	1	1.0	4/23/97	5/3/97	5/4/97	MW62081
224	HAA	Bromodichloroacetic acid	NR	µg/L	SM 6251 B	1	1.0	4/23/97	5/3/97	5/4/97	MW62081
225	HAA	Chlorodibromoacetic acid	1.0	µg/L	SM 6251 B	1	1.0	4/23/97	5/3/97	5/4/97	MW62081
226	HAA	Dibromoacetic acid	2.0	µg/L	SM 6251 B	1	1.0	4/23/97	5/3/97	5/4/97	MW62081
227	HAA	Dichloroacetic acid	4.0	µg/L	SM 6251 B	1	1.0	4/23/97	5/3/97	5/4/97	MW62081
228	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	4/23/97	5/3/97	5/4/97	MW62081
229	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	4/23/97	5/3/97	5/4/97	MW62081
230	HAA	Tribromoacetic acid	1.0	µg/L	SM 6251 B	1	1.0	4/23/97	5/3/97	5/4/97	MW62081
231	HAA	Trichloroacetic acid	ND	µg/L	SM 6251 B	1	1.0	4/23/97	5/3/97	5/4/97	MW62081
232	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	4/22/97		4/23/97	n/a
233	pH	Cl2 pH - Initial	9.0	Unit	SM 4500-H+ B	1	n/a	4/22/97		4/22/97	n/a
234	pH	pH	8.5	Unit	SM 4500-H+ B	1	n/a	4/17/97		4/17/97	n/a
235	TEMP	Cl2 Temperature	10.1	ºC	SM 2550 B	1	n/a	4/22/97		4/23/97	n/a
236	TEMP	Temperature	22.3	ºC	SM 2550 B	1	n/a	4/17/97		4/17/97	n/a
237	TIME	Cl2 Incubation Time	24.1	hrs	n/a	1	n/a	4/22/97		4/23/97	n/a

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 39
Study Title: ICR RSSCT #2

238	TOC-ICR	TOC	0.87	mg/L	SM 5310 C	1	0.50	4/17/97		4/18/97	7-0-35
239	TOC-ICR	TOC (Dupl)	0.87	mg/L	SM 5310 C	1	0.50	4/17/97		4/18/97	7-0-35
			0.87	**mg/L**	**0.0 % RPD**						
240	TOX-ICR	TOX	36	µg Cl-/L	SM 5320 B	1	25	4/23/97		4/27/97	12-0-7
241	TOX-ICR	TOX (Dupl)	38	µg Cl-/L	SM 5320 B	1	25	4/23/97		4/27/97	12-0-7
			37	**µg Cl-/L**	**5.4 % RPD**						
242	THM4	Bromodichloromethane	5.6	µg/L	EPA 551	1	1.0	4/23/97	4/30/97	5/1/97	MW61995
243	THM4	Bromoform	1.8	µg/L	EPA 551	1	1.0	4/23/97	4/30/97	5/1/97	MW61995
244	THM4	Chloroform	2.7	µg/L	EPA 551	1	1.0	4/23/97	4/30/97	5/1/97	MW61995
245	THM4	Dibromochloromethane	6.7	µg/L	EPA 551	1	1.0	4/23/97	4/30/97	5/1/97	MW61995
246	UV-ICR	UV	0.012	1/cm	SM 5910 B	1	0.009	4/17/97		4/18/97	8-0-27
247	UV-ICR	UV (Dupl)	0.012	1/cm	SM 5910 B	1	0.009	4/17/97		4/18/97	8-0-27
			0.012	**1/cm**	**0.0 % RPD**						

Sample ID: 39.10.Eff.8d **S&H ID:** 9704-106 **Date Sampled:** 4/18/97 7:54:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
248	Cl2Dose	Chlorine Dose	1.53	mg/L as Cl2	SM 4500-Cl B	1	n/a	4/22/97		4/22/97	n/a
249	Cl2Res	Chlorine Residual	0.85	mg/L as Cl2	SM 4500-Cl F	1	0.10	4/22/97		4/23/97	n/a
250	HAA	Bromochloroacetic acid	3.0	µg/L	SM 6251 B	1	1.0	4/23/97	5/3/97	5/5/97	MW62081
251	HAA	Bromodichloroacetic acid	NR	µg/L	SM 6251 B	1	1.0	4/23/97	5/3/97	5/5/97	MW62081
252	HAA	Chlorodibromoacetic acid	NR	µg/L	SM 6251 B	1	1.0	4/23/97	5/3/97	5/5/97	MW62081
253	HAA	Dibromoacetic acid	2.0	µg/L	SM 6251 B	1	1.0	4/23/97	5/3/97	5/5/97	MW62081
254	HAA	Dichloroacetic acid	7.0	µg/L	SM 6251 B	1	1.0	4/23/97	5/3/97	5/5/97	MW62081
255	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	4/23/97	5/3/97	5/5/97	MW62081
256	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	4/23/97	5/3/97	5/5/97	MW62081
257	HAA	Tribromoacetic acid	2.0	µg/L	SM 6251 B	1	1.0	4/23/97	5/3/97	5/5/97	MW62081
258	HAA	Trichloroacetic acid	1.0	µg/L	SM 6251 B	1	1.0	4/23/97	5/3/97	5/5/97	MW62081
259	pH	Cl2 pH - Final	8.9	Unit	SM 4500-H+ B	1	n/a	4/22/97		4/23/97	n/a
260	pH	Cl2 pH - Initial	9.0	Unit	SM 4500-H+ B	1	n/a	4/22/97		4/22/97	n/a
261	pH	pH	8.1	Unit	SM 4500-H+ B	1	n/a	4/18/97		4/18/97	n/a
262	TEMP	Cl2 Temperature	10.1	ºC	SM 2550 B	1	n/a	4/22/97		4/23/97	n/a
263	TEMP	Temperature	22.6	ºC	SM 2550 B	1	n/a	4/18/97		4/18/97	n/a
264	TIME	Cl2 Incubation Time	24.1	hrs	n/a	1	n/a	4/22/97		4/23/97	n/a
265	TOC-ICR	TOC	1.21	mg/L	SM 5310 C	1	0.50	4/18/97		4/18/97	7-0-35
266	TOC-ICR	TOC (Dupl)	1.19	mg/L	SM 5310 C	1	0.50	4/18/97		4/18/97	7-0-35
			1.20	**mg/L**	**1.7 % RPD**						
267	TOX-ICR	TOX	53	µg Cl-/L	SM 5320 B	1	25	4/23/97		4/27/97	12-0-7
268	TOX-ICR	TOX (Dupl)	53	µg Cl-/L	SM 5320 B	1	25	4/23/97		4/27/97	12-0-7
			53	**µg Cl-/L**	**0.0 % RPD**						
269	THM4	Bromodichloromethane	8.3	µg/L	EPA 551	1	1.0	4/23/97	4/30/97	5/1/97	MW61995

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 39
Study Title: ICR RSSCT #2

270	THM4	Bromoform	1.0	µg/L	EPA 551	1	1.0	4/23/97	4/30/97	5/1/97	MW61995
271	THM4	Chloroform	7.3	µg/L	EPA 551	1	1.0	4/23/97	4/30/97	5/1/97	MW61995
272	THM4	Dibromochloromethane	7.3	µg/L	EPA 551	1	1.0	4/23/97	4/30/97	5/1/97	MW61995
273	UV-ICR	UV	0.018	1/cm	SM 5910 B	1	0.009	4/18/97		4/18/97	8-0-27
274	UV-ICR	UV (Dupl)	0.018	1/cm	SM 5910 B	1	0.009	4/18/97		4/18/97	8-0-27
			0.018	**1/cm**	**0.0 % RPD**						

Sample ID: 39.10.Eff.9 **S&H ID:** 9704-108 **Date Sampled:** 4/18/97 5:11:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
275	Cl2Dose	Chlorine Dose	1.54	mg/L as Cl2	SM 4500-Cl B	1	n/a	4/22/97		4/22/97	n/a
276	Cl2Res	Chlorine Residual	0.80	mg/L as Cl2	SM 4500-Cl F	1	0.10	4/22/97		4/23/97	n/a
277	HAA	Bromochloroacetic acid	4.0	µg/L	SM 6251 B	1	1.0	4/23/97	5/3/97	5/5/97	MW62081
278	HAA	Bromodichloroacetic acid	NR	µg/L	SM 6251 B	1	1.0	4/23/97	5/3/97	5/5/97	MW62081
279	HAA	Chlorodibromoacetic acid	NR	µg/L	SM 6251 B	1	1.0	4/23/97	5/3/97	5/5/97	MW62081
280	HAA	Dibromoacetic acid	2.0	µg/L	SM 6251 B	1	1.0	4/23/97	5/3/97	5/5/97	MW62081
281	HAA	Dichloroacetic acid	8.0	µg/L	SM 6251 B	1	1.0	4/23/97	5/3/97	5/5/97	MW62081
282	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	4/23/97	5/3/97	5/5/97	MW62081
283	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	4/23/97	5/3/97	5/5/97	MW62081
284	HAA	Tribromoacetic acid	1.0	µg/L	SM 6251 B	1	1.0	4/23/97	5/3/97	5/5/97	MW62081
285	HAA	Trichloroacetic acid	2.0	µg/L	SM 6251 B	1	1.0	4/23/97	5/3/97	5/5/97	MW62081
286	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	4/22/97		4/23/97	n/a
287	pH	Cl2 pH - Initial	9.0	Unit	SM 4500-H+ B	1	n/a	4/22/97		4/22/97	n/a
288	pH	pH	8.7	Unit	SM 4500-H+ B	1	n/a	4/18/97		4/18/97	n/a
289	TEMP	Cl2 Temperature	10.1	ºC	SM 2550 B	1	n/a	4/22/97		4/23/97	n/a
290	TEMP	Temperature	22.7	ºC	SM 2550 B	1	n/a	4/18/97		4/18/97	n/a
291	TIME	Cl2 Incubation Time	24.2	hrs	n/a	1	n/a	4/22/97		4/23/97	n/a
292	TOC-ICR	TOC	1.39	mg/L	SM 5310 C	1	0.50	4/18/97		4/18/97	7-0-35
293	TOC-ICR	TOC (Dupl)	1.39	mg/L	SM 5310 C	1	0.50	4/18/97		4/18/97	7-0-35
			1.39	**mg/L**	**0.0 % RPD**						
294	TOX-ICR	TOX	67	µg Cl-/L	SM 5320 B	1	25	4/23/97		4/27/97	12-0-7
295	TOX-ICR	TOX (Dupl)	66	µg Cl-/L	SM 5320 B	1	25	4/23/97		4/27/97	12-0-7
			67	**µg Cl-/L**	**1.5 % RPD**						
296	THM4	Bromodichloromethane	8.9	µg/L	EPA 551	1	1.0	4/23/97	4/30/97	5/1/97	MW61995
297	THM4	Bromoform	ND	µg/L	EPA 551	1	1.0	4/23/97	4/30/97	5/1/97	MW61995
298	THM4	Chloroform	8.9	µg/L	EPA 551	1	1.0	4/23/97	4/30/97	5/1/97	MW61995
299	THM4	Dibromochloromethane	6.9	µg/L	EPA 551	1	1.0	4/23/97	4/30/97	5/1/97	MW61995
300	UV-ICR	UV	0.021	1/cm	SM 5910 B	1	0.009	4/18/97		4/18/97	8-0-27
301	UV-ICR	UV (Dupl)	0.021	1/cm	SM 5910 B	1	0.009	4/18/97		4/18/97	8-0-27
			0.021	**1/cm**	**0.0 % RPD**						

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Summers & Hooper, Inc.
6 Knollcrest Drive
Cincinnati, OH 45237

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 39
Study Title: ICR RSSCT #2

Sample ID: 39.10.Eff.9d **S&H ID:** 9704-109 **Date Sampled:** 4/18/97 5:11:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
302	Cl2Dose	Chlorine Dose	1.54	mg/L as Cl2	SM 4500-Cl B	1	n/a	4/22/97		4/22/97	n/a
303	Cl2Res	Chlorine Residual	0.82	mg/L as Cl2	SM 4500-Cl F	1	0.10	4/22/97		4/23/97	n/a
304	HAA	Bromochloroacetic acid	3.0	µg/L	SM 6251 B	1	1.0	4/23/97	5/7/97	5/8/97	MW62224
305	HAA	Bromodichloroacetic acid	2.0	µg/L	SM 6251 B	1	1.0	4/23/97	5/7/97	5/8/97	MW62224
306	HAA	Chlorodibromoacetic acid	1.0	µg/L	SM 6251 B	1	1.0	4/23/97	5/7/97	5/8/97	MW62224
307	HAA	Dibromoacetic acid	2.0	µg/L	SM 6251 B	1	1.0	4/23/97	5/7/97	5/8/97	MW62224
308	HAA	Dichloroacetic acid	8.0	µg/L	SM 6251 B	1	1.0	4/23/97	5/7/97	5/8/97	MW62224
309	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	4/23/97	5/7/97	5/8/97	MW62224
310	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	4/23/97	5/7/97	5/8/97	MW62224
311	HAA	Tribromoacetic acid	2.0	µg/L	SM 6251 B	1	1.0	4/23/97	5/7/97	5/8/97	MW62224
312	HAA	Trichloroacetic acid	2.0	µg/L	SM 6251 B	1	1.0	4/23/97	5/7/97	5/8/97	MW62224
313	pH	Cl2 pH - Final	8.9	Unit	SM 4500-H+ B	1	n/a	4/22/97		4/23/97	n/a
314	pH	Cl2 pH - Initial	9.0	Unit	SM 4500-H+ B	1	n/a	4/22/97		4/22/97	n/a
315	pH	pH	8.6	Unit	SM 4500-H+ B	1	n/a	4/18/97		4/18/97	n/a
316	TEMP	Cl2 Temperature	10.1	ºC	SM 2550 B	1	n/a	4/22/97		4/23/97	n/a
317	TEMP	Temperature	22.8	ºC	SM 2550 B	1	n/a	4/18/97		4/18/97	n/a
318	TIME	Cl2 Incubation Time	24.2	hrs	n/a	1	n/a	4/22/97		4/23/97	n/a
319	TOC-ICR	TOC	1.40	mg/L	SM 5310 C	1	0.50	4/18/97		4/18/97	7-0-35
320	TOC-ICR	TOC (Dupl)	1.42	mg/L	SM 5310 C	1	0.50	4/18/97		4/18/97	7-0-35
			1.41	**mg/L**	**1.4 % RPD**						
321	TOX-ICR	TOX	65	µg Cl-/L	SM 5320 B	1	25	4/23/97		4/27/97	12-0-7
322	TOX-ICR	TOX (Dupl)	66	µg Cl-/L	SM 5320 B	1	25	4/23/97		4/27/97	12-0-7
			66	**µg Cl-/L**	**1.5 % RPD**						
323	THM4	Bromodichloromethane	9.2	µg/L	EPA 551	1	1.0	4/23/97	4/30/97	5/1/97	MW61995
324	THM4	Bromoform	ND	µg/L	EPA 551	1	1.0	4/23/97	4/30/97	5/1/97	MW61995
325	THM4	Chloroform	10.1	µg/L	EPA 551	1	1.0	4/23/97	4/30/97	5/1/97	MW61995
326	THM4	Dibromochloromethane	7.0	µg/L	EPA 551	1	1.0	4/23/97	4/30/97	5/1/97	MW61995
327	UV-ICR	UV	0.021	1/cm	SM 5910 B	1	0.009	4/18/97		4/18/97	8-0-27
328	UV-ICR	UV (Dupl)	0.021	1/cm	SM 5910 B	1	0.009	4/18/97		4/18/97	8-0-27
			0.021	**1/cm**	**0.0 % RPD**						

Sample ID: 39.20.Eff.4 **S&H ID:** 9704-111 **Date Sampled:** 4/19/97 8:15:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
329	Cl2Dose	Chlorine Dose	1.19	mg/L as Cl2	SM 4500-Cl B	1	n/a	4/22/97		4/22/97	n/a
330	Cl2Res	Chlorine Residual	0.79	mg/L as Cl2	SM 4500-Cl F	1	0.10	4/22/97		4/23/97	n/a
331	HAA	Bromochloroacetic acid	1.0	µg/L	SM 6251 B	1	1.0	4/23/97	5/7/97	5/8/97	MW62225

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 39
Study Title: ICR RSSCT #2

332	HAA	Bromodichloroacetic acid	1.0	µg/L	SM 6251 B	1	1.0	4/23/97	5/7/97	5/8/97	MW62225
333	HAA	Chlorodibromoacetic acid	1.0	µg/L	SM 6251 B	1	1.0	4/23/97	5/7/97	5/8/97	MW62225
334	HAA	Dibromoacetic acid	1.0	µg/L	SM 6251 B	1	1.0	4/23/97	5/7/97	5/8/97	MW62225
335	HAA	Dichloroacetic acid	ND	µg/L	SM 6251 B	1	1.0	4/23/97	5/7/97	5/8/97	MW62225
336	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	4/23/97	5/7/97	5/8/97	MW62225
337	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	4/23/97	5/7/97	5/8/97	MW62225
338	HAA	Tribromoacetic acid	2.0	µg/L	SM 6251 B	1	1.0	4/23/97	5/7/97	5/8/97	MW62225
339	HAA	Trichloroacetic acid	ND	µg/L	SM 6251 B	1	1.0	4/23/97	5/7/97	5/8/97	MW62225
340	pH	Cl2 pH - Final	8.9	Unit	SM 4500-H+ B	1	n/a	4/22/97		4/23/97	n/a
341	pH	Cl2 pH - Initial	9.0	Unit	SM 4500-H+ B	1	n/a	4/22/97		4/22/97	n/a
342	pH	pH	8.6	Unit	SM 4500-H+ B	1	n/a	4/19/97		4/19/97	n/a
343	TEMP	Cl2 Temperature	10.1	ºC	SM 2550 B	1	n/a	4/22/97		4/23/97	n/a
344	TEMP	Temperature	22.0	ºC	SM 2550 B	1	n/a	4/19/97		4/19/97	n/a
345	TIME	Cl2 Incubation Time	24.3	hrs	n/a	1	n/a	4/22/97		4/23/97	n/a
346	TOC-ICR	TOC	ND	mg/L	SM 5310 C	1	0.50	4/19/97		4/19/97	7-0-36
347	TOC-ICR	TOC (Dupl)	ND	mg/L	SM 5310 C	1	0.50	4/19/97		4/19/97	7-0-36
			ND	**mg/L**							
348	TOX-ICR	TOX	ND	µg Cl-/L	SM 5320 B	1	25	4/23/97		4/27/97	12-0-7
349	TOX-ICR	TOX (Dupl)	ND	µg Cl-/L	SM 5320 B	1	25	4/23/97		4/27/97	12-0-7
			ND	**µg Cl-/L**							
350	THM4	Bromodichloromethane	1.4	µg/L	EPA 551	1	1.0	4/23/97	4/30/97	5/1/97	MW61995
351	THM4	Bromoform	1.8	µg/L	EPA 551	1	1.0	4/23/97	4/30/97	5/1/97	MW61995
352	THM4	Chloroform	ND	µg/L	EPA 551	1	1.0	4/23/97	4/30/97	5/1/97	MW61995
353	THM4	Dibromochloromethane	3.1	µg/L	EPA 551	1	1.0	4/23/97	4/30/97	5/1/97	MW61995
354	UV-ICR	UV	ND	1/cm	SM 5910 B	1	0.009	4/19/97		4/20/97	8-0-28
355	UV-ICR	UV (Dupl)	ND	1/cm	SM 5910 B	1	0.009	4/19/97		4/20/97	8-0-28
			ND	**1/cm**							

Sample ID: 39.10.Eff.10 **S&H ID:** 9704-114 **Date Sampled:** 4/19/97 2:25:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
356	Cl2Dose	Chlorine Dose	1.76	mg/L as Cl2	SM 4500-Cl B	1	n/a	4/19/97		4/19/97	n/a
357	Cl2Res	Chlorine Residual	0.95	mg/L as Cl2	SM 4500-Cl F	1	0.10	4/19/97		4/20/97	n/a
358	HAA	Bromochloroacetic acid	4.0	µg/L	SM 6251 B	1	1.0	4/20/97	4/30/97	5/2/97	MW62039
359	HAA	Bromodichloroacetic acid	2.0	µg/L	SM 6251 B	1	1.0	4/20/97	4/30/97	5/2/97	MW62039
360	HAA	Chlorodibromoacetic acid	1.0	µg/L	SM 6251 B	1	1.0	4/20/97	4/30/97	5/2/97	MW62039
361	HAA	Dibromoacetic acid	2.0	µg/L	SM 6251 B	1	1.0	4/20/97	4/30/97	5/2/97	MW62039
362	HAA	Dichloroacetic acid	8.0	µg/L	SM 6251 B	1	1.0	4/20/97	4/30/97	5/2/97	MW62039
363	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	4/20/97	4/30/97	5/2/97	MW62039
364	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	4/20/97	4/30/97	5/2/97	MW62039
365	HAA	Tribromoacetic acid	1.0	µg/L	SM 6251 B	1	1.0	4/20/97	4/30/97	5/2/97	MW62039

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 39
Study Title: ICR RSSCT #2

366	HAA	Trichloroacetic acid	2.0	µg/L	SM 6251 B	1	1.0	4/20/97	4/30/97	5/2/97	MW62039
367	pH	Cl2 pH - Final	8.9	Unit	SM 4500-H+ B	1	n/a	4/19/97		4/20/97	n/a
368	pH	Cl2 pH - Initial	9.0	Unit	SM 4500-H+ B	1	n/a	4/19/97		4/19/97	n/a
369	pH	pH	8.5	Unit	SM 4500-H+ B	1	n/a	4/19/97		4/19/97	n/a
370	TEMP	Cl2 Temperature	10.0	ºC	SM 2550 B	1	n/a	4/19/97		4/20/97	n/a
371	TEMP	Temperature	23.1	ºC	SM 2550 B	1	n/a	4/19/97		4/19/97	n/a
372	TIME	Cl2 Incubation Time	23.9	hrs	n/a	1	n/a	4/19/97		4/20/97	n/a
373	TOC-ICR	TOC	1.52	mg/L	SM 5310 C	1	0.50	4/19/97		4/19/97	7-0-36
374	TOC-ICR	TOC (Dupl)	1.54	mg/L	SM 5310 C	1	0.50	4/19/97		4/19/97	7-0-36
			1.53	**mg/L**	**1.3 % RPD**						
375	TOX-ICR	TOX	78	µg Cl-/L	SM 5320 B	1	25	4/20/97		4/26/97	12-0-6
376	TOX-ICR	TOX (Dupl)	83	µg Cl-/L	SM 5320 B	1	25	4/20/97		4/26/97	12-0-6
			81	**µg Cl-/L**	**6.2 % RPD**						
377	THM4	Bromodichloromethane	9.7	µg/L	EPA 551	1	1.0	4/20/97	4/30/97	5/1/97	MW61995
378	THM4	Bromoform	ND	µg/L	EPA 551	1	1.0	4/20/97	4/30/97	5/1/97	MW61995
379	THM4	Chloroform	11.1	µg/L	EPA 551	1	1.0	4/20/97	4/30/97	5/1/97	MW61995
380	THM4	Dibromochloromethane	6.6	µg/L	EPA 551	1	1.0	4/20/97	4/30/97	5/1/97	MW61995
381	UV-ICR	UV	0.023	1/cm	SM 5910 B	1	0.009	4/19/97		4/20/97	8-0-28
382	UV-ICR	UV (Dupl)	0.024	1/cm	SM 5910 B	1	0.009	4/19/97		4/20/97	8-0-28
			0.024	**1/cm**	**4.2 % RPD**						

Sample ID: 39.10.Eff.11 **S&H ID:** 9704-115 **Date Sampled:** 4/19/97 11:52:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
383	Cl2Dose	Chlorine Dose	1.61	mg/L as Cl2	SM 4500-Cl B	1	n/a	4/22/97		4/22/97	n/a
384	Cl2Res	Chlorine Residual	0.78	mg/L as Cl2	SM 4500-Cl F	1	0.10	4/22/97		4/23/97	n/a
385	HAA	Bromochloroacetic acid	4.0	µg/L	SM 6251 B	1	1.0	4/23/97	5/7/97	5/8/97	MW62224
386	HAA	Bromodichloroacetic acid	2.0	µg/L	SM 6251 B	1	1.0	4/23/97	5/7/97	5/8/97	MW62224
387	HAA	Chlorodibromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	4/23/97	5/7/97	5/8/97	MW62224
388	HAA	Dibromoacetic acid	2.0	µg/L	SM 6251 B	1	1.0	4/23/97	5/7/97	5/8/97	MW62224
389	HAA	Dichloroacetic acid	8.0	µg/L	SM 6251 B	1	1.0	4/23/97	5/7/97	5/8/97	MW62224
390	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	4/23/97	5/7/97	5/8/97	MW62224
391	HAA	Monochloroacetic acid	2.0	µg/L	SM 6251 B	1	2.0	4/23/97	5/7/97	5/8/97	MW62224
392	HAA	Tribromoacetic acid	2.0	µg/L	SM 6251 B	1	1.0	4/23/97	5/7/97	5/8/97	MW62224
393	HAA	Trichloroacetic acid	2.0	µg/L	SM 6251 B	1	1.0	4/23/97	5/7/97	5/8/97	MW62224
394	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	4/22/97		4/23/97	n/a
395	pH	Cl2 pH - Initial	9.0	Unit	SM 4500-H+ B	1	n/a	4/22/97		4/22/97	n/a
396	pH	pH	8.7	Unit	SM 4500-H+ B	1	n/a	4/19/97		4/19/97	n/a
397	TEMP	Cl2 Temperature	10.1	ºC	SM 2550 B	1	n/a	4/22/97		4/23/97	n/a
398	TEMP	Temperature	21.9	ºC	SM 2550 B	1	n/a	4/19/97		4/19/97	n/a

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 39
Study Title: ICR RSSCT #2

399	TIME	Cl2 Incubation Time	24.0	hrs	n/a	1	n/a	4/22/97		4/23/97	n/a
400	TOC-ICR	TOC	1.64	mg/L	SM 5310 C	1	0.50	4/19/97		4/19/97	7-0-36
401	TOC-ICR	TOC (Dupl)	1.61	mg/L	SM 5310 C	1	0.50	4/19/97		4/19/97	7-0-36
			1.63	**mg/L**	**1.8 % RPD**						
402	TOX-ICR	TOX	80	µg Cl-/L	SM 5320 B	1	25	4/23/97		5/3/97	12-0-8
403	TOX-ICR	TOX (Dupl)	86	µg Cl-/L	SM 5320 B	1	25	4/23/97		5/3/97	12-0-8
			83	**µg Cl-/L**	**7.2 % RPD**						
404	THM4	Bromodichloromethane	10.7	µg/L	EPA 551	1	1.0	4/23/97	4/30/97	5/1/97	MW61995
405	THM4	Bromoform	ND	µg/L	EPA 551	1	1.0	4/23/97	4/30/97	5/1/97	MW61995
406	THM4	Chloroform	15.8	µg/L	EPA 551	1	1.0	4/23/97	4/30/97	5/1/97	MW61995
407	THM4	Dibromochloromethane	6.6	µg/L	EPA 551	1	1.0	4/23/97	4/30/97	5/1/97	MW61995
408	UV-ICR	UV	0.026	1/cm	SM 5910 B	1	0.009	4/19/97		4/20/97	8-0-28
409	UV-ICR	UV (Dupl)	0.026	1/cm	SM 5910 B	1	0.009	4/19/97		4/20/97	8-0-28
			0.026	**1/cm**	**0.0 % RPD**						

Sample ID: 39.20.Eff.5 **S&H ID:** 9704-116 **Date Sampled:** 4/19/97 5:34:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
410	Cl2Dose	Chlorine Dose	1.16	mg/L as Cl2	SM 4500-Cl B	1	n/a	4/23/97		4/23/97	n/a
411	Cl2Res	Chlorine Residual	0.74	mg/L as Cl2	SM 4500-Cl F	1	0.10	4/23/97		4/24/97	n/a
412	HAA	Bromochloroacetic acid	1.0	µg/L	SM 6251 B	1	1.0	4/24/97	5/7/97	5/8/97	MW62224
413	HAA	Bromodichloroacetic acid	1.0	µg/L	SM 6251 B	1	1.0	4/24/97	5/7/97	5/8/97	MW62224
414	HAA	Chlorodibromoacetic acid	1.0	µg/L	SM 6251 B	1	1.0	4/24/97	5/7/97	5/8/97	MW62224
415	HAA	Dibromoacetic acid	1.0	µg/L	SM 6251 B	1	1.0	4/24/97	5/7/97	5/8/97	MW62224
416	HAA	Dichloroacetic acid	ND	µg/L	SM 6251 B	1	1.0	4/24/97	5/7/97	5/8/97	MW62224
417	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	4/24/97	5/7/97	5/8/97	MW62224
418	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	4/24/97	5/7/97	5/8/97	MW62224
419	HAA	Tribromoacetic acid	2.0	µg/L	SM 6251 B	1	1.0	4/24/97	5/7/97	5/8/97	MW62224
420	HAA	Trichloroacetic acid	ND	µg/L	SM 6251 B	1	1.0	4/24/97	5/7/97	5/8/97	MW62224
421	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	4/23/97		4/24/97	n/a
422	pH	Cl2 pH - Initial	9.0	Unit	SM 4500-H+ B	1	n/a	4/23/97		4/23/97	n/a
423	pH	pH	8.6	Unit	SM 4500-H+ B	1	n/a	4/19/97		4/19/97	n/a
424	TEMP	Cl2 Temperature	9.9	ºC	SM 2550 B	1	n/a	4/23/97		4/24/97	n/a
425	TEMP	Temperature	23.6	ºC	SM 2550 B	1	n/a	4/19/97		4/19/97	n/a
426	TIME	Cl2 Incubation Time	24.1	hrs	n/a	1	n/a	4/23/97		4/24/97	n/a
427	TOC-ICR	TOC	0.51	mg/L	SM 5310 C	1	0.50	4/19/97		4/20/97	7-0-37
428	TOC-ICR	TOC (Dupl)	0.51	mg/L	SM 5310 C	1	0.50	4/19/97		4/20/97	7-0-37
			0.51	**mg/L**	**0.0 % RPD**						
429	TOX-ICR	TOX	ND	µg Cl-/L	SM 5320 B	1	25	4/24/97		5/3/97	12-0-8
430	TOX-ICR	TOX (Dupl)	ND	µg Cl-/L	SM 5320 B	1	25	4/24/97		5/3/97	12-0-8
			ND	**µg Cl-/L**							

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 39
Study Title: ICR RSSCT #2

431	THM4	Bromodichloromethane	2.1	µg/L	EPA 551	1	1.0	4/24/97	4/30/97	5/1/97	MW61995
432	THM4	Bromoform	2.4	µg/L	EPA 551	1	1.0	4/24/97	4/30/97	5/1/97	MW61995
433	THM4	Chloroform	ND	µg/L	EPA 551	1	1.0	4/24/97	4/30/97	5/1/97	MW61995
434	THM4	Dibromochloromethane	4.2	µg/L	EPA 551	1	1.0	4/24/97	4/30/97	5/1/97	MW61995
435	UV-ICR	UV	ND	1/cm	SM 5910 B	1	0.009	4/19/97		4/20/97	8-0-28
436	UV-ICR	UV (Dupl)	ND	1/cm	SM 5910 B	1	0.009	4/19/97		4/20/97	8-0-28
			ND	**1/cm**							

Sample ID: 39.20.Eff.5d **S&H ID:** 9704-117 **Date Sampled:** 4/19/97 5:34:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
437	Cl2Dose	Chlorine Dose	1.16	mg/L as Cl2	SM 4500-Cl B	1	n/a	4/23/97		4/23/97	n/a
438	Cl2Res	Chlorine Residual	0.73	mg/L as Cl2	SM 4500-Cl F	1	0.10	4/23/97		4/24/97	n/a
439	HAA	Bromochloroacetic acid	1.0	µg/L	SM 6251 B	1	1.0	4/24/97	5/7/97	5/8/97	MW62224
440	HAA	Bromodichloroacetic acid	1.0	µg/L	SM 6251 B	1	1.0	4/24/97	5/7/97	5/8/97	MW62224
441	HAA	Chlorodibromoacetic acid	1.0	µg/L	SM 6251 B	1	1.0	4/24/97	5/7/97	5/8/97	MW62224
442	HAA	Dibromoacetic acid	1.0	µg/L	SM 6251 B	1	1.0	4/24/97	5/7/97	5/8/97	MW62224
443	HAA	Dichloroacetic acid	ND	µg/L	SM 6251 B	1	1.0	4/24/97	5/7/97	5/8/97	MW62224
444	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	4/24/97	5/7/97	5/8/97	MW62224
445	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	4/24/97	5/7/97	5/8/97	MW62224
446	HAA	Tribromoacetic acid	2.0	µg/L	SM 6251 B	1	1.0	4/24/97	5/7/97	5/8/97	MW62224
447	HAA	Trichloroacetic acid	ND	µg/L	SM 6251 B	1	1.0	4/24/97	5/7/97	5/8/97	MW62224
448	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	4/23/97		4/24/97	n/a
449	pH	Cl2 pH - Initial	9.0	Unit	SM 4500-H+ B	1	n/a	4/23/97		4/23/97	n/a
450	pH	pH	8.6	Unit	SM 4500-H+ B	1	n/a	4/19/97		4/19/97	n/a
451	TEMP	Cl2 Temperature	9.9	ºC	SM 2550 B	1	n/a	4/23/97		4/24/97	n/a
452	TEMP	Temperature	23.7	ºC	SM 2550 B	1	n/a	4/19/97		4/19/97	n/a
453	TIME	Cl2 Incubation Time	24.2	hrs	n/a	1	n/a	4/23/97		4/24/97	n/a
454	TOC-ICR	TOC	0.54	mg/L	SM 5310 C	1	0.50	4/19/97		4/20/97	7-0-37
455	TOC-ICR	TOC (Dupl)	0.52	mg/L	SM 5310 C	1	0.50	4/19/97		4/20/97	7-0-37
			0.53	**mg/L**	**3.8 % RPD**						
456	TOX-ICR	TOX	ND	µg Cl-/L	SM 5320 B	1	25	4/24/97		5/3/97	12-0-8
457	TOX-ICR	TOX (Dupl)	ND	µg Cl-/L	SM 5320 B	1	25	4/24/97		5/3/97	12-0-8
			ND	**µg Cl-/L**							
458	THM4	Bromodichloromethane	2.0	µg/L	EPA 551	1	1.0	4/24/97	4/30/97	5/1/97	MW61995
459	THM4	Bromoform	2.4	µg/L	EPA 551	1	1.0	4/24/97	4/30/97	5/1/97	MW61995
460	THM4	Chloroform	ND	µg/L	EPA 551	1	1.0	4/24/97	4/30/97	5/1/97	MW61995
461	THM4	Dibromochloromethane	4.1	µg/L	EPA 551	1	1.0	4/24/97	4/30/97	5/1/97	MW61995
462	UV-ICR	UV	ND	1/cm	SM 5910 B	1	0.009	4/19/97		4/20/97	8-0-28
463	UV-ICR	UV (Dupl)	ND	1/cm	SM 5910 B	1	0.009	4/19/97		4/20/97	8-0-28
			ND	**1/cm**							

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Summers & Hooper, Inc.
6 Knollcrest Drive
Cincinnati, OH 45237

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 39
Study Title: ICR RSSCT #2

Sample ID: 39.20.Eff.7d **S&H ID:** 9704-129 **Date Sampled:** 4/20/97 12:01:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
464	Cl2Dose	Chlorine Dose	1.44	mg/L as Cl2	SM 4500-Cl B	1	n/a	4/23/97		4/23/97	n/a
465	Cl2Res	Chlorine Residual	0.96	mg/L as Cl2	SM 4500-Cl F	1	0.10	4/23/97		4/24/97	n/a
466	HAA	Bromochloroacetic acid	2.0	µg/L	SM 6251 B	1	1.0	4/24/97	5/7/97	5/8/97	MW62224
467	HAA	Bromodichloroacetic acid	1.0	µg/L	SM 6251 B	1	1.0	4/24/97	5/7/97	5/8/97	MW62224
468	HAA	Chlorodibromoacetic acid	1.0	µg/L	SM 6251 B	1	1.0	4/24/97	5/7/97	5/8/97	MW62224
469	HAA	Dibromoacetic acid	2.0	µg/L	SM 6251 B	1	1.0	4/24/97	5/7/97	5/8/97	MW62224
470	HAA	Dichloroacetic acid	2.0	µg/L	SM 6251 B	1	1.0	4/24/97	5/7/97	5/8/97	MW62224
471	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	4/24/97	5/7/97	5/8/97	MW62224
472	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	4/24/97	5/7/97	5/8/97	MW62224
473	HAA	Tribromoacetic acid	2.0	µg/L	SM 6251 B	1	1.0	4/24/97	5/7/97	5/8/97	MW62224
474	HAA	Trichloroacetic acid	ND	µg/L	SM 6251 B	1	1.0	4/24/97	5/7/97	5/8/97	MW62224
475	pH	Cl2 pH - Final	8.9	Unit	SM 4500-H+ B	1	n/a	4/23/97		4/24/97	n/a
476	pH	Cl2 pH - Initial	9.0	Unit	SM 4500-H+ B	1	n/a	4/23/97		4/23/97	n/a
477	pH	pH	8.6	Unit	SM 4500-H+ B	1	n/a	4/20/97		4/20/97	n/a
478	TEMP	Cl2 Temperature	9.9	ºC	SM 2550 B	1	n/a	4/23/97		4/24/97	n/a
479	TEMP	Temperature	20.7	ºC	SM 2550 B	1	n/a	4/20/97		4/20/97	n/a
480	TIME	Cl2 Incubation Time	24.3	hrs	n/a	1	n/a	4/23/97		4/24/97	n/a
481	TOC-ICR	TOC	0.72	mg/L	SM 5310 C	1	0.50	4/20/97		4/20/97	7-0-37
482	TOC-ICR	TOC (Dupl)	0.71	mg/L	SM 5310 C	1	0.50	4/20/97		4/20/97	7-0-37
			0.71	**mg/L**	**1.4 % RPD**						
483	TOX-ICR	TOX	25	µg Cl-/L	SM 5320 B	1	25	4/24/97		5/3/97	12-0-8
484	TOX-ICR	TOX (Dupl)	ND	µg Cl-/L	SM 5320 B	1	25	4/24/97		5/3/97	12-0-8
			ND	**µg Cl-/L**							
485	THM4	Bromodichloromethane	4.0	µg/L	EPA 551	1	1.0	4/24/97	4/30/97	5/1/97	MW61995
486	THM4	Bromoform	2.2	µg/L	EPA 551	1	1.0	4/24/97	4/30/97	5/1/97	MW61995
487	THM4	Chloroform	1.2	µg/L	EPA 551	1	1.0	4/24/97	4/30/97	5/1/97	MW61995
488	THM4	Dibromochloromethane	5.7	µg/L	EPA 551	1	1.0	4/24/97	4/30/97	5/1/97	MW61995
489	UV-ICR	UV	0.009	1/cm	SM 5910 B	1	0.009	4/20/97		4/21/97	8-0-29
490	UV-ICR	UV (Dupl)	0.009	1/cm	SM 5910 B	1	0.009	4/20/97		4/21/97	8-0-29
			0.009	**1/cm**	**0.0 % RPD**						

Sample ID: 39.10.Eff.14 **S&H ID:** 9704-131 **Date Sampled:** 4/20/97 4:44:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
491	Cl2Dose	Chlorine Dose	1.70	mg/L as Cl2	SM 4500-Cl B	1	n/a	4/23/97		4/23/97	n/a
492	Cl2Res	Chlorine Residual	0.72	mg/L as Cl2	SM 4500-Cl F	1	0.10	4/23/97		4/24/97	n/a
493	HAA	Bromochloroacetic acid	4.0	µg/L	SM 6251 B	1	1.0	4/24/97	5/7/97	5/8/97	MW62224

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 39
Study Title: ICR RSSCT #2

494	HAA	Bromodichloroacetic acid	2.0	µg/L	SM 6251 B	1	1.0	4/24/97	5/7/97	5/8/97	MW62224
495	HAA	Chlorodibromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	4/24/97	5/7/97	5/8/97	MW62224
496	HAA	Dibromoacetic acid	1.0	µg/L	SM 6251 B	1	1.0	4/24/97	5/7/97	5/8/97	MW62224
497	HAA	Dichloroacetic acid	10.0	µg/L	SM 6251 B	1	1.0	4/24/97	5/7/97	5/8/97	MW62224
498	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	4/24/97	5/7/97	5/8/97	MW62224
499	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	4/24/97	5/7/97	5/8/97	MW62224
500	HAA	Tribromoacetic acid	1.0	µg/L	SM 6251 B	1	1.0	4/24/97	5/7/97	5/8/97	MW62224
501	HAA	Trichloroacetic acid	4.0	µg/L	SM 6251 B	1	1.0	4/24/97	5/7/97	5/8/97	MW62224
502	pH	Cl2 pH - Final	8.9	Unit	SM 4500-H+ B	1	n/a	4/23/97		4/24/97	n/a
503	pH	Cl2 pH - Initial	9.0	Unit	SM 4500-H+ B	1	n/a	4/23/97		4/23/97	n/a
504	pH	pH	8.5	Unit	SM 4500-H+ B	1	n/a	4/20/97		4/20/97	n/a
505	TEMP	Cl2 Temperature	9.9	ºC	SM 2550 B	1	n/a	4/23/97		4/24/97	n/a
506	TEMP	Temperature	22.4	ºC	SM 2550 B	1	n/a	4/20/97		4/20/97	n/a
507	TIME	Cl2 Incubation Time	24.3	hrs	n/a	1	n/a	4/23/97		4/24/97	n/a
508	TOC-ICR	TOC	1.90	mg/L	SM 5310 C	1	0.50	4/20/97		4/20/97	7-0-37
509	TOC-ICR	TOC (Dupl)	1.89	mg/L	SM 5310 C	1	0.50	4/20/97		4/20/97	7-0-37
			1.90	**mg/L**	**0.5 % RPD**						
510	TOX-ICR	TOX	109	µg Cl-/L	SM 5320 B	1	25	4/24/97		5/3/97	12-0-8
511	TOX-ICR	TOX (Dupl)	111	µg Cl-/L	SM 5320 B	1	25	4/24/97		5/3/97	12-0-8
			110	**µg Cl-/L**	**1.8 % RPD**						
512	THM4	Bromodichloromethane	10.6	µg/L	EPA 551	1	1.0	4/24/97	4/30/97	5/1/97	MW61995
513	THM4	Bromoform	ND	µg/L	EPA 551	1	1.0	4/24/97	4/30/97	5/1/97	MW61995
514	THM4	Chloroform	16.4	µg/L	EPA 551	1	1.0	4/24/97	4/30/97	5/1/97	MW61995
515	THM4	Dibromochloromethane	5.7	µg/L	EPA 551	1	1.0	4/24/97	4/30/97	5/1/97	MW61995
516	UV-ICR	UV	0.033	1/cm	SM 5910 B	1	0.009	4/20/97		4/21/97	8-0-29
517	UV-ICR	UV (Dupl)	0.033	1/cm	SM 5910 B	1	0.009	4/20/97		4/21/97	8-0-29
			0.033	**1/cm**	**0.0 % RPD**						

Sample ID: 39.10.Eff.14d **S&H ID:** 9704-132 **Date Sampled:** 4/20/97 4:44:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
518	Cl2Dose	Chlorine Dose	1.70	mg/L as Cl2	SM 4500-Cl B	1	n/a	4/23/97		4/23/97	n/a
519	Cl2Res	Chlorine Residual	0.72	mg/L as Cl2	SM 4500-Cl F	1	0.10	4/23/97		4/24/97	n/a
520	HAA	Bromochloroacetic acid	4.0	µg/L	SM 6251 B	1	1.0	4/24/97	5/7/97	5/8/97	MW62224
521	HAA	Bromodichloroacetic acid	2.0	µg/L	SM 6251 B	1	1.0	4/24/97	5/7/97	5/8/97	MW62224
522	HAA	Chlorodibromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	4/24/97	5/7/97	5/8/97	MW62224
523	HAA	Dibromoacetic acid	1.0	µg/L	SM 6251 B	1	1.0	4/24/97	5/7/97	5/8/97	MW62224
524	HAA	Dichloroacetic acid	10.0	µg/L	SM 6251 B	1	1.0	4/24/97	5/7/97	5/8/97	MW62224
525	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	4/24/97	5/7/97	5/8/97	MW62224
526	HAA	Monochloroacetic acid	2.0	µg/L	SM 6251 B	1	2.0	4/24/97	5/7/97	5/8/97	MW62224
527	HAA	Tribromoacetic acid	1.0	µg/L	SM 6251 B	1	1.0	4/24/97	5/7/97	5/8/97	MW62224

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 39
Study Title: ICR RSSCT #2

528	HAA	Trichloroacetic acid	4.0	µg/L	SM 6251 B	1	1.0	4/24/97	5/7/97	5/8/97	MW62224
529	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	4/23/97		4/24/97	n/a
530	pH	Cl2 pH - Initial	9.0	Unit	SM 4500-H+ B	1	n/a	4/23/97		4/23/97	n/a
531	pH	pH	8.6	Unit	SM 4500-H+ B	1	n/a	4/20/97		4/20/97	n/a
532	TEMP	Cl2 Temperature	9.9	ºC	SM 2550 B	1	n/a	4/23/97		4/24/97	n/a
533	TEMP	Temperature	22.5	ºC	SM 2550 B	1	n/a	4/20/97		4/20/97	n/a
534	TIME	Cl2 Incubation Time	24.4	hrs	n/a	1	n/a	4/23/97		4/24/97	n/a
535	TOC-ICR	TOC	1.89	mg/L	SM 5310 C	1	0.50	4/20/97		4/20/97	7-0-37
536	TOC-ICR	TOC (Dupl)	1.86	mg/L	SM 5310 C	1	0.50	4/20/97		4/20/97	7-0-37
			1.88	**mg/L**	**1.6 % RPD**						
537	TOX-ICR	TOX	95	µg Cl-/L	SM 5320 B	1	25	4/24/97		5/3/97	12-0-8
538	TOX-ICR	TOX (Dupl)	102	µg Cl-/L	SM 5320 B	1	25	4/24/97		5/3/97	12-0-8
			99	**µg Cl-/L**	**7.1 % RPD**						
539	THM4	Bromodichloromethane	11.9	µg/L	EPA 551	1	1.0	4/24/97	5/5/97	5/6/97	MW62130
540	THM4	Bromoform	ND	µg/L	EPA 551	1	1.0	4/24/97	5/5/97	5/6/97	MW62130
541	THM4	Chloroform	18.7	µg/L	EPA 551	1	1.0	4/24/97	5/5/97	5/6/97	MW62130
542	THM4	Dibromochloromethane	5.9	µg/L	EPA 551	1	1.0	4/24/97	5/5/97	5/6/97	MW62130
543	UV-ICR	UV	0.033	1/cm	SM 5910 B	1	0.009	4/20/97		4/21/97	8-0-29
544	UV-ICR	UV (Dupl)	0.033	1/cm	SM 5910 B	1	0.009	4/20/97		4/21/97	8-0-29
			0.033	**1/cm**	**0.0 % RPD**						

Sample ID: 39.20.Eff.9 **S&H ID:** 9704-139 **Date Sampled:** 4/21/97 8:02:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
545	Cl2Dose	Chlorine Dose	1.38	mg/L as Cl2	SM 4500-Cl B	1	n/a	4/22/97		4/22/97	n/a
546	Cl2Res	Chlorine Residual	0.81	mg/L as Cl2	SM 4500-Cl F	1	0.10	4/22/97		4/23/97	n/a
547	HAA	Bromochloroacetic acid	2.0	µg/L	SM 6251 B	1	1.0	4/23/97	5/7/97	5/8/97	MW62224
548	HAA	Bromodichloroacetic acid	1.0	µg/L	SM 6251 B	1	1.0	4/23/97	5/7/97	5/8/97	MW62224
549	HAA	Chlorodibromoacetic acid	1.0	µg/L	SM 6251 B	1	1.0	4/23/97	5/7/97	5/8/97	MW62224
550	HAA	Dibromoacetic acid	2.0	µg/L	SM 6251 B	1	1.0	4/23/97	5/7/97	5/8/97	MW62224
551	HAA	Dichloroacetic acid	7.0	µg/L	SM 6251 B	1	1.0	4/23/97	5/7/97	5/8/97	MW62224
552	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	4/23/97	5/7/97	5/8/97	MW62224
553	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	4/23/97	5/7/97	5/8/97	MW62224
554	HAA	Tribromoacetic acid	2.0	µg/L	SM 6251 B	1	1.0	4/23/97	5/7/97	5/8/97	MW62224
555	HAA	Trichloroacetic acid	ND	µg/L	SM 6251 B	1	1.0	4/23/97	5/7/97	5/8/97	MW62224
556	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	4/22/97		4/23/97	n/a
557	pH	Cl2 pH - Initial	9.0	Unit	SM 4500-H+ B	1	n/a	4/22/97		4/22/97	n/a
558	pH	pH	8.5	Unit	SM 4500-H+ B	1	n/a	4/21/97		4/21/97	n/a
559	TEMP	Cl2 Temperature	10.1	ºC	SM 2550 B	1	n/a	4/22/97		4/23/97	n/a
560	TEMP	Temperature	22.8	ºC	SM 2550 B	1	n/a	4/21/97		4/21/97	n/a

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 39
Study Title: ICR RSSCT #2

561	TIME	Cl2 Incubation Time	24.0	hrs	n/a	1	n/a	4/22/97		4/23/97	n/a
562	TOC-ICR	TOC	0.90	mg/L	SM 5310 C	1	0.50	4/21/97		4/21/97	7-0-38
563	TOC-ICR	TOC (Dupl)	0.88	mg/L	SM 5310 C	1	0.50	4/21/97		4/21/97	7-0-38
			0.89	**mg/L**	**2.2 % RPD**						
564	TOX-ICR	TOX	29	µg Cl-/L	SM 5320 B	1	25	4/23/97		5/3/97	12-0-8
565	TOX-ICR	TOX (Dupl)	33	µg Cl-/L	SM 5320 B	1	25	4/23/97		5/3/97	12-0-8
			31	**µg Cl-/L**	**12.9 % RPD**						
566	THM4	Bromodichloromethane	5.4	µg/L	EPA 551	1	1.0	4/23/97	4/30/97	5/1/97	MW61995
567	THM4	Bromoform	2.0	µg/L	EPA 551	1	1.0	4/23/97	4/30/97	5/1/97	MW61995
568	THM4	Chloroform	2.4	µg/L	EPA 551	1	1.0	4/23/97	4/30/97	5/1/97	MW61995
569	THM4	Dibromochloromethane	6.6	µg/L	EPA 551	1	1.0	4/23/97	4/30/97	5/1/97	MW61995
570	UV-ICR	UV	0.011	1/cm	SM 5910 B	1	0.009	4/21/97		4/21/97	8-0-29
571	UV-ICR	UV (Dupl)	0.011	1/cm	SM 5910 B	1	0.009	4/21/97		4/21/97	8-0-29
			0.011	**1/cm**	**0.0 % RPD**						

Sample ID: 39.10.Eff.16d **S&H ID:** 9704-144 **Date Sampled:** 4/21/97 12:05:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
572	Cl2Dose	Chlorine Dose	1.75	mg/L as Cl2	SM 4500-Cl B	1	n/a	4/25/97		4/25/97	n/a
573	Cl2Res	Chlorine Residual	0.73	mg/L as Cl2	SM 4500-Cl F	1	0.10	4/25/97		4/26/97	n/a
574	HAA	Bromochloroacetic acid	4.0	µg/L	SM 6251 B	1	1.0	4/26/97	5/7/97	5/8/97	MW62224
575	HAA	Bromodichloroacetic acid	2.0	µg/L	SM 6251 B	1	1.0	4/26/97	5/7/97	5/8/97	MW62224
576	HAA	Chlorodibromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	4/26/97	5/7/97	5/8/97	MW62224
577	HAA	Dibromoacetic acid	1.0	µg/L	SM 6251 B	1	1.0	4/26/97	5/7/97	5/8/97	MW62224
578	HAA	Dichloroacetic acid	10.0	µg/L	SM 6251 B	1	1.0	4/26/97	5/7/97	5/8/97	MW62224
579	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	4/26/97	5/7/97	5/8/97	MW62224
580	HAA	Monochloroacetic acid	2.0	µg/L	SM 6251 B	1	2.0	4/26/97	5/7/97	5/8/97	MW62224
581	HAA	Tribromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	4/26/97	5/7/97	5/8/97	MW62224
582	HAA	Trichloroacetic acid	4.0	µg/L	SM 6251 B	1	1.0	4/26/97	5/7/97	5/8/97	MW62224
583	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	4/25/97		4/26/97	n/a
584	pH	Cl2 pH - Initial	9.0	Unit	SM 4500-H+ B	1	n/a	4/25/97		4/25/97	n/a
585	pH	pH	8.6	Unit	SM 4500-H+ B	1	n/a	4/21/97		4/21/97	n/a
586	TEMP	Cl2 Temperature	9.8	ºC	SM 2550 B	1	n/a	4/25/97		4/26/97	n/a
587	TEMP	Temperature	22.2	ºC	SM 2550 B	1	n/a	4/21/97		4/21/97	n/a
588	TIME	Cl2 Incubation Time	23.9	hrs	n/a	1	n/a	4/25/97		4/26/97	n/a
589	TOC-ICR	TOC	1.96	mg/L	SM 5310 C	1	0.50	4/21/97		4/21/97	7-0-38
590	TOC-ICR	TOC (Dupl)	1.98	mg/L	SM 5310 C	1	0.50	4/21/97		4/21/97	7-0-38
			1.97	**mg/L**	**1.0 % RPD**						
591	TOX-ICR	TOX	107	µg Cl-/L	SM 5320 B	1	25	4/26/97		5/6/97	12-0-10
592	TOX-ICR	TOX (Dupl)	106	µg Cl-/L	SM 5320 B	1	25	4/26/97		5/6/97	12-0-10
			107	**µg Cl-/L**	**0.9 % RPD**						

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 39
Study Title: ICR RSSCT #2

593	THM4	Bromodichloromethane	11.3	µg/L	EPA 551	1	1.0	4/26/97	5/5/97	5/6/97	MW62130
594	THM4	Bromoform	ND	µg/L	EPA 551	1	1.0	4/26/97	5/5/97	5/6/97	MW62130
595	THM4	Chloroform	19.3	µg/L	EPA 551	1	1.0	4/26/97	5/5/97	5/6/97	MW62130
596	THM4	Dibromochloromethane	5.3	µg/L	EPA 551	1	1.0	4/26/97	5/5/97	5/6/97	MW62130
597	UV-ICR	UV	0.035	1/cm	SM 5910 B	1	0.009	4/21/97		4/22/97	8-0-30
598	UV-ICR	UV (Dupl)	0.035	1/cm	SM 5910 B	1	0.009	4/21/97		4/22/97	8-0-30
			0.035	**1/cm**	**0.0 % RPD**						

Sample ID: 39.20.Eff.10 **S&H ID:** 9704-148 **Date Sampled:** 4/21/97 5:12:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
599	Cl2Dose	Chlorine Dose	1.45	mg/L as Cl2	SM 4500-Cl B	1	n/a	4/22/97		4/22/97	n/a
600	Cl2Res	Chlorine Residual	0.82	mg/L as Cl2	SM 4500-Cl F	1	0.10	4/22/97		4/23/97	n/a
601	HAA	Bromochloroacetic acid	3.0	µg/L	SM 6251 B	1	1.0	4/23/97	5/7/97	5/8/97	MW62224
602	HAA	Bromodichloroacetic acid	1.0	µg/L	SM 6251 B	1	1.0	4/23/97	5/7/97	5/8/97	MW62224
603	HAA	Chlorodibromoacetic acid	1.0	µg/L	SM 6251 B	1	1.0	4/23/97	5/7/97	5/8/97	MW62224
604	HAA	Dibromoacetic acid	2.0	µg/L	SM 6251 B	1	1.0	4/23/97	5/7/97	5/8/97	MW62224
605	HAA	Dichloroacetic acid	8.0	µg/L	SM 6251 B	1	1.0	4/23/97	5/7/97	5/8/97	MW62224
606	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	4/23/97	5/7/97	5/8/97	MW62224
607	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	4/23/97	5/7/97	5/8/97	MW62224
608	HAA	Tribromoacetic acid	2.0	µg/L	SM 6251 B	1	1.0	4/23/97	5/7/97	5/8/97	MW62224
609	HAA	Trichloroacetic acid	1.0	µg/L	SM 6251 B	1	1.0	4/23/97	5/7/97	5/8/97	MW62224
610	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	4/22/97		4/23/97	n/a
611	pH	Cl2 pH - Initial	9.0	Unit	SM 4500-H+ B	1	n/a	4/22/97		4/22/97	n/a
612	pH	pH	8.6	Unit	SM 4500-H+ B	1	n/a	4/21/97		4/21/97	n/a
613	TEMP	Cl2 Temperature	10.1	ºC	SM 2550 B	1	n/a	4/22/97		4/23/97	n/a
614	TEMP	Temperature	22.7	ºC	SM 2550 B	1	n/a	4/21/97		4/21/97	n/a
615	TIME	Cl2 Incubation Time	24.0	hrs	n/a	1	n/a	4/22/97		4/23/97	n/a
616	TOC-ICR	TOC	1.10	mg/L	SM 5310 C	1	0.50	4/21/97		4/21/97	7-0-38
617	TOC-ICR	TOC (Dupl)	1.10	mg/L	SM 5310 C	1	0.50	4/21/97		4/21/97	7-0-38
			1.10	**mg/L**	**0.0 % RPD**						
618	TOX-ICR	TOX	50	µg Cl-/L	SM 5320 B	1	25	4/23/97		4/27/97	12-0-7
619	TOX-ICR	TOX (Dupl)	47	µg Cl-/L	SM 5320 B	1	25	4/23/97		4/27/97	12-0-7
			49	**µg Cl-/L**	**6.1 % RPD**						
620	THM4	Bromodichloromethane	7.1	µg/L	EPA 551	1	1.0	4/23/97	4/30/97	5/1/97	MW61995
621	THM4	Bromoform	1.5	µg/L	EPA 551	1	1.0	4/23/97	4/30/97	5/1/97	MW61995
622	THM4	Chloroform	4.3	µg/L	EPA 551	1	1.0	4/23/97	4/30/97	5/1/97	MW61995
623	THM4	Dibromochloromethane	7.2	µg/L	EPA 551	1	1.0	4/23/97	4/30/97	5/1/97	MW61995
624	UV-ICR	UV	0.015	1/cm	SM 5910 B	1	0.009	4/21/97		4/22/97	8-0-30
625	UV-ICR	UV (Dupl)	0.015	1/cm	SM 5910 B	1	0.009	4/21/97		4/22/97	8-0-30
			0.015	**1/cm**	**0.0 % RPD**						

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Summers & Hooper, Inc.
6 Knollcrest Drive
Cincinnati, OH 45237

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 39
Study Title: ICR RSSCT #2

Sample ID: 39.10.20.Inf.A-2 **S&H ID:** 9704-155 **Date Sampled:** 4/22/97 2:00:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
626	ALK	Alkalinity	25	mg/L	SM 2320 B	1	5	4/22/97		4/22/97	1-0-2
627	NH3	Ammonia Nitrogen	ND	mg/L	EPA 350.1	1	0.05	4/22/97		4/29/97	MW61943
628	BR	Bromide	0.039	mg/L	EPA 300.0 A	1	0.020	4/22/97		4/25/97	MW61852
629	CaHard	Calcium Hardness	78	mg/L CaCO3	SM 3500-Ca D	1	5	4/22/97		4/22/97	33-0-2
630	TotHard	Total Hardness	95	mg/L CaCO3	SM 2340 C	1	5	4/22/97		4/22/97	3-0-2

Sample ID: 39.10.20.Inf.B-2 **S&H ID:** 9704-156 **Date Sampled:** 4/22/97 2:00:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
631	Cl2Dose	Chlorine Dose	2.49	mg/L as Cl2	SM 4500-Cl B	1	n/a	4/25/97		4/25/97	n/a
632	Cl2Res	Chlorine Residual	0.78	mg/L as Cl2	SM 4500-Cl F	1	0.10	4/25/97		4/26/97	n/a
633	HAA	Bromochloroacetic acid	5.0	µg/L	SM 6251 B	1	1.0	4/26/97	5/7/97	5/8/97	MW62224
634	HAA	Bromodichloroacetic acid	3.0	µg/L	SM 6251 B	1	1.0	4/26/97	5/7/97	5/8/97	MW62224
635	HAA	Chlorodibromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	4/26/97	5/7/97	5/8/97	MW62224
636	HAA	Dibromoacetic acid	1.0	µg/L	SM 6251 B	1	1.0	4/26/97	5/7/97	5/8/97	MW62224
637	HAA	Dichloroacetic acid	19.0	µg/L	SM 6251 B	1	1.0	4/26/97	5/7/97	5/8/97	MW62224
638	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	4/26/97	5/7/97	5/8/97	MW62224
639	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	4/26/97	5/7/97	5/8/97	MW62224
640	HAA	Tribromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	4/26/97	5/7/97	5/8/97	MW62224
641	HAA	Trichloroacetic acid	10.0	µg/L	SM 6251 B	1	1.0	4/26/97	5/7/97	5/8/97	MW62224
642	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	4/25/97		4/26/97	n/a
643	pH	Cl2 pH - Initial	9.0	Unit	SM 4500-H+ B	1	n/a	4/25/97		4/25/97	n/a
644	pH	pH	8.9	Unit	SM 4500-H+ B	1	n/a	4/22/97		4/22/97	n/a
645	TEMP	Cl2 Temperature	9.8	ºC	SM 2550 B	1	n/a	4/25/97		4/26/97	n/a
646	TEMP	Temperature	16.9	ºC	SM 2550 B	1	n/a	4/22/97		4/22/97	n/a
647	TIME	Cl2 Incubation Time	24.0	hrs	n/a	1	n/a	4/25/97		4/26/97	n/a
648	TOC-ICR	TOC	3.22	mg/L	SM 5310 C	1	0.50	4/22/97		4/22/97	7-0-39
649	TOC-ICR	TOC (Dupl)	3.21	mg/L	SM 5310 C	1	0.50	4/22/97		4/22/97	7-0-39
			3.21	**mg/L**	**0.3 % RPD**						
650	TOX-ICR	TOX	224	µg Cl-/L	SM 5320 B	1	25	4/26/97		5/6/97	12-0-10
651	TOX-ICR	TOX (Dupl)	225	µg Cl-/L	SM 5320 B	1	25	4/26/97		5/6/97	12-0-10
			225	**µg Cl-/L**	**0.4 % RPD**						
652	THM4	Bromodichloromethane	12.9	µg/L	EPA 551	1	1.0	4/26/97	5/5/97	5/6/97	MW62130
653	THM4	Bromoform	ND	µg/L	EPA 551	1	1.0	4/26/97	5/5/97	5/6/97	MW62130
654	THM4	Chloroform	43.4	µg/L	EPA 551	1	1.0	4/26/97	5/5/97	5/6/97	MW62130
655	THM4	Dibromochloromethane	3.0	µg/L	EPA 551	1	1.0	4/26/97	5/5/97	5/6/97	MW62130

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 39
Study Title: ICR RSSCT #2

656	TURB	Turbidity	0.15	ntu	SM 2130 B	1	0.05	4/22/97		4/22/97	9-0-2
657	UV-ICR	UV	0.066	1/cm	SM 5910 B	1	0.009	4/22/97		4/22/97	8-0-30
658	UV-ICR	UV (Dupl)	0.066	1/cm	SM 5910 B	1	0.009	4/22/97		4/22/97	8-0-30
			0.066	**1/cm**	**0.0 % RPD**						

Sample ID: 39.10.Eff.19 **S&H ID:** 9704-162 **Date Sampled:** 4/22/97 4:45:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
659	Cl2Dose	Chlorine Dose	1.78	mg/L as Cl2	SM 4500-Cl B	1	n/a	4/23/97		4/23/97	n/a
660	Cl2Res	Chlorine Residual	0.68	mg/L as Cl2	SM 4500-Cl F	1	0.10	4/23/97		4/24/97	n/a
661	HAA	Bromochloroacetic acid	5.0	µg/L	SM 6251 B	1	1.0	4/24/97	5/7/97	5/8/97	MW62224
662	HAA	Bromodichloroacetic acid	2.0	µg/L	SM 6251 B	1	1.0	4/24/97	5/7/97	5/8/97	MW62224
663	HAA	Chlorodibromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	4/24/97	5/7/97	5/8/97	MW62224
664	HAA	Dibromoacetic acid	1.0	µg/L	SM 6251 B	1	1.0	4/24/97	5/7/97	5/8/97	MW62224
665	HAA	Dichloroacetic acid	12.0	µg/L	SM 6251 B	1	1.0	4/24/97	5/7/97	5/8/97	MW62224
666	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	4/24/97	5/7/97	5/8/97	MW62224
667	HAA	Monochloroacetic acid	2.0	µg/L	SM 6251 B	1	2.0	4/24/97	5/7/97	5/8/97	MW62224
668	HAA	Tribromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	4/24/97	5/7/97	5/8/97	MW62224
669	HAA	Trichloroacetic acid	5.0	µg/L	SM 6251 B	1	1.0	4/24/97	5/7/97	5/8/97	MW62224
670	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	4/23/97		4/24/97	n/a
671	pH	Cl2 pH - Initial	9.0	Unit	SM 4500-H+ B	1	n/a	4/23/97		4/23/97	n/a
672	pH	pH	8.6	Unit	SM 4500-H+ B	1	n/a	4/22/97		4/22/97	n/a
673	TEMP	Cl2 Temperature	9.9	ºC	SM 2550 B	1	n/a	4/23/97		4/24/97	n/a
674	TEMP	Temperature	22.1	ºC	SM 2550 B	1	n/a	4/22/97		4/22/97	n/a
675	TIME	Cl2 Incubation Time	24.3	hrs	n/a	1	n/a	4/23/97		4/24/97	n/a
676	TOC-ICR	TOC	2.26	mg/L	SM 5310 C	1	0.50	4/22/97		4/22/97	7-0-39
677	TOC-ICR	TOC (Dupl)	2.21	mg/L	SM 5310 C	1	0.50	4/22/97		4/22/97	7-0-39
			2.23	**mg/L**	**2.2 % RPD**						
678	TOX-ICR	TOX	121	µg Cl-/L	SM 5320 B	1	25	4/24/97		5/3/97	12-0-8
679	TOX-ICR	TOX (Dupl)	121	µg Cl-/L	SM 5320 B	1	25	4/24/97		5/3/97	12-0-8
			121	**µg Cl-/L**	**0.0 % RPD**						
680	THM4	Bromodichloromethane	12.5	µg/L	EPA 551	1	1.0	4/24/97	5/5/97	5/6/97	MW62130
681	THM4	Bromoform	ND	µg/L	EPA 551	1	1.0	4/24/97	5/5/97	5/6/97	MW62130
682	THM4	Chloroform	23.7	µg/L	EPA 551	1	1.0	4/24/97	5/5/97	5/6/97	MW62130
683	THM4	Dibromochloromethane	5.2	µg/L	EPA 551	1	1.0	4/24/97	5/5/97	5/6/97	MW62130
684	UV-ICR	UV	0.039	1/cm	SM 5910 B	1	0.009	4/22/97		4/23/97	8-0-31
685	UV-ICR	UV (Dupl)	0.039	1/cm	SM 5910 B	1	0.009	4/22/97		4/23/97	8-0-31
			0.039	**1/cm**	**0.0 % RPD**						

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Summers & Hooper, Inc.
6 Knollcrest Drive
Cincinnati, OH 45237

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 39
Study Title: ICR RSSCT #2

Sample ID: 39.20.Eff.13 **S&H ID:** 9704-163 **Date Sampled:** 4/22/97 7:57:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
686	Cl2Dose	Chlorine Dose	1.58	mg/L as Cl2	SM 4500-Cl B	1	n/a	4/25/97		4/25/97	n/a
687	Cl2Res	Chlorine Residual	0.87	mg/L as Cl2	SM 4500-Cl F	1	0.10	4/25/97		4/26/97	n/a
688	HAA	Bromochloroacetic acid	3.0	µg/L	SM 6251 B	1	1.0	4/26/97	5/7/97	5/8/97	MW62224
689	HAA	Bromodichloroacetic acid	2.0	µg/L	SM 6251 B	1	1.0	4/26/97	5/7/97	5/8/97	MW62224
690	HAA	Chlorodibromoacetic acid	1.0	µg/L	SM 6251 B	1	1.0	4/26/97	5/7/97	5/8/97	MW62224
691	HAA	Dibromoacetic acid	2.0	µg/L	SM 6251 B	1	1.0	4/26/97	5/7/97	5/8/97	MW62224
692	HAA	Dichloroacetic acid	7.0	µg/L	SM 6251 B	1	1.0	4/26/97	5/7/97	5/8/97	MW62224
693	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	4/26/97	5/7/97	5/8/97	MW62224
694	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	4/26/97	5/7/97	5/8/97	MW62224
695	HAA	Tribromoacetic acid	2.0	µg/L	SM 6251 B	1	1.0	4/26/97	5/7/97	5/8/97	MW62224
696	HAA	Trichloroacetic acid	1.0	µg/L	SM 6251 B	1	1.0	4/26/97	5/7/97	5/8/97	MW62224
697	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	4/25/97		4/26/97	n/a
698	pH	Cl2 pH - Initial	9.0	Unit	SM 4500-H+ B	1	n/a	4/25/97		4/25/97	n/a
699	pH	pH	8.6	Unit	SM 4500-H+ B	1	n/a	4/22/97		4/22/97	n/a
700	TEMP	Cl2 Temperature	9.8	ºC	SM 2550 B	1	n/a	4/25/97		4/26/97	n/a
701	TEMP	Temperature	22.1	ºC	SM 2550 B	1	n/a	4/22/97		4/22/97	n/a
702	TIME	Cl2 Incubation Time	24.0	hrs	n/a	1	n/a	4/25/97		4/26/97	n/a
703	TOC-ICR	TOC	1.26	mg/L	SM 5310 C	1	0.50	4/22/97		4/22/97	7-0-39
704	TOC-ICR	TOC (Dupl)	1.25	mg/L	SM 5310 C	1	0.50	4/22/97		4/22/97	7-0-39
			1.25	**mg/L**	**0.8 % RPD**						
705	TOX-ICR	TOX	55	µg Cl-/L	SM 5320 B	1	25	4/26/97		5/7/97	12-0-11
706	TOX-ICR	TOX (Dupl)	55	µg Cl-/L	SM 5320 B	1	25	4/26/97		5/7/97	12-0-11
			55	**µg Cl-/L**	**0.0 % RPD**						
707	THM4	Bromodichloromethane	8.5	µg/L	EPA 551	1	1.0	4/26/97	5/5/97	5/6/97	MW62130
708	THM4	Bromoform	1.0	µg/L	EPA 551	1	1.0	4/26/97	5/5/97	5/6/97	MW62130
709	THM4	Chloroform	7.0	µg/L	EPA 551	1	1.0	4/26/97	5/5/97	5/6/97	MW62130
710	THM4	Dibromochloromethane	7.1	µg/L	EPA 551	1	1.0	4/26/97	5/5/97	5/6/97	MW62130
711	UV-ICR	UV	0.017	1/cm	SM 5910 B	1	0.009	4/22/97		4/23/97	8-0-31
712	UV-ICR	UV (Dupl)	0.017	1/cm	SM 5910 B	1	0.009	4/22/97		4/23/97	8-0-31
			0.017	**1/cm**	**0.0 % RPD**						

Sample ID: 39.20.Eff.13d **S&H ID:** 9704-164 **Date Sampled:** 4/22/97 7:57:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
713	Cl2Dose	Chlorine Dose	1.58	mg/L as Cl2	SM 4500-Cl B	1	n/a	4/25/97		4/25/97	n/a
714	Cl2Res	Chlorine Residual	0.85	mg/L as Cl2	SM 4500-Cl F	1	0.10	4/25/97		4/26/97	n/a
715	HAA	Bromochloroacetic acid	3.0	µg/L	SM 6251 B	1	1.0	4/26/97	5/7/97	5/8/97	MW62224
716	HAA	Bromodichloroacetic acid	2.0	µg/L	SM 6251 B	1	1.0	4/26/97	5/7/97	5/8/97	MW62224

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 39
Study Title: ICR RSSCT #2

717	HAA	Chlorodibromoacetic acid	1.0	µg/L	SM 6251 B	1	1.0	4/26/97	5/7/97	5/8/97	MW62224
718	HAA	Dibromoacetic acid	2.0	µg/L	SM 6251 B	1	1.0	4/26/97	5/7/97	5/8/97	MW62224
719	HAA	Dichloroacetic acid	7.0	µg/L	SM 6251 B	1	1.0	4/26/97	5/7/97	5/8/97	MW62224
720	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	4/26/97	5/7/97	5/8/97	MW62224
721	HAA	Monochloroacetic acid	2.0	µg/L	SM 6251 B	1	2.0	4/26/97	5/7/97	5/8/97	MW62224
722	HAA	Tribromoacetic acid	2.0	µg/L	SM 6251 B	1	1.0	4/26/97	5/7/97	5/8/97	MW62224
723	HAA	Trichloroacetic acid	1.0	µg/L	SM 6251 B	1	1.0	4/26/97	5/7/97	5/8/97	MW62224
724	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	4/25/97		4/26/97	n/a
725	pH	Cl2 pH - Initial	8.9	Unit	SM 4500-H+ B	1	n/a	4/25/97		4/25/97	n/a
726	pH	pH	8.7	Unit	SM 4500-H+ B	1	n/a	4/22/97		4/23/97	n/a
727	TEMP	Cl2 Temperature	9.8	ºC	SM 2550 B	1	n/a	4/25/97		4/26/97	n/a
728	TEMP	Temperature	22.2	ºC	SM 2550 B	1	n/a	4/22/97		4/22/97	n/a
729	TIME	Cl2 Incubation Time	24.0	hrs	n/a	1	n/a	4/25/97		4/26/97	n/a
730	TOC-ICR	TOC	1.25	mg/L	SM 5310 C	1	0.50	4/22/97		4/22/97	7-0-39
731	TOC-ICR	TOC (Dupl)	1.26	mg/L	SM 5310 C	1	0.50	4/22/97		4/22/97	7-0-39
			1.25	**mg/L**	**0.8 % RPD**						
732	TOX-ICR	TOX	56	µg Cl-/L	SM 5320 B	1	25	4/26/97		5/7/97	12-0-11
733	TOX-ICR	TOX (Dupl)	55	µg Cl-/L	SM 5320 B	1	25	4/26/97		5/7/97	12-0-11
			56	**µg Cl-/L**	**1.8 % RPD**						
734	THM4	Bromodichloromethane	8.5	µg/L	EPA 551	1	1.0	4/26/97	5/5/97	5/6/97	MW62130
735	THM4	Bromoform	1.0	µg/L	EPA 551	1	1.0	4/26/97	5/5/97	5/6/97	MW62130
736	THM4	Chloroform	6.9	µg/L	EPA 551	1	1.0	4/26/97	5/5/97	5/6/97	MW62130
737	THM4	Dibromochloromethane	7.2	µg/L	EPA 551	1	1.0	4/26/97	5/5/97	5/6/97	MW62130
738	UV-ICR	UV	0.018	1/cm	SM 5910 B	1	0.009	4/22/97		4/23/97	8-0-31
739	UV-ICR	UV (Dupl)	0.018	1/cm	SM 5910 B	1	0.009	4/22/97		4/23/97	8-0-31
			0.018	**1/cm**	**0.0 % RPD**						

Sample ID: 39.20.Eff.16 **S&H ID:** 9704-181 **Date Sampled:** 4/23/97 9:49:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
740	Cl2Dose	Chlorine Dose	1.56	mg/L as Cl2	SM 4500-Cl B	1	n/a	4/25/97		4/25/97	n/a
741	Cl2Res	Chlorine Residual	0.81	mg/L as Cl2	SM 4500-Cl F	1	0.10	4/25/97		4/26/97	n/a
742	HAA	Bromochloroacetic acid	3.0	µg/L	SM 6251 B	1	1.0	4/26/97	5/7/97	5/8/97	MW62224
743	HAA	Bromodichloroacetic acid	2.0	µg/L	SM 6251 B	1	1.0	4/26/97	5/7/97	5/8/97	MW62224
744	HAA	Chlorodibromoacetic acid	1.0	µg/L	SM 6251 B	1	1.0	4/26/97	5/7/97	5/8/97	MW62224
745	HAA	Dibromoacetic acid	2.0	µg/L	SM 6251 B	1	1.0	4/26/97	5/7/97	5/8/97	MW62224
746	HAA	Dichloroacetic acid	7.0	µg/L	SM 6251 B	1	1.0	4/26/97	5/7/97	5/8/97	MW62224
747	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	4/26/97	5/7/97	5/8/97	MW62224
748	HAA	Monochloroacetic acid	2.0	µg/L	SM 6251 B	1	2.0	4/26/97	5/7/97	5/8/97	MW62224
749	HAA	Tribromoacetic acid	2.0	µg/L	SM 6251 B	1	1.0	4/26/97	5/7/97	5/8/97	MW62224
750	HAA	Trichloroacetic acid	1.0	µg/L	SM 6251 B	1	1.0	4/26/97	5/7/97	5/8/97	MW62224

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 39
Study Title: ICR RSSCT #2

751	pH	Cl2 pH - Final	8.9	Unit	SM 4500-H+ B	1	n/a	4/25/97		4/26/97	n/a
752	pH	Cl2 pH - Initial	9.0	Unit	SM 4500-H+ B	1	n/a	4/25/97		4/25/97	n/a
753	pH	pH	8.5	Unit	SM 4500-H+ B	1	n/a	4/23/97		4/23/97	n/a
754	TEMP	Cl2 Temperature	9.8	ºC	SM 2550 B	1	n/a	4/25/97		4/26/97	n/a
755	TEMP	Temperature	22.9	ºC	SM 2550 B	1	n/a	4/23/97		4/24/97	n/a
756	TIME	Cl2 Incubation Time	24.1	hrs	n/a	1	n/a	4/25/97		4/26/97	n/a
757	TOC-ICR	TOC	1.43	mg/L	SM 5310 C	1	0.50	4/23/97		4/24/97	7-0-41
758	TOC-ICR	TOC (Dupl)	1.44	mg/L	SM 5310 C	1	0.50	4/23/97		4/24/97	7-0-41
			1.44	**mg/L**	**0.7 % RPD**						
759	TOX-ICR	TOX	55	µg Cl-/L	SM 5320 B	1	25	4/26/97		5/7/97	12-0-11
760	TOX-ICR	TOX (Dupl)	60	µg Cl-/L	SM 5320 B	1	25	4/26/97		5/7/97	12-0-11
			58	**µg Cl-/L**	**8.6 % RPD**						
761	THM4	Bromodichloromethane	9.6	µg/L	EPA 551	1	1.0	4/26/97	5/5/97	5/6/97	MW62130
762	THM4	Bromoform	ND	µg/L	EPA 551	1	1.0	4/26/97	5/5/97	5/6/97	MW62130
763	THM4	Chloroform	8.7	µg/L	EPA 551	1	1.0	4/26/97	5/5/97	5/6/97	MW62130
764	THM4	Dibromochloromethane	7.5	µg/L	EPA 551	1	1.0	4/26/97	5/5/97	5/6/97	MW62130
765	UV-ICR	UV	0.019	1/cm	SM 5910 B	1	0.009	4/23/97		4/24/97	8-0-32
766	UV-ICR	UV (Dupl)	0.019	1/cm	SM 5910 B	1	0.009	4/23/97		4/24/97	8-0-32
			0.019	**1/cm**	**0.0 % RPD**						

Sample ID: 39.20.Eff.17 **S&H ID:** 9704-182 **Date Sampled:** 4/24/97 7:07:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
767	Cl2Dose	Chlorine Dose	1.61	mg/L as Cl2	SM 4500-Cl B	1	n/a	4/25/97		4/25/97	n/a
768	Cl2Res	Chlorine Residual	0.80	mg/L as Cl2	SM 4500-Cl F	1	0.10	4/25/97		4/26/97	n/a
769	HAA	Bromochloroacetic acid	4.0	µg/L	SM 6251 B	1	1.0	4/26/97	5/7/97	5/8/97	MW62224
770	HAA	Bromodichloroacetic acid	2.0	µg/L	SM 6251 B	1	1.0	4/26/97	5/7/97	5/8/97	MW62224
771	HAA	Chlorodibromoacetic acid	1.0	µg/L	SM 6251 B	1	1.0	4/26/97	5/7/97	5/8/97	MW62224
772	HAA	Dibromoacetic acid	2.0	µg/L	SM 6251 B	1	1.0	4/26/97	5/7/97	5/8/97	MW62224
773	HAA	Dichloroacetic acid	8.0	µg/L	SM 6251 B	1	1.0	4/26/97	5/7/97	5/8/97	MW62224
774	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	4/26/97	5/7/97	5/8/97	MW62224
775	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	4/26/97	5/7/97	5/8/97	MW62224
776	HAA	Tribromoacetic acid	2.0	µg/L	SM 6251 B	1	1.0	4/26/97	5/7/97	5/8/97	MW62224
777	HAA	Trichloroacetic acid	2.0	µg/L	SM 6251 B	1	1.0	4/26/97	5/7/97	5/8/97	MW62224
778	pH	Cl2 pH - Final	8.9	Unit	SM 4500-H+ B	1	n/a	4/25/97		4/26/97	n/a
779	pH	Cl2 pH - Initial	9.0	Unit	SM 4500-H+ B	1	n/a	4/25/97		4/25/97	n/a
780	pH	pH	8.5	Unit	SM 4500-H+ B	1	n/a	4/24/97		4/23/97	n/a
781	TEMP	Cl2 Temperature	9.8	ºC	SM 2550 B	1	n/a	4/25/97		4/26/97	n/a
782	TEMP	Temperature	20.9	ºC	SM 2550 B	1	n/a	4/24/97		4/24/97	n/a
783	TIME	Cl2 Incubation Time	24.1	hrs	n/a	1	n/a	4/25/97		4/26/97	n/a

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 39
Study Title: ICR RSSCT #2

784	TOC-ICR	TOC	1.59	mg/L	SM 5310 C	1	0.50	4/24/97		4/24/97	7-0-41
785	TOC-ICR	TOC (Dupl)	1.58	mg/L	SM 5310 C	1	0.50	4/24/97		4/24/97	7-0-41
			1.59	**mg/L**	**0.6 % RPD**						
786	TOX-ICR	TOX	70	µg Cl-/L	SM 5320 B	1	25	4/26/97		5/7/97	12-0-11
787	TOX-ICR	TOX (Dupl)	75	µg Cl-/L	SM 5320 B	1	25	4/26/97		5/7/97	12-0-11
			73	**µg Cl-/L**	**6.8 % RPD**						
788	THM4	Bromodichloromethane	10.2	µg/L	EPA 551	1	1.0	4/26/97	5/5/97	5/6/97	MW62130
789	THM4	Bromoform	ND	µg/L	EPA 551	1	1.0	4/26/97	5/5/97	5/6/97	MW62130
790	THM4	Chloroform	11.5	µg/L	EPA 551	1	1.0	4/26/97	5/5/97	5/6/97	MW62130
791	THM4	Dibromochloromethane	7.1	µg/L	EPA 551	1	1.0	4/26/97	5/5/97	5/6/97	MW62130
792	UV-ICR	UV	0.023	1/cm	SM 5910 B	1	0.009	4/24/97		4/24/97	8-0-32
793	UV-ICR	UV (Dupl)	0.023	1/cm	SM 5910 B	1	0.009	4/24/97		4/24/97	8-0-32
			0.023	**1/cm**	**0.0 % RPD**						

Sample ID: 39.10.Eff.21 **S&H ID:** 9704-188 **Date Sampled:** 4/24/97 6:44:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
794	pH	pH	8.4	Unit	SM 4500-H+ B	1	n/a	4/24/97		4/24/97	n/a
795	TEMP	Temperature	22.2	ºC	SM 2550 B	1	n/a	4/24/97		4/24/97	n/a
796	TOC-ICR	TOC	2.55	mg/L	SM 5310 C	1	0.50	4/24/97		4/25/97	7-0-42
797	TOC-ICR	TOC (Dupl)	2.54	mg/L	SM 5310 C	1	0.50	4/24/97		4/25/97	7-0-42
			2.54	**mg/L**	**0.4 % RPD**						
798	UV-ICR	UV	0.045	1/cm	SM 5910 B	1	0.009	4/24/97		4/24/97	8-0-32
799	UV-ICR	UV (Dupl)	0.045	1/cm	SM 5910 B	1	0.009	4/24/97		4/24/97	8-0-32
			0.045	**1/cm**	**0.0 % RPD**						

Sample ID: 39.20.Eff.20 **S&H ID:** 9704-192 **Date Sampled:** 4/25/97 12:02:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
800	Cl2Dose	Chlorine Dose	1.76	mg/L as Cl2	SM 4500-Cl B	1	n/a	4/29/97		4/29/97	n/a
801	Cl2Res	Chlorine Residual	0.83	mg/L as Cl2	SM 4500-Cl F	1	0.10	4/29/97		4/30/97	n/a
802	HAA	Bromochloroacetic acid	3.5	µg/L	SM 6251 B	1	1.0	4/30/97	5/7/97	5/9/97	MW62225
803	HAA	Bromodichloroacetic acid	2.0	µg/L	SM 6251 B	1	1.0	4/30/97	5/7/97	5/9/97	MW62225
804	HAA	Chlorodibromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	4/30/97	5/7/97	5/9/97	MW62225
805	HAA	Dibromoacetic acid	2.0	µg/L	SM 6251 B	1	1.0	4/30/97	5/7/97	5/9/97	MW62225
806	HAA	Dichloroacetic acid	8.0	µg/L	SM 6251 B	1	1.0	4/30/97	5/7/97	5/9/97	MW62225
807	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	4/30/97	5/7/97	5/9/97	MW62225
808	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	4/30/97	5/7/97	5/9/97	MW62225
809	HAA	Tribromoacetic acid	2.0	µg/L	SM 6251 B	1	1.0	4/30/97	5/7/97	5/9/97	MW62225
810	HAA	Trichloroacetic acid	2.0	µg/L	SM 6251 B	1	1.0	4/30/97	5/7/97	5/9/97	MW62225
811	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	4/29/97		4/30/97	n/a
812	pH	Cl2 pH - Initial	9.0	Unit	SM 4500-H+ B	1	n/a	4/29/97		4/29/97	n/a

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Summers & Hooper, Inc.
6 Knollcrest Drive
Cincinnati, OH 45237

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 39
Study Title: ICR RSSCT #2

813	pH	pH	8.8	Unit	SM 4500-H+ B	1	n/a	4/25/97		4/25/97	n/a
814	TEMP	Cl2 Temperature	10.2	ºC	SM 2550 B	1	n/a	4/29/97		4/30/97	n/a
815	TEMP	Temperature	22.2	ºC	SM 2550 B	1	n/a	4/25/97		4/25/97	n/a
816	TIME	Cl2 Incubation Time	23.9	hrs	n/a	1	n/a	4/29/97		4/30/97	n/a
817	TOC-ICR	TOC	1.83	mg/L	SM 5310 C	1	0.50	4/25/97		4/25/97	7-0-42
818	TOC-ICR	TOC (Dupl)	1.81	mg/L	SM 5310 C	1	0.50	4/25/97		4/25/97	7-0-42
			1.82	**mg/L**	**1.1 % RPD**						
819	TOX-ICR	TOX	91	µg Cl-/L	SM 5320 B	1	25	4/30/97		5/7/97	12-0-11
820	TOX-ICR	TOX (Dupl)	96	µg Cl-/L	SM 5320 B	1	25	4/30/97		5/7/97	12-0-11
			94	**µg Cl-/L**	**5.3 % RPD**						
821	THM4	Bromodichloromethane	10.5	µg/L	EPA 551	1	1.0	4/30/97	5/5/97	5/6/97	MW62130
822	THM4	Bromoform	ND	µg/L	EPA 551	1	1.0	4/30/97	5/5/97	5/6/97	MW62130
823	THM4	Chloroform	12.1	µg/L	EPA 551	1	1.0	4/30/97	5/5/97	5/6/97	MW62130
824	THM4	Dibromochloromethane	7.1	µg/L	EPA 551	1	1.0	4/30/97	5/5/97	5/6/97	MW62130
825	UV-ICR	UV	0.028	1/cm	SM 5910 B	1	0.009	4/25/97		4/25/97	8-0-33
826	UV-ICR	UV (Dupl)	0.028	1/cm	SM 5910 B	1	0.009	4/25/97		4/25/97	8-0-33
			0.028	**1/cm**	**0.0 % RPD**						

Sample ID: 39.20.Eff.20d **S&H ID:** 9704-193 **Date Sampled:** 4/25/97 12:02:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
827	Cl2Dose	Chlorine Dose	1.76	mg/L as Cl2	SM 4500-Cl B	1	n/a	4/29/97		4/29/97	n/a
828	Cl2Res	Chlorine Residual	0.85	mg/L as Cl2	SM 4500-Cl F	1	0.10	4/29/97		4/30/97	n/a
829	HAA	Bromochloroacetic acid	3.5	µg/L	SM 6251 B	1	1.0	4/30/97	5/7/97	5/9/97	MW62225
830	HAA	Bromodichloroacetic acid	2.0	µg/L	SM 6251 B	1	1.0	4/30/97	5/7/97	5/9/97	MW62225
831	HAA	Chlorodibromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	4/30/97	5/7/97	5/9/97	MW62225
832	HAA	Dibromoacetic acid	2.0	µg/L	SM 6251 B	1	1.0	4/30/97	5/7/97	5/9/97	MW62225
833	HAA	Dichloroacetic acid	8.5	µg/L	SM 6251 B	1	1.0	4/30/97	5/7/97	5/9/97	MW62225
834	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	4/30/97	5/7/97	5/9/97	MW62225
835	HAA	Monochloroacetic acid	2.0	µg/L	SM 6251 B	1	2.0	4/30/97	5/7/97	5/9/97	MW62225
836	HAA	Tribromoacetic acid	2.0	µg/L	SM 6251 B	1	1.0	4/30/97	5/7/97	5/9/97	MW62225
837	HAA	Trichloroacetic acid	2.0	µg/L	SM 6251 B	1	1.0	4/30/97	5/7/97	5/9/97	MW62225
838	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	4/29/97		4/30/97	n/a
839	pH	Cl2 pH - Initial	8.9	Unit	SM 4500-H+ B	1	n/a	4/29/97		4/29/97	n/a
840	pH	pH	8.8	Unit	SM 4500-H+ B	1	n/a	4/25/97		4/25/97	n/a
841	TEMP	Cl2 Temperature	10.2	ºC	SM 2550 B	1	n/a	4/29/97		4/30/97	n/a
842	TEMP	Temperature	22.2	ºC	SM 2550 B	1	n/a	4/25/97		4/25/97	n/a
843	TIME	Cl2 Incubation Time	24.0	hrs	n/a	1	n/a	4/29/97		4/30/97	n/a
844	TOC-ICR	TOC	1.81	mg/L	SM 5310 C	1	0.50	4/25/97		4/25/97	7-0-42
845	TOC-ICR	TOC (Dupl)	1.82	mg/L	SM 5310 C	1	0.50	4/25/97		4/25/97	7-0-42

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 39
Study Title: ICR RSSCT #2

			1.81	**mg/L**	**0.6 % RPD**						
846	TOX-ICR	TOX	94	µg Cl-/L	SM 5320 B	1	25	4/30/97		5/7/97	12-0-11
847	TOX-ICR	TOX (Dupl)	92	µg Cl-/L	SM 5320 B	1	25	4/30/97		5/7/97	12-0-11
			93	**µg Cl-/L**	**2.2 % RPD**						
848	THM4	Bromodichloromethane	10.0	µg/L	EPA 551	1	1.0	4/30/97	5/5/97	5/6/97	MW62130
849	THM4	Bromoform	ND	µg/L	EPA 551	1	1.0	4/30/97	5/5/97	5/6/97	MW62130
850	THM4	Chloroform	11.1	µg/L	EPA 551	1	1.0	4/30/97	5/5/97	5/6/97	MW62130
851	THM4	Dibromochloromethane	6.9	µg/L	EPA 551	1	1.0	4/30/97	5/5/97	5/6/97	MW62130
852	UV-ICR	UV	0.028	1/cm	SM 5910 B	1	0.009	4/25/97		4/25/97	8-0-33
853	UV-ICR	UV (Dupl)	0.028	1/cm	SM 5910 B	1	0.009	4/25/97		4/25/97	8-0-33
			0.028	**1/cm**	**0.0 % RPD**						

Sample ID: 39.20.Eff.29 **S&H ID:** 9704-264 **Date Sampled:** 4/29/97 6:41:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
854	Cl2Dose	Chlorine Dose	1.74	mg/L as Cl2	SM 4500-Cl B	1	n/a	4/29/97		4/29/97	n/a
855	Cl2Res	Chlorine Residual	0.72	mg/L as Cl2	SM 4500-Cl F	1	0.10	4/29/97		4/30/97	n/a
856	HAA	Bromochloroacetic acid	4.0	µg/L	SM 6251 B	1	1.0	4/30/97	5/7/97	5/9/97	MW62225
857	HAA	Bromodichloroacetic acid	2.0	µg/L	SM 6251 B	1	1.0	4/30/97	5/7/97	5/9/97	MW62225
858	HAA	Chlorodibromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	4/30/97	5/7/97	5/9/97	MW62225
859	HAA	Dibromoacetic acid	1.0	µg/L	SM 6251 B	1	1.0	4/30/97	5/7/97	5/9/97	MW62225
860	HAA	Dichloroacetic acid	10.0	µg/L	SM 6251 B	1	1.0	4/30/97	5/7/97	5/9/97	MW62225
861	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	4/30/97	5/7/97	5/9/97	MW62225
862	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	4/30/97	5/7/97	5/9/97	MW62225
863	HAA	Tribromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	4/30/97	5/7/97	5/9/97	MW62225
864	HAA	Trichloroacetic acid	4.0	µg/L	SM 6251 B	1	1.0	4/30/97	5/7/97	5/9/97	MW62225
865	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	4/29/97		4/30/97	n/a
866	pH	Cl2 pH - Initial	9.0	Unit	SM 4500-H+ B	1	n/a	4/29/97		4/29/97	n/a
867	pH	pH	8.8	Unit	SM 4500-H+ B	1	n/a	4/29/97		4/29/97	n/a
868	TEMP	Cl2 Temperature	10.2	ºC	SM 2550 B	1	n/a	4/29/97		4/30/97	n/a
869	TEMP	Temperature	20.5	ºC	SM 2550 B	1	n/a	4/29/97		4/29/97	n/a
870	TIME	Cl2 Incubation Time	24.0	hrs	n/a	1	n/a	4/29/97		4/30/97	n/a
871	TOC-ICR	TOC	2.00	mg/L	SM 5310 C	1	0.50	4/29/97		4/29/97	7-0-46
872	TOC-ICR	TOC (Dupl)	2.02	mg/L	SM 5310 C	1	0.50	4/29/97		4/29/97	7-0-46
			2.01	**mg/L**	**1.0 % RPD**						
873	TOX-ICR	TOX	105	µg Cl-/L	SM 5320 B	1	25	4/30/97		5/11/97	12-0-13
874	TOX-ICR	TOX (Dupl)	106	µg Cl-/L	SM 5320 B	1	25	4/30/97		5/11/97	12-0-13
			106	**µg Cl-/L**	**0.9 % RPD**						
875	THM4	Bromodichloromethane	11.7	µg/L	EPA 551	1	1.0	4/30/97	5/5/97	5/6/97	MW62130
876	THM4	Bromoform	ND	µg/L	EPA 551	1	1.0	4/30/97	5/5/97	5/6/97	MW62130
877	THM4	Chloroform	19.6	µg/L	EPA 551	1	1.0	4/30/97	5/5/97	5/6/97	MW62130

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 39
Study Title: ICR RSSCT #2

878	THM4	Dibromochloromethane	5.6	µg/L	EPA 551	1	1.0	4/30/97	5/5/97	5/6/97	MW62130
879	UV-ICR	UV	0.034	1/cm	SM 5910 B	1	0.009	4/29/97		4/29/97	8-0-35
880	UV-ICR	UV (Dupl)	0.034	1/cm	SM 5910 B	1	0.009	4/29/97		4/29/97	8-0-35
			0.034	**1/cm**	**0.0 % RPD**						

Sample ID: 39.10.20.Inf.B-3 **S&H ID:** 9705-2 **Date Sampled:** 5/1/97 12:00:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
881	Cl2Dose	Chlorine Dose	2.46	mg/L as Cl2	SM 4500-Cl B	1	n/a	5/2/97		5/2/97	n/a
882	Cl2Res	Chlorine Residual	0.70	mg/L as Cl2	SM 4500-Cl F	1	0.10	5/2/97		5/3/97	n/a
883	HAA	Bromochloroacetic acid	5.0	µg/L	SM 6251 B	1	1.0	5/3/97	5/14/97	5/15/97	MW62525
884	HAA	Bromodichloroacetic acid	3.0	µg/L	SM 6251 B	1	1.0	5/3/97	5/14/97	5/15/97	MW62525
885	HAA	Chlorodibromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	5/3/97	5/14/97	5/15/97	MW62525
886	HAA	Dibromoacetic acid	1.0	µg/L	SM 6251 B	1	1.0	5/3/97	5/14/97	5/15/97	MW62525
887	HAA	Dichloroacetic acid	21.0	µg/L	SM 6251 B	1	1.0	5/3/97	5/14/97	5/15/97	MW62525
888	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	5/3/97	5/14/97	5/15/97	MW62525
889	HAA	Monochloroacetic acid	4.0	µg/L	SM 6251 B	1	2.0	5/3/97	5/14/97	5/15/97	MW62525
890	HAA	Tribromoacetic acid	NR	µg/L	SM 6251 B	1	2.0	5/3/97	5/14/97	5/15/97	MW62525
891	HAA	Trichloroacetic acid	10.0	µg/L	SM 6251 B	1	1.0	5/3/97	5/14/97	5/15/97	MW62525
892	pH	Cl2 pH - Final	8.9	Unit	SM 4500-H+ B	1	n/a	5/2/97		5/3/97	n/a
893	pH	Cl2 pH - Initial	8.9	Unit	SM 4500-H+ B	1	n/a	5/2/97		5/2/97	n/a
894	pH	pH	9.0	Unit	SM 4500-H+ B	1	n/a	5/1/97		5/1/97	n/a
895	TEMP	Cl2 Temperature	10.0	ºC	SM 2550 B	1	n/a	5/2/97		5/3/97	n/a
896	TEMP	Temperature	18.5	ºC	SM 2550 B	1	n/a	5/1/97		5/1/97	n/a
897	TIME	Cl2 Incubation Time	25.0	hrs	n/a	1	n/a	5/2/97		5/3/97	n/a
898	TOC-ICR	TOC	3.38	mg/L	SM 5310 C	1	0.50	5/1/97		5/1/97	7-0-48
899	TOC-ICR	TOC (Dupl)	3.37	mg/L	SM 5310 C	1	0.50	5/1/97		5/1/97	7-0-48
			3.38	**mg/L**	**0.3 % RPD**						
900	TOX-ICR	TOX	226	µg Cl-/L	SM 5320 B	1	25	5/3/97		5/11/97	12-0-13
901	TOX-ICR	TOX (Dupl)	216	µg Cl-/L	SM 5320 B	1	25	5/3/97		5/11/97	12-0-13
			221	**µg Cl-/L**	**4.5 % RPD**						
902	THM4	Bromodichloromethane	NR	µg/L	EPA 551	1	1.0	5/3/97	5/13/97	5/16/97	MW62559
903	THM4	Bromoform	NR	µg/L	EPA 551	1	1.0	5/3/97	5/13/97	5/16/97	MW62559
904	THM4	Chloroform	NR	µg/L	EPA 551	1	1.0	5/3/97	5/13/97	5/16/97	MW62559
905	THM4	Dibromochloromethane	NR	µg/L	EPA 551	1	1.0	5/3/97	5/13/97	5/16/97	MW62559
906	TURB	Turbidity	0.15	ntu	SM 2130 B	1	0.05	5/1/97		5/1/97	9-0-2
907	UV-ICR	UV	0.066	1/cm	SM 5910 B	1	0.009	5/1/97		5/2/97	8-0-36
908	UV-ICR	UV (Dupl)	0.066	1/cm	SM 5910 B	1	0.009	5/1/97		5/2/97	8-0-36
			0.066	**1/cm**	**0.0 % RPD**						

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Summers & Hooper, Inc.
6 Knollcrest Drive
Cincinnati, OH 45237

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 39
Study Title: ICR RSSCT #2

Sample ID: 39.20.Eff.31 **S&H ID:** 9705-8 **Date Sampled:** 5/1/97 7:10:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
909	Cl2Dose	Chlorine Dose	1.84	mg/L as Cl2	SM 4500-Cl B	1	n/a	5/2/97		5/2/97	n/a
910	Cl2Res	Chlorine Residual	0.70	mg/L as Cl2	SM 4500-Cl F	1	0.10	5/2/97		5/3/97	n/a
911	HAA	Bromochloroacetic acid	5.0	µg/L	SM 6251 B	1	1.0	5/3/97	5/14/97	5/15/97	MW62525
912	HAA	Bromodichloroacetic acid	2.0	µg/L	SM 6251 B	1	1.0	5/3/97	5/14/97	5/15/97	MW62525
913	HAA	Chlorodibromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	5/3/97	5/14/97	5/15/97	MW62525
914	HAA	Dibromoacetic acid	1.0	µg/L	SM 6251 B	1	1.0	5/3/97	5/14/97	5/15/97	MW62525
915	HAA	Dichloroacetic acid	11.0	µg/L	SM 6251 B	1	1.0	5/3/97	5/14/97	5/15/97	MW62525
916	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	5/3/97	5/14/97	5/15/97	MW62525
917	HAA	Monochloroacetic acid	3.0	µg/L	SM 6251 B	1	2.0	5/3/97	5/14/97	5/15/97	MW62525
918	HAA	Tribromoacetic acid	NR	µg/L	SM 6251 B	1	2.0	5/3/97	5/14/97	5/15/97	MW62525
919	HAA	Trichloroacetic acid	5.0	µg/L	SM 6251 B	1	1.0	5/3/97	5/14/97	5/15/97	MW62525
920	pH	Cl2 pH - Final	8.9	Unit	SM 4500-H+ B	1	n/a	5/2/97		5/3/97	n/a
921	pH	Cl2 pH - Initial	8.8	Unit	SM 4500-H+ B	1	n/a	5/2/97		5/2/97	n/a
922	pH	pH	8.4	Unit	SM 4500-H+ B	1	n/a	5/1/97		5/1/97	n/a
923	TEMP	Cl2 Temperature	10.0	ºC	SM 2550 B	1	n/a	5/2/97		5/3/97	n/a
924	TEMP	Temperature	22.9	ºC	SM 2550 B	1	n/a	5/1/97		5/1/97	n/a
925	TIME	Cl2 Incubation Time	25.0	hrs	n/a	1	n/a	5/2/97		5/3/97	n/a
926	TOC-ICR	TOC	2.28	mg/L	SM 5310 C	1	0.50	5/1/97		5/1/97	7-0-48
927	TOC-ICR	TOC (Dupl)	2.28	mg/L	SM 5310 C	1	0.50	5/1/97		5/1/97	7-0-48
			2.28	**mg/L**	**0.0 % RPD**						
928	TOX-ICR	TOX	120	µg Cl-/L	SM 5320 B	1	25	5/3/97		5/11/97	12-0-13
929	TOX-ICR	TOX (Dupl)	121	µg Cl-/L	SM 5320 B	1	25	5/3/97		5/11/97	12-0-13
			121	**µg Cl-/L**	**0.8 % RPD**						
930	THM4	Bromodichloromethane	NR	µg/L	EPA 551	1	1.0	5/3/97	5/13/97	5/16/97	MW62559
931	THM4	Bromoform	NR	µg/L	EPA 551	1	1.0	5/3/97	5/13/97	5/16/97	MW62559
932	THM4	Chloroform	NR	µg/L	EPA 551	1	1.0	5/3/97	5/13/97	5/16/97	MW62559
933	THM4	Dibromochloromethane	NR	µg/L	EPA 551	1	1.0	5/3/97	5/13/97	5/16/97	MW62559
934	UV-ICR	UV	0.038	1/cm	SM 5910 B	1	0.009	5/1/97		5/2/97	8-0-36
935	UV-ICR	UV (Dupl)	0.038	1/cm	SM 5910 B	1	0.009	5/1/97		5/2/97	8-0-36
			0.038	**1/cm**	**0.0 % RPD**						

Sample ID: 39.20.Eff.33 **S&H ID:** 9705-20 **Date Sampled:** 5/3/97 4:12:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
936	pH	pH	8.5	Unit	SM 4500-H+ B	1	n/a	5/3/97		5/3/97	n/a
937	TEMP	Temperature	22.0	ºC	SM 2550 B	1	n/a	5/3/97		5/3/97	n/a
938	TOC-ICR	TOC	2.33	mg/L	SM 5310 C	1	0.50	5/3/97		5/3/97	7-0-50
939	TOC-ICR	TOC (Dupl)	2.32	mg/L	SM 5310 C	1	0.50	5/3/97		5/3/97	7-0-50

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 39
Study Title: ICR RSSCT #2

2.33 mg/L	**0.4 % RPD**	

End of laboratory test results

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

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

Summers & Hooper, Inc.
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Quality Control Report

Mr. John Zackasee
Superintendent-Purification
Mahoning Valley Sanitary District
P.O. Box 4119
Youngstown, OH 44515

Phone: 330-652-3614 Fax: 330-652-6293

Study#: 39
Study Title: ICR RSSCT #2

Analysis: TOC-ICR (Total Organic Carbon) **Method:** SM 5310 C

QC Batch ID: 7-0-31

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	Acceptance Criteria RPD
Method Blank	Method Blank		ND*	mg/L			9704-18	0.5		
Method Blank (Dupl)	Method Blank		ND*	mg/L			9704-18	0.5		
			ND*	**mg/L**						
Standard	Standard	0.50	0.61	mg/L	122%		9704-9	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.56	mg/L	112%		9704-9	0.5	50-150%	
		0.50	**0.59**	**mg/L**	**118%**	**8.5 %**			50-150%	20%
Standard	Standard	4.00	3.91	mg/L	98%		9704-10	0.5	90-110%	
Standard (Dupl)	Standard	4.00	3.98	mg/L	100%		9704-10	0.5	90-110%	
		4.00	**3.95**	**mg/L**	**99%**	**1.8 %**			90-110%	10%
Standard	Standard	10.00	10.03	mg/L	100%		9704-11	0.5	90-110%	
Standard	Standard	10.00	10.00	mg/L	100%		9704-11	0.5	90-110%	
Standard (Dupl)	Standard	10.00	10.05	mg/L	101%		9704-11	0.5	90-110%	
		10.00	**10.03**	**mg/L**	**100%**	**0.5 %**			90-110%	10%

Analysis: TOC-ICR (Total Organic Carbon) **Method:** SM 5310 C

QC Batch ID: 7-0-32

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	Acceptance Criteria RPD
Method Blank	Method Blank		ND*	mg/L			9704-22	0.5		
Method Blank (Dupl)	Method Blank		ND*	mg/L			9704-22	0.5		
			ND*	**mg/L**						
Standard	Standard	0.50	0.56	mg/L	112%		9704-9	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.57	mg/L	114%		9704-9	0.5	50-150%	
		0.50	**0.56**	**mg/L**	**112%**	**1.8 %**			50-150%	20%
Standard	Standard	4.00	3.92	mg/L	98%		9704-10	0.5	90-110%	
Standard (Dupl)	Standard	4.00	3.91	mg/L	98%		9704-10	0.5	90-110%	
		4.00	**3.91**	**mg/L**	**98%**	**0.3 %**			90-110%	10%
Standard	Standard	10.00	10.00	mg/L	100%		9704-11	0.5	90-110%	

Analysis: TOC-ICR (Total Organic Carbon) **Method:** SM 5310 C

QC Batch ID: 7-0-34

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	Acceptance Criteria RPD
Matrix Spike	Matrix Spike	4.00	3.97	mg/L	99%		9704-93	0.5		
Matrix Spike (Dupl)	Matrix Spike	4.00	3.98	mg/L	100%		9704-93	0.5		

ND: non-detect. *Recovery is below 1/2 minimum reporting level (MRL). NA (not applicable): RPD calculation is not applicable.

Summers & Hooper, Inc.
6 Knollcrest Drive
Cincinnati, OH 45237

Quality Control Report

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 39
Study Title: ICR RSSCT #2

		4.00	**3.97**	**mg/L**	**99%**	**0.3 %**				
Method Blank	Method Blank		ND*	mg/L			9704-97	0.5		
Method Blank (Dupl)	Method Blank		ND*	mg/L			9704-97	0.5		
			ND*	**mg/L**						
Standard	Standard	0.50	0.55	mg/L	110%		9704-9	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.56	mg/L	112%		9704-9	0.5	50-150%	
		0.50	**0.56**	**mg/L**	**112%**	**1.8 %**			50-150%	20%
Standard	Standard	4.00	3.89	mg/L	97%		9704-10	0.5	90-110%	
Standard (Dupl)	Standard	4.00	3.84	mg/L	96%		9704-10	0.5	90-110%	
		4.00	**3.87**	**mg/L**	**97%**	**1.3 %**			90-110%	10%
Standard	Standard	10.00	9.81	mg/L	98%		9704-11	0.5	90-110%	
Standard (Dupl)	Standard	10.00	10.00	mg/L	100%		9704-11	0.5	90-110%	
		10.00	**9.91**	**mg/L**	**99%**	**1.9 %**			90-110%	10%

Analysis: TOC-ICR (Total Organic Carbon) **Method:** SM 5310 C

QC Batch ID: 7-0-35

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	RPD
Matrix Spike	Matrix Spike	4.00	4.04	mg/L	101%		9704-104	0.5		
Matrix Spike (Dupl)	Matrix Spike	4.00	4.08	mg/L	102%		9704-104	0.5		
		4.00	**4.06**	**mg/L**	**101%**	**0.7 %**				
Method Blank	Method Blank		ND*	mg/L			9704-107	0.5		
Method Blank (Dupl)	Method Blank		ND*	mg/L			9704-107	0.5		
			ND*	**mg/L**						
Standard	Standard	0.50	0.54	mg/L	108%		9704-9	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.54	mg/L	108%		9704-9	0.5	50-150%	
		0.50	**0.54**	**mg/L**	**108%**	**0.0 %**			50-150%	20%
Standard	Standard	4.00	3.95	mg/L	99%		9704-10	0.5	90-110%	
Standard (Dupl)	Standard	4.00	3.95	mg/L	99%		9704-10	0.5	90-110%	
		4.00	**3.95**	**mg/L**	**99%**	**0.0 %**			90-110%	10%
Standard	Standard	10.00	10.07	mg/L	101%		9704-11	0.5	90-110%	
Standard (Dupl)	Standard	10.00	10.13	mg/L	101%		9704-11	0.5	90-110%	
		10.00	**10.10**	**mg/L**	**101%**	**0.6 %**			90-110%	10%

Analysis: TOC-ICR (Total Organic Carbon) **Method:** SM 5310 C

QC Batch ID: 7-0-36

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	RPD
Matrix Spike	Matrix Spike	4.00	4.04	mg/L	101%		9704-111	0.5		
Matrix Spike (Dupl)	Matrix Spike	4.00	4.17	mg/L	104%		9704-111	0.5		
		4.00	**4.11**	**mg/L**	**103%**	**2.9 %**				
Method Blank	Method Blank		ND*	mg/L			9704-113	0.5		
Method Blank (Dupl)	Method Blank		ND*	mg/L			9704-113	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.

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Standard	Standard	0.50	0.55	mg/L	110%		9704-9	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.53	mg/L	106%		9704-9	0.5	50-150%	
		0.50	**0.54**	**mg/L**	**108%**	**3.7 %**			50-150%	20%
Standard	Standard	4.00	4.04	mg/L	101%		9704-10	0.5	90-110%	
Standard (Dupl)	Standard	4.00	4.07	mg/L	102%		9704-10	0.5	90-110%	
		4.00	**4.06**	**mg/L**	**101%**	**0.7 %**			90-110%	10%

Analysis: TOC-ICR (Total Organic Carbon) **Method:** SM 5310 C

QC Batch ID: 7-0-37

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	RPD
Matrix Spike	Matrix Spike	4.00	3.84	mg/L	96%		9704-121	0.5		
Matrix Spike (Dupl)	Matrix Spike	4.00	3.76	mg/L	94%		9704-121	0.5		
		4.00	**3.80**	**mg/L**	**95%**	**2.1 %**				
Method Blank	Method Blank		ND*	mg/L			9704-126	0.5		
Method Blank (Dupl)	Method Blank		ND*	mg/L			9704-126	0.5		
			ND*	**mg/L**						
Standard	Standard	0.50	0.54	mg/L	108%		9704-9	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.53	mg/L	106%		9704-9	0.5	50-150%	
		0.50	**0.53**	**mg/L**	**106%**	**1.9 %**			50-150%	20%
Standard	Standard	4.00	3.93	mg/L	98%		9704-10	0.5	90-110%	
Standard (Dupl)	Standard	4.00	3.96	mg/L	99%		9704-10	0.5	90-110%	
		4.00	**3.95**	**mg/L**	**99%**	**0.8 %**			90-110%	10%
Standard	Standard	10.00	9.52	mg/L	95%		9704-11	0.5	90-110%	
Standard (Dupl)	Standard	10.00	9.77	mg/L	98%		9704-11	0.5	90-110%	
		10.00	**9.64**	**mg/L**	**96%**	**2.6 %**			90-110%	10%

Analysis: TOC-ICR (Total Organic Carbon) **Method:** SM 5310 C

QC Batch ID: 7-0-38

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	RPD
Matrix Spike	Matrix Spike	4.00	3.85	mg/L	96%		9704-138	0.5		
Matrix Spike (Dupl)	Matrix Spike	4.00	3.87	mg/L	97%		9704-138	0.5		
		4.00	**3.86**	**mg/L**	**96%**	**0.5 %**				
Method Blank	Method Blank		ND*	mg/L			9704-141	0.5		
Method Blank (Dupl)	Method Blank		ND*	mg/L			9704-141	0.5		
			ND*	**mg/L**						
Standard	Standard	0.50	0.54	mg/L	108%		9704-9	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.54	mg/L	108%		9704-9	0.5	50-150%	
		0.50	**0.54**	**mg/L**	**108%**	**0.0 %**			50-150%	20%
Standard	Standard	4.00	3.76	mg/L	94%		9704-10	0.5	90-110%	
Standard (Dupl)	Standard	4.00	3.79	mg/L	95%		9704-10	0.5	90-110%	
		4.00	**3.78**	**mg/L**	**94%**	**0.8 %**			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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Mahoning Valley Sanitary District

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Analysis: TOC-ICR (Total Organic Carbon) **Method:** SM 5310 C

QC Batch ID: 7-0-39

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	Acceptance Criteria RPD
Matrix Spike	Matrix Spike	4.00	3.76	mg/L	94%		9704-154	0.5		
Matrix Spike (Dupl)	Matrix Spike	4.00	3.75	mg/L	94%		9704-154	0.5		
		4.00	**3.75**	**mg/L**	**94%**	**0.3 %**				
Method Blank	Method Blank		ND*	mg/L			9704-150	0.5		
Method Blank (Dupl)	Method Blank		ND*	mg/L			9704-150	0.5		
			ND*	**mg/L**						
Standard	Standard	0.50	0.58	mg/L	116%		9704-9	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.56	mg/L	112%		9704-9	0.5	50-150%	
		0.50	**0.57**	**mg/L**	**114%**	**3.5 %**			50-150%	20%
Standard	Standard	4.00	3.98	mg/L	100%		9704-160	0.5	90-110%	
Standard (Dupl)	Standard	4.00	4.00	mg/L	100%		9704-160	0.5	90-110%	
		4.00	**3.99**	**mg/L**	**100%**	**0.5 %**			90-110%	10%
Standard	Standard	10.00	9.83	mg/L	98%		9704-161	0.5	90-110%	
Standard (Dupl)	Standard	10.00	9.87	mg/L	99%		9704-161	0.5	90-110%	
		10.00	**9.85**	**mg/L**	**98%**	**0.4 %**			90-110%	10%

Analysis: TOC-ICR (Total Organic Carbon) **Method:** SM 5310 C

QC Batch ID: 7-0-41

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	Acceptance Criteria RPD
Matrix Spike	Matrix Spike	4.00	3.93	mg/L	98%		9704-182	0.5		
Matrix Spike (Dupl)	Matrix Spike	4.00	3.93	mg/L	98%		9704-182	0.5		
		4.00	**3.93**	**mg/L**	**98%**	**0.3 %**				
Method Blank	Method Blank		ND*	mg/L			9704-185	0.5		
Method Blank (Dupl)	Method Blank		ND*	mg/L			9704-185	0.5		
			ND*	**mg/L**						
Standard	Standard	0.50	0.54	mg/L	108%		9704-159	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.54	mg/L	108%		9704-159	0.5	50-150%	
		0.50	**0.54**	**mg/L**	**108%**	**0.0 %**			50-150%	20%
Standard	Standard	4.00	4.12	mg/L	103%		9704-160	0.5	90-110%	
Standard (Dupl)	Standard	4.00	4.05	mg/L	101%		9704-160	0.5	90-110%	
		4.00	**4.09**	**mg/L**	**102%**	**1.7 %**			90-110%	10%

Analysis: TOC-ICR (Total Organic Carbon) **Method:** SM 5310 C

QC Batch ID: 7-0-42

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	Acceptance Criteria RPD
Matrix Spike	Matrix Spike	4.00	4.01	mg/L	100%		9704-188	0.5		
Matrix Spike (Dupl)	Matrix Spike	4.00	4.04	mg/L	101%		9704-188	0.5		
		4.00	**4.03**	**mg/L**	**101%**	**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	Method Blank		ND*	mg/L			9704-189	0.5		
Method Blank (Dupl)	Method Blank		ND*	mg/L			9704-189	0.5		
			ND*	**mg/L**						
Standard	Standard	0.50	0.54	mg/L	108%		9704-159	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.54	mg/L	108%		9704-159	0.5	50-150%	
		0.50	**0.54**	**mg/L**	**108%**	**0.0 %**			50-150%	20%
Standard	Standard	4.00	4.01	mg/L	100%		9704-160	0.5	90-110%	
Standard (Dupl)	Standard	4.00	4.02	mg/L	100%		9704-160	0.5	90-110%	
		4.00	**4.02**	**mg/L**	**100%**	**0.2 %**			90-110%	10%

Analysis: TOC-ICR (Total Organic Carbon) **Method:** SM 5310 C

QC Batch ID: 7-0-46

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	RPD
Matrix Spike	Matrix Spike	4.00	3.91	mg/L	98%		9704-264	0.5		
Matrix Spike (Dupl)	Matrix Spike	4.00	3.93	mg/L	98%		9704-264	0.5		
		4.00	**3.92**	**mg/L**	**98%**	**0.8 %**				
Method Blank	Method Blank		ND*	mg/L			9704-261	0.5		
Method Blank (Dupl)	Method Blank		ND*	mg/L			9704-261	0.5		
			ND*	**mg/L**						
Standard	Standard	0.50	0.54	mg/L	108%		9704-159	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.55	mg/L	110%		9704-159	0.5	50-150%	
		0.50	**0.54**	**mg/L**	**108%**	**1.9 %**			50-150%	20%
Standard	Standard	4.00	3.88	mg/L	97%		9704-160	0.5	90-110%	
Standard (Dupl)	Standard	4.00	3.93	mg/L	98%		9704-160	0.5	90-110%	
		4.00	**3.90**	**mg/L**	**97%**	**1.3 %**			90-110%	10%
Standard	Standard	10.00	9.83	mg/L	98%		9704-161	0.5	90-110%	
Standard (Dupl)	Standard	10.00	9.82	mg/L	98%		9704-161	0.5	90-110%	
		10.00	**9.83**	**mg/L**	**98%**	**0.1 %**			90-110%	10%

Analysis: TOC-ICR (Total Organic Carbon) **Method:** SM 5310 C

QC Batch ID: 7-0-48

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	RPD
Matrix Spike	Matrix Spike	4.00	4.13	mg/L	103%		9704-266	0.5		
Matrix Spike (Dupl)	Matrix Spike	4.00	4.24	mg/L	106%		9704-266	0.5		
		4.00	**4.18**	**mg/L**	**104%**	**2.6 %**				
Method Blank	Method Blank		ND*	mg/L			9705-1	0.5		
Method Blank (Dupl)	Method Blank		ND*	mg/L			9705-1	0.5		
			ND*	**mg/L**						
Standard	Standard	0.50	0.55	mg/L	110%		9704-159	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.55	mg/L	110%		9704-159	0.5	50-150%	
		0.50	**0.55**	**mg/L**	**110%**	**0.0 %**			50-150%	20%
Standard	Standard	4.00	4.11	mg/L	103%		9704-160	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	4.12	mg/L	103%		9704-160	0.5	90-110%	
		4.00	**4.12**	**mg/L**	**103%**	**0.2 %**			90-110%	10%
Standard	Standard	10.00	10.34	mg/L	103%		9704-161	0.5	90-110%	
Standard (Dupl)	Standard	10.00	10.21	mg/L	102%		9704-161	0.5	90-110%	
		10.00	**10.27**	**mg/L**	**103%**	**1.3 %**			90-110%	10%

Analysis: TOC-ICR (Total Organic Carbon) **Method:** SM 5310 C

QC Batch ID: 7-0-50

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	RPD
Matrix Spike	Matrix Spike	4.00	3.92	mg/L	98%		9705-20	0.5		
Matrix Spike (Dupl)	Matrix Spike	4.00	3.92	mg/L	98%		9705-20	0.5		
		4.00	**3.92**	**mg/L**	**98%**	**0.0 %**				
Method Blank	Method Blank		ND*	mg/L			9705-18	0.5		
Method Blank (Dupl)	Method Blank		ND*	mg/L			9705-18	0.5		
			ND*	**mg/L**						
Standard	Standard	0.50	0.53	mg/L	106%		9705-5	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.53	mg/L	106%		9705-5	0.5	50-150%	
		0.50	**0.53**	**mg/L**	**106%**	**0.0 %**			50-150%	20%
Standard	Standard	4.00	3.98	mg/L	100%		9705-6	0.5	90-110%	
Standard (Dupl)	Standard	4.00	3.96	mg/L	99%		9705-6	0.5	90-110%	
		4.00	**3.97**	**mg/L**	**99%**	**0.5 %**			90-110%	10%

Analysis: UV-ICR (UV-254) **Method:** SM 5910 B

QC Batch ID: 8-0-25

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	RPD
Method Blank	Method Blank		ND*	1/cm			9704-89	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9704-89	0.009		
			ND*	**1/cm**						
Method Blank	Method Blank		ND*	1/cm			9704-89	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9704-89	0.009		
			ND*	**1/cm**						
Standard	Standard	0.009	0.008	1/cm	89%		9704-84	0.009	75-125%	
Standard (Dupl)	Standard	0.009	0.008	1/cm	89%		9704-84	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%		9704-85	0.009	85-115%	
Standard (Dupl)	Standard	0.088	0.088	1/cm	100%		9704-85	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: 8-0-26

QC Type	Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria 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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Method Blank	Method Blank		ND*	1/cm			9704-102	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9704-102	0.009		
			ND*	**1/cm**						
Method Blank	Method Blank		ND*	1/cm			9704-102	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9704-102	0.009		
			ND*	**1/cm**						
Standard	Standard	0.009	0.008	1/cm	89%		9704-84	0.009	75-125%	
Standard (Dupl)	Standard	0.009	0.008	1/cm	89%		9704-84	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%		9704-85	0.009	85-115%	
Standard (Dupl)	Standard	0.088	0.088	1/cm	100%		9704-85	0.009	85-115%	
		0.088	**0.088**	**1/cm**	**100%**	**1.1 %**			85-115%	10%

Analysis: UV-ICR (UV-254) **Method:** SM 5910 B

QC Batch ID: 8-0-27

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	RPD
Method Blank	Method Blank		ND*	1/cm			9704-110	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9704-110	0.009		
			ND*	**1/cm**						
Method Blank	Method Blank		ND*	1/cm			9704-110	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9704-110	0.009		
			ND*	**1/cm**						
Standard	Standard	0.009	0.007	1/cm	78%		9704-84	0.009	75-125%	
Standard (Dupl)	Standard	0.009	0.007	1/cm	78%		9704-84	0.009	75-125%	
		0.009	**0.007**	**1/cm**	**78%**	**0.0 %**			75-125%	20%
Standard	Standard	0.088	0.087	1/cm	99%		9704-85	0.009	85-115%	
Standard (Dupl)	Standard	0.088	0.087	1/cm	99%		9704-85	0.009	85-115%	
		0.088	**0.087**	**1/cm**	**99%**	**0.0 %**			85-115%	10%

Analysis: UV-ICR (UV-254) **Method:** SM 5910 B

QC Batch ID: 8-0-28

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	RPD
Method Blank	Method Blank		ND*	1/cm			9704-127	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9704-127	0.009		
			ND*	**1/cm**						
Method Blank	Method Blank		ND*	1/cm			9704-127	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9704-127	0.009		
			ND*	**1/cm**						
Standard	Standard	0.009	0.007	1/cm	78%		9704-130	0.009	75-125%	
Standard (Dupl)	Standard	0.009	0.008	1/cm	89%		9704-130	0.009	75-125%	
		0.009	**0.007**	**1/cm**	**78%**	**14.3 %**			75-125%	20%
Standard	Standard	0.088	0.087	1/cm	99%		9704-85	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	0.088	1/cm	100%		9704-85	0.009	85-115%	
		0.088	**0.088**	**1/cm**	**100%**	**1.1 %**			85-115%	10%

Analysis: UV-ICR (UV-254) **Method:** SM 5910 B

QC Batch ID: 8-0-29

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	RPD
Method Blank	Method Blank		ND*	1/cm			9704-142	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9704-142	0.009		
			ND*	**1/cm**						
Method Blank	Method Blank		ND*	1/cm			9704-142	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9704-142	0.009		
			ND*	**1/cm**						
Standard	Standard	0.009	0.008	1/cm	89%		9704-130	0.009	75-125%	
Standard (Dupl)	Standard	0.009	0.008	1/cm	89%		9704-130	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%		9704-145	0.009	85-115%	
Standard (Dupl)	Standard	0.088	0.087	1/cm	99%		9704-145	0.009	85-115%	
		0.088	**0.087**	**1/cm**	**99%**	**0.0 %**			85-115%	10%

Analysis: UV-ICR (UV-254) **Method:** SM 5910 B

QC Batch ID: 8-0-30

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	RPD
Method Blank	Method Blank		ND*	1/cm			9704-151	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9704-151	0.009		
			ND*	**1/cm**						
Method Blank	Method Blank		ND*	1/cm			9704-151	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9704-151	0.009		
			ND*	**1/cm**						
Standard	Standard	0.009	0.008	1/cm	89%		9704-130	0.009	75-125%	
Standard (Dupl)	Standard	0.009	0.008	1/cm	89%		9704-130	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%		9704-145	0.009	85-115%	
Standard (Dupl)	Standard	0.088	0.088	1/cm	100%		9704-145	0.009	85-115%	
		0.088	**0.087**	**1/cm**	**99%**	**1.1 %**			85-115%	10%

Analysis: UV-ICR (UV-254) **Method:** SM 5910 B

QC Batch ID: 8-0-31

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	RPD
Method Blank	Method Blank		ND*	1/cm			9704-166	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9704-166	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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Cincinnati, OH 45237

Quality Control Report

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 39
Study Title: ICR RSSCT #2

Method Blank	Method Blank		ND*	1/cm			9704-166	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9704-166	0.009		
			ND*	**1/cm**						
Standard	Standard	0.009	0.008	1/cm	89%		9704-130	0.009	75-125%	
Standard (Dupl)	Standard	0.009	0.008	1/cm	89%		9704-130	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%		9704-145	0.009	85-115%	
Standard (Dupl)	Standard	0.088	0.087	1/cm	99%		9704-145	0.009	85-115%	
		0.088	**0.087**	**1/cm**	**99%**	**0.0 %**			85-115%	10%

Analysis: UV-ICR (UV-254) **Method:** SM 5910 B

QC Batch ID: 8-0-32

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	Acceptance Criteria RPD
Method Blank	Method Blank		ND*	1/cm			9704-187	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9704-187	0.009		
			ND*	**1/cm**						
Method Blank	Method Blank		ND*	1/cm			9704-187	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9704-187	0.009		
			ND*	**1/cm**						
Standard	Standard	0.009	0.008	1/cm	89%		9704-130	0.009	75-125%	
Standard (Dupl)	Standard	0.009	0.008	1/cm	89%		9704-130	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%		9704-145	0.009	85-115%	
Standard (Dupl)	Standard	0.088	0.088	1/cm	100%		9704-145	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: 8-0-33

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	Acceptance Criteria RPD
Method Blank	Method Blank		ND*	1/cm			9704-194	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9704-194	0.009		
			ND*	**1/cm**						
Method Blank	Method Blank		ND*	1/cm			9704-194	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9704-194	0.009		
			ND*	**1/cm**						
Standard	Standard	0.009	0.008	1/cm	89%		9704-130	0.009	75-125%	
Standard (Dupl)	Standard	0.009	0.008	1/cm	89%		9704-130	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%		9704-145	0.009	85-115%	
Standard (Dupl)	Standard	0.088	0.088	1/cm	100%		9704-145	0.009	85-115%	
		0.088	**0.088**	**1/cm**	**100%**	**1.1 %**			85-115%	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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Quality Control Report

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 39
Study Title: ICR RSSCT #2

Analysis: UV-ICR (UV-254) **Method:** SM 5910 B

QC Batch ID: 8-0-35

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	Acceptance Criteria RPD
Method Blank	Method Blank		ND*	1/cm			9704-262	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9704-262	0.009		
			ND*	**1/cm**						
Method Blank	Method Blank		ND*	1/cm			9704-262	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9704-262	0.009		
			ND*	**1/cm**						
Standard	Standard	0.009	0.008	1/cm	89%		9704-215	0.009	75-125%	
Standard (Dupl)	Standard	0.009	0.008	1/cm	89%		9704-215	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%		9704-216	0.009	85-115%	
Standard (Dupl)	Standard	0.088	0.088	1/cm	100%		9704-216	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: 8-0-36

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	Acceptance Criteria RPD
Method Blank	Method Blank		ND*	1/cm			9705-12	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9705-12	0.009		
			ND*	**1/cm**						
Method Blank	Method Blank		ND*	1/cm			9705-12	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9705-12	0.009		
			ND*	**1/cm**						
Standard	Standard	0.009	0.008	1/cm	89%		9704-215	0.009	75-125%	
Standard (Dupl)	Standard	0.009	0.008	1/cm	89%		9704-215	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%		9704-216	0.009	85-115%	
Standard (Dupl)	Standard	0.088	0.087	1/cm	99%		9704-216	0.009	85-115%	
		0.088	**0.087**	**1/cm**	**99%**	**0.0 %**			85-115%	10%

Analysis: TOX-ICR (Total Organic Halide) **Method:** SM 5320 B

QC Batch ID: 12-0-10

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	Acceptance Criteria RPD
Matrix Spike	Matrix Spike	240	213	µg Cl-/L	89%		9704-239	25		
Matrix Spike (Dupl)	Matrix Spike	240	232	µg Cl-/L	97%		9704-239	25		
		240	**222**	**µg Cl-/L**	**93%**	**8.6 %**				
Standard - TCP Aqueous	Standard	25	25	µg Cl-/L	100%		9705-26	25	75-125%	
Standard - TCP Aqueous	Standard	200	193	µg Cl-/L	96%		9705-28	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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Mahoning Valley Sanitary District

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Study Title: ICR RSSCT #2

System Blank	Blank		ND*	µg Cl-/L		9705-27	25

Analysis: TOX-ICR (Total Organic Halide) **Method:** SM 5320 B

QC Batch ID: 12-0-11

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	RPD
Matrix Spike	Matrix Spike	200	195	µg Cl-/L	97%		9704-164	25		
Matrix Spike (Dupl)	Matrix Spike	200	182	µg Cl-/L	91%		9704-164	25		
		200	**189**	**µg Cl-/L**	**94%**	**6.3 %**				
Standard - TCP Aqueous	Standard	25	24	µg Cl-/L	96%		9705-43	25	75-125%	
Standard - TCP Aqueous	Standard	200	191	µg Cl-/L	95%		9705-45	25	85-115%	
System Blank	Blank		ND*	µg Cl-/L			9705-44	25		

Analysis: TOX-ICR (Total Organic Halide) **Method:** SM 5320 B

QC Batch ID: 12-0-13

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	RPD
Matrix Spike	Matrix Spike	200	170	µg Cl-/L	85%		9705-8	25		
Matrix Spike (Dupl)	Matrix Spike	200	194	µg Cl-/L	97%		9705-8	25		
		200	**182**	**µg Cl-/L**	**91%**	**13.2 %**				
Standard - TCP Aqueous	Standard	25	24	µg Cl-/L	96%		9705-74	25	75-125%	
Standard - TCP Aqueous	Standard	200	194	µg Cl-/L	97%		9705-76	25	85-115%	
System Blank	Blank		ND*	µg Cl-/L			9705-75	25		

Analysis: TOX-ICR (Total Organic Halide) **Method:** SM 5320 B

QC Batch ID: 12-0-4

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	RPD
Standard - TCP Aqueous	Standard	25	28	µg Cl-/L	112%		9704-80	25	75-125%	
Standard - TCP Aqueous	Standard	200	194	µg Cl-/L	97%		9704-87	25	85-115%	
Standard - TCP Aqueous	Standard	200	199	µg Cl-/L	100%		9704-87	25	85-115%	
Standard - TCP Aqueous	Standard	500	503	µg Cl-/L	101%		9704-92	25	85-115%	
System Blank	Blank		ND*	µg Cl-/L			9704-81	25		

Analysis: TOX-ICR (Total Organic Halide) **Method:** SM 5320 B

QC Batch ID: 12-0-6

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	RPD
Standard - TCP Aqueous	Standard	25	25	µg Cl-/L	100%		9704-197	25	75-125%	
Standard - TCP Aqueous	Standard	200	206	µg Cl-/L	103%		9704-208	25	85-115%	
System Blank	Blank		ND*	µg Cl-/L			9704-199	25		

ND: non-detect. *Recovery is below 1/2 minimum reporting level (MRL). NA (not applicable): RPD calculation is not applicable.

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Quality Control Report

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 39
Study Title: ICR RSSCT #2

Analysis: TOX-ICR (Total Organic Halide) **Method:** SM 5320 B

QC Batch ID: 12-0-7

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	RPD
Standard - TCP Aqueous	Standard	25	20	µg Cl-/L	80%		9704-212	25	75-125%	
Standard - TCP Aqueous	Standard	200	194	µg Cl-/L	97%		9704-214	25	85-115%	
System Blank	Blank		ND*	µg Cl-/L			9704-213	25		

Analysis: TOX-ICR (Total Organic Halide) **Method:** SM 5320 B

QC Batch ID: 12-0-8

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	RPD
Matrix Spike	Matrix Spike	200	188	µg Cl-/L	94%		9704-162	25		
Matrix Spike (Dupl)	Matrix Spike	200	203	µg Cl-/L	101%		9704-162	25		
		200	**195**	**µg Cl-/L**	**97%**	**8.2 %**				
Standard - TCP Aqueous	Standard	25	22	µg Cl-/L	88%		9705-16	25	75-125%	
Standard - TCP Aqueous	Standard	200	210	µg Cl-/L	105%		9705-17	25	85-115%	
Standard - TCP Aqueous	Standard	500	545	µg Cl-/L	109%		9705-19	25	85-115%	
System Blank	Blank		ND*	µg Cl-/L			9705-15	25		

End of quality control report

ND: non-detect. *Recovery is below 1/2 minimum reporting level (MRL). NA (not applicable): RPD calculation is not applicable.

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QC Results from Montgomery Watson Laboratories

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Superintendent-Purification
Mahoning Valley Sanitary District
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Phone: 330-652-3614 Fax: 330-652-6293

Study#: 39
Study Title: ICR RSSCT #2

QC Batch ID: 61509 **Report #:** 33560

Analysis: @THM551 **Method:** ML/EPA 551

QC	Analyte	Spike	Recovery	Yield	RPD	Acceptance Criteria Range
LCS1	Bromodichloromethane	10.0	9.4	94.0%		(80 - 120)
LCS2	Bromodichloromethane	10.0	9.7	97.0%		(80 - 120)
MBLK	Bromodichloromethane	ND	ND			
MS1	Bromodichloromethane	10.0	10.3	103.0%		(80 - 120)
MS2	Bromodichloromethane	10.0	9.8	98.0%		(80 - 120)
LCS1	Bromoform	10.0	9.2	92.0%		(80 - 120)
LCS2	Bromoform	10.0	8.4	84.0%		(80 - 120)
MBLK	Bromoform	ND	ND			
MS1	Bromoform	10.0	9.2	92.0%		(80 - 120)
MS2	Bromoform	10.0	9.3	93.0%		(80 - 120)
LCS1	Chloroform	10.0	9.5	95.0%		(80 - 120)
LCS2	Chloroform	10.0	9.7	97.0%		(80 - 120)
MBLK	Chloroform	ND	ND			
MS1	Chloroform	10.0	8.3	83.0%		(80 - 120)
MS2	Chloroform	10.0	9.8	98.0%		(80 - 120)
LCS1	Dibromochloromethane	10.0	9.3	93.0%		(80 - 120)
LCS2	Dibromochloromethane	10.0	9.4	94.0%		(80 - 120)
MBLK	Dibromochloromethane	ND	ND			
MS1	Dibromochloromethane	10.0	9.9	99.0%		(80 - 120)
MS2	Dibromochloromethane	10.0	9.7	97.0%		(80 - 120)

QC Batch ID: 61759 **Report #:** 33560

Analysis: @HALOAC **Method:** ML/S6251B

QC	Analyte	Spike	Recovery	Yield	RPD	Acceptance Criteria Range
DUP	Bromochloroacetic acid	3	3		0.0%	(0 - 20)
LCS1	Bromochloroacetic acid	1.0	0.9	90.0%		(50 - 150)
LCS2	Bromochloroacetic acid	20	21	105.0%		(80 - 120)
MBLK	Bromochloroacetic acid	ND	ND			
MS	Bromochloroacetic acid	10	11	110.0%		(70 - 130)
DUP	Bromodichloroacetic acid	2	2		0.0%	(0 - 20)
LCS1	Bromodichloroacetic acid	1.0	1.2	120.0%		(50 - 150)

ND (non-detect): Result is below 1/2 minimum reporting level (MRL).

QC Results from Montgomery Watson Laboratories

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LCS2	Bromodichloroacetic acid	20	20	100.0%		(80 - 120)
MBLK	Bromodichloroacetic acid	ND	ND			
MS	Bromodichloroacetic acid	10	11	110.0%		(70 - 130)
DUP	Chlorodibromoacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Chlorodibromoacetic acid	1.0	1.3	130.0%		(50 - 150)
LCS2	Chlorodibromoacetic acid	20	20	100.0%		(80 - 120)
MBLK	Chlorodibromoacetic acid	ND	ND			
MS	Chlorodibromoacetic acid	10	11	110.0%		(70 - 130)
DUP	Dibromoacetic acid	1	1		0.0%	(0 - 20)
LCS1	Dibromoacetic acid	1.0	1.0	100.0%		(50 - 150)
LCS2	Dibromoacetic acid	20	20	100.0%		(80 - 120)
MBLK	Dibromoacetic acid	ND	ND			
MS	Dibromoacetic acid	10	11	110.0%		(70 - 130)
DUP	Dichloroacetic acid	7	8		13.0%	(0 - 20)
LCS1	Dichloroacetic acid	1.0	0.9	90.0%		(50 - 150)
LCS2	Dichloroacetic acid	20	20	100.0%		(80 - 120)
MBLK	Dichloroacetic acid	ND	ND			
MS	Dichloroacetic acid	10	8	80.0%		(70 - 130)
DUP	Monobromoacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Monobromoacetic acid	1.0	0.9	90.0%		(50 - 150)
LCS2	Monobromoacetic acid	20	20	100.0%		(80 - 120)
MBLK	Monobromoacetic acid	ND	ND			
MS	Monobromoacetic acid	10	11	110.0%		(70 - 130)
DUP	Monochloroacetic acid	2	2		0.0%	(0 - 20)
LCS1	Monochloroacetic acid	2.0	1.7	85.0%		(50 - 150)
LCS2	Monochloroacetic acid	40	40	100.0%		(80 - 120)
MBLK	Monochloroacetic acid	ND	ND			
MS	Monochloroacetic acid	20	22	110.0%		(70 - 130)
DUP	Tribromoacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Tribromoacetic acid	1.0	1.2	120.0%		(50 - 150)
LCS2	Tribromoacetic acid	20	20	100.0%		(80 - 120)
MBLK	Tribromoacetic acid	ND	ND			
MS	Tribromoacetic acid	10	12	120.0%		(70 - 130)
DUP	Trichloroacetic acid	3	3		0.0%	(0 - 20)
LCS1	Trichloroacetic acid	1.0	1.0	100.0%		(50 - 150)
LCS2	Trichloroacetic acid	20	20	100.0%		(80 - 120)
MBLK	Trichloroacetic acid	ND	ND			

ND (non-detect): Result is below 1/2 minimum reporting level (MRL).

QC Results from Montgomery Watson Laboratories

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 39
Study Title: ICR RSSCT #2

MS	Trichloroacetic acid	10	7	70.0%	(70 - 130)

QC Batch ID: 61852 **Report #:** 33799, 33887

Analysis: BR **Method:** ML/EPA 300

QC	Analyte	Spike	Recovery	Yield	RPD	Acceptance Criteria Range
LCS1	Bromide	0.1	0.103	103.0%		(90 - 110)
LCS2	Bromide	0.1	0.100	100.0%		(90 - 110)
MBLK	Bromide	ND	ND			(70 - 130)
MS	Bromide	0.1	0.108	108.0%		(80 - 120)
MSD	Bromide	0.1	0.105	105.0%		(80 - 120)

QC Batch ID: 61943 **Report #:** 33799, 33887

Analysis: NH3 **Method:** ML/EPA 350.1

QC	Analyte	Spike	Recovery	Yield	RPD	Acceptance Criteria Range
LCS1	Ammonia Nitrogen	1.00	1.07	107.0%		(80 - 120)
LCS2	Ammonia Nitrogen	1.00	1.08	108.0%		(80 - 120)
MBLK	Ammonia Nitrogen	ND	ND			
MS	Ammonia Nitrogen	1.00	1.33	133.0%		(80 - 120)
MSD	Ammonia Nitrogen	1.00	1.33	133.0%		(80 - 120)

QC Batch ID: 61995 **Report #:** 33799, 33887

Analysis: @THM-ICR **Method:** ML/EPA 551

QC	Analyte	Spike	Recovery	Yield	RPD	Acceptance Criteria Range
LCS1	Bromodichloromethane	1.0	0.7	70.0%		(50 - 150)
LCS2	Bromodichloromethane	20.0	19.2	96.0%		(80 - 120)
LCS3	Bromodichloromethane	40.0	40.1	100.0%		(80 - 120)
MBLK	Bromodichloromethane	ND	ND			
MS1	Bromodichloromethane	1.0	1.1	110.0%		(80 - 120)
MS2	Bromodichloromethane	20.0	19.8	99.0%		(80 - 120)
LCS1	Bromoform	1.0	0.7	70.0%		(50 - 150)
LCS2	Bromoform	20.0	19.3	96.0%		(80 - 120)
LCS3	Bromoform	40.0	39.7	99.0%		(80 - 120)
MBLK	Bromoform	ND	ND			
MS1	Bromoform	1.0	1.3	130.0%		(80 - 120)
MS2	Bromoform	20.0	19.8	99.0%		(80 - 120)
LCS1	Chloroform	1.0	0.6	60.0%		(50 - 150)

ND (non-detect): Result is below 1/2 minimum reporting level (MRL).

QC Results from Montgomery Watson Laboratories

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 39
Study Title: ICR RSSCT #2

LCS2	Chloroform	20.0	18.7	94.0%	(80 - 120)
LCS3	Chloroform	40.0	39.5	99.0%	(80 - 120)
MBLK	Chloroform	ND	ND		
MS1	Chloroform	1.0	1.1	110.0%	(80 - 120)
MS2	Chloroform	20.0	18.6	93.0%	(80 - 120)
LCS1	Dibromochloromethane	1.0	0.7	70.0%	(50 - 150)
LCS2	Dibromochloromethane	20.0	19.2	96.0%	(80 - 120)
LCS3	Dibromochloromethane	40.0	40.2	100.0%	(80 - 120)
MBLK	Dibromochloromethane	ND	ND		
MS1	Dibromochloromethane	1.0	1.2	120.0%	(80 - 120)
MS2	Dibromochloromethane	20.0	19.9	100.0%	(80 - 120)

QC Batch ID: 62039 **Report #:** 33799

Analysis: @HALOAC **Method:** ML/S6251B

QC	Analyte	Spike	Recovery	Yield	RPD	Acceptance Criteria Range
DUP	Bromochloroacetic acid	8	8		0.0%	(0 - 20)
LCS1	Bromochloroacetic acid	1.0	0.9	90.0%		(50 - 150)
LCS2	Bromochloroacetic acid	20	21	105.0%		(80 - 120)
MBLK	Bromochloroacetic acid	ND	ND			
MS	Bromochloroacetic acid	10	11	110.0%		(70 - 130)
DUP	Bromodichloroacetic acid	7	7		0.0%	(0 - 20)
LCS1	Bromodichloroacetic acid	1.0	1.2	120.0%		(50 - 150)
LCS2	Bromodichloroacetic acid	20	24	120.0%		(80 - 120)
MBLK	Bromodichloroacetic acid	ND	ND			
MS	Bromodichloroacetic acid	10	12	120.0%		(70 - 130)
DUP	Chlorodibromoacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Chlorodibromoacetic acid	1.0	1.2	120.0%		(50 - 150)
LCS2	Chlorodibromoacetic acid	20	23	115.0%		(80 - 120)
MBLK	Chlorodibromoacetic acid	ND	ND			
MS	Chlorodibromoacetic acid	10	13	130.0%		(70 - 130)
DUP	Dibromoacetic acid	2	2		0.0%	(0 - 20)
LCS1	Dibromoacetic acid	1.0	0.9	90.0%		(50 - 150)
LCS2	Dibromoacetic acid	20	23	115.0%		(80 - 120)
MBLK	Dibromoacetic acid	ND	ND			
MS	Dibromoacetic acid	10	11	110.0%		(70 - 130)
DUP	Dichloroacetic acid	22	22		0.0%	(0 - 20)
LCS1	Dichloroacetic acid	1.0	0.9	90.0%		(50 - 150)
LCS2	Dichloroacetic acid	20	20	100.0%		(80 - 120)

ND (non-detect): Result is below 1/2 minimum reporting level (MRL).

QC Results from Montgomery Watson Laboratories

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 39
Study Title: ICR RSSCT #2

MBLK	Dichloroacetic acid	ND	ND			
MS	Dichloroacetic acid	10	8	80.0%		(70 - 130)
DUP	Monobromoacetic acid	1	1		0.0%	(0 - 20)
LCS1	Monobromoacetic acid	1.0	0.9	90.0%		(50 - 150)
LCS2	Monobromoacetic acid	20	20	100.0%		(80 - 120)
MBLK	Monobromoacetic acid	ND	ND			
MS	Monobromoacetic acid	10	11	110.0%		(70 - 130)
DUP	Monochloroacetic acid	6	6		0.0%	(0 - 20)
LCS1	Monochloroacetic acid	2.0	1.8	90.0%		(50 - 150)
LCS2	Monochloroacetic acid	40	43	108.0%		(80 - 120)
MBLK	Monochloroacetic acid	ND	ND			
MS	Monochloroacetic acid	20	22	110.0%		(70 - 130)
DUP	Tribromoacetic acid	1	1		0.0%	(0 - 20)
LCS1	Tribromoacetic acid	1.0	1.4	140.0%		(50 - 150)
LCS2	Tribromoacetic acid	20	23	115.0%		(80 - 120)
MBLK	Tribromoacetic acid	ND	ND			
MS	Tribromoacetic acid	10	13	130.0%		(70 - 130)
DUP	Trichloroacetic acid	13	13		0.0%	(0 - 20)
LCS1	Trichloroacetic acid	1.0	0.9	90.0%		(50 - 150)
LCS2	Trichloroacetic acid	20	20	100.0%		(80 - 120)
MBLK	Trichloroacetic acid	ND	ND			
MS	Trichloroacetic acid	10	10	100.0%		(70 - 130)

QC Batch ID: 62080 **Report #:** 33799
33887

Analysis: @HALOAC **Method:** ML/S6251B

QC	Analyte	Spike	Recovery	Yield	RPD	Acceptance Criteria Range
DUP	Bromochloroacetic acid	5	5		0.0%	(0 - 20)
LCS1	Bromochloroacetic acid	1.0	0.9	90.0%		(50 - 150)
LCS2	Bromochloroacetic acid	20	21	105.0%		(80 - 120)
MBLK	Bromochloroacetic acid	ND	ND			
MS	Bromochloroacetic acid	10	10	100.0%		(70 - 130)
DUP	Bromodichloroacetic acid	2	3		40.0%	(0 - 20)
LCS1	Bromodichloroacetic acid	1.0	1.1	110.0%		(50 - 150)
LCS2	Bromodichloroacetic acid	20	23	115.0%		(80 - 120)
MBLK	Bromodichloroacetic acid	ND	ND			
MS	Bromodichloroacetic acid	10	9	90.0%		(70 - 130)
DUP	Chlorodibromoacetic acid	ND	ND		0.0%	(0 - 20)

ND (non-detect): Result is below 1/2 minimum reporting level (MRL).

QC Results from Montgomery Watson Laboratories

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 39
Study Title: ICR RSSCT #2

LCS1	Chlorodibromoacetic acid	1.0	1.2	120.0%		(50 - 150)
LCS2	Chlorodibromoacetic acid	20	23	115.0%		(80 - 120)
MBLK	Chlorodibromoacetic acid	ND	ND			
MS	Chlorodibromoacetic acid	10	9	90.0%		(70 - 130)
DUP	Dibromoacetic acid	1	1		0.0%	(0 - 20)
LCS1	Dibromoacetic acid	1.0	0.9	90.0%		(50 - 150)
LCS2	Dibromoacetic acid	20	20	100.0%		(80 - 120)
MBLK	Dibromoacetic acid	ND	ND			
MS	Dibromoacetic acid	10	10	100.0%		(70 - 130)
DUP	Dichloroacetic acid	20	20		0.0%	(0 - 20)
LCS1	Dichloroacetic acid	1.0	0.9	90.0%		(50 - 150)
LCS2	Dichloroacetic acid	20	20	100.0%		(80 - 120)
MBLK	Dichloroacetic acid	ND	ND			
MS	Dichloroacetic acid	10	10	100.0%		(70 - 130)
DUP	Monobromoacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Monobromoacetic acid	1.0	0.9	90.0%		(50 - 150)
LCS2	Monobromoacetic acid	20	20	100.0%		(80 - 120)
MBLK	Monobromoacetic acid	ND	ND			
MS	Monobromoacetic acid	10	11	110.0%		(70 - 130)
DUP	Monochloroacetic acid	3	3		0.0%	(0 - 20)
LCS1	Monochloroacetic acid	2.0	1.8	90.0%		(50 - 150)
LCS2	Monochloroacetic acid	40	40	100.0%		(80 - 120)
MBLK	Monochloroacetic acid	ND	ND			
MS	Monochloroacetic acid	20	22	110.0%		(70 - 130)
DUP	Tribromoacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Tribromoacetic acid	1.0	1.3	130.0%		(50 - 150)
LCS2	Tribromoacetic acid	20	23	115.0%		(80 - 120)
MBLK	Tribromoacetic acid	ND	ND			
MS	Tribromoacetic acid	10	8	80.0%		(70 - 130)
DUP	Trichloroacetic acid	10	10		0.0%	(0 - 20)
LCS1	Trichloroacetic acid	1.0	0.9	90.0%		(50 - 150)
LCS2	Trichloroacetic acid	20	20	100.0%		(80 - 120)
MBLK	Trichloroacetic acid	ND	ND			
MS	Trichloroacetic acid	10	11	110.0%		(70 - 130)

QC Batch ID: 62081 **Report #:** 33887

Analysis: @HALOAC **Method:** ML/S6251B

QC	Analyte	Spike	Recovery	Yield	RPD	Acceptance Criteria Range

ND (non-detect): Result is below 1/2 minimum reporting level (MRL).

QC Results from Montgomery Watson Laboratories

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 39
Study Title: ICR RSSCT #2

DUP	Bromochloroacetic acid	10	10		0.0%	(0 - 20)
LCS1	Bromochloroacetic acid	1.0	0.9	90.0%		(50 - 150)
LCS2	Bromochloroacetic acid	20	21	105.0%		(80 - 120)
MBLK	Bromochloroacetic acid	ND	ND			
MS	Bromochloroacetic acid	10	12	120.0%		(70 - 130)
DUP	Bromodichloroacetic acid	11	11		0.0%	(0 - 20)
LCS1	Bromodichloroacetic acid	1.0	1.1	110.0%		(50 - 150)
LCS2	Bromodichloroacetic acid	20	25	125.0%		(80 - 120)
MBLK	Bromodichloroacetic acid	ND	ND			
MS	Bromodichloroacetic acid	10	12	120.0%		(70 - 130)
DUP	Chlorodibromoacetic acid	3	3		0.0%	(0 - 20)
LCS1	Chlorodibromoacetic acid	1.0	1.2	120.0%		(50 - 150)
LCS2	Chlorodibromoacetic acid	20	24	120.0%		(80 - 120)
MBLK	Chlorodibromoacetic acid	ND	ND			
MS	Chlorodibromoacetic acid	10	12	120.0%		(70 - 130)
DUP	Dibromoacetic acid	3	3		0.0%	(0 - 20)
LCS1	Dibromoacetic acid	1.0	0.9	90.0%		(50 - 150)
LCS2	Dibromoacetic acid	20	21	105.0%		(80 - 120)
MBLK	Dibromoacetic acid	ND	ND			
MS	Dibromoacetic acid	10	11	110.0%		(70 - 130)
DUP	Dichloroacetic acid	15	15		0.0%	(0 - 20)
LCS1	Dichloroacetic acid	1.0	0.9	90.0%		(50 - 150)
LCS2	Dichloroacetic acid	20	20	100.0%		(80 - 120)
MBLK	Dichloroacetic acid	ND	ND			
MS	Dichloroacetic acid	10	10	100.0%		(70 - 130)
DUP	Monobromoacetic acid	1	1		0.0%	(0 - 20)
LCS1	Monobromoacetic acid	1.0	0.9	90.0%		(50 - 150)
LCS2	Monobromoacetic acid	20	20	100.0%		(80 - 120)
MBLK	Monobromoacetic acid	ND	ND			
MS	Monobromoacetic acid	10	11	110.0%		(70 - 130)
DUP	Monochloroacetic acid	2	2		0.0%	(0 - 20)
LCS1	Monochloroacetic acid	2.0	1.8	90.0%		(50 - 150)
LCS2	Monochloroacetic acid	40	41	102.0%		(80 - 120)
MBLK	Monochloroacetic acid	ND	ND			
MS	Monochloroacetic acid	20	22	110.0%		(70 - 130)
DUP	Tribromoacetic acid	2	2		0.0%	(0 - 20)
LCS1	Tribromoacetic acid	1.0	1.3	130.0%		(50 - 150)

ND (non-detect): Result is below 1/2 minimum reporting level (MRL).

QC Results from Montgomery Watson Laboratories

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 39
Study Title: ICR RSSCT #2

LCS2	Tribromoacetic acid	20	24	120.0%		(80 - 120)
MBLK	Tribromoacetic acid	ND	ND			
MS	Tribromoacetic acid	10	11	110.0%		(70 - 130)
DUP	Trichloroacetic acid	16	16		0.0%	(0 - 20)
LCS1	Trichloroacetic acid	1.0	0.9	90.0%		(50 - 150)
LCS2	Trichloroacetic acid	20	21	105.0%		(80 - 120)
MBLK	Trichloroacetic acid	ND	ND			
MS	Trichloroacetic acid	10	11	110.0%		(70 - 130)

QC Batch ID: 62130 **Report #:** 33887
33923
33981

Analysis: @THM-ICR **Method:** ML/EPA 551

QC	Analyte	Spike	Recovery	Yield	RPD	Acceptance Criteria Range
LCS1	Bromodichloromethane	1.0	0.6	60.0%		(50 - 150)
LCS2	Bromodichloromethane	20.0	20.0	100.0%		(80 - 120)
LCS3	Bromodichloromethane	40.0	38.4	96.0%		(80 - 120)
MBLK	Bromodichloromethane	ND	ND			
MS1	Bromodichloromethane	20.0	18.6	93.0%		(80 - 120)
MS2	Bromodichloromethane	40.0	37.4	94.0%		(80 - 120)
LCS1	Bromoform	1.0	0.6	60.0%		(50 - 150)
LCS2	Bromoform	20.0	20.1	100.0%		(80 - 120)
LCS3	Bromoform	40.0	39.1	98.0%		(80 - 120)
MBLK	Bromoform	ND	ND			
MS1	Bromoform	20.0	20.1	100.0%		(80 - 120)
MS2	Bromoform	40.0	39.1	98.0%		(80 - 120)
LCS1	Chloroform	1.0	0.6	60.0%		(50 - 150)
LCS2	Chloroform	20.0	20.3	102.0%		(80 - 120)
LCS3	Chloroform	40.0	39.2	98.0%		(80 - 120)
MBLK	Chloroform	ND	ND			
MS1	Chloroform	20.0	17.8	89.0%		(80 - 120)
MS2	Chloroform	40.0	37.3	93.0%		(80 - 120)
LCS1	Dibromochloromethane	1.0	0.5	50.0%		(50 - 150)
LCS2	Dibromochloromethane	20.0	20.3	102.0%		(80 - 120)
LCS3	Dibromochloromethane	40.0	38.2	96.0%		(80 - 120)
MBLK	Dibromochloromethane	ND	ND			
MS1	Dibromochloromethane	20.0	19.1	96.0%		(80 - 120)
MS2	Dibromochloromethane	40.0	37.4	94.0%		(80 - 120)

ND (non-detect): Result is below 1/2 minimum reporting level (MRL).

QC Results from Montgomery Watson Laboratories

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 39
Study Title: ICR RSSCT #2

QC Batch ID: 62224 **Report #:** 33887
33923

Analysis: @HALOAC **Method:** ML/S6251B

QC	Analyte	Spike	Recovery	Yield	RPD	Acceptance Criteria Range
DUP	Bromochloroacetic acid	2	2		0.0%	(0 - 20)
LCS1	Bromochloroacetic acid	1.0	0.9	90.0%		(50 - 150)
LCS2	Bromochloroacetic acid	20	20	100.0%		(80 - 120)
MBLK	Bromochloroacetic acid	ND	ND			
MS	Bromochloroacetic acid	10	10	100.0%		(70 - 130)
DUP	Bromodichloroacetic acid	1	1		0.0%	(0 - 20)
LCS1	Bromodichloroacetic acid	1.0	1.1	110.0%		(50 - 150)
LCS2	Bromodichloroacetic acid	20	24	120.0%		(80 - 120)
MBLK	Bromodichloroacetic acid	ND	ND			
MS	Bromodichloroacetic acid	10	10	100.0%		(70 - 130)
DUP	Chlorodibromoacetic acid	1	1		0.0%	(0 - 20)
LCS1	Chlorodibromoacetic acid	1.0	1.2	120.0%		(50 - 150)
LCS2	Chlorodibromoacetic acid	20	24	120.0%		(80 - 120)
MBLK	Chlorodibromoacetic acid	ND	ND			
MS	Chlorodibromoacetic acid	10	12	120.0%		(70 - 130)
DUP	Dibromoacetic acid	2	2		0.0%	(0 - 20)
LCS1	Dibromoacetic acid	1.0	1.0	100.0%		(50 - 150)
LCS2	Dibromoacetic acid	20	20	100.0%		(80 - 120)
MBLK	Dibromoacetic acid	ND	ND			
MS	Dibromoacetic acid	10	10	100.0%		(70 - 130)
DUP	Dichloroacetic acid	7	7		0.0%	(0 - 20)
LCS1	Dichloroacetic acid	1.0	0.9	90.0%		(50 - 150)
LCS2	Dichloroacetic acid	20	20	100.0%		(80 - 120)
MBLK	Dichloroacetic acid	ND	ND			
MS	Dichloroacetic acid	10	10	100.0%		(70 - 130)
DUP	Monobromoacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Monobromoacetic acid	1.0	1.0	100.0%		(50 - 150)
LCS2	Monobromoacetic acid	20	20	100.0%		(80 - 120)
MBLK	Monobromoacetic acid	ND	ND			
MS	Monobromoacetic acid	10	11	110.0%		(70 - 130)
DUP	Monochloroacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Monochloroacetic acid	2.0	1.8	90.0%		(50 - 150)
LCS2	Monochloroacetic acid	40	41	102.0%		(80 - 120)

ND (non-detect): Result is below 1/2 minimum reporting level (MRL).

QC Results from Montgomery Watson Laboratories

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 39
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MBLK	Monochloroacetic acid	ND	ND			
MS	Monochloroacetic acid	20	22	110.0%		(70 - 130)
DUP	Tribromoacetic acid	2	2		0.0%	(0 - 20)
LCS1	Tribromoacetic acid	1.0	1.5	150.0%		(50 - 150)
LCS2	Tribromoacetic acid	20	22	110.0%		(80 - 120)
MBLK	Tribromoacetic acid	ND	ND			
MS	Tribromoacetic acid	10	8	80.0%		(70 - 130)
DUP	Trichloroacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Trichloroacetic acid	1.0	0.9	90.0%		(50 - 150)
LCS2	Trichloroacetic acid	20	20	100.0%		(80 - 120)
MBLK	Trichloroacetic acid	ND	ND			
MS	Trichloroacetic acid	10	10	100.0%		(70 - 130)

QC Batch ID: 62225 **Report #:** 33887
33981

Analysis: @HALOAC **Method:** ML/S6251B

QC	Analyte	Spike	Recovery	Yield	RPD	Acceptance Criteria Range
DUP	Bromochloroacetic acid	1	1		0.0%	(0 - 20)
LCS1	Bromochloroacetic acid	1.0	0.9	90.0%		(50 - 150)
LCS2	Bromochloroacetic acid	20	20	100.0%		(80 - 120)
MBLK	Bromochloroacetic acid	ND	ND			
MS	Bromochloroacetic acid	10	10	100.0%		(70 - 130)
DUP	Bromodichloroacetic acid	1	1		0.0%	(0 - 20)
LCS1	Bromodichloroacetic acid	1.0	1.1	110.0%		(50 - 150)
LCS2	Bromodichloroacetic acid	20	25	125.0%		(80 - 120)
MBLK	Bromodichloroacetic acid	ND	ND			
MS	Bromodichloroacetic acid	10	12	120.0%		(70 - 130)
DUP	Chlorodibromoacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Chlorodibromoacetic acid	1.0	1.2	120.0%		(50 - 150)
LCS2	Chlorodibromoacetic acid	20	25	125.0%		(80 - 120)
MBLK	Chlorodibromoacetic acid	ND	ND			
MS	Chlorodibromoacetic acid	10	12	120.0%		(70 - 130)
DUP	Dibromoacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Dibromoacetic acid	1.0	1.0	100.0%		(50 - 150)
LCS2	Dibromoacetic acid	20	20	100.0%		(80 - 120)
MBLK	Dibromoacetic acid	ND	ND			
MS	Dibromoacetic acid	10	10	100.0%		(70 - 130)
DUP	Dichloroacetic acid	18	17		6.0%	(0 - 20)

ND (non-detect): Result is below 1/2 minimum reporting level (MRL).

QC Results from Montgomery Watson Laboratories

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 39
Study Title: ICR RSSCT #2

LCS1	Dichloroacetic acid	1.0	0.9	90.0%		(50 - 150)
LCS2	Dichloroacetic acid	20	20	100.0%		(80 - 120)
MBLK	Dichloroacetic acid	ND	ND			
MS	Dichloroacetic acid	10	10	100.0%		(70 - 130)
DUP	Monobromoacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Monobromoacetic acid	1.0	1.0	100.0%		(50 - 150)
LCS2	Monobromoacetic acid	20	20	100.0%		(80 - 120)
MBLK	Monobromoacetic acid	ND	ND			
MS	Monobromoacetic acid	10	10	100.0%		(70 - 130)
DUP	Monochloroacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Monochloroacetic acid	2.0	1.8	90.0%		(50 - 150)
LCS2	Monochloroacetic acid	40	41	102.0%		(80 - 120)
MBLK	Monochloroacetic acid	ND	ND			
MS	Monochloroacetic acid	20	21	105.0%		(70 - 130)
DUP	Tribromoacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Tribromoacetic acid	1.0	1.5	150.0%		(50 - 150)
LCS2	Tribromoacetic acid	20	22	110.0%		(80 - 120)
MBLK	Tribromoacetic acid	ND	ND			
MS	Tribromoacetic acid	10	9	90.0%		(70 - 130)
DUP	Trichloroacetic acid	23	23		0.0%	(0 - 20)
LCS1	Trichloroacetic acid	1.0	0.9	90.0%		(50 - 150)
LCS2	Trichloroacetic acid	20	20	100.0%		(80 - 120)
MBLK	Trichloroacetic acid	ND	ND			
MS	Trichloroacetic acid	10	10	100.0%		(70 - 130)

QC Batch ID: 62525 **Report #:** 34079

Analysis: @HALOAC **Method:** ML/S6251B

QC	Analyte	Spike	Recovery	Yield	RPD	Acceptance Criteria Range
DUP	Bromochloroacetic acid	5	5		0.0%	(0 - 20)
LCS1	Bromochloroacetic acid	1.0	0.9	90.0%		(50 - 150)
LCS2	Bromochloroacetic acid	20	20	100.0%		(80 - 120)
MBLK	Bromochloroacetic acid	ND	ND			
MS	Bromochloroacetic acid	10	10	100.0%		(70 - 130)
DUP	Bromodichloroacetic acid	3	3		0.0%	(0 - 20)
LCS1	Bromodichloroacetic acid	1.0	1.2	120.0%		(50 - 150)
LCS2	Bromodichloroacetic acid	20	22	110.0%		(80 - 120)
MBLK	Bromodichloroacetic acid	ND	ND			
MS	Bromodichloroacetic acid	10	11	110.0%		(70 - 130)

ND (non-detect): Result is below 1/2 minimum reporting level (MRL).

QC Results from Montgomery Watson Laboratories

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 39
Study Title: ICR RSSCT #2

DUP	Chlorodibromoacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Chlorodibromoacetic acid	1.0	1.4	140.0%		(50 - 150)
LCS2	Chlorodibromoacetic acid	20	22	110.0%		(80 - 120)
MBLK	Chlorodibromoacetic acid	ND	ND			
MS	Chlorodibromoacetic acid	10	12	120.0%		(70 - 130)
DUP	Dibromoacetic acid	1	1		0.0%	(0 - 20)
LCS1	Dibromoacetic acid	1.0	0.9	90.0%		(50 - 150)
LCS2	Dibromoacetic acid	20	20	100.0%		(80 - 120)
MBLK	Dibromoacetic acid	ND	ND			
MS	Dibromoacetic acid	10	10	100.0%		(70 - 130)
DUP	Dichloroacetic acid	21	21		0.0%	(0 - 20)
LCS1	Dichloroacetic acid	1.0	0.8	80.0%		(50 - 150)
LCS2	Dichloroacetic acid	20	20	100.0%		(80 - 120)
MBLK	Dichloroacetic acid	ND	ND			
MS	Dichloroacetic acid	10	10	100.0%		(70 - 130)
DUP	Monobromoacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Monobromoacetic acid	1.0	0.9	90.0%		(50 - 150)
LCS2	Monobromoacetic acid	20	20	100.0%		(80 - 120)
MBLK	Monobromoacetic acid	ND	ND			
MS	Monobromoacetic acid	10	10	100.0%		(70 - 130)
DUP	Monochloroacetic acid	4	4		0.0%	(0 - 20)
LCS1	Monochloroacetic acid	2.0	1.9	95.0%		(50 - 150)
LCS2	Monochloroacetic acid	40	40	100.0%		(80 - 120)
MBLK	Monochloroacetic acid	ND	ND			
MS	Monochloroacetic acid	20	19	95.0%		(70 - 130)
DUP	Tribromoacetic acid	ND	ND		0.0%	(0 - 20)
LCS2	Tribromoacetic acid	20	22	110.0%		(80 - 120)
MBLK	Tribromoacetic acid	ND	ND			
MS	Tribromoacetic acid	10	10	100.0%		(70 - 130)
DUP	Trichloroacetic acid	10	10		0.0%	(0 - 20)
LCS1	Trichloroacetic acid	1.0	0.9	90.0%		(50 - 150)
LCS2	Trichloroacetic acid	20	20	100.0%		(80 - 120)
MBLK	Trichloroacetic acid	ND	ND			
MS	Trichloroacetic acid	10	10	100.0%		(70 - 130)

QC Batch ID: 62559 **Report #:** 34079

Analysis: @THM-ICR **Method:** ML/EPA 551

QC	Analyte	Spike	Recovery	Yield	RPD	Acceptance Criteria Range

ND (non-detect): Result is below 1/2 minimum reporting level (MRL).

QC Results from Montgomery Watson Laboratories

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 39
Study Title: ICR RSSCT #2

LCS1	Bromodichloromethane	20.0	20.9	104.0%	(50 - 150)
LCS2	Bromodichloromethane	40.0	39.7	99.0%	(80 - 120)
LCS3	Bromodichloromethane	20.0	20.7	104.0%	(80 - 120)
MBLK	Bromodichloromethane	ND	ND		
MS1	Bromodichloromethane	20.0	19.9	100.0%	(80 - 120)
MS2	Bromodichloromethane	40.0	36.4	91.0%	(80 - 120)
LCS1	Bromoform	20.0	20.4	102.0%	(50 - 150)
LCS2	Bromoform	40.0	39.7	99.0%	(80 - 120)
LCS3	Bromoform	20.0	20.3	102.0%	(80 - 120)
MBLK	Bromoform	ND	ND		
MS1	Bromoform	20.0	20.6	103.0%	(80 - 120)
MS2	Bromoform	40.0	40.6	102.0%	(80 - 120)
LCS1	Chloroform	20.0	20.7	104.0%	(50 - 150)
LCS2	Chloroform	40.0	39.7	99.0%	(80 - 120)
LCS3	Chloroform	20.0	20.3	102.0%	(80 - 120)
MBLK	Chloroform	ND	ND		
MS1	Chloroform	20.0	14.7	74.0%	(80 - 120)
MS2	Chloroform	40.0	37.1	93.0%	(80 - 120)
LCS1	Dibromochloromethane	20.0	20.8	104.0%	(50 - 150)
LCS2	Dibromochloromethane	40.0	39.7	99.0%	(80 - 120)
LCS3	Dibromochloromethane	20.0	20.4	102.0%	(80 - 120)
MBLK	Dibromochloromethane	ND	ND		
MS1	Dibromochloromethane	20.0	20.8	104.0%	(80 - 120)
MS2	Dibromochloromethane	40.0	40.6	102.0%	(80 - 120)

End of MW QC report

ND (non-detect): Result is below 1/2 minimum reporting level (MRL).

Summers & Hooper, Inc.
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Comments

Mr. John Zackasee
Superintendent-Purification
Mahoning Valley Sanitary District
P.O. Box 4119
Youngstown, OH 44515

Phone: 330-652-3614 Fax: 330-652-6293

Study#: 39
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.

Turbidity Range	Report to Nearest
0-1.0	0.05
1-10	0.1
10-40	1
40-100	5
100-400	10
400-1000	50
> 1000	100

QC comments

QCBatch: 0-16-0 **Description:** MW Labs Report # 33799

HAA BDCAA result for sample 9704-88: "Sample results for [bromodichloroacetic acid] reported as NR for sample [9704-88] due to QC failure on LCS recoveries."

NH3 QC Batch MW61943. From MW Labs: "MS/MSD recoveries out of control limit."

QCBatch: 0-17-0 **Description:** MW Labs Report # 33887

HAA BDCAA and CDBAA results for samples 9704-103, 9704-104, 9704-106, and 9704-108: "[Bromodichloroacetic acid] and [chlorodibromoacetic acid] reported as NR on some samples due to QC failure on LCS and continuing calibration standard recoveries."

NH3 QC Batch MW61943. From MW Labs: "MS/MSD recoveries out of control limit."

QCBatch: 0-20-0 **Description:** MW Labs Report # 34079

THM4 samples 9705-2 and 9705-8. From MW Labs: "[THM]551 - Sample results reported as NR due to insufficient QC data - analyst did not include a low level LFB with this extraction batch."

HAA samples 9705-2 and 9705-8. From MW Labs: "Tribromoacetic acid was not detected on the low std (1ug/L). Sample results for this taret analyte were reported as NR."

End of comments

Summers & Hooper, Inc.
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Laboratory Report

Client:

Mr. John Zackasee
Superintendant-Purification
Mahoning Valley Sanitation District
P.O. Box 4119
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Phone: 330-652-3614 Fax: 330-652-6293

Study Title: ICR RSSCT #3

Study #: 66

Reviewed By: _____
Stuart M. Hooper

Date Reviewed: 7/12/99

Electronic copies of the results and quality control data are available upon request.

Summers & Hooper, Inc.
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Laboratory Test Results

Mr. John Zackasee
Superintendent-Purification
Mahoning Valley Sanitary District
P.O. Box 4119
Youngstown, OH 44515

Phone: 330-652-3614 Fax: 330-652-6293

Study#: 66
Study Title: ICR RSSCT #3

Sample ID: Plant settled water **S&H ID:** 9707-169 **Date Sampled:** 7/14/97 9:05:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
1	ALK	Alkalinity	47	mg/L	SM 2320 B	1	5	7/14/97		7/15/97	1-0-4
2	CaHard	Calcium Hardness	82	mg/L CaCO3	SM 3500-Ca D	1	5	7/14/97		7/15/97	33-0-4
3	HAA	Bromochloroacetic acid	ND	µg/L	SM 6251 B	0	1.0	7/14/97	7/29/97	8/3/97	MW65283
4	HAA	Dibromoacetic acid	ND	µg/L	SM 6251 B	0	1.0	7/14/97	7/29/97	8/3/97	MW65283
5	HAA	Dichloroacetic acid	1.0	µg/L	SM 6251 B	0	1.0	7/14/97	7/29/97	8/3/97	MW65283
6	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	0	1.0	7/14/97	7/29/97	8/3/97	MW65283
7	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	0	2.0	7/14/97	7/29/97	8/3/97	MW65283
8	HAA	Trichloroacetic acid	ND	µg/L	SM 6251 B	0	1.0	7/14/97	7/29/97	8/3/97	MW65283
9	pH	pH	10.9	Unit	SM 4500-H+ B	1	n/a	7/14/97		7/15/97	n/a
10	TotHard	Total Hardness	101	mg/L CaCO3	SM 2340 C	1	5	7/14/97		7/14/97	3-0-4
11	TOC-ICR	TOC	3.69	mg/L	SM 5310 C	1	0.50	7/14/97		7/15/97	7-0-86
12	TOC-ICR	TOC (Dupl)	3.77	mg/L	SM 5310 C	1	0.50	7/14/97		7/15/97	7-0-86
			3.73	**mg/L**	**2.1 % RPD**						
13	TOX-ICR	TOX	ND	µg Cl-/L	SM 5320 B	1	25	7/14/97		7/23/97	12-0-39
14	TOX-ICR	TOX (Dupl)	ND	µg Cl-/L	SM 5320 B	1	25	7/14/97		7/23/97	12-0-39
			ND	**µg Cl-/L**							
15	THM-ICR	1,2,3-Trichloropropane (Surrogate)	106.4	%	EPA 551.1	1	1.0	7/14/97	7/23/97	7/24/97	0-29-0
16	THM-ICR	Bromodichloromethane	ND	µg/L	EPA 551.1	1	1.0	7/14/97	7/23/97	7/24/97	0-29-0
17	THM-ICR	Bromoform	ND	µg/L	EPA 551.1	1	1.0	7/14/97	7/23/97	7/24/97	0-29-0
18	THM-ICR	Chloroform	1.2	µg/L	EPA 551.1	1	1.0	7/14/97	7/23/97	7/24/97	0-29-0
19	THM-ICR	Dibromochloromethane	ND	µg/L	EPA 551.1	1	1.0	7/14/97	7/23/97	7/24/97	0-29-0
20	TURB	Turbidity	14.00	ntu	SM 2130 B	1	0.05	7/14/97		7/15/97	9-0-2

Sample ID: Settled Water on Arrival **S&H ID:** 9707-179 **Date Sampled:** 7/16/97

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
21	TOC-ICR	TOC	3.62	mg/L	SM 5310 C	1	0.50	7/16/97		7/19/97	7-0-87
22	TOC-ICR	TOC	3.65	mg/L	SM 5310 C	1	0.50	7/16/97		7/19/97	7-0-87
23	TOC-ICR	TOC (Dupl)	3.65	mg/L	SM 5310 C	1	0.50	7/16/97		7/19/97	7-0-87
24	TOC-ICR	TOC (Dupl)	3.67	mg/L	SM 5310 C	1	0.50	7/16/97		7/19/97	7-0-87
			3.65	**mg/L**	**0.6 % RPD**						

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

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

Summers & Hooper, Inc.
6 Knollcrest Drive
Cincinnati, OH 45237

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 66
Study Title: ICR RSSCT #3

Sample ID: 66.10.20.Inf.A-1 **S&H ID:** 9707-339 **Date Sampled:** 7/30/97 2:30:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
25	ALK	Alkalinity	19	mg/L	SM 2320 B	1	5	7/30/97		7/31/97	1-0-5
26	ALK	Alkalinity (Dupl)	19	mg/L	SM 2320 B	1	5	7/30/97		7/31/97	1-0-5
			19	**mg/L**	**0.0 % RPD**						
27	NH3	Ammonia Nitrogen	0.07	mg/L	EPA 350.1	1	0.05	7/30/97		8/18/97	MW65578
28	BR	Bromide	0.039	mg/L	EPA 300.0 A	1	0.020	7/30/97		8/19/97	MW65553
29	CaHard	Calcium Hardness	74	mg/L CaCO3	SM 3500-Ca D	1	10	7/30/97		7/31/97	33-0-5
30	CaHard	Calcium Hardness (Dupl)	73	mg/L CaCO3	SM 3500-Ca D	1	10	7/30/97		7/31/97	33-0-5
			74	**mg/L CaCO3**	**1.4 % RPD**						
31	TotHard	Total Hardness	94	mg/L CaCO3	SM 2340 C	1	5	7/30/97		7/31/97	3-0-5
32	TotHard	Total Hardness (Dupl)	90	mg/L CaCO3	SM 2340 C	1	5	7/30/97		7/31/97	3-0-5
			92	**mg/L CaCO3**	**4.3 % RPD**						

Sample ID: 66.10.20.Inf.B-1 **S&H ID:** 9707-340 **Date Sampled:** 7/30/97 2:35:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
33	Cl2Dose	Chlorine Dose	3.75	mg/L as Cl2	SM 4500-Cl B	1	n/a	8/2/97		8/2/97	n/a
34	Cl2Res	Chlorine Residual	0.81	mg/L as Cl2	SM 4500-Cl F	1	0.10	8/2/97		8/3/97	n/a
35	HAA	Bromochloroacetic acid	5.8	µg/L	SM 6251 B	1	1.0	8/3/97	8/15/97	8/19/97	MW65558
36	HAA	Bromodichloroacetic acid	3.5	µg/L	SM 6251 B	1	1.0	8/3/97	8/15/97	8/19/97	MW65558
37	HAA	Chlorodibromoacetic acid	ND	µg/L	SM 6251 B	1	2.0	8/3/97	8/15/97	8/19/97	MW65558
38	HAA	Dibromoacetic acid	1.0	µg/L	SM 6251 B	1	1.0	8/3/97	8/15/97	8/19/97	MW65558
39	HAA	Dichloroacetic acid	24.0	µg/L	SM 6251 B	1	1.0	8/3/97	8/15/97	8/19/97	MW65558
40	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	8/3/97	8/15/97	8/19/97	MW65558
41	HAA	Monochloroacetic acid	2.4	µg/L	SM 6251 B	1	2.0	8/3/97	8/15/97	8/19/97	MW65558
42	HAA	Tribromoacetic acid	ND	µg/L	SM 6251 B	1	4.0	8/3/97	8/15/97	8/19/97	MW65558
43	HAA	Trichloroacetic acid	11.0	µg/L	SM 6251 B	1	1.0	8/3/97	8/15/97	8/19/97	MW65558
44	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	8/2/97		8/3/97	n/a
45	pH	Cl2 pH - Initial	9.1	Unit	SM 4500-H+ B	1	n/a	8/2/97		8/2/97	n/a
46	pH	pH	9.1	Unit	SM 4500-H+ B	1	n/a	7/30/97		7/30/97	n/a
47	TEMP	Cl2 Temperature	20.6	ºC	SM 2550 B	1	n/a	8/2/97		8/3/97	n/a
48	TEMP	Temperature	18.6	ºC	SM 2550 B	1	n/a	7/30/97		7/30/97	n/a
49	TIME	Cl2 Incubation Time	24.0	hrs	n/a	1	n/a	8/2/97		8/3/97	n/a
50	TOC-ICR	TOC	3.42	mg/L	SM 5310 C	1	0.50	7/30/97		7/30/97	7-0-93
51	TOC-ICR	TOC (Dupl)	3.43	mg/L	SM 5310 C	1	0.50	7/30/97		7/30/97	7-0-93
			3.42	**mg/L**	**0.3 % RPD**						
52	TOX-ICR	TOX	266	µg Cl-/L	SM 5320 B	1	25	8/3/97		8/7/97	12-0-47
53	TOX-ICR	TOX (Dupl)	257	µg Cl-/L	SM 5320 B	1	25	8/3/97		8/7/97	12-0-47
			262	**µg Cl-/L**	**3.4 % RPD**						

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 66
Study Title: ICR RSSCT #3

54	THM-ICR	1,2,3-Trichloropropane (Surrogate)	96.0	%	EPA 551.1	1	1.0	8/3/97	8/6/97	8/7/97	0-32-0
55	THM-ICR	Bromodichloromethane	21.4	µg/L	EPA 551.1	1	1.0	8/3/97	8/6/97	8/7/97	0-32-0
56	THM-ICR	Bromoform	ND	µg/L	EPA 551.1	1	1.0	8/3/97	8/6/97	8/7/97	0-32-0
57	THM-ICR	Chloroform	88.8	µg/L	EPA 551.1	2	1.0	8/3/97	8/6/97	8/8/97	0-32-0
58	THM-ICR	Dibromochloromethane	4.4	µg/L	EPA 551.1	1	1.0	8/3/97	8/6/97	8/7/97	0-32-0
59	TURB	Turbidity	0.05	ntu	SM 2130 B	1	0.05	7/30/97		7/30/97	9-0-2
60	UV-ICR	UV	0.066	1/cm	SM 5910 B	1	0.009	7/30/97		8/1/97	8-0-57
61	UV-ICR	UV (Dupl)	0.066	1/cm	SM 5910 B	1	0.009	7/30/97		8/1/97	8-0-57
			0.066	**1/cm**	**0.0 % RPD**						

Sample ID: 66.10.Eff.1 **S&H ID:** 9707-342 **Date Sampled:** 7/30/97 3:21:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
62	Cl2Dose	Chlorine Dose	1.62	mg/L as Cl2	SM 4500-Cl B	1	n/a	8/2/97		8/2/97	n/a
63	Cl2Res	Chlorine Residual	0.72	mg/L as Cl2	SM 4500-Cl F	1	0.10	8/2/97		8/3/97	n/a
64	HAA	Bromochloroacetic acid	ND	µg/L	SM 6251 B	1	1.0	8/3/97	8/19/97	8/25/97	MW65882
65	HAA	Bromodichloroacetic acid	NR	µg/L	SM 6251 B	1	1.0	8/3/97	8/19/97	8/25/97	MW65882
66	HAA	Chlorodibromoacetic acid	NR	µg/L	SM 6251 B	1	2.0	8/3/97	8/19/97	8/25/97	MW65882
67	HAA	Dibromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	8/3/97	8/19/97	8/25/97	MW65882
68	HAA	Dichloroacetic acid	ND	µg/L	SM 6251 B	1	1.0	8/3/97	8/19/97	8/25/97	MW65882
69	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	8/3/97	8/19/97	8/25/97	MW65882
70	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	8/3/97	8/19/97	8/25/97	MW65882
71	HAA	Tribromoacetic acid	NR	µg/L	SM 6251 B	1	4.0	8/3/97	8/19/97	8/25/97	MW65882
72	HAA	Trichloroacetic acid	ND	µg/L	SM 6251 B	1	1.0	8/3/97	8/19/97	8/25/97	MW65882
73	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	8/2/97		8/3/97	n/a
74	pH	Cl2 pH - Initial	9.0	Unit	SM 4500-H+ B	1	n/a	8/2/97		8/2/97	n/a
75	pH	pH	8.8	Unit	SM 4500-H+ B	1	n/a	7/30/97		7/30/97	n/a
76	TEMP	Cl2 Temperature	20.6	ºC	SM 2550 B	1	n/a	8/2/97		8/3/97	n/a
77	TEMP	Temperature	21.8	ºC	SM 2550 B	1	n/a	7/30/97		7/30/97	n/a
78	TIME	Cl2 Incubation Time	24.0	hrs	n/a	1	n/a	8/2/97		8/3/97	n/a
79	TOC-ICR	TOC	ND	mg/L	SM 5310 C	1	0.50	7/30/97		7/30/97	7-0-93
80	TOC-ICR	TOC (Dupl)	ND	mg/L	SM 5310 C	1	0.50	7/30/97		7/30/97	7-0-93
			ND	**mg/L**							
81	TOX-ICR	TOX	ND	µg Cl-/L	SM 5320 B	1	25	8/3/97		8/5/97	12-0-46
82	TOX-ICR	TOX (Dupl)	ND	µg Cl-/L	SM 5320 B	1	25	8/3/97		8/5/97	12-0-46
			ND	**µg Cl-/L**							
83	THM-ICR	1,2,3-Trichloropropane (Surrogate)	96.8	%	EPA 551.1	1	1.0	8/3/97	8/6/97	8/7/97	0-32-0
84	THM-ICR	Bromodichloromethane	ND	µg/L	EPA 551.1	1	1.0	8/3/97	8/6/97	8/7/97	0-32-0
85	THM-ICR	Bromoform	ND	µg/L	EPA 551.1	1	1.0	8/3/97	8/6/97	8/7/97	0-32-0

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 66
Study Title: ICR RSSCT #3

86	THM-ICR	Chloroform	ND	µg/L	EPA 551.1	1	1.0	8/3/97	8/6/97	8/7/97	0-32-0
87	THM-ICR	Dibromochloromethane	ND	µg/L	EPA 551.1	1	1.0	8/3/97	8/6/97	8/7/97	0-32-0
88	UV-ICR	UV	ND	1/cm	SM 5910 B	1	0.009	7/30/97		8/1/97	8-0-57
89	UV-ICR	UV (Dupl)	ND	1/cm	SM 5910 B	1	0.009	7/30/97		8/1/97	8-0-57
			ND	**1/cm**							

Sample ID: 66.20.Eff.1 **S&H ID:** 9707-343 **Date Sampled:** 7/30/97 3:19:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
90	Cl2Dose	Chlorine Dose	1.66	mg/L as Cl2	SM 4500-Cl B	1	n/a	8/2/97		8/2/97	n/a
91	Cl2Res	Chlorine Residual	0.71	mg/L as Cl2	SM 4500-Cl F	1	0.10	8/2/97		8/3/97	n/a
92	HAA	Bromochloroacetic acid	ND	µg/L	SM 6251 B	1	1.0	8/3/97	8/15/97	8/19/97	MW65558
93	HAA	Bromodichloroacetic acid	1.0	µg/L	SM 6251 B	1	1.0	8/3/97	8/15/97	8/19/97	MW65558
94	HAA	Chlorodibromoacetic acid	ND	µg/L	SM 6251 B	1	2.0	8/3/97	8/15/97	8/19/97	MW65558
95	HAA	Dibromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	8/3/97	8/15/97	8/19/97	MW65558
96	HAA	Dichloroacetic acid	ND	µg/L	SM 6251 B	1	1.0	8/3/97	8/15/97	8/19/97	MW65558
97	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	8/3/97	8/15/97	8/19/97	MW65558
98	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	8/3/97	8/15/97	8/19/97	MW65558
99	HAA	Tribromoacetic acid	ND	µg/L	SM 6251 B	1	4.0	8/3/97	8/15/97	8/19/97	MW65558
100	HAA	Trichloroacetic acid	ND	µg/L	SM 6251 B	1	1.0	8/3/97	8/15/97	8/19/97	MW65558
101	pH	Cl2 pH - Final	9.1	Unit	SM 4500-H+ B	1	n/a	8/2/97		8/3/97	n/a
102	pH	Cl2 pH - Initial	9.0	Unit	SM 4500-H+ B	1	n/a	8/2/97		8/2/97	n/a
103	pH	pH	8.8	Unit	SM 4500-H+ B	1	n/a	7/30/97		7/30/97	n/a
104	TEMP	Cl2 Temperature	20.6	ºC	SM 2550 B	1	n/a	8/2/97		8/3/97	n/a
105	TEMP	Temperature	22.1	ºC	SM 2550 B	1	n/a	7/30/97		7/30/97	n/a
106	TIME	Cl2 Incubation Time	24.0	hrs	n/a	1	n/a	8/2/97		8/3/97	n/a
107	TOC-ICR	TOC	ND	mg/L	SM 5310 C	1	0.50	7/30/97		7/30/97	7-0-93
108	TOC-ICR	TOC (Dupl)	ND	mg/L	SM 5310 C	1	0.50	7/30/97		7/30/97	7-0-93
			ND	**mg/L**							
109	TOX-ICR	TOX	ND	µg Cl-/L	SM 5320 B	1	25	8/3/97		8/7/97	12-0-47
110	TOX-ICR	TOX (Dupl)	ND	µg Cl-/L	SM 5320 B	1	25	8/3/97		8/7/97	12-0-47
			ND	**µg Cl-/L**							
111	THM-ICR	1,2,3-Trichloropropane (Surrogate)	100.0	%	EPA 551.1	1	1.0	8/3/97	8/6/97	8/7/97	0-32-0
112	THM-ICR	Bromodichloromethane	ND	µg/L	EPA 551.1	1	1.0	8/3/97	8/6/97	8/7/97	0-32-0
113	THM-ICR	Bromoform	ND	µg/L	EPA 551.1	1	1.0	8/3/97	8/6/97	8/7/97	0-32-0
114	THM-ICR	Chloroform	ND	µg/L	EPA 551.1	1	1.0	8/3/97	8/6/97	8/7/97	0-32-0
115	THM-ICR	Dibromochloromethane	ND	µg/L	EPA 551.1	1	1.0	8/3/97	8/6/97	8/7/97	0-32-0
116	UV-ICR	UV	ND	1/cm	SM 5910 B	1	0.009	7/30/97		8/1/97	8-0-57
117	UV-ICR	UV (Dupl)	ND	1/cm	SM 5910 B	1	0.009	7/30/97		8/1/97	8-0-57
			ND	**1/cm**							

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Summers & Hooper, Inc.
6 Knollcrest Drive
Cincinnati, OH 45237

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 66
Study Title: ICR RSSCT #3

Sample ID: 66.10.Eff.3 **S&H ID:** 9708-1 **Date Sampled:** 8/1/97 1:00:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
118	Cl2Dose	Chlorine Dose	1.72	mg/L as Cl2	SM 4500-Cl B	1	n/a	8/2/97		8/2/97	n/a
119	Cl2Res	Chlorine Residual	0.75	mg/L as Cl2	SM 4500-Cl F	1	0.10	8/2/97		8/3/97	n/a
120	HAA	Bromochloroacetic acid	ND	µg/L	SM 6251 B	1	1.0	8/3/97	8/15/97	8/19/97	MW65558
121	HAA	Bromodichloroacetic acid	1.6	µg/L	SM 6251 B	1	1.0	8/3/97	8/15/97	8/19/97	MW65558
122	HAA	Chlorodibromoacetic acid	ND	µg/L	SM 6251 B	1	2.0	8/3/97	8/15/97	8/19/97	MW65558
123	HAA	Dibromoacetic acid	1.2	µg/L	SM 6251 B	1	1.0	8/3/97	8/15/97	8/19/97	MW65558
124	HAA	Dichloroacetic acid	ND	µg/L	SM 6251 B	1	1.0	8/3/97	8/15/97	8/19/97	MW65558
125	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	8/3/97	8/15/97	8/19/97	MW65558
126	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	8/3/97	8/15/97	8/19/97	MW65558
127	HAA	Tribromoacetic acid	ND	µg/L	SM 6251 B	1	4.0	8/3/97	8/15/97	8/19/97	MW65558
128	HAA	Trichloroacetic acid	ND	µg/L	SM 6251 B	1	1.0	8/3/97	8/15/97	8/19/97	MW65558
129	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	8/2/97		8/3/97	n/a
130	pH	Cl2 pH - Initial	9.0	Unit	SM 4500-H+ B	1	n/a	8/2/97		8/2/97	n/a
131	pH	pH	8.3	Unit	SM 4500-H+ B	1	n/a	8/1/97		8/1/97	n/a
132	TEMP	Cl2 Temperature	20.6	ºC	SM 2550 B	1	n/a	8/2/97		8/3/97	n/a
133	TEMP	Temperature	21.5	ºC	SM 2550 B	1	n/a	8/1/97		8/1/97	n/a
134	TIME	Cl2 Incubation Time	23.9	hrs	n/a	1	n/a	8/2/97		8/3/97	n/a
135	TOC-ICR	TOC	ND	mg/L	SM 5310 C	1	0.50	8/1/97		8/1/97	7-0-95
136	TOC-ICR	TOC (Dupl)	ND	mg/L	SM 5310 C	1	0.50	8/1/97		8/1/97	7-0-95
			ND	**mg/L**							
137	TOX-ICR	TOX	ND	µg Cl-/L	SM 5320 B	1	25	8/3/97		8/5/97	12-0-46
138	TOX-ICR	TOX (Dupl)	ND	µg Cl-/L	SM 5320 B	1	25	8/3/97		8/5/97	12-0-46
			ND	**µg Cl-/L**							
139	THM-ICR	1,2,3-Trichloropropane (Surrogate)	100.0	%	EPA 551.1	1	1.0	8/3/97	8/6/97	8/7/97	0-32-0
140	THM-ICR	Bromodichloromethane	1.8	µg/L	EPA 551.1	1	1.0	8/3/97	8/6/97	8/7/97	0-32-0
141	THM-ICR	Bromoform	2.2	µg/L	EPA 551.1	1	1.0	8/3/97	8/6/97	8/7/97	0-32-0
142	THM-ICR	Chloroform	ND	µg/L	EPA 551.1	1	1.0	8/3/97	8/6/97	8/7/97	0-32-0
143	THM-ICR	Dibromochloromethane	4.1	µg/L	EPA 551.1	1	1.0	8/3/97	8/6/97	8/7/97	0-32-0
144	UV-ICR	UV	ND	1/cm	SM 5910 B	1	0.009	8/1/97		8/1/97	8-0-57
145	UV-ICR	UV (Dupl)	ND	1/cm	SM 5910 B	1	0.009	8/1/97		8/1/97	8-0-57
			ND	**1/cm**							

Sample ID: 66.10.Eff.4 **S&H ID:** 9708-2 **Date Sampled:** 8/1/97 6:27:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
146	Cl2Dose	Chlorine Dose	1.83	mg/L as Cl2	SM 4500-Cl B	1	n/a	8/2/97		8/2/97	n/a

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 66
Study Title: ICR RSSCT #3

147	Cl2Res	Chlorine Residual	0.81	mg/L as Cl2	SM 4500-Cl F	1	0.10	8/2/97		8/3/97	n/a
148	HAA	Bromochloroacetic acid	1.6	µg/L	SM 6251 B	1	1.0	8/3/97	8/15/97	8/19/97	MW65558
149	HAA	Bromodichloroacetic acid	2.0	µg/L	SM 6251 B	1	1.0	8/3/97	8/15/97	8/19/97	MW65558
150	HAA	Chlorodibromoacetic acid	ND	µg/L	SM 6251 B	1	2.0	8/3/97	8/15/97	8/19/97	MW65558
151	HAA	Dibromoacetic acid	1.9	µg/L	SM 6251 B	1	1.0	8/3/97	8/15/97	8/19/97	MW65558
152	HAA	Dichloroacetic acid	1.1	µg/L	SM 6251 B	1	1.0	8/3/97	8/15/97	8/19/97	MW65558
153	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	8/3/97	8/15/97	8/19/97	MW65558
154	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	8/3/97	8/15/97	8/19/97	MW65558
155	HAA	Tribromoacetic acid	ND	µg/L	SM 6251 B	1	4.0	8/3/97	8/15/97	8/19/97	MW65558
156	HAA	Trichloroacetic acid	ND	µg/L	SM 6251 B	1	1.0	8/3/97	8/15/97	8/19/97	MW65558
157	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	8/2/97		8/3/97	n/a
158	pH	Cl2 pH - Initial	9.0	Unit	SM 4500-H+ B	1	n/a	8/2/97		8/2/97	n/a
159	pH	pH	8.5	Unit	SM 4500-H+ B	1	n/a	8/1/97		8/1/97	n/a
160	TEMP	Cl2 Temperature	20.6	ºC	SM 2550 B	1	n/a	8/2/97		8/3/97	n/a
161	TEMP	Temperature	21.1	ºC	SM 2550 B	1	n/a	8/1/97		8/1/97	n/a
162	TIME	Cl2 Incubation Time	24.0	hrs	n/a	1	n/a	8/2/97		8/3/97	n/a
163	TOC-ICR	TOC	0.71	mg/L	SM 5310 C	1	0.50	8/1/97		8/3/97	7-0-95
164	TOC-ICR	TOC (Dupl)	0.71	mg/L	SM 5310 C	1	0.50	8/1/97		8/3/97	7-0-95
			0.71	**mg/L**	**0.0 % RPD**						
165	TOX-ICR	TOX	26	µg Cl-/L	SM 5320 B	1	25	8/3/97		8/5/97	12-0-46
166	TOX-ICR	TOX (Dupl)	25	µg Cl-/L	SM 5320 B	1	25	8/3/97		8/5/97	12-0-46
			26	**µg Cl-/L**	**3.8 % RPD**						
167	THM-ICR	1,2,3-Trichloropropane (Surrogate)	102.0	%	EPA 551.1	1	1.0	8/3/97	8/6/97	8/7/97	0-32-0
168	THM-ICR	Bromodichloromethane	5.1	µg/L	EPA 551.1	1	1.0	8/3/97	8/6/97	8/7/97	0-32-0
169	THM-ICR	Bromoform	2.9	µg/L	EPA 551.1	1	1.0	8/3/97	8/6/97	8/7/97	0-32-0
170	THM-ICR	Chloroform	1.9	µg/L	EPA 551.1	1	1.0	8/3/97	8/6/97	8/7/97	0-32-0
171	THM-ICR	Dibromochloromethane	7.6	µg/L	EPA 551.1	1	1.0	8/3/97	8/6/97	8/7/97	0-32-0
172	UV-ICR	UV	ND	1/cm	SM 5910 B	1	0.009	8/1/97		8/1/97	8-0-57
173	UV-ICR	UV (Dupl)	ND	1/cm	SM 5910 B	1	0.009	8/1/97		8/1/97	8-0-57
			ND	**1/cm**							

Sample ID: 66.10.Eff.5 **S&H ID:** 9708-16 **Date Sampled:** 8/1/97 5:29:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
174	Cl2Dose	Chlorine Dose	1.95	mg/L as Cl2	SM 4500-Cl B	1	n/a	8/2/97		8/2/97	n/a
175	Cl2Res	Chlorine Residual	0.74	mg/L as Cl2	SM 4500-Cl F	1	0.10	8/2/97		8/3/97	n/a
176	HAA	Bromochloroacetic acid	2.7	µg/L	SM 6251 B	1	1.0	8/3/97	8/15/97	8/19/97	MW65558
177	HAA	Bromodichloroacetic acid	2.4	µg/L	SM 6251 B	1	1.0	8/3/97	8/15/97	8/19/97	MW65558
178	HAA	Chlorodibromoacetic acid	ND	µg/L	SM 6251 B	1	2.0	8/3/97	8/15/97	8/19/97	MW65558
179	HAA	Dibromoacetic acid	2.3	µg/L	SM 6251 B	1	1.0	8/3/97	8/15/97	8/19/97	MW65558

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 66
Study Title: ICR RSSCT #3

180	HAA	Dichloroacetic acid	2.6	µg/L	SM 6251 B	1	1.0	8/3/97	8/15/97	8/19/97	MW65558
181	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	8/3/97	8/15/97	8/19/97	MW65558
182	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	8/3/97	8/15/97	8/19/97	MW65558
183	HAA	Tribromoacetic acid	ND	µg/L	SM 6251 B	1	4.0	8/3/97	8/15/97	8/19/97	MW65558
184	HAA	Trichloroacetic acid	ND	µg/L	SM 6251 B	1	1.0	8/3/97	8/15/97	8/19/97	MW65558
185	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	8/2/97		8/3/97	n/a
186	pH	Cl2 pH - Initial	9.0	Unit	SM 4500-H+ B	1	n/a	8/2/97		8/2/97	n/a
187	pH	pH	8.4	Unit	SM 4500-H+ B	1	n/a	8/1/97		8/1/97	n/a
188	TEMP	Cl2 Temperature	20.6	ºC	SM 2550 B	1	n/a	8/2/97		8/3/97	n/a
189	TEMP	Temperature	21.9	ºC	SM 2550 B	1	n/a	8/1/97		8/1/97	n/a
190	TIME	Cl2 Incubation Time	24.0	hrs	n/a	1	n/a	8/2/97		8/3/97	n/a
191	TOC-ICR	TOC	0.97	mg/L	SM 5310 C	1	0.50	8/1/97		8/2/97	7-0-94
192	TOC-ICR	TOC (Dupl)	0.99	mg/L	SM 5310 C	1	0.50	8/1/97		8/2/97	7-0-94
			0.98	**mg/L**	**2.0 % RPD**						
193	TOX-ICR	TOX	39	µg Cl-/L	SM 5320 B	1	25	8/3/97		8/5/97	12-0-46
194	TOX-ICR	TOX (Dupl)	41	µg Cl-/L	SM 5320 B	1	25	8/3/97		8/5/97	12-0-46
			40	**µg Cl-/L**	**5.0 % RPD**						
195	THM-ICR	1,2,3-Trichloropropane (Surrogate)	105.6	%	EPA 551.1	1	1.0	8/3/97	8/6/97	8/7/97	0-32-0
196	THM-ICR	Bromodichloromethane	8.9	µg/L	EPA 551.1	1	1.0	8/3/97	8/6/97	8/7/97	0-32-0
197	THM-ICR	Bromoform	2.3	µg/L	EPA 551.1	1	1.0	8/3/97	8/6/97	8/7/97	0-32-0
198	THM-ICR	Chloroform	5.2	µg/L	EPA 551.1	1	1.0	8/3/97	8/6/97	8/7/97	0-32-0
199	THM-ICR	Dibromochloromethane	9.8	µg/L	EPA 551.1	1	1.0	8/3/97	8/6/97	8/7/97	0-32-0
200	UV-ICR	UV	0.011	1/cm	SM 5910 B	1	0.009	8/1/97		8/3/97	8-0-58
201	UV-ICR	UV (Dupl)	0.011	1/cm	SM 5910 B	1	0.009	8/1/97		8/3/97	8-0-58
			0.011	**1/cm**	**0.0 % RPD**						

Sample ID: 66.10.Eff.5d **S&H ID:** 9708-17 **Date Sampled:** 8/1/97 5:29:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
202	Cl2Dose	Chlorine Dose	1.95	mg/L as Cl2	SM 4500-Cl B	1	n/a	8/2/97		8/2/97	n/a
203	Cl2Res	Chlorine Residual	0.71	mg/L as Cl2	SM 4500-Cl F	1	0.10	8/2/97		8/3/97	n/a
204	HAA	Bromochloroacetic acid	2.4	µg/L	SM 6251 B	1	1.0	8/3/97	8/15/97	8/19/97	MW65558
205	HAA	Bromodichloroacetic acid	2.3	µg/L	SM 6251 B	1	1.0	8/3/97	8/15/97	8/19/97	MW65558
206	HAA	Chlorodibromoacetic acid	ND	µg/L	SM 6251 B	1	2.0	8/3/97	8/15/97	8/19/97	MW65558
207	HAA	Dibromoacetic acid	2.2	µg/L	SM 6251 B	1	1.0	8/3/97	8/15/97	8/19/97	MW65558
208	HAA	Dichloroacetic acid	2.4	µg/L	SM 6251 B	1	1.0	8/3/97	8/15/97	8/19/97	MW65558
209	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	8/3/97	8/15/97	8/19/97	MW65558
210	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	8/3/97	8/15/97	8/19/97	MW65558
211	HAA	Tribromoacetic acid	ND	µg/L	SM 6251 B	1	4.0	8/3/97	8/15/97	8/19/97	MW65558
212	HAA	Trichloroacetic acid	ND	µg/L	SM 6251 B	1	1.0	8/3/97	8/15/97	8/19/97	MW65558

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 66
Study Title: ICR RSSCT #3

213	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	8/2/97		8/3/97	n/a
214	pH	Cl2 pH - Initial	9.0	Unit	SM 4500-H+ B	1	n/a	8/2/97		8/2/97	n/a
215	pH	pH	8.4	Unit	SM 4500-H+ B	1	n/a	8/1/97		8/1/97	n/a
216	TEMP	Cl2 Temperature	20.6	ºC	SM 2550 B	1	n/a	8/2/97		8/3/97	n/a
217	TEMP	Temperature	21.9	ºC	SM 2550 B	1	n/a	8/1/97		8/1/97	n/a
218	TIME	Cl2 Incubation Time	24.0	hrs	n/a	1	n/a	8/2/97		8/3/97	n/a
219	TOC-ICR	TOC	0.99	mg/L	SM 5310 C	1	0.50	8/1/97		8/2/97	7-0-94
220	TOC-ICR	TOC (Dupl)	1.00	mg/L	SM 5310 C	1	0.50	8/1/97		8/2/97	7-0-94
			1.00	**mg/L**	**1.0 % RPD**						
221	TOX-ICR	TOX	43	µg Cl-/L	SM 5320 B	1	25	8/3/97		8/7/97	12-0-47
222	TOX-ICR	TOX (Dupl)	46	µg Cl-/L	SM 5320 B	1	25	8/3/97		8/7/97	12-0-47
			45	**µg Cl-/L**	**6.7 % RPD**						
223	THM-ICR	1,2,3-Trichloropropane (Surrogate)	92.0	%	EPA 551.1	1	1.0	8/3/97	8/6/97	8/7/97	0-32-0
224	THM-ICR	Bromodichloromethane	8.8	µg/L	EPA 551.1	1	1.0	8/3/97	8/6/97	8/7/97	0-32-0
225	THM-ICR	Bromoform	2.1	µg/L	EPA 551.1	1	1.0	8/3/97	8/6/97	8/7/97	0-32-0
226	THM-ICR	Chloroform	5.4	µg/L	EPA 551.1	1	1.0	8/3/97	8/6/97	8/7/97	0-32-0
227	THM-ICR	Dibromochloromethane	9.3	µg/L	EPA 551.1	1	1.0	8/3/97	8/6/97	8/7/97	0-32-0
228	UV-ICR	UV	0.011	1/cm	SM 5910 B	1	0.009	8/1/97		8/3/97	8-0-58
229	UV-ICR	UV (Dupl)	0.011	1/cm	SM 5910 B	1	0.009	8/1/97		8/3/97	8-0-58
			0.011	**1/cm**	**0.0 % RPD**						

Sample ID: 66.10.Eff.6 **S&H ID:** 9708-19 **Date Sampled:** 8/1/97 10:08:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
230	Cl2Dose	Chlorine Dose	2.01	mg/L as Cl2	SM 4500-Cl B	1	n/a	8/2/97		8/2/97	n/a
231	Cl2Res	Chlorine Residual	0.72	mg/L as Cl2	SM 4500-Cl F	1	0.10	8/2/97		8/3/97	n/a
232	HAA	Bromochloroacetic acid	2.9	µg/L	SM 6251 B	1	1.0	8/3/97	8/15/97	8/19/97	MW65558
233	HAA	Bromodichloroacetic acid	2.5	µg/L	SM 6251 B	1	1.0	8/3/97	8/15/97	8/19/97	MW65558
234	HAA	Chlorodibromoacetic acid	ND	µg/L	SM 6251 B	1	2.0	8/3/97	8/15/97	8/19/97	MW65558
235	HAA	Dibromoacetic acid	2.3	µg/L	SM 6251 B	1	1.0	8/3/97	8/15/97	8/19/97	MW65558
236	HAA	Dichloroacetic acid	4.0	µg/L	SM 6251 B	1	1.0	8/3/97	8/15/97	8/19/97	MW65558
237	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	8/3/97	8/15/97	8/19/97	MW65558
238	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	8/3/97	8/15/97	8/19/97	MW65558
239	HAA	Tribromoacetic acid	ND	µg/L	SM 6251 B	1	4.0	8/3/97	8/15/97	8/19/97	MW65558
240	HAA	Trichloroacetic acid	1.0	µg/L	SM 6251 B	1	1.0	8/3/97	8/15/97	8/19/97	MW65558
241	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	8/2/97		8/3/97	n/a
242	pH	Cl2 pH - Initial	9.0	Unit	SM 4500-H+ B	1	n/a	8/2/97		8/2/97	n/a
243	pH	pH	8.4	Unit	SM 4500-H+ B	1	n/a	8/1/97		8/1/97	n/a
244	TEMP	Cl2 Temperature	20.6	ºC	SM 2550 B	1	n/a	8/2/97		8/3/97	n/a
245	TEMP	Temperature	22.2	ºC	SM 2550 B	1	n/a	8/1/97		8/1/97	n/a

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 66
Study Title: ICR RSSCT #3

246	TIME	Cl2 Incubation Time	24.2	hrs	n/a	1	n/a	8/2/97		8/3/97	n/a
247	TOC-ICR	TOC	1.14	mg/L	SM 5310 C	1	0.50	8/1/97		8/2/97	7-0-94
248	TOC-ICR	TOC (Dupl)	1.14	mg/L	SM 5310 C	1	0.50	8/1/97		8/2/97	7-0-94
			1.14	**mg/L**	**0.0 % RPD**						
249	TOX-ICR	TOX	49	µg Cl-/L	SM 5320 B	1	25	8/3/97		8/5/97	12-0-46
250	TOX-ICR	TOX (Dupl)	50	µg Cl-/L	SM 5320 B	1	25	8/3/97		8/5/97	12-0-46
			50	**µg Cl-/L**	**2.0 % RPD**						
251	THM-ICR	1,2,3-Trichloropropane (Surrogate)	94.4	%	EPA 551.1	1	1.0	8/3/97	8/6/97	8/7/97	0-32-0
252	THM-ICR	Bromodichloromethane	11.5	µg/L	EPA 551.1	1	1.0	8/3/97	8/6/97	8/7/97	0-32-0
253	THM-ICR	Bromoform	1.7	µg/L	EPA 551.1	1	1.0	8/3/97	8/6/97	8/7/97	0-32-0
254	THM-ICR	Chloroform	8.5	µg/L	EPA 551.1	1	1.0	8/3/97	8/6/97	8/7/97	0-32-0
255	THM-ICR	Dibromochloromethane	9.9	µg/L	EPA 551.1	1	1.0	8/3/97	8/6/97	8/7/97	0-32-0
256	UV-ICR	UV	0.013	1/cm	SM 5910 B	1	0.009	8/1/97		8/3/97	8-0-58
257	UV-ICR	UV (Dupl)	0.013	1/cm	SM 5910 B	1	0.009	8/1/97		8/3/97	8-0-58
			0.013	**1/cm**	**0.0 % RPD**						

Sample ID: 66.10.Eff.7 **S&H ID:** 9708-21 **Date Sampled:** 8/2/97 9:03:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
258	Cl2Dose	Chlorine Dose	2.11	mg/L as Cl2	SM 4500-Cl B	1	n/a	8/5/97		8/5/97	n/a
259	Cl2Res	Chlorine Residual	0.71	mg/L as Cl2	SM 4500-Cl F	1	0.10	8/5/97		8/6/97	n/a
260	HAA	Bromochloroacetic acid	3.7	µg/L	SM 6251 B	1	1.0	8/6/97	8/18/97	8/25/97	MW65939
261	HAA	Bromodichloroacetic acid	2.5	µg/L	SM 6251 B	1	1.0	8/6/97	8/18/97	8/25/97	MW65939
262	HAA	Chlorodibromoacetic acid	ND	µg/L	SM 6251 B	1	2.0	8/6/97	8/18/97	8/25/97	MW65939
263	HAA	Dibromoacetic acid	2.5	µg/L	SM 6251 B	1	1.0	8/6/97	8/18/97	8/25/97	MW65939
264	HAA	Dichloroacetic acid	5.4	µg/L	SM 6251 B	1	1.0	8/6/97	8/18/97	8/25/97	MW65939
265	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	8/6/97	8/18/97	8/25/97	MW65939
266	HAA	Monochloroacetic acid	2.0	µg/L	SM 6251 B	1	2.0	8/6/97	8/18/97	8/25/97	MW65939
267	HAA	Tribromoacetic acid	ND	µg/L	SM 6251 B	1	4.0	8/6/97	8/18/97	8/25/97	MW65939
268	HAA	Trichloroacetic acid	1.8	µg/L	SM 6251 B	1	1.0	8/6/97	8/18/97	8/25/97	MW65939
269	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	8/5/97		8/6/97	n/a
270	pH	Cl2 pH - Initial	9.0	Unit	SM 4500-H+ B	1	n/a	8/5/97		8/5/97	n/a
271	pH	pH	8.4	Unit	SM 4500-H+ B	1	n/a	8/2/97		8/2/97	n/a
272	TEMP	Cl2 Temperature	20.6	ºC	SM 2550 B	1	n/a	8/5/97		8/6/97	n/a
273	TEMP	Temperature	21.2	ºC	SM 2550 B	1	n/a	8/2/97		8/2/97	n/a
274	TIME	Cl2 Incubation Time	24.0	hrs	n/a	1	n/a	8/5/97		8/6/97	n/a
275	TOC-ICR	TOC	1.35	mg/L	SM 5310 C	1	0.50	8/2/97		8/2/97	7-0-94
276	TOC-ICR	TOC (Dupl)	1.36	mg/L	SM 5310 C	1	0.50	8/2/97		8/2/97	7-0-94
			1.36	**mg/L**	**0.7 % RPD**						
277	TOX-ICR	TOX	69	µg Cl-/L	SM 5320 B	1	25	8/6/97		8/12/97	12-0-48

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 66
Study Title: ICR RSSCT #3

278	TOX-ICR	TOX (Dupl)	68	µg Cl-/L	SM 5320 B	1	25	8/6/97		8/12/97	12-0-48
			69	**µg Cl-/L**	**1.4 % RPD**						
279	THM-ICR	1,2,3-Trichloropropane (Surrogate)	95.6	%	EPA 551.1	1	1.0	8/6/97	8/6/97	8/7/97	0-32-0
280	THM-ICR	Bromodichloromethane	13.6	µg/L	EPA 551.1	1	1.0	8/6/97	8/6/97	8/7/97	0-32-0
281	THM-ICR	Bromoform	ND	µg/L	EPA 551.1	1	1.0	8/6/97	8/6/97	8/7/97	0-32-0
282	THM-ICR	Chloroform	13.7	µg/L	EPA 551.1	1	1.0	8/6/97	8/6/97	8/7/97	0-32-0
283	THM-ICR	Dibromochloromethane	10.1	µg/L	EPA 551.1	1	1.0	8/6/97	8/6/97	8/7/97	0-32-0
284	UV-ICR	UV	0.017	1/cm	SM 5910 B	1	0.009	8/2/97		8/3/97	8-0-58
285	UV-ICR	UV (Dupl)	0.017	1/cm	SM 5910 B	1	0.009	8/2/97		8/3/97	8-0-58
			0.017	**1/cm**	**0.0 % RPD**						

Sample ID: 66.20.Eff.4 **S&H ID:** 9708-36 **Date Sampled:** 8/2/97 5:58:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
286	Cl2Dose	Chlorine Dose	1.73	mg/L as Cl2	SM 4500-Cl B	1	n/a	8/2/97		8/2/97	n/a
287	Cl2Res	Chlorine Residual	0.71	mg/L as Cl2	SM 4500-Cl F	1	0.10	8/2/97		8/3/97	n/a
288	HAA	Bromochloroacetic acid	ND	µg/L	SM 6251 B	1	1.0	8/3/97	8/15/97	8/19/97	MW65558
289	HAA	Bromodichloroacetic acid	1.4	µg/L	SM 6251 B	1	1.0	8/3/97	8/15/97	8/19/97	MW65558
290	HAA	Chlorodibromoacetic acid	ND	µg/L	SM 6251 B	1	2.0	8/3/97	8/15/97	8/19/97	MW65558
291	HAA	Dibromoacetic acid	1.0	µg/L	SM 6251 B	1	1.0	8/3/97	8/15/97	8/19/97	MW65558
292	HAA	Dichloroacetic acid	ND	µg/L	SM 6251 B	1	1.0	8/3/97	8/15/97	8/19/97	MW65558
293	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	8/3/97	8/15/97	8/19/97	MW65558
294	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	8/3/97	8/15/97	8/19/97	MW65558
295	HAA	Tribromoacetic acid	ND	µg/L	SM 6251 B	1	4.0	8/3/97	8/15/97	8/19/97	MW65558
296	HAA	Trichloroacetic acid	ND	µg/L	SM 6251 B	1	1.0	8/3/97	8/15/97	8/19/97	MW65558
297	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	8/2/97		8/3/97	n/a
298	pH	Cl2 pH - Initial	9.0	Unit	SM 4500-H+ B	1	n/a	8/2/97		8/2/97	n/a
299	pH	pH	8.3	Unit	SM 4500-H+ B	1	n/a	8/2/97		8/2/97	n/a
300	TEMP	Cl2 Temperature	20.6	ºC	SM 2550 B	1	n/a	8/2/97		8/3/97	n/a
301	TEMP	Temperature	22.1	ºC	SM 2550 B	1	n/a	8/2/97		8/2/97	n/a
302	TIME	Cl2 Incubation Time	24.1	hrs	n/a	1	n/a	8/2/97		8/3/97	n/a
303	TOC-ICR	TOC	ND	mg/L	SM 5310 C	1	0.50	8/2/97		8/2/97	7-0-94
304	TOC-ICR	TOC (Dupl)	ND	mg/L	SM 5310 C	1	0.50	8/2/97		8/2/97	7-0-94
			ND	**mg/L**							
305	TOX-ICR	TOX	ND	µg Cl-/L	SM 5320 B	1	25	8/3/97		8/5/97	12-0-46
306	TOX-ICR	TOX (Dupl)	ND	µg Cl-/L	SM 5320 B	1	25	8/3/97		8/5/97	12-0-46
			ND	**µg Cl-/L**							
307	THM-ICR	1,2,3-Trichloropropane (Surrogate)	88.8	%	EPA 551.1	1	1.0	8/3/97	8/6/97	8/7/97	0-32-0
308	THM-ICR	Bromodichloromethane	1.8	µg/L	EPA 551.1	1	1.0	8/3/97	8/6/97	8/7/97	0-32-0

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 66
Study Title: ICR RSSCT #3

309	THM-ICR	Bromoform	2.3	µg/L	EPA 551.1	1	1.0	8/3/97	8/6/97	8/7/97	0-32-0
310	THM-ICR	Chloroform	ND	µg/L	EPA 551.1	1	1.0	8/3/97	8/6/97	8/7/97	0-32-0
311	THM-ICR	Dibromochloromethane	3.9	µg/L	EPA 551.1	1	1.0	8/3/97	8/6/97	8/7/97	0-32-0
312	UV-ICR	UV	ND	1/cm	SM 5910 B	1	0.009	8/2/97		8/3/97	8-0-58
313	UV-ICR	UV (Dupl)	ND	1/cm	SM 5910 B	1	0.009	8/2/97		8/3/97	8-0-58
			ND	**1/cm**							

Sample ID: 66.10.Eff.9 **S&H ID:** 9708-39 **Date Sampled:** 8/3/97 1:30:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
314	Cl2Dose	Chlorine Dose	2.22	mg/L as Cl2	SM 4500-Cl B	1	n/a	8/5/97		8/5/97	n/a
315	Cl2Res	Chlorine Residual	0.71	mg/L as Cl2	SM 4500-Cl F	1	0.10	8/5/97		8/6/97	n/a
316	HAA	Bromochloroacetic acid	4.3	µg/L	SM 6251 B	1	1.0	8/6/97	8/18/97	8/25/97	MW65939
317	HAA	Bromodichloroacetic acid	2.7	µg/L	SM 6251 B	1	1.0	8/6/97	8/18/97	8/25/97	MW65939
318	HAA	Chlorodibromoacetic acid	2.0	µg/L	SM 6251 B	1	2.0	8/6/97	8/18/97	8/25/97	MW65939
319	HAA	Dibromoacetic acid	2.3	µg/L	SM 6251 B	1	1.0	8/6/97	8/18/97	8/25/97	MW65939
320	HAA	Dichloroacetic acid	7.1	µg/L	SM 6251 B	1	1.0	8/6/97	8/18/97	8/25/97	MW65939
321	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	8/6/97	8/18/97	8/25/97	MW65939
322	HAA	Monochloroacetic acid	2.1	µg/L	SM 6251 B	1	2.0	8/6/97	8/18/97	8/25/97	MW65939
323	HAA	Tribromoacetic acid	ND	µg/L	SM 6251 B	1	4.0	8/6/97	8/18/97	8/25/97	MW65939
324	HAA	Trichloroacetic acid	2.5	µg/L	SM 6251 B	1	1.0	8/6/97	8/18/97	8/25/97	MW65939
325	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	8/5/97		8/6/97	n/a
326	pH	Cl2 pH - Initial	9.0	Unit	SM 4500-H+ B	1	n/a	8/5/97		8/5/97	n/a
327	pH	pH	8.4	Unit	SM 4500-H+ B	1	n/a	8/3/97		8/3/97	n/a
328	TEMP	Cl2 Temperature	20.1	ºC	SM 2550 B	1	n/a	8/5/97		8/6/97	n/a
329	TEMP	Temperature	22.0	ºC	SM 2550 B	1	n/a	8/3/97		8/3/97	n/a
330	TIME	Cl2 Incubation Time	24.0	hrs	n/a	1	n/a	8/5/97		8/6/97	n/a
331	TOC-ICR	TOC	1.63	mg/L	SM 5310 C	1	0.50	8/3/97		8/3/97	7-0-96
332	TOC-ICR	TOC (Dupl)	1.64	mg/L	SM 5310 C	1	0.50	8/3/97		8/3/97	7-0-96
			1.63	**mg/L**	**0.6 % RPD**						
333	TOX-ICR	TOX	90	µg Cl-/L	SM 5320 B	1	25	8/6/97		8/7/97	12-0-47
334	TOX-ICR	TOX (Dupl)	92	µg Cl-/L	SM 5320 B	1	25	8/6/97		8/7/97	12-0-47
			91	**µg Cl-/L**	**2.2 % RPD**						
335	THM-ICR	1,2,3-Trichloropropane (Surrogate)	91.2	%	EPA 551.1	1	1.0	8/6/97	8/6/97	8/7/97	0-32-0
336	THM-ICR	Bromodichloromethane	15.4	µg/L	EPA 551.1	1	1.0	8/6/97	8/6/97	8/7/97	0-32-0
337	THM-ICR	Bromoform	ND	µg/L	EPA 551.1	1	1.0	8/6/97	8/6/97	8/7/97	0-32-0
338	THM-ICR	Chloroform	21.7	µg/L	EPA 551.1	1	1.0	8/6/97	8/6/97	8/7/97	0-32-0
339	THM-ICR	Dibromochloromethane	8.9	µg/L	EPA 551.1	1	1.0	8/6/97	8/6/97	8/7/97	0-32-0
340	UV-ICR	UV	0.022	1/cm	SM 5910 B	1	0.009	8/3/97		8/3/97	8-0-58
341	UV-ICR	UV (Dupl)	0.022	1/cm	SM 5910 B	1	0.009	8/3/97		8/3/97	8-0-58

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 66
Study Title: ICR RSSCT #3

			0.022	**1/cm**	**0.0 % RPD**						

Sample ID: 66.10.Eff.9d **S&H ID:** 9708-40 **Date Sampled:** 8/3/97 1:30:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
342	Cl2Dose	Chlorine Dose	2.22	mg/L as Cl2	SM 4500-Cl B	1	n/a	8/5/97		8/5/97	n/a
343	Cl2Res	Chlorine Residual	0.70	mg/L as Cl2	SM 4500-Cl F	1	0.10	8/5/97		8/6/97	n/a
344	HAA	Bromochloroacetic acid	4.3	µg/L	SM 6251 B	1	1.0	8/6/97	8/18/97	8/25/97	MW65939
345	HAA	Bromodichloroacetic acid	2.7	µg/L	SM 6251 B	1	1.0	8/6/97	8/18/97	8/25/97	MW65939
346	HAA	Chlorodibromoacetic acid	ND	µg/L	SM 6251 B	1	2.0	8/6/97	8/18/97	8/25/97	MW65939
347	HAA	Dibromoacetic acid	2.3	µg/L	SM 6251 B	1	1.0	8/6/97	8/18/97	8/25/97	MW65939
348	HAA	Dichloroacetic acid	6.9	µg/L	SM 6251 B	1	1.0	8/6/97	8/18/97	8/25/97	MW65939
349	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	8/6/97	8/18/97	8/25/97	MW65939
350	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	8/6/97	8/18/97	8/25/97	MW65939
351	HAA	Tribromoacetic acid	ND	µg/L	SM 6251 B	1	4.0	8/6/97	8/18/97	8/25/97	MW65939
352	HAA	Trichloroacetic acid	2.6	µg/L	SM 6251 B	1	1.0	8/6/97	8/18/97	8/25/97	MW65939
353	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	8/5/97		8/6/97	n/a
354	pH	Cl2 pH - Initial	9.0	Unit	SM 4500-H+ B	1	n/a	8/5/97		8/5/97	n/a
355	pH	pH	8.4	Unit	SM 4500-H+ B	1	n/a	8/3/97		8/3/97	n/a
356	TEMP	Cl2 Temperature	20.1	ºC	SM 2550 B	1	n/a	8/5/97		8/6/97	n/a
357	TEMP	Temperature	22.0	ºC	SM 2550 B	1	n/a	8/3/97		8/3/97	n/a
358	TIME	Cl2 Incubation Time	24.0	hrs	n/a	1	n/a	8/5/97		8/6/97	n/a
359	TOC-ICR	TOC	1.65	mg/L	SM 5310 C	1	0.50	8/3/97		8/3/97	7-0-96
360	TOC-ICR	TOC (Dupl)	1.61	mg/L	SM 5310 C	1	0.50	8/3/97		8/3/97	7-0-96
			1.63	**mg/L**	**2.5 % RPD**						
361	TOX-ICR	TOX	92	µg Cl-/L	SM 5320 B	1	25	8/6/97		8/12/97	12-0-48
362	TOX-ICR	TOX (Dupl)	88	µg Cl-/L	SM 5320 B	1	25	8/6/97		8/12/97	12-0-48
			90	**µg Cl-/L**	**4.4 % RPD**						
363	THM-ICR	1,2,3-Trichloropropane (Surrogate)	93.6	%	EPA 551.1	1	1.0	8/6/97	8/6/97	8/8/97	0-32-0
364	THM-ICR	Bromodichloromethane	14.9	µg/L	EPA 551.1	1	1.0	8/6/97	8/6/97	8/8/97	0-32-0
365	THM-ICR	Bromoform	ND	µg/L	EPA 551.1	1	1.0	8/6/97	8/6/97	8/8/97	0-32-0
366	THM-ICR	Chloroform	21.1	µg/L	EPA 551.1	1	1.0	8/6/97	8/6/97	8/8/97	0-32-0
367	THM-ICR	Dibromochloromethane	8.8	µg/L	EPA 551.1	1	1.0	8/6/97	8/6/97	8/8/97	0-32-0
368	UV-ICR	UV	0.023	1/cm	SM 5910 B	1	0.009	8/3/97		8/4/97	8-0-59
369	UV-ICR	UV (Dupl)	0.022	1/cm	SM 5910 B	1	0.009	8/3/97		8/4/97	8-0-59
			0.022	**1/cm**	**4.5 % RPD**						

Sample ID: 66.10.Eff.10 **S&H ID:** 9708-41 **Date Sampled:** 8/3/97 9:33:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 66
Study Title: ICR RSSCT #3

370	Cl2Dose	Chlorine Dose	2.30	mg/L as Cl2	SM 4500-Cl B	1	n/a	8/5/97		8/5/97	n/a
371	Cl2Res	Chlorine Residual	0.68	mg/L as Cl2	SM 4500-Cl F	1	0.10	8/5/97		8/6/97	n/a
372	HAA	Bromochloroacetic acid	4.7	µg/L	SM 6251 B	1	1.0	8/6/97	8/18/97	8/25/97	MW65939
373	HAA	Bromodichloroacetic acid	2.8	µg/L	SM 6251 B	1	1.0	8/6/97	8/18/97	8/25/97	MW65939
374	HAA	Chlorodibromoacetic acid	ND	µg/L	SM 6251 B	1	2.0	8/6/97	8/18/97	8/25/97	MW65939
375	HAA	Dibromoacetic acid	2.2	µg/L	SM 6251 B	1	1.0	8/6/97	8/18/97	8/25/97	MW65939
376	HAA	Dichloroacetic acid	8.3	µg/L	SM 6251 B	1	1.0	8/6/97	8/18/97	8/25/97	MW65939
377	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	8/6/97	8/18/97	8/25/97	MW65939
378	HAA	Monochloroacetic acid	2.2	µg/L	SM 6251 B	1	2.0	8/6/97	8/18/97	8/25/97	MW65939
379	HAA	Tribromoacetic acid	ND	µg/L	SM 6251 B	1	4.0	8/6/97	8/18/97	8/25/97	MW65939
380	HAA	Trichloroacetic acid	3.2	µg/L	SM 6251 B	1	1.0	8/6/97	8/18/97	8/25/97	MW65939
381	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	8/5/97		8/6/97	n/a
382	pH	Cl2 pH - Initial	9.0	Unit	SM 4500-H+ B	1	n/a	8/5/97		8/5/97	n/a
383	pH	pH	8.6	Unit	SM 4500-H+ B	1	n/a	8/3/97		8/3/97	n/a
384	TEMP	Cl2 Temperature	20.1	ºC	SM 2550 B	1	n/a	8/5/97		8/6/97	n/a
385	TEMP	Temperature	21.4	ºC	SM 2550 B	1	n/a	8/3/97		8/3/97	n/a
386	TIME	Cl2 Incubation Time	24.0	hrs	n/a	1	n/a	8/5/97		8/6/97	n/a
387	TOC-ICR	TOC	1.82	mg/L	SM 5310 C	1	0.50	8/3/97		8/3/97	7-0-96
388	TOC-ICR	TOC (Dupl)	1.85	mg/L	SM 5310 C	1	0.50	8/3/97		8/3/97	7-0-96
			1.84	**mg/L**	**1.6 % RPD**						
389	TOX-ICR	TOX	109	µg Cl-/L	SM 5320 B	1	25	8/6/97		8/7/97	12-0-47
390	TOX-ICR	TOX (Dupl)	110	µg Cl-/L	SM 5320 B	1	25	8/6/97		8/7/97	12-0-47
			110	**µg Cl-/L**	**0.9 % RPD**						
391	THM-ICR	1,2,3-Trichloropropane (Surrogate)	92.0	%	EPA 551.1	1	1.0	8/6/97	8/6/97	8/8/97	0-32-0
392	THM-ICR	1,2,3-Trichloropropane (Surrogate) (Lab Dupl)	98.0	%	EPA 551.1	1	1.0	8/6/97	8/6/97	8/8/97	0-32-0
			95.0	**%**	**6.3 % RPD**						
393	THM-ICR	Bromodichloromethane	16.9	µg/L	EPA 551.1	1	1.0	8/6/97	8/6/97	8/8/97	0-32-0
394	THM-ICR	Bromodichloromethane (Lab Dupl)	17.5	µg/L	EPA 551.1	1	1.0	8/6/97	8/6/97	8/8/97	0-32-0
			17.2	**µg/L**	**3.5 % RPD**						
395	THM-ICR	Bromoform	ND	µg/L	EPA 551.1	1	1.0	8/6/97	8/6/97	8/8/97	0-32-0
396	THM-ICR	Bromoform (Lab Dupl)	ND	µg/L	EPA 551.1	1	1.0	8/6/97	8/6/97	8/8/97	0-32-0
			ND	**µg/L**							
397	THM-ICR	Chloroform	28.5	µg/L	EPA 551.1	1	1.0	8/6/97	8/6/97	8/8/97	0-32-0
398	THM-ICR	Chloroform (Lab Dupl)	29.5	µg/L	EPA 551.1	1	1.0	8/6/97	8/6/97	8/8/97	0-32-0
			29.0	**µg/L**	**3.4 % RPD**						
399	THM-ICR	Dibromochloromethane	8.7	µg/L	EPA 551.1	1	1.0	8/6/97	8/6/97	8/8/97	0-32-0
400	THM-ICR	Dibromochloromethane (Lab Dupl)	8.8	µg/L	EPA 551.1	1	1.0	8/6/97	8/6/97	8/8/97	0-32-0
			8.8	**µg/L**	**1.1 % RPD**						
401	UV-ICR	UV	0.026	1/cm	SM 5910 B	1	0.009	8/3/97		8/4/97	8-0-59
402	UV-ICR	UV (Dupl)	0.026	1/cm	SM 5910 B	1	0.009	8/3/97		8/4/97	8-0-59

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

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

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 66
Study Title: ICR RSSCT #3

			0.026	**1/cm**	**0.0 % RPD**						

Sample ID: 66.20.Eff.6 **S&H ID:** 9708-45 **Date Sampled:** 8/3/97 3:02:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
403	Cl2Dose	Chlorine Dose	1.86	mg/L as Cl2	SM 4500-Cl B	1	n/a	8/5/97		8/5/97	n/a
404	Cl2Res	Chlorine Residual	0.82	mg/L as Cl2	SM 4500-Cl F	1	0.10	8/5/97		8/6/97	n/a
405	HAA	Bromochloroacetic acid	1.4	µg/L	SM 6251 B	1	1.0	8/6/97	8/18/97	8/25/97	MW65939
406	HAA	Bromodichloroacetic acid	2.1	µg/L	SM 6251 B	1	1.0	8/6/97	8/18/97	8/25/97	MW65939
407	HAA	Chlorodibromoacetic acid	ND	µg/L	SM 6251 B	1	2.0	8/6/97	8/18/97	8/25/97	MW65939
408	HAA	Dibromoacetic acid	1.9	µg/L	SM 6251 B	1	1.0	8/6/97	8/18/97	8/25/97	MW65939
409	HAA	Dichloroacetic acid	1.1	µg/L	SM 6251 B	1	1.0	8/6/97	8/18/97	8/25/97	MW65939
410	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	8/6/97	8/18/97	8/25/97	MW65939
411	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	8/6/97	8/18/97	8/25/97	MW65939
412	HAA	Tribromoacetic acid	ND	µg/L	SM 6251 B	1	4.0	8/6/97	8/18/97	8/25/97	MW65939
413	HAA	Trichloroacetic acid	ND	µg/L	SM 6251 B	1	1.0	8/6/97	8/18/97	8/25/97	MW65939
414	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	8/5/97		8/6/97	n/a
415	pH	Cl2 pH - Initial	9.0	Unit	SM 4500-H+ B	1	n/a	8/5/97		8/5/97	n/a
416	pH	pH	8.1	Unit	SM 4500-H+ B	1	n/a	8/3/97		8/3/97	n/a
417	TEMP	Cl2 Temperature	20.1	ºC	SM 2550 B	1	n/a	8/5/97		8/6/97	n/a
418	TEMP	Temperature	23.2	ºC	SM 2550 B	1	n/a	8/3/97		8/3/97	n/a
419	TIME	Cl2 Incubation Time	24.0	hrs	n/a	1	n/a	8/5/97		8/6/97	n/a
420	TOC-ICR	TOC	0.72	mg/L	SM 5310 C	1	0.50	8/3/97		8/3/97	7-0-96
421	TOC-ICR	TOC (Dupl)	0.72	mg/L	SM 5310 C	1	0.50	8/3/97		8/3/97	7-0-96
			0.72	**mg/L**	**0.0 % RPD**						
422	TOX-ICR	TOX	ND	µg Cl-/L	SM 5320 B	1	25	8/6/97		8/12/97	12-0-48
423	TOX-ICR	TOX (Dupl)	ND	µg Cl-/L	SM 5320 B	1	25	8/6/97		8/12/97	12-0-48
			ND	**µg Cl-/L**							
424	THM-ICR	1,2,3-Trichloropropane (Surrogate)	102.4	%	EPA 551.1	1	1.0	8/6/97	8/6/97	8/8/97	0-32-0
425	THM-ICR	Bromodichloromethane	4.9	µg/L	EPA 551.1	1	1.0	8/6/97	8/6/97	8/8/97	0-32-0
426	THM-ICR	Bromoform	2.9	µg/L	EPA 551.1	1	1.0	8/6/97	8/6/97	8/8/97	0-32-0
427	THM-ICR	Chloroform	1.8	µg/L	EPA 551.1	1	1.0	8/6/97	8/6/97	8/8/97	0-32-0
428	THM-ICR	Dibromochloromethane	7.5	µg/L	EPA 551.1	1	1.0	8/6/97	8/6/97	8/8/97	0-32-0
429	UV-ICR	UV	ND	1/cm	SM 5910 B	1	0.009	8/3/97		8/4/97	8-0-59
430	UV-ICR	UV (Dupl)	ND	1/cm	SM 5910 B	1	0.009	8/3/97		8/4/97	8-0-59
			ND	**1/cm**							

Sample ID: 66.20.Eff.6d **S&H ID:** 9708-46 **Date Sampled:** 8/3/97 3:02:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 66
Study Title: ICR RSSCT #3

431	Cl2Dose	Chlorine Dose	1.86	mg/L as Cl2	SM 4500-Cl B	1	n/a	8/5/97		8/5/97	n/a
432	Cl2Res	Chlorine Residual	0.77	mg/L as Cl2	SM 4500-Cl F	1	0.10	8/5/97		8/6/97	n/a
433	HAA	Bromochloroacetic acid	1.6	µg/L	SM 6251 B	1	1.0	8/6/97	8/18/97	8/25/97	MW65939
434	HAA	Bromodichloroacetic acid	2.1	µg/L	SM 6251 B	1	1.0	8/6/97	8/18/97	8/25/97	MW65939
435	HAA	Chlorodibromoacetic acid	ND	µg/L	SM 6251 B	1	2.0	8/6/97	8/18/97	8/25/97	MW65939
436	HAA	Dibromoacetic acid	2.0	µg/L	SM 6251 B	1	1.0	8/6/97	8/18/97	8/25/97	MW65939
437	HAA	Dichloroacetic acid	1.2	µg/L	SM 6251 B	1	1.0	8/6/97	8/18/97	8/25/97	MW65939
438	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	8/6/97	8/18/97	8/25/97	MW65939
439	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	8/6/97	8/18/97	8/25/97	MW65939
440	HAA	Tribromoacetic acid	ND	µg/L	SM 6251 B	1	4.0	8/6/97	8/18/97	8/25/97	MW65939
441	HAA	Trichloroacetic acid	ND	µg/L	SM 6251 B	1	1.0	8/6/97	8/18/97	8/25/97	MW65939
442	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	8/5/97		8/6/97	n/a
443	pH	Cl2 pH - Initial	9.0	Unit	SM 4500-H+ B	1	n/a	8/5/97		8/5/97	n/a
444	pH	pH	8.1	Unit	SM 4500-H+ B	1	n/a	8/3/97		8/3/97	n/a
445	TEMP	Cl2 Temperature	20.1	ºC	SM 2550 B	1	n/a	8/5/97		8/6/97	n/a
446	TEMP	Temperature	22.2	ºC	SM 2550 B	1	n/a	8/3/97		8/3/97	n/a
447	TIME	Cl2 Incubation Time	24.0	hrs	n/a	1	n/a	8/5/97		8/6/97	n/a
448	TOC-ICR	TOC	0.72	mg/L	SM 5310 C	1	0.50	8/3/97		8/3/97	7-0-96
449	TOC-ICR	TOC (Dupl)	0.73	mg/L	SM 5310 C	1	0.50	8/3/97		8/3/97	7-0-96
			0.72	**mg/L**	**1.4 % RPD**						
450	TOX-ICR	TOX	26	µg Cl-/L	SM 5320 B	1	25	8/6/97		8/7/97	12-0-47
451	TOX-ICR	TOX (Dupl)	ND	µg Cl-/L	SM 5320 B	1	25	8/6/97		8/7/97	12-0-47
			ND	**µg Cl-/L**							
452	THM-ICR	1,2,3-Trichloropropane (Surrogate)	102.0	%	EPA 551.1	1	1.0	8/6/97	8/6/97	8/8/97	0-32-0
453	THM-ICR	Bromodichloromethane	5.0	µg/L	EPA 551.1	1	1.0	8/6/97	8/6/97	8/8/97	0-32-0
454	THM-ICR	Bromoform	2.8	µg/L	EPA 551.1	1	1.0	8/6/97	8/6/97	8/8/97	0-32-0
455	THM-ICR	Chloroform	1.8	µg/L	EPA 551.1	1	1.0	8/6/97	8/6/97	8/8/97	0-32-0
456	THM-ICR	Dibromochloromethane	7.4	µg/L	EPA 551.1	1	1.0	8/6/97	8/6/97	8/8/97	0-32-0
457	UV-ICR	UV	ND	1/cm	SM 5910 B	1	0.009	8/3/97		8/4/97	8-0-59
458	UV-ICR	UV (Dupl)	ND	1/cm	SM 5910 B	1	0.009	8/3/97		8/4/97	8-0-59
			ND	**1/cm**							

Sample ID: 66.10.Eff.12 **S&H ID:** 9708-49 **Date Sampled:** 8/4/97 7:18:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
459	Cl2Dose	Chlorine Dose	2.36	mg/L as Cl2	SM 4500-Cl B	1	n/a	8/5/97		8/5/97	n/a
460	Cl2Res	Chlorine Residual	0.67	mg/L as Cl2	SM 4500-Cl F	1	0.10	8/5/97		8/6/97	n/a
461	HAA	Bromochloroacetic acid	5.0	µg/L	SM 6251 B	1	1.0	8/6/97	8/18/97	8/25/97	MW65939
462	HAA	Bromodichloroacetic acid	2.9	µg/L	SM 6251 B	1	1.0	8/6/97	8/18/97	8/25/97	MW65939
463	HAA	Chlorodibromoacetic acid	2.0	µg/L	SM 6251 B	1	2.0	8/6/97	8/18/97	8/25/97	MW65939

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 66
Study Title: ICR RSSCT #3

464	HAA	Dibromoacetic acid	2.0	µg/L	SM 6251 B	1	1.0	8/6/97	8/18/97	8/25/97	MW65939
465	HAA	Dichloroacetic acid	9.3	µg/L	SM 6251 B	1	1.0	8/6/97	8/18/97	8/25/97	MW65939
466	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	8/6/97	8/18/97	8/25/97	MW65939
467	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	8/6/97	8/18/97	8/25/97	MW65939
468	HAA	Tribromoacetic acid	ND	µg/L	SM 6251 B	1	4.0	8/6/97	8/18/97	8/25/97	MW65939
469	HAA	Trichloroacetic acid	3.7	µg/L	SM 6251 B	1	1.0	8/6/97	8/18/97	8/25/97	MW65939
470	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	8/5/97		8/6/97	n/a
471	pH	Cl2 pH - Initial	9.0	Unit	SM 4500-H+ B	1	n/a	8/5/97		8/5/97	n/a
472	pH	pH	8.4	Unit	SM 4500-H+ B	1	n/a	8/4/97		8/4/97	n/a
473	TEMP	Cl2 Temperature	20.1	ºC	SM 2550 B	1	n/a	8/5/97		8/6/97	n/a
474	TEMP	Temperature	21.3	ºC	SM 2550 B	1	n/a	8/4/97		8/4/97	n/a
475	TIME	Cl2 Incubation Time	24.0	hrs	n/a	1	n/a	8/5/97		8/6/97	n/a
476	TOC-ICR	TOC	2.00	mg/L	SM 5310 C	1	0.50	8/4/97		8/4/97	7-0-97
477	TOC-ICR	TOC (Dupl)	1.99	mg/L	SM 5310 C	1	0.50	8/4/97		8/4/97	7-0-97
			2.00	**mg/L**	**0.5 % RPD**						
478	TOX-ICR	TOX	120	µg Cl-/L	SM 5320 B	1	25	8/6/97		8/7/97	12-0-47
479	TOX-ICR	TOX (Dupl)	121	µg Cl-/L	SM 5320 B	1	25	8/6/97		8/7/97	12-0-47
			121	**µg Cl-/L**	**0.8 % RPD**						
480	THM-ICR	1,2,3-Trichloropropane (Surrogate)	102.4	%	EPA 551.1	1	1.0	8/6/97	8/6/97	8/8/97	0-32-0
481	THM-ICR	Bromodichloromethane	18.8	µg/L	EPA 551.1	1	1.0	8/6/97	8/6/97	8/8/97	0-32-0
482	THM-ICR	Bromoform	ND	µg/L	EPA 551.1	1	1.0	8/6/97	8/6/97	8/8/97	0-32-0
483	THM-ICR	Chloroform	35.5	µg/L	EPA 551.1	1	1.0	8/6/97	8/6/97	8/8/97	0-32-0
484	THM-ICR	Dibromochloromethane	8.8	µg/L	EPA 551.1	1	1.0	8/6/97	8/6/97	8/8/97	0-32-0
485	UV-ICR	UV	0.029	1/cm	SM 5910 B	1	0.009	8/4/97		8/4/97	8-0-59
486	UV-ICR	UV (Dupl)	0.029	1/cm	SM 5910 B	1	0.009	8/4/97		8/4/97	8-0-59
			0.029	**1/cm**	**0.0 % RPD**						

Sample ID: 66.20.Eff.8 **S&H ID:** 9708-59 **Date Sampled:** 8/4/97 12:01:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
487	Cl2Dose	Chlorine Dose	1.97	mg/L as Cl2	SM 4500-Cl B	1	n/a	8/5/97		8/5/97	n/a
488	Cl2Res	Chlorine Residual	0.83	mg/L as Cl2	SM 4500-Cl F	1	0.10	8/5/97		8/6/97	n/a
489	HAA	Bromochloroacetic acid	2.8	µg/L	SM 6251 B	1	1.0	8/6/97	8/19/97	8/25/97	MW65882
490	HAA	Bromodichloroacetic acid	1.3	µg/L	SM 6251 B	1	1.0	8/6/97	8/19/97	8/25/97	MW65882
491	HAA	Chlorodibromoacetic acid	ND	µg/L	SM 6251 B	1	2.0	8/6/97	8/19/97	8/25/97	MW65882
492	HAA	Dibromoacetic acid	3.0	µg/L	SM 6251 B	1	1.0	8/6/97	8/19/97	8/25/97	MW65882
493	HAA	Dichloroacetic acid	3.1	µg/L	SM 6251 B	1	1.0	8/6/97	8/19/97	8/25/97	MW65882
494	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	8/6/97	8/19/97	8/25/97	MW65882
495	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	8/6/97	8/19/97	8/25/97	MW65882
496	HAA	Tribromoacetic acid	ND	µg/L	SM 6251 B	1	4.0	8/6/97	8/19/97	8/25/97	MW65882

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 66
Study Title: ICR RSSCT #3

497	HAA	Trichloroacetic acid	1.2	µg/L	SM 6251 B	1	1.0	8/6/97	8/19/97	8/25/97	MW65882
498	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	8/5/97		8/6/97	n/a
499	pH	Cl2 pH - Initial	9.0	Unit	SM 4500-H+ B	1	n/a	8/5/97		8/5/97	n/a
500	pH	pH	8.0	Unit	SM 4500-H+ B	1	n/a	8/4/97		8/4/97	n/a
501	TEMP	Cl2 Temperature	20.1	ºC	SM 2550 B	1	n/a	8/5/97		8/6/97	n/a
502	TEMP	Temperature	22.2	ºC	SM 2550 B	1	n/a	8/4/97		8/4/97	n/a
503	TIME	Cl2 Incubation Time	24.0	hrs	n/a	1	n/a	8/5/97		8/6/97	n/a
504	TOC-ICR	TOC	0.99	mg/L	SM 5310 C	1	0.50	8/4/97		8/4/97	7-0-97
505	TOC-ICR	TOC (Dupl)	0.96	mg/L	SM 5310 C	1	0.50	8/4/97		8/4/97	7-0-97
			0.97	**mg/L**	**3.1 % RPD**						
506	TOX-ICR	TOX	37	µg Cl-/L	SM 5320 B	1	25	8/6/97		8/12/97	12-0-48
507	TOX-ICR	TOX (Dupl)	38	µg Cl-/L	SM 5320 B	1	25	8/6/97		8/12/97	12-0-48
			38	**µg Cl-/L**	**2.6 % RPD**						
508	THM-ICR	1,2,3-Trichloropropane (Surrogate)	108.8	%	EPA 551.1	1	1.0	8/6/97	8/6/97	8/8/97	0-32-0
509	THM-ICR	Bromodichloromethane	9.3	µg/L	EPA 551.1	1	1.0	8/6/97	8/6/97	8/8/97	0-32-0
510	THM-ICR	Bromoform	2.4	µg/L	EPA 551.1	1	1.0	8/6/97	8/6/97	8/8/97	0-32-0
511	THM-ICR	Chloroform	5.0	µg/L	EPA 551.1	1	1.0	8/6/97	8/6/97	8/8/97	0-32-0
512	THM-ICR	Dibromochloromethane	10.3	µg/L	EPA 551.1	1	1.0	8/6/97	8/6/97	8/8/97	0-32-0
513	UV-ICR	UV	0.011	1/cm	SM 5910 B	1	0.009	8/4/97		8/4/97	8-0-59
514	UV-ICR	UV (Dupl)	0.011	1/cm	SM 5910 B	1	0.009	8/4/97		8/4/97	8-0-59
			0.011	**1/cm**	**0.0 % RPD**						

Sample ID: 66.20.Eff.10 **S&H ID:** 9708-72 **Date Sampled:** 8/5/97 8:52:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
515	Cl2Dose	Chlorine Dose	2.00	mg/L as Cl2	SM 4500-Cl B	1	n/a	8/6/97		8/6/97	n/a
516	Cl2Res	Chlorine Residual	0.76	mg/L as Cl2	SM 4500-Cl F	1	0.10	8/6/97		8/7/97	n/a
517	HAA	Bromochloroacetic acid	2.8	µg/L	SM 6251 B	1	1.0	8/7/97	8/19/97	8/26/97	MW65867
518	HAA	Bromodichloroacetic acid	2.4	µg/L	SM 6251 B	1	1.0	8/7/97	8/19/97	8/26/97	MW65867
519	HAA	Chlorodibromoacetic acid	ND	µg/L	SM 6251 B	1	2.0	8/7/97	8/19/97	8/26/97	MW65867
520	HAA	Dibromoacetic acid	2.2	µg/L	SM 6251 B	1	1.0	8/7/97	8/19/97	8/26/97	MW65867
521	HAA	Dichloroacetic acid	4.2	µg/L	SM 6251 B	1	1.0	8/7/97	8/19/97	8/26/97	MW65867
522	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	8/7/97	8/19/97	8/26/97	MW65867
523	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	8/7/97	8/19/97	8/26/97	MW65867
524	HAA	Tribromoacetic acid	ND	µg/L	SM 6251 B	1	4.0	8/7/97	8/19/97	8/26/97	MW65867
525	HAA	Trichloroacetic acid	ND	µg/L	SM 6251 B	1	1.0	8/7/97	8/19/97	8/26/97	MW65867
526	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	8/6/97		8/7/97	n/a
527	pH	Cl2 pH - Initial	9.0	Unit	SM 4500-H+ B	1	n/a	8/6/97		8/6/97	n/a
528	pH	pH	7.9	Unit	SM 4500-H+ B	1	n/a	8/5/97		8/5/97	n/a
529	TEMP	Cl2 Temperature	20.2	ºC	SM 2550 B	1	n/a	8/6/97		8/7/97	n/a

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 66
Study Title: ICR RSSCT #3

530	TEMP	Temperature	22.3	ºC	SM 2550 B	1	n/a	8/5/97		8/5/97	n/a
531	TIME	Cl2 Incubation Time	24.1	hrs	n/a	1	n/a	8/6/97		8/7/97	n/a
532	TOC-ICR	TOC	1.06	mg/L	SM 5310 C	1	0.50	8/5/97		8/5/97	7-0-98
533	TOC-ICR	TOC (Dupl)	1.07	mg/L	SM 5310 C	1	0.50	8/5/97		8/5/97	7-0-98
			1.06	**mg/L**	**0.9 % RPD**						
534	TOX-ICR	TOX	60	µg Cl-/L	SM 5320 B	1	25	8/7/97		8/13/97	12-0-49
535	TOX-ICR	TOX (Dupl)	62	µg Cl-/L	SM 5320 B	1	25	8/7/97		8/13/97	12-0-49
			61	**µg Cl-/L**	**3.3 % RPD**						
536	THM-ICR	1,2,3-Trichloropropane (Surrogate)	95.6	%	EPA 551.1	1	1.0	8/7/97	8/15/97	8/15/97	0-39-0
537	THM-ICR	Bromodichloromethane	10.6	µg/L	EPA 551.1	1	1.0	8/7/97	8/15/97	8/15/97	0-39-0
538	THM-ICR	Bromoform	2.5	µg/L	EPA 551.1	1	1.0	8/7/97	8/15/97	8/15/97	0-39-0
539	THM-ICR	Chloroform	6.9	µg/L	EPA 551.1	1	1.0	8/7/97	8/15/97	8/15/97	0-39-0
540	THM-ICR	Dibromochloromethane	10.6	µg/L	EPA 551.1	1	1.0	8/7/97	8/15/97	8/15/97	0-39-0
541	UV-ICR	UV	0.013	1/cm	SM 5910 B	1	0.009	8/5/97		8/6/97	8-0-61
542	UV-ICR	UV (Dupl)	0.013	1/cm	SM 5910 B	1	0.009	8/5/97		8/6/97	8-0-61
			0.013	**1/cm**	**0.0 % RPD**						

Sample ID: 66.10.Eff.15 **S&H ID:** 9708-84 **Date Sampled:** 8/5/97 4:10:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
543	Cl2Dose	Chlorine Dose	2.52	mg/L as Cl2	SM 4500-Cl B	1	n/a	8/6/97		8/6/97	n/a
544	Cl2Res	Chlorine Residual	0.62	mg/L as Cl2	SM 4500-Cl F	1	0.10	8/6/97		8/7/97	n/a
545	HAA	Bromochloroacetic acid	5.3	µg/L	SM 6251 B	1	1.0	8/7/97	8/19/97	8/26/97	MW65867
546	HAA	Bromodichloroacetic acid	2.9	µg/L	SM 6251 B	1	1.0	8/7/97	8/19/97	8/26/97	MW65867
547	HAA	Chlorodibromoacetic acid	ND	µg/L	SM 6251 B	1	2.0	8/7/97	8/19/97	8/26/97	MW65867
548	HAA	Dibromoacetic acid	1.6	µg/L	SM 6251 B	1	1.0	8/7/97	8/19/97	8/26/97	MW65867
549	HAA	Dichloroacetic acid	12.0	µg/L	SM 6251 B	1	1.0	8/7/97	8/19/97	8/26/97	MW65867
550	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	8/7/97	8/19/97	8/26/97	MW65867
551	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	8/7/97	8/19/97	8/26/97	MW65867
552	HAA	Tribromoacetic acid	ND	µg/L	SM 6251 B	1	4.0	8/7/97	8/19/97	8/26/97	MW65867
553	HAA	Trichloroacetic acid	4.7	µg/L	SM 6251 B	1	1.0	8/7/97	8/19/97	8/26/97	MW65867
554	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	8/6/97		8/7/97	n/a
555	pH	Cl2 pH - Initial	9.0	Unit	SM 4500-H+ B	1	n/a	8/6/97		8/6/97	n/a
556	pH	pH	8.3	Unit	SM 4500-H+ B	1	n/a	8/5/97		8/5/97	n/a
557	TEMP	Cl2 Temperature	20.2	ºC	SM 2550 B	1	n/a	8/6/97		8/7/97	n/a
558	TEMP	Temperature	21.8	ºC	SM 2550 B	1	n/a	8/5/97		8/5/97	n/a
559	TIME	Cl2 Incubation Time	24.0	hrs	n/a	1	n/a	8/6/97		8/7/97	n/a
560	TOC-ICR	TOC	2.21	mg/L	SM 5310 C	1	0.50	8/5/97		8/5/97	7-0-98
561	TOC-ICR	TOC (Dupl)	2.21	mg/L	SM 5310 C	1	0.50	8/5/97		8/5/97	7-0-98
			2.21	**mg/L**	**0.0 % RPD**						

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 66
Study Title: ICR RSSCT #3

562	TOX-ICR	TOX	135	µg Cl-/L	SM 5320 B	1	25	8/7/97		8/12/97	12-0-48
563	TOX-ICR	TOX (Dupl)	142	µg Cl-/L	SM 5320 B	1	25	8/7/97		8/12/97	12-0-48
			139	**µg Cl-/L**	**5.0 % RPD**						
564	THM-ICR	1,2,3-Trichloropropane (Surrogate)	91.2	%	EPA 551.1	1	1.0	8/7/97	8/15/97	8/15/97	0-39-0
565	THM-ICR	Bromodichloromethane	19.0	µg/L	EPA 551.1	1	1.0	8/7/97	8/15/97	8/15/97	0-39-0
566	THM-ICR	Bromoform	ND	µg/L	EPA 551.1	1	1.0	8/7/97	8/15/97	8/15/97	0-39-0
567	THM-ICR	Chloroform	41.3	µg/L	EPA 551.1	1	1.0	8/7/97	8/15/97	8/15/97	0-39-0
568	THM-ICR	Dibromochloromethane	7.7	µg/L	EPA 551.1	1	1.0	8/7/97	8/15/97	8/15/97	0-39-0
569	UV-ICR	UV	0.036	1/cm	SM 5910 B	1	0.009	8/5/97		8/6/97	8-0-61
570	UV-ICR	UV (Dupl)	0.036	1/cm	SM 5910 B	1	0.009	8/5/97		8/6/97	8-0-61
			0.036	**1/cm**	**0.0 % RPD**						

Sample ID: 66.10.Eff.15d **S&H ID:** 9708-85 **Date Sampled:** 8/5/97 4:10:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
571	Cl2Dose	Chlorine Dose	2.52	mg/L as Cl2	SM 4500-Cl B	1	n/a	8/6/97		8/6/97	n/a
572	Cl2Res	Chlorine Residual	0.62	mg/L as Cl2	SM 4500-Cl F	1	0.10	8/6/97		8/7/97	n/a
573	HAA	Bromochloroacetic acid	5.3	µg/L	SM 6251 B	1	1.0	8/7/97	8/19/97	8/26/97	MW65867
574	HAA	Bromodichloroacetic acid	3.0	µg/L	SM 6251 B	1	1.0	8/7/97	8/19/97	8/26/97	MW65867
575	HAA	Chlorodibromoacetic acid	ND	µg/L	SM 6251 B	1	2.0	8/7/97	8/19/97	8/26/97	MW65867
576	HAA	Dibromoacetic acid	1.6	µg/L	SM 6251 B	1	1.0	8/7/97	8/19/97	8/26/97	MW65867
577	HAA	Dichloroacetic acid	11.0	µg/L	SM 6251 B	1	1.0	8/7/97	8/19/97	8/26/97	MW65867
578	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	8/7/97	8/19/97	8/26/97	MW65867
579	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	8/7/97	8/19/97	8/26/97	MW65867
580	HAA	Tribromoacetic acid	ND	µg/L	SM 6251 B	1	4.0	8/7/97	8/19/97	8/26/97	MW65867
581	HAA	Trichloroacetic acid	4.7	µg/L	SM 6251 B	1	1.0	8/7/97	8/19/97	8/26/97	MW65867
582	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	8/6/97		8/7/97	n/a
583	pH	Cl2 pH - Initial	9.0	Unit	SM 4500-H+ B	1	n/a	8/6/97		8/6/97	n/a
584	pH	pH	8.3	Unit	SM 4500-H+ B	1	n/a	8/5/97		8/5/97	n/a
585	TEMP	Cl2 Temperature	20.2	ºC	SM 2550 B	1	n/a	8/6/97		8/7/97	n/a
586	TEMP	Temperature	21.8	ºC	SM 2550 B	1	n/a	8/5/97		8/5/97	n/a
587	TIME	Cl2 Incubation Time	24.0	hrs	n/a	1	n/a	8/6/97		8/7/97	n/a
588	TOC-ICR	TOC	2.21	mg/L	SM 5310 C	1	0.50	8/5/97		8/5/97	7-0-98
589	TOC-ICR	TOC (Dupl)	2.20	mg/L	SM 5310 C	1	0.50	8/5/97		8/5/97	7-0-98
			2.21	**mg/L**	**0.5 % RPD**						
590	TOX-ICR	TOX	139	µg Cl-/L	SM 5320 B	1	25	8/7/97		8/13/97	12-0-49
591	TOX-ICR	TOX (Dupl)	138	µg Cl-/L	SM 5320 B	1	25	8/7/97		8/13/97	12-0-49
			139	**µg Cl-/L**	**0.7 % RPD**						
592	THM-ICR	1,2,3-Trichloropropane (Surrogate)	99.6	%	EPA 551.1	1	1.0	8/7/97	8/15/97	8/15/97	0-39-0

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 66
Study Title: ICR RSSCT #3

593	THM-ICR	Bromodichloromethane	18.9	µg/L	EPA 551.1	1	1.0	8/7/97	8/15/97	8/15/97	0-39-0
594	THM-ICR	Bromoform	ND	µg/L	EPA 551.1	1	1.0	8/7/97	8/15/97	8/15/97	0-39-0
595	THM-ICR	Chloroform	42.6	µg/L	EPA 551.1	1	1.0	8/7/97	8/15/97	8/15/97	0-39-0
596	THM-ICR	Dibromochloromethane	7.8	µg/L	EPA 551.1	1	1.0	8/7/97	8/15/97	8/15/97	0-39-0
597	UV-ICR	UV	0.036	1/cm	SM 5910 B	1	0.009	8/5/97		8/6/97	8-0-61
598	UV-ICR	UV (Dupl)	0.036	1/cm	SM 5910 B	1	0.009	8/5/97		8/6/97	8-0-61
			0.036	**1/cm**	**0.0 % RPD**						

Sample ID: 66.20.Eff.12 **S&H ID:** 9708-88 **Date Sampled:** 8/6/97 5:54:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
599	Cl2Dose	Chlorine Dose	2.09	mg/L as Cl2	SM 4500-Cl B	1	n/a	8/6/97		8/6/97	n/a
600	Cl2Res	Chlorine Residual	0.75	mg/L as Cl2	SM 4500-Cl F	1	0.10	8/6/97		8/7/97	n/a
601	HAA	Bromochloroacetic acid	3.6	µg/L	SM 6251 B	1	1.0	8/7/97	8/19/97	8/26/97	MW65867
602	HAA	Bromodichloroacetic acid	2.5	µg/L	SM 6251 B	1	1.0	8/7/97	8/19/97	8/26/97	MW65867
603	HAA	Chlorodibromoacetic acid	ND	µg/L	SM 6251 B	1	2.0	8/7/97	8/19/97	8/26/97	MW65867
604	HAA	Dibromoacetic acid	2.3	µg/L	SM 6251 B	1	1.0	8/7/97	8/19/97	8/26/97	MW65867
605	HAA	Dichloroacetic acid	4.9	µg/L	SM 6251 B	1	1.0	8/7/97	8/19/97	8/26/97	MW65867
606	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	8/7/97	8/19/97	8/26/97	MW65867
607	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	8/7/97	8/19/97	8/26/97	MW65867
608	HAA	Tribromoacetic acid	ND	µg/L	SM 6251 B	1	4.0	8/7/97	8/19/97	8/26/97	MW65867
609	HAA	Trichloroacetic acid	1.3	µg/L	SM 6251 B	1	1.0	8/7/97	8/19/97	8/26/97	MW65867
610	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	8/6/97		8/7/97	n/a
611	pH	Cl2 pH - Initial	9.0	Unit	SM 4500-H+ B	1	n/a	8/6/97		8/6/97	n/a
612	pH	pH	7.9	Unit	SM 4500-H+ B	1	n/a	8/6/97		8/6/97	n/a
613	TEMP	Cl2 Temperature	20.2	ºC	SM 2550 B	1	n/a	8/6/97		8/7/97	n/a
614	TEMP	Temperature	22.0	ºC	SM 2550 B	1	n/a	8/6/97		8/6/97	n/a
615	TIME	Cl2 Incubation Time	24.1	hrs	n/a	1	n/a	8/6/97		8/7/97	n/a
616	TOC-ICR	TOC	1.31	mg/L	SM 5310 C	1	0.50	8/6/97		8/7/97	7-0-99
617	TOC-ICR	TOC (Dupl)	1.32	mg/L	SM 5310 C	1	0.50	8/6/97		8/7/97	7-0-99
			1.31	**mg/L**	**0.8 % RPD**						
618	TOX-ICR	TOX	65	µg Cl-/L	SM 5320 B	1	25	8/7/97		8/12/97	12-0-48
619	TOX-ICR	TOX (Dupl)	60	µg Cl-/L	SM 5320 B	1	25	8/7/97		8/12/97	12-0-48
			63	**µg Cl-/L**	**7.9 % RPD**						
620	THM-ICR	1,2,3-Trichloropropane (Surrogate)	99.2	%	EPA 551.1	1	1.0	8/7/97	8/15/97	8/18/97	0-39-0
621	THM-ICR	Bromodichloromethane	12.9	µg/L	EPA 551.1	1	1.0	8/7/97	8/15/97	8/18/97	0-39-0
622	THM-ICR	Bromoform	1.9	µg/L	EPA 551.1	1	1.0	8/7/97	8/15/97	8/18/97	0-39-0
623	THM-ICR	Chloroform	12.5	µg/L	EPA 551.1	1	1.0	8/7/97	8/15/97	8/18/97	0-39-0
624	THM-ICR	Dibromochloromethane	10.6	µg/L	EPA 551.1	1	1.0	8/7/97	8/15/97	8/18/97	0-39-0
625	UV-ICR	UV	0.017	1/cm	SM 5910 B	1	0.009	8/6/97		8/6/97	8-0-61

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 66
Study Title: ICR RSSCT #3

626	UV-ICR	UV (Dupl)	0.017	1/cm	SM 5910 B	1	0.009	8/6/97		8/6/97	8-0-61
			0.017	**1/cm**	**0.0 % RPD**						

Sample ID: 66.10.Eff.17 **S&H ID:** 9708-89 **Date Sampled:** 8/6/97 1:47:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
627	Cl2Dose	Chlorine Dose	2.59	mg/L as Cl2	SM 4500-Cl B	1	n/a	8/6/97		8/6/97	n/a
628	Cl2Res	Chlorine Residual	0.61	mg/L as Cl2	SM 4500-Cl F	1	0.10	8/6/97		8/7/97	n/a
629	HAA	Bromochloroacetic acid	5.5	µg/L	SM 6251 B	1	1.0	8/7/97	8/19/97	8/26/97	MW65867
630	HAA	Bromodichloroacetic acid	3.1	µg/L	SM 6251 B	1	1.0	8/7/97	8/19/97	8/26/97	MW65867
631	HAA	Chlorodibromoacetic acid	ND	µg/L	SM 6251 B	1	2.0	8/7/97	8/19/97	8/26/97	MW65867
632	HAA	Dibromoacetic acid	1.5	µg/L	SM 6251 B	1	1.0	8/7/97	8/19/97	8/26/97	MW65867
633	HAA	Dichloroacetic acid	13.0	µg/L	SM 6251 B	1	1.0	8/7/97	8/19/97	8/26/97	MW65867
634	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	8/7/97	8/19/97	8/26/97	MW65867
635	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	8/7/97	8/19/97	8/26/97	MW65867
636	HAA	Tribromoacetic acid	ND	µg/L	SM 6251 B	1	4.0	8/7/97	8/19/97	8/26/97	MW65867
637	HAA	Trichloroacetic acid	5.3	µg/L	SM 6251 B	1	1.0	8/7/97	8/19/97	8/26/97	MW65867
638	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	8/6/97		8/7/97	n/a
639	pH	Cl2 pH - Initial	9.0	Unit	SM 4500-H+ B	1	n/a	8/6/97		8/6/97	n/a
640	pH	pH	8.4	Unit	SM 4500-H+ B	1	n/a	8/6/97		8/6/97	n/a
641	TEMP	Cl2 Temperature	20.2	ºC	SM 2550 B	1	n/a	8/6/97		8/7/97	n/a
642	TEMP	Temperature	21.6	ºC	SM 2550 B	1	n/a	8/6/97		8/6/97	n/a
643	TIME	Cl2 Incubation Time	24.0	hrs	n/a	1	n/a	8/6/97		8/7/97	n/a
644	TOC-ICR	TOC	2.41	mg/L	SM 5310 C	1	0.50	8/6/97		8/7/97	7-0-99
645	TOC-ICR	TOC (Dupl)	2.37	mg/L	SM 5310 C	1	0.50	8/6/97		8/7/97	7-0-99
			2.39	**mg/L**	**1.7 % RPD**						
646	TOX-ICR	TOX	157	µg Cl-/L	SM 5320 B	1	25	8/7/97		8/13/97	12-0-49
647	TOX-ICR	TOX (Dupl)	150	µg Cl-/L	SM 5320 B	1	25	8/7/97		8/13/97	12-0-49
			154	**µg Cl-/L**	**4.5 % RPD**						
648	THM-ICR	1,2,3-Trichloropropane (Surrogate)	98.4	%	EPA 551.1	1	1.0	8/7/97	8/15/97	8/15/97	0-39-0
649	THM-ICR	1,2,3-Trichloropropane (Surrogate) (Lab Dupl)	98.4	%	EPA 551.1	1	1.0	8/7/97	8/15/97	8/15/97	0-39-0
			98.4	**%**	**0.0 % RPD**						
650	THM-ICR	Bromodichloromethane	19.0	µg/L	EPA 551.1	1	1.0	8/7/97	8/15/97	8/15/97	0-39-0
651	THM-ICR	Bromodichloromethane (Lab Dupl)	18.5	µg/L	EPA 551.1	1	1.0	8/7/97	8/15/97	8/15/97	0-39-0
			18.8	**µg/L**	**2.7 % RPD**						
652	THM-ICR	Bromoform	ND	µg/L	EPA 551.1	1	1.0	8/7/97	8/15/97	8/15/97	0-39-0
653	THM-ICR	Bromoform (Lab Dupl)	ND	µg/L	EPA 551.1	1	1.0	8/7/97	8/15/97	8/15/97	0-39-0
			ND	**µg/L**							
654	THM-ICR	Chloroform	49.6	µg/L	EPA 551.1	2	1.0	8/7/97	8/15/97	8/18/97	0-39-0
655	THM-ICR	Chloroform (Lab Dupl)	47.9	µg/L	EPA 551.1	2	1.0	8/7/97	8/15/97	8/18/97	0-39-0

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 66
Study Title: ICR RSSCT #3

			48.8	**µg/L**	**3.5 % RPD**						
656	THM-ICR	Dibromochloromethane	7.2	µg/L	EPA 551.1	1	1.0	8/7/97	8/15/97	8/15/97	0-39-0
657	THM-ICR	Dibromochloromethane (Lab Dupl)	7.3	µg/L	EPA 551.1	1	1.0	8/7/97	8/15/97	8/15/97	0-39-0
			7.3	**µg/L**	**1.4 % RPD**						
658	UV-ICR	UV	0.039	1/cm	SM 5910 B	1	0.009	8/6/97		8/6/97	8-0-61
659	UV-ICR	UV (Dupl)	0.039	1/cm	SM 5910 B	1	0.009	8/6/97		8/6/97	8-0-61
			0.039	**1/cm**	**0.0 % RPD**						

Sample ID: 66.20.Eff.14 **S&H ID:** 9708-94 **Date Sampled:** 8/7/97 3:08:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
660	Cl2Dose	Chlorine Dose	2.21	mg/L as Cl2	SM 4500-Cl B	1	n/a	8/9/97		8/9/97	n/a
661	Cl2Res	Chlorine Residual	0.77	mg/L as Cl2	SM 4500-Cl F	1	0.10	8/9/97		8/10/97	n/a
662	HAA	Bromochloroacetic acid	4.1	µg/L	SM 6251 B	1	1.0	8/10/97	8/19/97	8/26/97	MW65867
663	HAA	Bromodichloroacetic acid	2.8	µg/L	SM 6251 B	1	1.0	8/10/97	8/19/97	8/26/97	MW65867
664	HAA	Chlorodibromoacetic acid	ND	µg/L	SM 6251 B	1	2.0	8/10/97	8/19/97	8/26/97	MW65867
665	HAA	Dibromoacetic acid	2.2	µg/L	SM 6251 B	1	1.0	8/10/97	8/19/97	8/26/97	MW65867
666	HAA	Dichloroacetic acid	5.7	µg/L	SM 6251 B	1	1.0	8/10/97	8/19/97	8/26/97	MW65867
667	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	8/10/97	8/19/97	8/26/97	MW65867
668	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	8/10/97	8/19/97	8/26/97	MW65867
669	HAA	Tribromoacetic acid	ND	µg/L	SM 6251 B	1	4.0	8/10/97	8/19/97	8/26/97	MW65867
670	HAA	Trichloroacetic acid	1.8	µg/L	SM 6251 B	1	1.0	8/10/97	8/19/97	8/26/97	MW65867
671	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	8/9/97		8/10/97	n/a
672	pH	Cl2 pH - Initial	9.0	Unit	SM 4500-H+ B	1	n/a	8/9/97		8/9/97	n/a
673	pH	pH	7.9	Unit	SM 4500-H+ B	1	n/a	8/7/97		8/7/97	n/a
674	TEMP	Cl2 Temperature	19.8	ºC	SM 2550 B	1	n/a	8/9/97		8/10/97	n/a
675	TEMP	Temperature	22.0	ºC	SM 2550 B	1	n/a	8/7/97		8/7/97	n/a
676	TIME	Cl2 Incubation Time	24.0	hrs	n/a	1	n/a	8/9/97		8/10/97	n/a
677	TOC-ICR	TOC	1.48	mg/L	SM 5310 C	1	0.50	8/7/97		8/7/97	7-0-99
678	TOC-ICR	TOC (Dupl)	1.46	mg/L	SM 5310 C	1	0.50	8/7/97		8/7/97	7-0-99
			1.47	**mg/L**	**1.4 % RPD**						
679	TOX-ICR	TOX	76	µg Cl-/L	SM 5320 B	1	25	8/10/97		8/13/97	12-0-49
680	TOX-ICR	TOX (Dupl)	81	µg Cl-/L	SM 5320 B	1	25	8/10/97		8/13/97	12-0-49
			79	**µg Cl-/L**	**6.3 % RPD**						
681	THM-ICR	1,2,3-Trichloropropane (Surrogate)	101.2	%	EPA 551.1	1	1.0	8/10/97	8/15/97	8/15/97	0-39-0
682	THM-ICR	Bromodichloromethane	14.4	µg/L	EPA 551.1	1	1.0	8/10/97	8/15/97	8/15/97	0-39-0
683	THM-ICR	Bromoform	1.3	µg/L	EPA 551.1	1	1.0	8/10/97	8/15/97	8/15/97	0-39-0
684	THM-ICR	Chloroform	15.7	µg/L	EPA 551.1	1	1.0	8/10/97	8/15/97	8/15/97	0-39-0
685	THM-ICR	Dibromochloromethane	9.8	µg/L	EPA 551.1	1	1.0	8/10/97	8/15/97	8/15/97	0-39-0
686	UV-ICR	UV	0.020	1/cm	SM 5910 B	1	0.009	8/7/97		8/8/97	8-0-62

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 66
Study Title: ICR RSSCT #3

687	UV-ICR	UV (Dupl)	0.020	1/cm	SM 5910 B	1	0.009	8/7/97		8/8/97	8-0-62
			0.020	**1/cm**	**0.0 % RPD**						

Sample ID: 66.20.Eff.14d **S&H ID:** 9708-95 **Date Sampled:** 8/7/97 3:08:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
688	Cl2Dose	Chlorine Dose	2.21	mg/L as Cl2	SM 4500-Cl B	1	n/a	8/9/97		8/9/97	n/a
689	Cl2Res	Chlorine Residual	0.77	mg/L as Cl2	SM 4500-Cl F	1	0.10	8/9/97		8/10/97	n/a
690	HAA	Bromochloroacetic acid	4.8	µg/L	SM 6251 B	1	1.0	8/10/97	8/19/97	8/26/97	MW65867
691	HAA	Bromodichloroacetic acid	2.9	µg/L	SM 6251 B	1	1.0	8/10/97	8/19/97	8/26/97	MW65867
692	HAA	Chlorodibromoacetic acid	ND	µg/L	SM 6251 B	1	2.0	8/10/97	8/19/97	8/26/97	MW65867
693	HAA	Dibromoacetic acid	2.8	µg/L	SM 6251 B	1	1.0	8/10/97	8/19/97	8/26/97	MW65867
694	HAA	Dichloroacetic acid	6.6	µg/L	SM 6251 B	1	1.0	8/10/97	8/19/97	8/26/97	MW65867
695	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	8/10/97	8/19/97	8/26/97	MW65867
696	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	8/10/97	8/19/97	8/26/97	MW65867
697	HAA	Tribromoacetic acid	ND	µg/L	SM 6251 B	1	4.0	8/10/97	8/19/97	8/26/97	MW65867
698	HAA	Trichloroacetic acid	2.0	µg/L	SM 6251 B	1	1.0	8/10/97	8/19/97	8/26/97	MW65867
699	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	8/9/97		8/10/97	n/a
700	pH	Cl2 pH - Initial	9.0	Unit	SM 4500-H+ B	1	n/a	8/9/97		8/9/97	n/a
701	pH	pH	7.9	Unit	SM 4500-H+ B	1	n/a	8/7/97		8/7/97	n/a
702	TEMP	Cl2 Temperature	19.8	ºC	SM 2550 B	1	n/a	8/9/97		8/10/97	n/a
703	TEMP	Temperature	23.0	ºC	SM 2550 B	1	n/a	8/7/97		8/7/97	n/a
704	TIME	Cl2 Incubation Time	24.0	hrs	n/a	1	n/a	8/9/97		8/10/97	n/a
705	TOC-ICR	TOC	1.44	mg/L	SM 5310 C	1	0.50	8/7/97		8/7/97	7-0-99
706	TOC-ICR	TOC (Dupl)	1.46	mg/L	SM 5310 C	1	0.50	8/7/97		8/7/97	7-0-99
			1.45	**mg/L**	**1.4 % RPD**						
707	TOX-ICR	TOX	73	µg Cl-/L	SM 5320 B	1	25	8/10/97		8/13/97	12-0-49
708	TOX-ICR	TOX (Dupl)	76	µg Cl-/L	SM 5320 B	1	25	8/10/97		8/13/97	12-0-49
			75	**µg Cl-/L**	**4.0 % RPD**						
709	THM-ICR	1,2,3-Trichloropropane (Surrogate)	90.8	%	EPA 551.1	1	1.0	8/10/97	8/15/97	8/15/97	0-39-0
710	THM-ICR	Bromodichloromethane	13.7	µg/L	EPA 551.1	1	1.0	8/10/97	8/15/97	8/15/97	0-39-0
711	THM-ICR	Bromoform	1.5	µg/L	EPA 551.1	1	1.0	8/10/97	8/15/97	8/15/97	0-39-0
712	THM-ICR	Chloroform	15.4	µg/L	EPA 551.1	1	1.0	8/10/97	8/15/97	8/15/97	0-39-0
713	THM-ICR	Dibromochloromethane	9.6	µg/L	EPA 551.1	1	1.0	8/10/97	8/15/97	8/15/97	0-39-0
714	UV-ICR	UV	0.020	1/cm	SM 5910 B	1	0.009	8/7/97		8/8/97	8-0-62
715	UV-ICR	UV (Dupl)	0.019	1/cm	SM 5910 B	1	0.009	8/7/97		8/8/97	8-0-62
			0.020	**1/cm**	**5.0 % RPD**						

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Summers & Hooper, Inc.
6 Knollcrest Drive
Cincinnati, OH 45237

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 66
Study Title: ICR RSSCT #3

Sample ID: 66.10.20.INF.A-2 **S&H ID:** 9708-105 **Date Sampled:** 8/7/97 11:15:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
716	ALK	Alkalinity	24	mg/L	SM 2320 B	1	5	8/7/97		8/7/97	1-0-6
717	ALK	Alkalinity (Dupl)	22	mg/L	SM 2320 B	1	5	8/7/97		8/7/97	1-0-6
			23	**mg/L**	**8.7 % RPD**						
718	NH3	Ammonia Nitrogen	0.06	mg/L	EPA 350.1	1	0.05	8/7/97		8/18/97	MW65580
719	BR	Bromide	0.040	mg/L	EPA 300.0 A	1	0.020	8/7/97		8/23/97	MW65950
720	CaHard	Calcium Hardness	74	mg/L CaCO3	SM 3500-Ca D	1	10	8/7/97		8/7/97	33-0-6
721	CaHard	Calcium Hardness (Dupl)	74	mg/L CaCO3	SM 3500-Ca D	1	10	8/7/97		8/7/97	33-0-6
			74	**mg/L CaCO3**	**0.0 % RPD**						
722	TotHard	Total Hardness	91	mg/L CaCO3	SM 2340 C	1	5	8/7/97		8/7/97	3-0-6
723	TotHard	Total Hardness (Dupl)	89	mg/L CaCO3	SM 2340 C	1	5	8/7/97		8/7/97	3-0-6
			90	**mg/L CaCO3**	**2.2 % RPD**						

Sample ID: 66.10.20.INF.B-2 **S&H ID:** 9708-106 **Date Sampled:** 8/7/97 11:10:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
724	Cl2Dose	Chlorine Dose	3.65	mg/L as Cl2	SM 4500-Cl B	1	n/a	8/9/97		8/9/97	n/a
725	Cl2Res	Chlorine Residual	0.77	mg/L as Cl2	SM 4500-Cl F	1	0.10	8/9/97		8/10/97	n/a
726	HAA	Bromochloroacetic acid	5.8	µg/L	SM 6251 B	1	1.0	8/10/97	8/19/97	8/26/97	MW65867
727	HAA	Bromodichloroacetic acid	3.4	µg/L	SM 6251 B	1	1.0	8/10/97	8/19/97	8/26/97	MW65867
728	HAA	Chlorodibromoacetic acid	ND	µg/L	SM 6251 B	1	2.0	8/10/97	8/19/97	8/26/97	MW65867
729	HAA	Dibromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	8/10/97	8/19/97	8/26/97	MW65867
730	HAA	Dichloroacetic acid	22.0	µg/L	SM 6251 B	1	1.0	8/10/97	8/19/97	8/26/97	MW65867
731	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	8/10/97	8/19/97	8/26/97	MW65867
732	HAA	Monochloroacetic acid	2.3	µg/L	SM 6251 B	1	2.0	8/10/97	8/19/97	8/26/97	MW65867
733	HAA	Tribromoacetic acid	ND	µg/L	SM 6251 B	1	4.0	8/10/97	8/19/97	8/26/97	MW65867
734	HAA	Trichloroacetic acid	11.0	µg/L	SM 6251 B	1	1.0	8/10/97	8/19/97	8/26/97	MW65867
735	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	8/9/97		8/10/97	n/a
736	pH	Cl2 pH - Initial	9.0	Unit	SM 4500-H+ B	1	n/a	8/9/97		8/9/97	n/a
737	pH	pH	9.0	Unit	SM 4500-H+ B	1	n/a	8/7/97		8/7/97	n/a
738	TEMP	Cl2 Temperature	19.8	ºC	SM 2550 B	1	n/a	8/9/97		8/10/97	n/a
739	TEMP	Temperature	17.6	ºC	SM 2550 B	1	n/a	8/7/97		8/7/97	n/a
740	TIME	Cl2 Incubation Time	24.0	hrs	n/a	1	n/a	8/9/97		8/10/97	n/a
741	TOC-ICR	TOC	3.38	mg/L	SM 5310 C	1	0.50	8/7/97		8/7/97	7-0-99
742	TOC-ICR	TOC (Dupl)	3.43	mg/L	SM 5310 C	1	0.50	8/7/97		8/7/97	7-0-99
			3.41	**mg/L**	**1.5 % RPD**						
743	TOX-ICR	TOX	272	µg Cl-/L	SM 5320 B	1	25	8/10/97		8/13/97	12-0-49
744	TOX-ICR	TOX (Dupl)	269	µg Cl-/L	SM 5320 B	1	25	8/10/97		8/13/97	12-0-49
			271	**µg Cl-/L**	**1.1 % RPD**						

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 66
Study Title: ICR RSSCT #3

745	THM-ICR	1,2,3-Trichloropropane (Surrogate)	99.2	%	EPA 551.1	1	1.0	8/10/97	8/15/97	8/15/97	0-39-0
746	THM-ICR	Bromodichloromethane	20.8	µg/L	EPA 551.1	1	1.0	8/10/97	8/15/97	8/15/97	0-39-0
747	THM-ICR	Bromoform	ND	µg/L	EPA 551.1	1	1.0	8/10/97	8/15/97	8/15/97	0-39-0
748	THM-ICR	Chloroform	91.4	µg/L	EPA 551.1	2	1.0	8/10/97	8/15/97	8/15/97	0-39-0
749	THM-ICR	Dibromochloromethane	4.6	µg/L	EPA 551.1	1	1.0	8/10/97	8/15/97	8/15/97	0-39-0
750	TURB	Turbidity	0.10	ntu	SM 2130 B	1	0.05	8/7/97		8/7/97	9-0-2
751	UV-ICR	UV	0.067	1/cm	SM 5910 B	1	0.009	8/7/97		8/8/97	8-0-62
752	UV-ICR	UV (Dupl)	0.067	1/cm	SM 5910 B	1	0.009	8/7/97		8/8/97	8-0-62
			0.067	**1/cm**	**0.0 % RPD**						

Sample ID: 66.10.Eff.20 **S&H ID:** 9708-115 **Date Sampled:** 8/7/97 2:39:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
753	Cl2Dose	Chlorine Dose	2.76	mg/L as Cl2	SM 4500-Cl B	1	n/a	8/9/97		8/9/97	n/a
754	Cl2Res	Chlorine Residual	0.73	mg/L as Cl2	SM 4500-Cl F	1	0.10	8/9/97		8/10/97	n/a
755	HAA	Bromochloroacetic acid	6.0	µg/L	SM 6251 B	1	1.0	8/10/97	8/19/97	8/26/97	MW65867
756	HAA	Bromodichloroacetic acid	3.4	µg/L	SM 6251 B	1	1.0	8/10/97	8/19/97	8/26/97	MW65867
757	HAA	Chlorodibromoacetic acid	ND	µg/L	SM 6251 B	1	2.0	8/10/97	8/19/97	8/26/97	MW65867
758	HAA	Dibromoacetic acid	1.5	µg/L	SM 6251 B	1	1.0	8/10/97	8/19/97	8/26/97	MW65867
759	HAA	Dichloroacetic acid	14.0	µg/L	SM 6251 B	1	1.0	8/10/97	8/19/97	8/26/97	MW65867
760	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	8/10/97	8/19/97	8/26/97	MW65867
761	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	8/10/97	8/19/97	8/26/97	MW65867
762	HAA	Tribromoacetic acid	ND	µg/L	SM 6251 B	1	4.0	8/10/97	8/19/97	8/26/97	MW65867
763	HAA	Trichloroacetic acid	6.2	µg/L	SM 6251 B	1	1.0	8/10/97	8/19/97	8/26/97	MW65867
764	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	8/9/97		8/10/97	n/a
765	pH	Cl2 pH - Initial	9.0	Unit	SM 4500-H+ B	1	n/a	8/9/97		8/9/97	n/a
766	pH	pH	8.5	Unit	SM 4500-H+ B	1	n/a	8/7/97		8/7/97	n/a
767	TEMP	Cl2 Temperature	19.8	ºC	SM 2550 B	1	n/a	8/9/97		8/10/97	n/a
768	TEMP	Temperature	21.9	ºC	SM 2550 B	1	n/a	8/7/97		8/7/97	n/a
769	TIME	Cl2 Incubation Time	24.0	hrs	n/a	1	n/a	8/9/97		8/10/97	n/a
770	TOC-ICR	TOC	2.54	mg/L	SM 5310 C	1	0.50	8/7/97		8/7/97	7-0-99
771	TOC-ICR	TOC (Dupl)	2.55	mg/L	SM 5310 C	1	0.50	8/7/97		8/7/97	7-0-99
			2.54	**mg/L**	**0.4 % RPD**						
772	TOX-ICR	TOX	170	µg Cl-/L	SM 5320 B	1	25	8/10/97		8/13/97	12-0-49
773	TOX-ICR	TOX (Dupl)	160	µg Cl-/L	SM 5320 B	1	25	8/10/97		8/13/97	12-0-49
			165	**µg Cl-/L**	**6.1 % RPD**						
774	THM-ICR	1,2,3-Trichloropropane (Surrogate)	99.2	%	EPA 551.1	1	1.0	8/10/97	8/15/97	8/15/97	0-39-0
775	THM-ICR	Bromodichloromethane	19.5	µg/L	EPA 551.1	1	1.0	8/10/97	8/15/97	8/15/97	0-39-0
776	THM-ICR	Bromoform	ND	µg/L	EPA 551.1	1	1.0	8/10/97	8/15/97	8/15/97	0-39-0

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 66
Study Title: ICR RSSCT #3

777	THM-ICR	Chloroform	55.1	µg/L	EPA 551.1	2	1.0	8/10/97	8/15/97	8/18/97	0-39-0
778	THM-ICR	Dibromochloromethane	7.2	µg/L	EPA 551.1	1	1.0	8/10/97	8/15/97	8/15/97	0-39-0
779	UV-ICR	UV	0.041	1/cm	SM 5910 B	1	0.009	8/7/97		8/8/97	8-0-62
780	UV-ICR	UV (Dupl)	0.041	1/cm	SM 5910 B	1	0.009	8/7/97		8/8/97	8-0-62
			0.041	**1/cm**	**0.0 % RPD**						

Sample ID: 66.10.Eff.22 **S&H ID:** 9708-120 **Date Sampled:** 8/7/97 8:00:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
781	TOC-ICR	TOC	2.53	mg/L	SM 5310 C	1	0.50	8/7/97		8/8/97	7-0-100
782	TOC-ICR	TOC	2.42	mg/L	SM 5310 C	1	0.50	8/7/97		8/8/97	7-0-99
783	TOC-ICR	TOC (Dupl)	2.51	mg/L	SM 5310 C	1	0.50	8/7/97		8/8/97	7-0-100
784	TOC-ICR	TOC (Dupl)	2.37	mg/L	SM 5310 C	1	0.50	8/7/97		8/8/97	7-0-99
			2.46	**mg/L**	**3.1 % RPD**						

Sample ID: 66.20.Eff.17 **S&H ID:** 9708-126 **Date Sampled:** 8/8/97 10:48:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
785	Cl2Dose	Chlorine Dose	2.30	mg/L as Cl2	SM 4500-Cl B	1	n/a	8/9/97		8/9/97	n/a
786	Cl2Res	Chlorine Residual	0.76	mg/L as Cl2	SM 4500-Cl F	1	0.10	8/9/97		8/10/97	n/a
787	HAA	Bromochloroacetic acid	4.4	µg/L	SM 6251 B	1	1.0	8/10/97	8/19/97	8/26/97	MW65867
788	HAA	Bromodichloroacetic acid	2.8	µg/L	SM 6251 B	1	1.0	8/10/97	8/19/97	8/26/97	MW65867
789	HAA	Chlorodibromoacetic acid	ND	µg/L	SM 6251 B	1	2.0	8/10/97	8/19/97	8/26/97	MW65867
790	HAA	Dibromoacetic acid	2.1	µg/L	SM 6251 B	1	1.0	8/10/97	8/19/97	8/26/97	MW65867
791	HAA	Dichloroacetic acid	7.0	µg/L	SM 6251 B	1	1.0	8/10/97	8/19/97	8/26/97	MW65867
792	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	8/10/97	8/19/97	8/26/97	MW65867
793	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	8/10/97	8/19/97	8/26/97	MW65867
794	HAA	Tribromoacetic acid	ND	µg/L	SM 6251 B	1	4.0	8/10/97	8/19/97	8/26/97	MW65867
795	HAA	Trichloroacetic acid	2.6	µg/L	SM 6251 B	1	1.0	8/10/97	8/19/97	8/26/97	MW65867
796	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	8/9/97		8/10/97	n/a
797	pH	Cl2 pH - Initial	9.0	Unit	SM 4500-H+ B	1	n/a	8/9/97		8/9/97	n/a
798	pH	pH	7.9	Unit	SM 4500-H+ B	1	n/a	8/8/97		8/8/97	n/a
799	TEMP	Cl2 Temperature	19.8	ºC	SM 2550 B	1	n/a	8/9/97		8/10/97	n/a
800	TEMP	Temperature	22.7	ºC	SM 2550 B	1	n/a	8/8/97		8/8/97	n/a
801	TIME	Cl2 Incubation Time	23.9	hrs	n/a	1	n/a	8/9/97		8/10/97	n/a
802	TOC-ICR	TOC	1.64	mg/L	SM 5310 C	1	0.50	8/8/97		8/8/97	7-0-100
803	TOC-ICR	TOC (Dupl)	1.62	mg/L	SM 5310 C	1	0.50	8/8/97		8/8/97	7-0-100
			1.63	**mg/L**	**1.2 % RPD**						
804	TOX-ICR	TOX	85	µg Cl-/L	SM 5320 B	1	25	8/10/97		8/15/97	12-0-50
805	TOX-ICR	TOX (Dupl)	86	µg Cl-/L	SM 5320 B	1	25	8/10/97		8/15/97	12-0-50
			86	**µg Cl-/L**	**1.2 % RPD**						

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 66
Study Title: ICR RSSCT #3

806	THM-ICR	1,2,3-Trichloropropane (Surrogate)	97.6	%	EPA 551.1	1	1.0	8/10/97	8/15/97	8/15/97	0-39-0
807	THM-ICR	Bromodichloromethane	15.4	µg/L	EPA 551.1	1	1.0	8/10/97	8/15/97	8/15/97	0-39-0
808	THM-ICR	Bromoform	1.2	µg/L	EPA 551.1	1	1.0	8/10/97	8/15/97	8/15/97	0-39-0
809	THM-ICR	Chloroform	21.8	µg/L	EPA 551.1	1	1.0	8/10/97	8/15/97	8/15/97	0-39-0
810	THM-ICR	Dibromochloromethane	9.7	µg/L	EPA 551.1	1	1.0	8/10/97	8/15/97	8/15/97	0-39-0
811	UV-ICR	UV	0.023	1/cm	SM 5910 B	1	0.009	8/8/97		8/8/97	8-0-62
812	UV-ICR	UV (Dupl)	0.023	1/cm	SM 5910 B	1	0.009	8/8/97		8/8/97	8-0-62
			0.023	**1/cm**	**0.0 % RPD**						

Sample ID: 66.20.Eff.19 **S&H ID:** 9708-131 **Date Sampled:** 8/9/97 7:40:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
813	Cl2Dose	Chlorine Dose	2.42	mg/L as Cl2	SM 4500-Cl B	1	n/a	8/9/97		8/9/97	n/a
814	Cl2Res	Chlorine Residual	0.77	mg/L as Cl2	SM 4500-Cl F	1	0.10	8/9/97		8/10/97	n/a
815	HAA	Bromochloroacetic acid	5.0	µg/L	SM 6251 B	1	1.0	8/10/97	8/19/97	8/26/97	MW65867
816	HAA	Bromodichloroacetic acid	2.9	µg/L	SM 6251 B	1	1.0	8/10/97	8/19/97	8/26/97	MW65867
817	HAA	Chlorodibromoacetic acid	ND	µg/L	SM 6251 B	1	2.0	8/10/97	8/19/97	8/26/97	MW65867
818	HAA	Dibromoacetic acid	2.0	µg/L	SM 6251 B	1	1.0	8/10/97	8/19/97	8/26/97	MW65867
819	HAA	Dichloroacetic acid	8.4	µg/L	SM 6251 B	1	1.0	8/10/97	8/19/97	8/26/97	MW65867
820	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	8/10/97	8/19/97	8/26/97	MW65867
821	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	8/10/97	8/19/97	8/26/97	MW65867
822	HAA	Tribromoacetic acid	ND	µg/L	SM 6251 B	1	4.0	8/10/97	8/19/97	8/26/97	MW65867
823	HAA	Trichloroacetic acid	3.2	µg/L	SM 6251 B	1	1.0	8/10/97	8/19/97	8/26/97	MW65867
824	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	8/9/97		8/10/97	n/a
825	pH	Cl2 pH - Initial	9.0	Unit	SM 4500-H+ B	1	n/a	8/9/97		8/9/97	n/a
826	pH	pH	8.6	Unit	SM 4500-H+ B	1	n/a	8/9/97		8/9/97	n/a
827	TEMP	Cl2 Temperature	19.8	ºC	SM 2550 B	1	n/a	8/9/97		8/10/97	n/a
828	TEMP	Temperature	23.1	ºC	SM 2550 B	1	n/a	8/9/97		8/9/97	n/a
829	TIME	Cl2 Incubation Time	23.9	hrs	n/a	1	n/a	8/9/97		8/10/97	n/a
830	TOC-ICR	TOC	1.86	mg/L	SM 5310 C	1	0.50	8/9/97		8/9/97	7-0-101
831	TOC-ICR	TOC (Dupl)	1.87	mg/L	SM 5310 C	1	0.50	8/9/97		8/9/97	7-0-101
			1.87	**mg/L**	**0.5 % RPD**						
832	TOX-ICR	TOX	106	µg Cl-/L	SM 5320 B	1	25	8/10/97		8/15/97	12-0-50
833	TOX-ICR	TOX (Dupl)	106	µg Cl-/L	SM 5320 B	1	25	8/10/97		8/15/97	12-0-50
			106	**µg Cl-/L**	**0.0 % RPD**						
834	THM-ICR	1,2,3-Trichloropropane (Surrogate)	97.2	%	EPA 551.1	1	1.0	8/10/97	8/15/97	8/15/97	0-39-0
835	THM-ICR	Bromodichloromethane	17.1	µg/L	EPA 551.1	1	1.0	8/10/97	8/15/97	8/15/97	0-39-0
836	THM-ICR	Bromoform	ND	µg/L	EPA 551.1	1	1.0	8/10/97	8/15/97	8/15/97	0-39-0
837	THM-ICR	Chloroform	27.6	µg/L	EPA 551.1	1	1.0	8/10/97	8/15/97	8/15/97	0-39-0

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 66
Study Title: ICR RSSCT #3

838	THM-ICR	Dibromochloromethane	9.2	µg/L	EPA 551.1	1	1.0	8/10/97	8/15/97	8/15/97	0-39-0
839	UV-ICR	UV	0.027	1/cm	SM 5910 B	1	0.009	8/9/97		8/10/97	8-0-66
840	UV-ICR	UV (Dupl)	0.027	1/cm	SM 5910 B	1	0.009	8/9/97		8/10/97	8-0-66
			0.027	**1/cm**	**0.0 % RPD**						

Sample ID: 66.20.Eff.22 **S&H ID:** 9708-140 **Date Sampled:** 8/11/97 6:31:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
841	Cl2Dose	Chlorine Dose	2.54	mg/L as Cl2	SM 4500-Cl B	1	n/a	8/12/97		8/12/97	n/a
842	Cl2Res	Chlorine Residual	0.82	mg/L as Cl2	SM 4500-Cl F	1	0.10	8/12/97		8/13/97	n/a
843	HAA	Bromochloroacetic acid	5.2	µg/L	SM 6251 B	1	1.0	8/13/97	8/26/97	9/2/97	MW66194
844	HAA	Bromodichloroacetic acid	3.6	µg/L	SM 6251 B	1	1.0	8/13/97	8/26/97	9/2/97	MW66194
845	HAA	Chlorodibromoacetic acid	ND	µg/L	SM 6251 B	1	2.0	8/13/97	8/26/97	9/2/97	MW66194
846	HAA	Dibromoacetic acid	2.2	µg/L	SM 6251 B	1	1.0	8/13/97	8/26/97	9/2/97	MW66194
847	HAA	Dichloroacetic acid	10.0	µg/L	SM 6251 B	1	1.0	8/13/97	8/26/97	9/2/97	MW66194
848	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	8/13/97	8/26/97	9/2/97	MW66194
849	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	8/13/97	8/26/97	9/2/97	MW66194
850	HAA	Tribromoacetic acid	ND	µg/L	SM 6251 B	1	4.0	8/13/97	8/26/97	9/2/97	MW66194
851	HAA	Trichloroacetic acid	4.3	µg/L	SM 6251 B	1	1.0	8/13/97	8/26/97	9/2/97	MW66194
852	pH	Cl2 pH - Final	8.9	Unit	SM 4500-H+ B	1	n/a	8/12/97		8/13/97	n/a
853	pH	Cl2 pH - Initial	9.0	Unit	SM 4500-H+ B	1	n/a	8/12/97		8/12/97	n/a
854	pH	pH	8.5	Unit	SM 4500-H+ B	1	n/a	8/11/97		8/11/97	n/a
855	TEMP	Cl2 Temperature	19.8	ºC	SM 2550 B	1	n/a	8/12/97		8/13/97	n/a
856	TEMP	Temperature	22.0	ºC	SM 2550 B	1	n/a	8/11/97		8/11/97	n/a
857	TIME	Cl2 Incubation Time	23.8	hrs	n/a	1	n/a	8/12/97		8/13/97	n/a
858	TOC-ICR	TOC	2.03	mg/L	SM 5310 C	1	0.50	8/11/97		8/12/97	7-0-103
859	TOC-ICR	TOC (Dupl)	2.03	mg/L	SM 5310 C	1	0.50	8/11/97		8/12/97	7-0-103
			2.03	**mg/L**	**0.0 % RPD**						
860	TOX-ICR	TOX	130	µg Cl-/L	SM 5320 B	1	25	8/13/97		8/15/97	12-0-50
861	TOX-ICR	TOX (Dupl)	126	µg Cl-/L	SM 5320 B	1	25	8/13/97		8/15/97	12-0-50
			128	**µg Cl-/L**	**3.1 % RPD**						
862	THM-ICR	1,2,3-Trichloropropane (Surrogate)	97.2	%	EPA 551.1	1	1.0	8/13/97	8/15/97	8/15/97	0-39-0
863	THM-ICR	Bromodichloromethane	18.0	µg/L	EPA 551.1	1	1.0	8/13/97	8/15/97	8/15/97	0-39-0
864	THM-ICR	Bromoform	ND	µg/L	EPA 551.1	1	1.0	8/13/97	8/15/97	8/15/97	0-39-0
865	THM-ICR	Chloroform	34.1	µg/L	EPA 551.1	1	1.0	8/13/97	8/15/97	8/15/97	0-39-0
866	THM-ICR	Dibromochloromethane	8.7	µg/L	EPA 551.1	1	1.0	8/13/97	8/15/97	8/15/97	0-39-0
867	UV-ICR	UV	0.031	1/cm	SM 5910 B	1	0.009	8/11/97		8/12/97	8-0-67
868	UV-ICR	UV (Dupl)	0.031	1/cm	SM 5910 B	1	0.009	8/11/97		8/12/97	8-0-67
			0.031	**1/cm**	**0.0 % RPD**						

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Summers & Hooper, Inc.
6 Knollcrest Drive
Cincinnati, OH 45237

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 66
Study Title: ICR RSSCT #3

Sample ID: 66.20.Eff.22d **S&H ID:** 9708-141 **Date Sampled:** 8/11/97 6:31:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
869	Cl2Dose	Chlorine Dose	2.54	mg/L as Cl2	SM 4500-Cl B	1	n/a	8/12/97		8/12/97	n/a
870	Cl2Res	Chlorine Residual	0.79	mg/L as Cl2	SM 4500-Cl F	1	0.10	8/12/97		8/13/97	n/a
871	HAA	Bromochloroacetic acid	5.1	µg/L	SM 6251 B	1	1.0	8/13/97	8/26/97	9/2/97	MW66194
872	HAA	Bromodichloroacetic acid	3.4	µg/L	SM 6251 B	1	1.0	8/13/97	8/26/97	9/2/97	MW66194
873	HAA	Chlorodibromoacetic acid	ND	µg/L	SM 6251 B	1	2.0	8/13/97	8/26/97	9/2/97	MW66194
874	HAA	Dibromoacetic acid	2.0	µg/L	SM 6251 B	1	1.0	8/13/97	8/26/97	9/2/97	MW66194
875	HAA	Dichloroacetic acid	9.5	µg/L	SM 6251 B	1	1.0	8/13/97	8/26/97	9/2/97	MW66194
876	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	8/13/97	8/26/97	9/2/97	MW66194
877	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	8/13/97	8/26/97	9/2/97	MW66194
878	HAA	Tribromoacetic acid	ND	µg/L	SM 6251 B	1	4.0	8/13/97	8/26/97	9/2/97	MW66194
879	HAA	Trichloroacetic acid	4.2	µg/L	SM 6251 B	1	1.0	8/13/97	8/26/97	9/2/97	MW66194
880	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	8/12/97		8/13/97	n/a
881	pH	Cl2 pH - Initial	9.0	Unit	SM 4500-H+ B	1	n/a	8/12/97		8/12/97	n/a
882	pH	pH	8.6	Unit	SM 4500-H+ B	1	n/a	8/11/97		8/11/97	n/a
883	TEMP	Cl2 Temperature	19.8	ºC	SM 2550 B	1	n/a	8/12/97		8/13/97	n/a
884	TEMP	Temperature	22.1	ºC	SM 2550 B	1	n/a	8/11/97		8/11/97	n/a
885	TIME	Cl2 Incubation Time	23.9	hrs	n/a	1	n/a	8/12/97		8/13/97	n/a
886	TOC-ICR	TOC	2.06	mg/L	SM 5310 C	1	0.50	8/11/97		8/12/97	7-0-103
887	TOC-ICR	TOC	2.07	mg/L	SM 5310 C	1	0.50	8/11/97		8/11/97	7-0-102
888	TOC-ICR	TOC (Dupl)	2.09	mg/L	SM 5310 C	1	0.50	8/11/97		8/12/97	7-0-103
889	TOC-ICR	TOC (Dupl)	2.04	mg/L	SM 5310 C	1	0.50	8/11/97		8/11/97	7-0-102
			2.06	**mg/L**	**1.0 % RPD**						
890	TOX-ICR	TOX	127	µg Cl-/L	SM 5320 B	1	25	8/13/97		8/15/97	12-0-50
891	TOX-ICR	TOX (Dupl)	120	µg Cl-/L	SM 5320 B	1	25	8/13/97		8/15/97	12-0-50
			124	**µg Cl-/L**	**5.6 % RPD**						
892	THM-ICR	1,2,3-Trichloropropane (Surrogate)	96.0	%	EPA 551.1	1	1.0	8/13/97	8/15/97	8/15/97	0-39-0
893	THM-ICR	Bromodichloromethane	17.6	µg/L	EPA 551.1	1	1.0	8/13/97	8/15/97	8/15/97	0-39-0
894	THM-ICR	Bromoform	ND	µg/L	EPA 551.1	1	1.0	8/13/97	8/15/97	8/15/97	0-39-0
895	THM-ICR	Chloroform	33.6	µg/L	EPA 551.1	1	1.0	8/13/97	8/15/97	8/15/97	0-39-0
896	THM-ICR	Dibromochloromethane	8.6	µg/L	EPA 551.1	1	1.0	8/13/97	8/15/97	8/15/97	0-39-0
897	UV-ICR	UV	0.031	1/cm	SM 5910 B	1	0.009	8/11/97		8/12/97	8-0-67
898	UV-ICR	UV (Dupl)	0.031	1/cm	SM 5910 B	1	0.009	8/11/97		8/12/97	8-0-67
			0.031	**1/cm**	**0.0 % RPD**						

Sample ID: 66.20.Eff.26 **S&H ID:** 9708-178 **Date Sampled:** 8/14/97 6:13:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
899	Cl2Dose	Chlorine Dose	2.59	mg/L as Cl2	SM 4500-Cl B	1	n/a	8/15/97		8/15/97	n/a

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 66
Study Title: ICR RSSCT #3

900	Cl2Res	Chlorine Residual	0.76	mg/L as Cl2	SM 4500-Cl F	1	0.10	8/15/97		8/16/97	n/a
901	HAA	Bromochloroacetic acid	5.5	µg/L	SM 6251 B	1	1.0	8/16/97	8/26/97	9/2/97	MW66194
902	HAA	Bromodichloroacetic acid	3.5	µg/L	SM 6251 B	1	1.0	8/16/97	8/26/97	9/2/97	MW66194
903	HAA	Chlorodibromoacetic acid	ND	µg/L	SM 6251 B	1	2.0	8/16/97	8/26/97	9/2/97	MW66194
904	HAA	Dibromoacetic acid	1.9	µg/L	SM 6251 B	1	1.0	8/16/97	8/26/97	9/2/97	MW66194
905	HAA	Dichloroacetic acid	11.0	µg/L	SM 6251 B	1	1.0	8/16/97	8/26/97	9/2/97	MW66194
906	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	8/16/97	8/26/97	9/2/97	MW66194
907	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	8/16/97	8/26/97	9/2/97	MW66194
908	HAA	Tribromoacetic acid	ND	µg/L	SM 6251 B	1	4.0	8/16/97	8/26/97	9/2/97	MW66194
909	HAA	Trichloroacetic acid	5.0	µg/L	SM 6251 B	1	1.0	8/16/97	8/26/97	9/2/97	MW66194
910	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	8/15/97		8/16/97	n/a
911	pH	Cl2 pH - Initial	9.0	Unit	SM 4500-H+ B	1	n/a	8/15/97		8/15/97	n/a
912	pH	pH	8.5	Unit	SM 4500-H+ B	1	n/a	8/14/97		8/14/97	n/a
913	TEMP	Cl2 Temperature	19.8	ºC	SM 2550 B	1	n/a	8/15/97		8/16/97	n/a
914	TEMP	Temperature	22.7	ºC	SM 2550 B	1	n/a	8/14/97		8/14/97	n/a
915	TIME	Cl2 Incubation Time	24.0	hrs	n/a	1	n/a	8/15/97		8/16/97	n/a
916	TOC-ICR	TOC	2.20	mg/L	SM 5310 C	1	0.50	8/14/97		8/14/97	7-0-105
917	TOC-ICR	TOC (Dupl)	2.23	mg/L	SM 5310 C	1	0.50	8/14/97		8/14/97	7-0-105
			2.21	**mg/L**	**1.4 % RPD**						
918	TOX-ICR	TOX	138	µg Cl-/L	SM 5320 B	1	25	8/16/97		8/21/97	12-0-52
919	TOX-ICR	TOX (Dupl)	127	µg Cl-/L	SM 5320 B	1	25	8/16/97		8/21/97	12-0-52
			133	**µg Cl-/L**	**8.3 % RPD**						
920	THM-ICR	1,2,3-Trichloropropane (Surrogate)	105.2	%	EPA 551.1	1	1.0	8/16/97	8/21/97	8/21/97	0-41-0
921	THM-ICR	Bromodichloromethane	20.5	µg/L	EPA 551.1	1	1.0	8/16/97	8/21/97	8/21/97	0-41-0
922	THM-ICR	Bromoform	ND	µg/L	EPA 551.1	1	1.0	8/16/97	8/21/97	8/21/97	0-41-0
923	THM-ICR	Chloroform	47.7	µg/L	EPA 551.1	1	1.0	8/16/97	8/21/97	8/21/97	0-41-0
924	THM-ICR	Dibromochloromethane	8.2	µg/L	EPA 551.1	1	1.0	8/16/97	8/21/97	8/21/97	0-41-0
925	UV-ICR	UV	0.034	1/cm	SM 5910 B	1	0.009	8/14/97		8/14/97	8-0-65
926	UV-ICR	UV (Dupl)	0.034	1/cm	SM 5910 B	1	0.009	8/14/97		8/14/97	8-0-65
			0.034	**1/cm**	**0.0 % RPD**						

Sample ID: 66.20.Eff.27 **S&H ID:** 9708-189 **Date Sampled:** 8/15/97 4:15:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
927	TOC-ICR	TOC	2.42	mg/L	SM 5310 C	1	0.50	8/15/97		8/16/97	7-0-106
928	TOC-ICR	TOC (Dupl)	2.42	mg/L	SM 5310 C	1	0.50	8/15/97		8/16/97	7-0-106
			2.42	**mg/L**	**0.0 % RPD**						

Sample ID: 66.20.Eff-29 **S&H ID:** 9708-191 **Date Sampled:** 8/16/97 1:04:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 66
Study Title: ICR RSSCT #3

929	Cl2Dose	Chlorine Dose	2.68	mg/L as Cl2	SM 4500-Cl B	1	n/a	8/17/97		8/17/97	n/a
930	Cl2Res	Chlorine Residual	0.84	mg/L as Cl2	SM 4500-Cl F	1	0.10	8/17/97		8/18/97	n/a
931	HAA	Bromochloroacetic acid	5.1	µg/L	SM 6251 B	1	1.0	8/18/97	8/26/97	9/1/97	MW66127
932	HAA	Bromodichloroacetic acid	2.5	µg/L	SM 6251 B	1	1.0	8/18/97	8/26/97	9/1/97	MW66127
933	HAA	Chlorodibromoacetic acid	ND	µg/L	SM 6251 B	1	2.0	8/18/97	8/26/97	9/1/97	MW66127
934	HAA	Dibromoacetic acid	1.8	µg/L	SM 6251 B	1	1.0	8/18/97	8/26/97	9/1/97	MW66127
935	HAA	Dichloroacetic acid	12.0	µg/L	SM 6251 B	1	1.0	8/18/97	8/26/97	9/1/97	MW66127
936	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	8/18/97	8/26/97	9/1/97	MW66127
937	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	8/18/97	8/26/97	9/1/97	MW66127
938	HAA	Tribromoacetic acid	ND	µg/L	SM 6251 B	1	4.0	8/18/97	8/26/97	9/1/97	MW66127
939	HAA	Trichloroacetic acid	5.8	µg/L	SM 6251 B	1	1.0	8/18/97	8/26/97	9/1/97	MW66127
940	pH	Cl2 pH - Final	8.9	Unit	SM 4500-H+ B	1	n/a	8/17/97		8/18/97	n/a
941	pH	Cl2 pH - Initial	9.0	Unit	SM 4500-H+ B	1	n/a	8/17/97		8/17/97	n/a
942	pH	pH	8.3	Unit	SM 4500-H+ B	1	n/a	8/16/97		8/16/97	n/a
943	TEMP	Cl2 Temperature	19.9	ºC	SM 2550 B	1	n/a	8/17/97		8/18/97	n/a
944	TEMP	Temperature	23.0	ºC	SM 2550 B	1	n/a	8/16/97		8/16/97	n/a
945	TIME	Cl2 Incubation Time	24.3	hrs	n/a	1	n/a	8/17/97		8/18/97	n/a
946	TOC-ICR	TOC	2.40	mg/L	SM 5310 C	1	0.50	8/16/97		8/16/97	7-0-106
947	TOC-ICR	TOC (Dupl)	2.43	mg/L	SM 5310 C	1	0.50	8/16/97		8/16/97	7-0-106
			2.42	**mg/L**	**1.2 % RPD**						
948	TOX-ICR	TOX	151	µg Cl-/L	SM 5320 B	1	25	8/18/97		8/21/97	12-0-52
949	TOX-ICR	TOX (Dupl)	154	µg Cl-/L	SM 5320 B	1	25	8/18/97		8/21/97	12-0-52
			153	**µg Cl-/L**	**2.0 % RPD**						
950	THM-ICR	1,2,3-Trichloropropane (Surrogate)	102.4	%	EPA 551.1	1	1.0	8/18/97	8/21/97	8/21/97	0-41-0
951	THM-ICR	1,2,3-Trichloropropane (Surrogate) (Lab Dupl)	102.8	%	EPA 551.1	1	1.0	8/18/97	8/21/97	8/21/97	0-41-0
			102.6	**%**	**0.4 % RPD**						
952	THM-ICR	Bromodichloromethane	21.1	µg/L	EPA 551.1	1	1.0	8/18/97	8/21/97	8/21/97	0-41-0
953	THM-ICR	Bromodichloromethane (Lab Dupl)	21.5	µg/L	EPA 551.1	1	1.0	8/18/97	8/21/97	8/21/97	0-41-0
			21.3	**µg/L**	**1.9 % RPD**						
954	THM-ICR	Bromoform	ND	µg/L	EPA 551.1	1	1.0	8/18/97	8/21/97	8/21/97	0-41-0
955	THM-ICR	Bromoform (Lab Dupl)	ND	µg/L	EPA 551.1	1	1.0	8/18/97	8/21/97	8/21/97	0-41-0
			ND	**µg/L**							
956	THM-ICR	Chloroform	51.8	µg/L	EPA 551.1	2	1.0	8/18/97	8/21/97	8/22/97	0-41-0
957	THM-ICR	Chloroform (Lab Dupl)	51.4	µg/L	EPA 551.1	2	1.0	8/18/97	8/21/97	8/22/97	0-41-0
			51.6	**µg/L**	**0.8 % RPD**						
958	THM-ICR	Dibromochloromethane	7.9	µg/L	EPA 551.1	1	1.0	8/18/97	8/21/97	8/21/97	0-41-0
959	THM-ICR	Dibromochloromethane (Lab Dupl)	8.1	µg/L	EPA 551.1	1	1.0	8/18/97	8/21/97	8/21/97	0-41-0
			8.0	**µg/L**	**2.5 % RPD**						
960	UV-ICR	UV	0.039	1/cm	SM 5910 B	1	0.009	8/16/97		8/17/97	8-0-68
961	UV-ICR	UV (Dupl)	0.038	1/cm	SM 5910 B	1	0.009	8/16/97		8/17/97	8-0-68

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

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

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 66
Study Title: ICR RSSCT #3

			0.039	**1/cm**	**2.6 % RPD**						

Sample ID: 66.10.20.Inf.B-3 **S&H ID:** 9708-194 **Date Sampled:** 8/17/97 11:00:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
962	pH	pH	9.0	Unit	SM 4500-H+ B	1	n/a	8/17/97		8/17/97	n/a
963	TEMP	Temperature	19.3	ºC	SM 2550 B	1	n/a	8/17/97		8/17/97	n/a

Sample ID: 66.20.Eff-31 **S&H ID:** 9708-199 **Date Sampled:** 8/17/97 11:30:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
964	TOC-ICR	TOC	2.49	mg/L	SM 5310 C	1	0.50	8/17/97		8/17/97	7-0-107
965	TOC-ICR	TOC (Dupl)	2.49	mg/L	SM 5310 C	1	0.50	8/17/97		8/17/97	7-0-107
			2.49	**mg/L**	**0.0 % RPD**						

Sample ID: 66.10.20.Inf.B-4 **S&H ID:** 9708-220 **Date Sampled:** 8/18/97 10:00:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
966	Cl2Dose	Chlorine Dose	3.65	mg/L as Cl2	SM 4500-Cl B	1	n/a	8/20/97		8/20/97	n/a
967	Cl2Res	Chlorine Residual	0.85	mg/L as Cl2	SM 4500-Cl F	1	0.10	8/20/97		8/21/97	n/a
968	HAA	Bromochloroacetic acid	6.0	µg/L	SM 6251 B	1	1.0	8/21/97	9/3/97	9/9/97	MW66249
969	HAA	Bromodichloroacetic acid	3.4	µg/L	SM 6251 B	1	1.0	8/21/97	9/3/97	9/9/97	MW66249
970	HAA	Chlorodibromoacetic acid	ND	µg/L	SM 6251 B	1	2.0	8/21/97	9/3/97	9/9/97	MW66249
971	HAA	Dibromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	8/21/97	9/3/97	9/9/97	MW66249
972	HAA	Dichloroacetic acid	23.0	µg/L	SM 6251 B	1	1.0	8/21/97	9/3/97	9/9/97	MW66249
973	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	8/21/97	9/3/97	9/9/97	MW66249
974	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	8/21/97	9/3/97	9/9/97	MW66249
975	HAA	Tribromoacetic acid	ND	µg/L	SM 6251 B	1	4.0	8/21/97	9/3/97	9/9/97	MW66249
976	HAA	Trichloroacetic acid	11.0	µg/L	SM 6251 B	1	1.0	8/21/97	9/3/97	9/9/97	MW66249
977	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	8/20/97		8/21/97	n/a
978	pH	Cl2 pH - Initial	9.0	Unit	SM 4500-H+ B	1	n/a	8/20/97		8/20/97	n/a
979	TEMP	Cl2 Temperature	19.9	ºC	SM 2550 B	1	n/a	8/20/97		8/21/97	n/a
980	TIME	Cl2 Incubation Time	24.1	hrs	n/a	1	n/a	8/20/97		8/21/97	n/a
981	TOC-ICR	TOC	3.51	mg/L	SM 5310 C	1	0.50	8/18/97		8/19/97	7-0-109
982	TOC-ICR	TOC (Dupl)	3.52	mg/L	SM 5310 C	1	0.50	8/18/97		8/19/97	7-0-109
			3.51	**mg/L**	**0.3 % RPD**						
983	TOX-ICR	TOX	291	µg Cl-/L	SM 5320 B	1	25	8/21/97		8/21/97	12-0-52
984	TOX-ICR	TOX (Dupl)	274	µg Cl-/L	SM 5320 B	1	25	8/21/97		8/21/97	12-0-52
			283	**µg Cl-/L**	**6.0 % RPD**						
985	THM-ICR	1,2,3-Trichloropropane (Surrogate)	100.0	%	EPA 551.1	1	1.0	8/21/97	8/21/97	8/21/97	0-41-0
986	THM-ICR	Bromodichloromethane	22.9	µg/L	EPA 551.1	1	1.0	8/21/97	8/21/97	8/21/97	0-41-0

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Summers & Hooper, Inc.
6 Knollcrest Drive
Cincinnati, OH 45237

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 66
Study Title: ICR RSSCT #3

987	THM-ICR	Bromoform	ND	µg/L	EPA 551.1	1	1.0	8/21/97	8/21/97	8/21/97	0-41-0
988	THM-ICR	Chloroform	101.6	µg/L	EPA 551.1	5	1.0	8/21/97	8/21/97	8/22/97	0-41-0
989	THM-ICR	Dibromochloromethane	4.3	µg/L	EPA 551.1	1	1.0	8/21/97	8/21/97	8/21/97	0-41-0
990	TURB	Turbidity	0.15	ntu	SM 2130 B	1	0.05	8/18/97		8/18/97	9-0-3

End of laboratory test results

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

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

Summers & Hooper, Inc.
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Quality Control Report

Mr. John Zackasee
Superintendent-Purification
Mahoning Valley Sanitary District
P.O. Box 4119
Youngstown, OH 44515

Phone: 330-652-3614 Fax: 330-652-6293

Study#: 66
Study Title: ICR RSSCT #3

Analysis: ALK (Alkalinity) **Method:** SM 2320 B

QC Batch ID: 1-0-4

QC Type		Spike	Recovery	Unit	Yield	RPD	Date Run	S&H ID	MRL	Acceptance Criteria Range	Acceptance Criteria RPD
Method Blank	Method Blank		ND*	mg/L			07/15/97	9707-170	5		
Matrix Spike	Matrix Spike	100	96	mg/L	96%		07/19/97	9707-195	5		
Method Blank	Method Blank		ND*	mg/L			07/19/97	9707-205	5		
Standard	Standard	250	244	mg/L	98%		07/19/97	9707-208	5		
Matrix Spike	Matrix Spike	100	95	mg/L	95%		07/24/97	9707-261	5		
Method Blank	Method Blank		ND*	mg/L			07/24/97	9707-291	5		
Standard	Standard	250	242	mg/L	97%		07/24/97	9707-208	5		

Analysis: ALK (Alkalinity) **Method:** SM 2320 B

QC Batch ID: 1-0-5

QC Type		Spike	Recovery	Unit	Yield	RPD	Date Run	S&H ID	MRL	Acceptance Criteria Range	Acceptance Criteria RPD
Matrix Spike	Matrix Spike	100	97	mg/L	97%		07/31/97	9707-339	5		
Matrix Spike (Dupl)	Matrix Spike	100	96	mg/L	96%		07/31/97	9707-339	5		
		100	**97**	**mg/L**	**97%**	**1.0 %**					
Method Blank	Method Blank		ND*	mg/L			07/31/97	9707-352	5		
Standard	Standard	100	97	mg/L	97%		07/31/97	9707-355	5		
Standard (Dupl)	Standard	100	97	mg/L	97%		07/31/97	9707-355	5		
		100	**97**	**mg/L**	**97%**	**0.0 %**					
Method Blank	Method Blank		ND*	mg/L			08/02/97	9708-24	5		
Standard	Standard	100	98	mg/L	98%		08/02/97	9708-27	5		
Standard (Dupl)	Standard	100	99	mg/L	99%		08/02/97	9708-27	5		
		100	**99**	**mg/L**	**99%**	**1.0 %**					
Method Blank	Method Blank		ND*	mg/L			08/05/97	9708-77	5		
Standard	Standard	100	100	mg/L	100%		08/05/97	9708-80	5		
Standard (Dupl)	Standard	100	98	mg/L	98%		08/05/97	9708-80	5		
		100	**98**	**mg/L**	**98%**	**2.0 %**					

Analysis: ALK (Alkalinity) **Method:** SM 2320 B

QC Batch ID: 1-0-6

QC Type		Spike	Recovery	Unit	Yield	RPD	Date Run	S&H ID	MRL	Acceptance Criteria Range	Acceptance Criteria RPD
Matrix Spike	Matrix Spike	100	96	mg/L	96%		08/07/97	9708-105	5		

ND: non-detect. *Recovery is below 1/2 minimum reporting level (MRL). NA (not applicable): RPD calculation is not applicable.

Summers & Hooper, Inc.
6 Knollcrest Drive
Cincinnati, OH 45237

Quality Control Report

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 66
Study Title: ICR RSSCT #3

Matrix Spike (Dupl)	Matrix Spike	100	96	mg/L	96%		08/07/97	9708-105	5
		100	**96**	**mg/L**	**96%**	**1.0 %**			
Method Blank	Method Blank		ND*	mg/L			08/07/97	9708-107	5
Standard	Standard	100	98	mg/L	98%		08/07/97	9708-110	5
Standard (Dupl)	Standard	100	97	mg/L	97%		08/07/97	9708-110	5
		100	**98**	**mg/L**	**98%**	**1.0 %**			

Analysis: TotHard (Total Hardness) **Method:** SM 2340 C

QC Batch ID: 3-0-4

QC Type		Spike	Recovery	Unit	Yield	RPD	Date Run	S&H ID	MRL	Acceptance Criteria Range	RPD
Method Blank	Method Blank		ND*	mg/L CaCO3			07/14/97	9707-171	5		
Matrix Spike	Matrix Spike	90	90	mg/L CaCO3	100%		07/19/97	9707-195	5		
Method Blank	Method Blank		ND*	mg/L CaCO3			07/19/97	9707-207	5		
Standard	Standard	100	97	mg/L CaCO3	97%		07/19/97	9707-209	5	90-110%	
Matrix Spike	Matrix Spike	90	90	mg/L CaCO3	100%		07/24/97	9707-261	5		
Method Blank	Method Blank		ND*	mg/L CaCO3			07/24/97	9707-293	5		
Standard	Standard	100	99	mg/L CaCO3	99%		07/24/97	9707-294	5	90-110%	

Analysis: TotHard (Total Hardness) **Method:** SM 2340 C

QC Batch ID: 3-0-5

QC Type		Spike	Recovery	Unit	Yield	RPD	Date Run	S&H ID	MRL	Acceptance Criteria Range	RPD
Matrix Spike	Matrix Spike	91	89	mg/L CaCO3	98%		07/31/97	9707-339	5		
Matrix Spike (Dupl)	Matrix Spike	91	89	mg/L CaCO3	98%		07/31/97	9707-339	5		
		91	**89**	**mg/L CaCO3**	**98%**	**0.0 %**					
Method Blank	Method Blank		ND*	mg/L CaCO3			07/31/97	9707-352	5		
Standard	Standard	100	98	mg/L CaCO3	98%		07/31/97	9707-357	5	90-110%	
Standard (Dupl)	Standard	100	98	mg/L CaCO3	98%		07/31/97	9707-357	5	90-110%	
		100	**98**	**mg/L CaCO3**	**98%**	**0.0 %**				90-110%	10%
Matrix Spike	Matrix Spike	117	122	mg/L CaCO3	104%		08/02/97	9708-12	5		
Method Blank	Method Blank		ND*	mg/L CaCO3			08/02/97	9708-25	5		
Standard	Standard	100	98	mg/L CaCO3	98%		08/02/97	9708-28	5	90-110%	
Standard (Dupl)	Standard	100	97	mg/L CaCO3	97%		08/02/97	9708-28	5	90-110%	
		100	**98**	**mg/L CaCO3**	**98%**	**1.0 %**				90-110%	10%
Method Blank	Method Blank		ND*	mg/L CaCO3			08/05/97	9708-78	5		
Standard	Standard	100	99	mg/L CaCO3	99%		08/05/97	9708-81	5	90-110%	
Standard (Dupl)	Standard	100	98	mg/L CaCO3	98%		08/05/97	9708-81	5	90-110%	
		100	**98**	**mg/L CaCO3**	**98%**	**1.0 %**				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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Mr. John Zackasee
Mahoning Valley Sanitary District

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Analysis: TotHard (Total Hardness) **Method:** SM 2340 C

QC Batch ID: 3-0-6

QC Type		Spike	Recovery	Unit	Yield	RPD	Date Run	S&H ID	MRL	Acceptance Criteria Range	Acceptance Criteria RPD
Matrix Spike	Matrix Spike	109	108	mg/L CaCO3	99%		08/07/97	9708-105	5		
Matrix Spike (Dupl)	Matrix Spike	109	110	mg/L CaCO3	101%		08/07/97	9708-105	5		
		109	**109**	**mg/L CaCO3**	**100%**	**1.8 %**					
Method Blank	Method Blank		ND*	mg/L CaCO3			08/07/97	9708-108	5		
Standard	Standard	100	96	mg/L CaCO3	96%		08/07/97	9708-111	5	90-110%	
Standard (Dupl)	Standard	100	95	mg/L CaCO3	95%		08/07/97	9708-111	5	90-110%	
		100	**96**	**mg/L CaCO3**	**96%**	**1.0 %**				90-110%	10%

Analysis: TOC-ICR (Total Organic Carbon) **Method:** SM 5310 C

QC Batch ID: 7-0-100

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	Acceptance Criteria RPD
Matrix Spike	Matrix Spike	4.00	3.86	mg/L	96%		9708-121	0.5		
Matrix Spike (Dupl)	Matrix Spike	4.00	3.91	mg/L	98%		9708-121	0.5		
		4.00	**3.89**	**mg/L**	**97%**	**1.3 %**				
Method Blank	Method Blank		ND*	mg/L			9708-128	0.5		
Method Blank (Dupl)	Method Blank		ND*	mg/L			9708-128	0.5		
			ND*	**mg/L**						
Standard	Standard	0.50	0.54	mg/L	108%		9708-33	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.53	mg/L	106%		9708-33	0.5	50-150%	
		0.50	**0.54**	**mg/L**	**108%**	**1.9 %**			50-150%	20%
Standard	Standard	4.00	3.97	mg/L	99%		9708-34	0.5	90-110%	
Standard (Dupl)	Standard	4.00	3.95	mg/L	99%		9708-34	0.5	90-110%	
		4.00	**3.96**	**mg/L**	**99%**	**0.5 %**			90-110%	10%
Standard	Standard	10.00	9.87	mg/L	99%		9708-35	0.5	90-110%	
Standard (Dupl)	Standard	10.00	9.85	mg/L	98%		9708-35	0.5	90-110%	
		10.00	**9.86**	**mg/L**	**99%**	**0.2 %**			90-110%	10%

Analysis: TOC-ICR (Total Organic Carbon) **Method:** SM 5310 C

QC Batch ID: 7-0-101

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	Acceptance Criteria RPD
Matrix Spike	Matrix Spike	4.00	3.94	mg/L	98%		9708-131	0.5		
Matrix Spike (Dupl)	Matrix Spike	4.00	4.00	mg/L	100%		9708-131	0.5		
		4.00	**3.97**	**mg/L**	**99%**	**1.3 %**				
Method Blank	Method Blank		ND*	mg/L			9708-129	0.5		
Method Blank (Dupl)	Method Blank		ND*	mg/L			9708-129	0.5		
			ND*	**mg/L**						
Standard	Standard	0.50	0.55	mg/L	110%		9708-33	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.54	mg/L	108%		9708-33	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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		0.50	**0.54**	**mg/L**	**108%**	**1.9 %**			50-150%	20%
Standard	Standard	4.00	4.02	mg/L	100%		9708-34	0.5	90-110%	
Standard (Dupl)	Standard	4.00	4.00	mg/L	100%		9708-34	0.5	90-110%	
		4.00	**4.01**	**mg/L**	**100%**	**0.5 %**			90-110%	10%

Analysis: TOC-ICR (Total Organic Carbon) **Method:** SM 5310 C

QC Batch ID: 7-0-102

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	RPD
Matrix Spike	Matrix Spike	4.00	3.99	mg/L	100%		9708-139	0.5		
Matrix Spike (Dupl)	Matrix Spike	4.00	3.98	mg/L	100%		9708-139	0.5		
		4.00	**3.99**	**mg/L**	**100%**	**0.3 %**				
Method Blank	Method Blank		ND*	mg/L			9708-142	0.5		
Method Blank (Dupl)	Method Blank		ND*	mg/L			9708-142	0.5		
			ND*	**mg/L**						
Standard	Standard	0.50	0.57	mg/L	114%		9708-33	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.55	mg/L	110%		9708-33	0.5	50-150%	
		0.50	**0.56**	**mg/L**	**112%**	**3.6 %**			50-150%	20%
Standard	Standard	4.00	3.95	mg/L	99%		9708-34	0.5	90-110%	
Standard (Dupl)	Standard	4.00	3.98	mg/L	100%		9708-34	0.5	90-110%	
		4.00	**3.96**	**mg/L**	**99%**	**0.8 %**			90-110%	10%
Standard	Standard	10.00	9.92	mg/L	99%		9708-35	0.5	90-110%	
Standard (Dupl)	Standard	10.00	9.95	mg/L	99%		9708-35	0.5	90-110%	
		10.00	**9.93**	**mg/L**	**99%**	**0.3 %**			90-110%	10%

Analysis: TOC-ICR (Total Organic Carbon) **Method:** SM 5310 C

QC Batch ID: 7-0-103

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	RPD
Matrix Spike	Matrix Spike	4.00	3.77	mg/L	94%		9708-159	0.5		
Matrix Spike (Dupl)	Matrix Spike	4.00	3.78	mg/L	94%		9708-159	0.5		
		4.00	**3.77**	**mg/L**	**94%**	**0.0 %**				
Method Blank	Method Blank		ND*	mg/L			9708-162	0.5		
Method Blank (Dupl)	Method Blank		ND*	mg/L			9708-162	0.5		
			ND*	**mg/L**						
Standard	Standard	0.50	0.55	mg/L	110%		9708-33	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.54	mg/L	108%		9708-33	0.5	50-150%	
		0.50	**0.55**	**mg/L**	**110%**	**1.8 %**			50-150%	20%
Standard	Standard	4.00	3.99	mg/L	100%		9708-34	0.5	90-110%	
Standard (Dupl)	Standard	4.00	3.98	mg/L	100%		9708-34	0.5	90-110%	
		4.00	**3.99**	**mg/L**	**100%**	**0.3 %**			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: 7-0-105

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	Acceptance Criteria RPD
Matrix Spike	Matrix Spike	4.00	5.03	mg/L	126%		9708-178	0.5		
Matrix Spike (Dupl)	Matrix Spike	4.00	5.03	mg/L	126%		9708-178	0.5		
		4.00	**5.03**	**mg/L**	**126%**	**0.2 %**				
Method Blank	Method Blank		ND*	mg/L			9708-188	0.5		
Method Blank (Dupl)	Method Blank		ND*	mg/L			9708-188	0.5		
			ND*	**mg/L**						
Standard	Standard	0.50	0.53	mg/L	106%		9708-33	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.52	mg/L	104%		9708-33	0.5	50-150%	
		0.50	**0.53**	**mg/L**	**106%**	**1.9 %**			50-150%	20%
Standard	Standard	4.00	3.96	mg/L	99%		9708-34	0.5	90-110%	
Standard (Dupl)	Standard	4.00	3.97	mg/L	99%		9708-34	0.5	90-110%	
		4.00	**3.97**	**mg/L**	**99%**	**0.3 %**			90-110%	10%
Standard	Standard	10.00	9.93	mg/L	99%		9708-35	0.5	90-110%	
Standard (Dupl)	Standard	10.00	10.20	mg/L	102%		9708-35	0.5	90-110%	
		10.00	**10.07**	**mg/L**	**101%**	**2.7 %**			90-110%	10%

Analysis: TOC-ICR (Total Organic Carbon) **Method:** SM 5310 C

QC Batch ID: 7-0-106

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	Acceptance Criteria RPD
Matrix Spike	Matrix Spike	4.00	3.99	mg/L	100%		9708-190	0.5		
Matrix Spike (Dupl)	Matrix Spike	4.00	4.01	mg/L	100%		9708-190	0.5		
		4.00	**4.00**	**mg/L**	**100%**	**0.8 %**				
Method Blank	Method Blank		ND*	mg/L			9708-192	0.5		
Method Blank (Dupl)	Method Blank		ND*	mg/L			9708-192	0.5		
			ND*	**mg/L**						
Standard	Standard	0.50	0.56	mg/L	112%		9708-33	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.54	mg/L	108%		9708-33	0.5	50-150%	
		0.50	**0.55**	**mg/L**	**110%**	**3.6 %**			50-150%	20%
Standard	Standard	4.00	4.03	mg/L	101%		9708-34	0.5	90-110%	
Standard (Dupl)	Standard	4.00	4.03	mg/L	101%		9708-34	0.5	90-110%	
		4.00	**4.03**	**mg/L**	**101%**	**0.0 %**			90-110%	10%

Analysis: TOC-ICR (Total Organic Carbon) **Method:** SM 5310 C

QC Batch ID: 7-0-107

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	Acceptance Criteria RPD
Matrix Spike	Matrix Spike	4.00	4.02	mg/L	100%		9708-199	0.5		
Matrix Spike (Dupl)	Matrix Spike	4.00	4.04	mg/L	101%		9708-199	0.5		
		4.00	**4.03**	**mg/L**	**101%**	**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	Method Blank		ND*	mg/L			9708-195	0.5		
Method Blank (Dupl)	Method Blank		ND*	mg/L			9708-195	0.5		
			ND*	**mg/L**						
Standard	Standard	0.50	0.57	mg/L	114%		9708-196	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.56	mg/L	112%		9708-196	0.5	50-150%	
		0.50	**0.57**	**mg/L**	**114%**	**1.8 %**			50-150%	20%
Standard	Standard	4.00	4.05	mg/L	101%		9708-197	0.5	90-110%	
Standard (Dupl)	Standard	4.00	4.05	mg/L	101%		9708-197	0.5	90-110%	
		4.00	**4.05**	**mg/L**	**101%**	**0.0 %**			90-110%	10%

Analysis: TOC-ICR (Total Organic Carbon) **Method:** SM 5310 C

QC Batch ID: 7-0-109

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	RPD
Matrix Spike	Matrix Spike	4.00	4.09	mg/L	102%		9708-220	0.5		
Matrix Spike (Dupl)	Matrix Spike	4.00	4.08	mg/L	102%		9708-220	0.5		
		4.00	**4.09**	**mg/L**	**102%**	**0.0 %**				
Method Blank	Method Blank		ND*	mg/L			9708-219	0.5		
Method Blank (Dupl)	Method Blank		ND*	mg/L			9708-219	0.5		
			ND*	**mg/L**						
Standard	Standard	0.50	0.56	mg/L	112%		9708-196	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.54	mg/L	108%		9708-196	0.5	50-150%	
		0.50	**0.55**	**mg/L**	**110%**	**3.6 %**			50-150%	20%
Standard	Standard	4.00	4.08	mg/L	102%		9708-197	0.5	90-110%	
Standard (Dupl)	Standard	4.00	4.04	mg/L	101%		9708-197	0.5	90-110%	
		4.00	**4.06**	**mg/L**	**101%**	**1.0 %**			90-110%	10%
Standard	Standard	10.00	10.05	mg/L	101%		9708-198	0.5	90-110%	
Standard (Dupl)	Standard	10.00	9.97	mg/L	100%		9708-198	0.5	90-110%	
		10.00	**10.01**	**mg/L**	**100%**	**0.8 %**			90-110%	10%

Analysis: TOC-ICR (Total Organic Carbon) **Method:** SM 5310 C

QC Batch ID: 7-0-86

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	RPD
Matrix Spike	Matrix Spike	4.00	3.97	mg/L	99%		9707-169	0.5		
Matrix Spike (Dupl)	Matrix Spike	4.00	4.05	mg/L	101%		9707-169	0.5		
		4.00	**4.01**	**mg/L**	**100%**	**2.0 %**				
Method Blank	Method Blank		ND*	mg/L			9707-173	0.5		
Method Blank (Dupl)	Method Blank		ND*	mg/L			9707-173	0.5		
			ND*	**mg/L**						
Standard	Standard	0.50	0.60	mg/L	120%		9707-61	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.53	mg/L	106%		9707-61	0.5	50-150%	
		0.50	**0.57**	**mg/L**	**114%**	**12.3 %**			50-150%	20%
Standard	Standard	4.00	4.02	mg/L	100%		9707-62	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	4.02	mg/L	100%		9707-62	0.5	90-110%	
		4.00	**4.02**	**mg/L**	**100%**	**0.0 %**			90-110%	10%

Analysis: TOC-ICR (Total Organic Carbon) **Method:** SM 5310 C

QC Batch ID: 7-0-87

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	RPD
Matrix Spike	Matrix Spike	4.00	3.97	mg/L	99%		9707-196	0.5		
Matrix Spike (Dupl)	Matrix Spike	4.00	3.99	mg/L	100%		9707-196	0.5		
		4.00	**3.98**	**mg/L**	**100%**	**0.5 %**				
Method Blank	Method Blank		ND*	mg/L			9707-202	0.5		
Method Blank (Dupl)	Method Blank		ND*	mg/L			9707-202	0.5		
			ND*	**mg/L**						
Standard	Standard	0.50	0.55	mg/L	110%		9707-61	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.55	mg/L	110%		9707-61	0.5	50-150%	
		0.50	**0.55**	**mg/L**	**110%**	**0.0 %**			50-150%	20%
Standard	Standard	4.00	4.06	mg/L	101%		9707-62	0.5	90-110%	
Standard (Dupl)	Standard	4.00	4.04	mg/L	101%		9707-62	0.5	90-110%	
		4.00	**4.05**	**mg/L**	**101%**	**0.5 %**			90-110%	10%

Analysis: TOC-ICR (Total Organic Carbon) **Method:** SM 5310 C

QC Batch ID: 7-0-93

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	RPD
Matrix Spike	Matrix Spike	4.00	3.95	mg/L	99%		9707-342	0.5		
Matrix Spike (Dupl)	Matrix Spike	4.00	3.91	mg/L	98%		9707-342	0.5		
		4.00	**3.93**	**mg/L**	**98%**	**0.8 %**				
Method Blank	Method Blank		ND*	mg/L			9707-341	0.5		
Method Blank (Dupl)	Method Blank		ND*	mg/L			9707-341	0.5		
			ND*	**mg/L**						
Standard	Standard	0.50	0.59	mg/L	118%		9707-212	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.57	mg/L	114%		9707-212	0.5	50-150%	
		0.50	**0.58**	**mg/L**	**116%**	**3.4 %**			50-150%	20%
Standard	Standard	4.00	3.99	mg/L	100%		9707-213	0.5	90-110%	
Standard (Dupl)	Standard	4.00	3.99	mg/L	100%		9707-213	0.5	90-110%	
		4.00	**3.99**	**mg/L**	**100%**	**0.0 %**			90-110%	10%

Analysis: TOC-ICR (Total Organic Carbon) **Method:** SM 5310 C

QC Batch ID: 7-0-94

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	RPD
Matrix Spike	Matrix Spike	4.00	3.94	mg/L	98%		9708-21	0.5		
Matrix Spike (Dupl)	Matrix Spike	4.00	3.95	mg/L	99%		9708-21	0.5		
		4.00	**3.94**	**mg/L**	**98%**	**0.0 %**				

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			9708-37	0.5		
Method Blank (Dupl)	Method Blank		ND*	mg/L			9708-37	0.5		
			ND*	**mg/L**						
Standard	Standard	0.50	0.59	mg/L	118%		9707-212	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.58	mg/L	116%		9707-212	0.5	50-150%	
		0.50	**0.58**	**mg/L**	**116%**	**1.7 %**			50-150%	20%
Standard	Standard	4.00	4.09	mg/L	102%		9707-213	0.5	90-110%	
Standard (Dupl)	Standard	4.00	4.09	mg/L	102%		9707-213	0.5	90-110%	
		4.00	**4.09**	**mg/L**	**102%**	**0.0 %**			90-110%	10%
Standard	Standard	10.00	10.19	mg/L	102%		9707-214	0.5	90-110%	
Standard (Dupl)	Standard	10.00	10.12	mg/L	101%		9707-214	0.5	90-110%	
		10.00	**10.15**	**mg/L**	**102%**	**0.7 %**			90-110%	10%

Analysis: TOC-ICR (Total Organic Carbon) **Method:** SM 5310 C

QC Batch ID: 7-0-95

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%		9708-2	0.5		
Matrix Spike (Dupl)	Matrix Spike	4.00	4.01	mg/L	100%		9708-2	0.5		
		4.00	**3.98**	**mg/L**	**100%**	**1.5 %**				
Method Blank	Method Blank		ND*	mg/L			9708-3	0.5		
Method Blank (Dupl)	Method Blank		ND*	mg/L			9708-3	0.5		
			ND*	**mg/L**						
Standard	Standard	0.50	0.59	mg/L	118%		9707-212	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.58	mg/L	116%		9707-212	0.5	50-150%	
		0.50	**0.58**	**mg/L**	**116%**	**1.7 %**			50-150%	20%
Standard	Standard	4.00	4.07	mg/L	102%		9707-213	0.5	90-110%	
Standard (Dupl)	Standard	4.00	4.07	mg/L	102%		9707-213	0.5	90-110%	
		4.00	**4.07**	**mg/L**	**102%**	**0.0 %**			90-110%	10%

Analysis: TOC-ICR (Total Organic Carbon) **Method:** SM 5310 C

QC Batch ID: 7-0-96

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	RPD
Matrix Spike	Matrix Spike	4.00	3.85	mg/L	96%		9708-42	0.5		
Matrix Spike (Dupl)	Matrix Spike	4.00	3.88	mg/L	97%		9708-42	0.5		
		4.00	**3.87**	**mg/L**	**97%**	**0.5 %**				
Method Blank	Method Blank		ND*	mg/L			9708-38	0.5		
Method Blank (Dupl)	Method Blank		ND*	mg/L			9708-38	0.5		
			ND*	**mg/L**						
Standard	Standard	0.50	0.56	mg/L	112%		9708-33	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.56	mg/L	112%		9708-33	0.5	50-150%	
		0.50	**0.56**	**mg/L**	**112%**	**0.0 %**			50-150%	20%
Standard	Standard	4.00	4.01	mg/L	100%		9708-34	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	4.06	mg/L	101%		9708-34	0.5	90-110%	
		4.00	**4.04**	**mg/L**	**101%**	**1.2 %**			90-110%	10%

Analysis: TOC-ICR (Total Organic Carbon) **Method:** SM 5310 C

QC Batch ID: 7-0-97

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	RPD
Matrix Spike	Matrix Spike	4.00	4.12	mg/L	103%		9708-59	0.5		
Matrix Spike (Dupl)	Matrix Spike	4.00	4.07	mg/L	102%		9708-59	0.5		
		4.00	**4.09**	**mg/L**	**102%**	**1.0 %**				
Method Blank	Method Blank		ND*	mg/L			9708-51	0.5		
Method Blank (Dupl)	Method Blank		ND*	mg/L			9708-51	0.5		
			ND*	**mg/L**						
Standard	Standard	0.50	0.55	mg/L	110%		9708-33	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.56	mg/L	112%		9708-33	0.5	50-150%	
		0.50	**0.55**	**mg/L**	**110%**	**1.8 %**			50-150%	20%
Standard	Standard	4.00	4.11	mg/L	103%		9708-34	0.5	90-110%	
Standard (Dupl)	Standard	4.00	4.06	mg/L	101%		9708-34	0.5	90-110%	
		4.00	**4.08**	**mg/L**	**102%**	**1.2 %**			90-110%	10%
Standard	Standard	10.00	9.96	mg/L	100%		9708-35	0.5	90-110%	
Standard (Dupl)	Standard	10.00	10.13	mg/L	101%		9708-35	0.5	90-110%	
		10.00	**10.04**	**mg/L**	**100%**	**1.7 %**			90-110%	10%

Analysis: TOC-ICR (Total Organic Carbon) **Method:** SM 5310 C

QC Batch ID: 7-0-98

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	RPD
Matrix Spike	Matrix Spike	4.00	3.73	mg/L	93%		9708-70	0.5		
Matrix Spike (Dupl)	Matrix Spike	4.00	3.76	mg/L	94%		9708-70	0.5		
		4.00	**3.74**	**mg/L**	**94%**	**0.5 %**				
Method Blank	Method Blank		ND*	mg/L			9708-51	0.5		
Method Blank (Dupl)	Method Blank		ND*	mg/L			9708-51	0.5		
			ND*	**mg/L**						
Standard	Standard	0.50	0.54	mg/L	108%		9708-33	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.53	mg/L	106%		9708-33	0.5	50-150%	
		0.50	**0.53**	**mg/L**	**106%**	**1.9 %**			50-150%	20%
Standard	Standard	4.00	3.96	mg/L	99%		9708-34	0.5	90-110%	
Standard (Dupl)	Standard	4.00	3.95	mg/L	99%		9708-34	0.5	90-110%	
		4.00	**3.95**	**mg/L**	**99%**	**0.3 %**			90-110%	10%

Analysis: TOC-ICR (Total Organic Carbon) **Method:** SM 5310 C

QC Batch ID: 7-0-99

QC Type	Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria 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	3.45	mg/L	86%		9708-93	0.5		
Matrix Spike (Dupl)	Matrix Spike	4.00	3.43	mg/L	86%		9708-93	0.5		
		4.00	**3.44**	**mg/L**	**86%**	**0.6 %**				
Method Blank	Method Blank		ND*	mg/L			9708-118	0.5		
Method Blank (Dupl)	Method Blank		ND*	mg/L			9708-118	0.5		
			ND*	**mg/L**						
Standard	Standard	0.50	0.52	mg/L	104%		9708-33	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.52	mg/L	104%		9708-33	0.5	50-150%	
		0.50	**0.52**	**mg/L**	**104%**	**0.0 %**			50-150%	20%
Standard	Standard	4.00	3.98	mg/L	100%		9708-34	0.5	90-110%	
Standard (Dupl)	Standard	4.00	4.00	mg/L	100%		9708-34	0.5	90-110%	
		4.00	**3.99**	**mg/L**	**100%**	**0.5 %**			90-110%	10%
Standard	Standard	10.00	9.25	mg/L	93%		9708-35	0.5	90-110%	
Standard (Dupl)	Standard	10.00	9.22	mg/L	92%		9708-35	0.5	90-110%	
		10.00	**9.23**	**mg/L**	**92%**	**0.3 %**			90-110%	10%

Analysis: UV-ICR (UV-254) **Method:** SM 5910 B

QC Batch ID: 8-0-57

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	RPD
Method Blank	Method Blank		ND*	1/cm			9708-4	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9708-4	0.009		
			ND*	**1/cm**						
Method Blank	Method Blank		ND*	1/cm			9708-4	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9708-4	0.009		
			ND*	**1/cm**						
Standard	Standard	0.009	0.008	1/cm	89%		9707-258	0.009	75-125%	
Standard (Dupl)	Standard	0.009	0.008	1/cm	89%		9707-258	0.009	75-125%	
		0.009	**0.008**	**1/cm**	**89%**	**0.0 %**			75-125%	20%
Standard	Standard	0.088	0.091	1/cm	103%		9707-259	0.009	85-115%	
Standard (Dupl)	Standard	0.088	0.091	1/cm	103%		9707-259	0.009	85-115%	
		0.088	**0.091**	**1/cm**	**103%**	**0.0 %**			85-115%	10%

Analysis: UV-ICR (UV-254) **Method:** SM 5910 B

QC Batch ID: 8-0-58

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	RPD
Method Blank	Method Blank		ND*	1/cm			9708-44	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9708-44	0.009		
			ND*	**1/cm**						
Method Blank	Method Blank		ND*	1/cm			9708-44	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9708-44	0.009		
			ND*	**1/cm**						
Standard	Standard	0.009	0.008	1/cm	89%		9707-258	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%		9707-258	0.009	75-125%	
		0.009	**0.008**	**1/cm**	**89%**	**0.0 %**			75-125%	20%
Standard	Standard	0.088	0.090	1/cm	102%		9707-259	0.009	85-115%	
Standard (Dupl)	Standard	0.088	0.090	1/cm	102%		9707-259	0.009	85-115%	
		0.088	**0.090**	**1/cm**	**102%**	**0.0 %**			85-115%	10%

Analysis: UV-ICR (UV-254) **Method:** SM 5910 B

QC Batch ID: 8-0-59

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	Acceptance Criteria RPD
Method Blank	Method Blank		ND*	1/cm			9708-62	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9708-62	0.009		
			ND*	**1/cm**						
Method Blank	Method Blank		ND*	1/cm			9708-62	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9708-62	0.009		
			ND*	**1/cm**						
Standard	Standard	0.009	0.009	1/cm	100%		9708-60	0.009	75-125%	
Standard (Dupl)	Standard	0.009	0.009	1/cm	100%		9708-60	0.009	75-125%	
		0.009	**0.009**	**1/cm**	**100%**	**0.0 %**			75-125%	20%
Standard	Standard	0.088	0.089	1/cm	101%		9708-61	0.009	85-115%	
Standard (Dupl)	Standard	0.088	0.089	1/cm	101%		9708-61	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: 8-0-61

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	Acceptance Criteria RPD
Method Blank	Method Blank		ND*	1/cm			9708-90	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9708-90	0.009		
			ND*	**1/cm**						
Method Blank	Method Blank		ND*	1/cm			9708-90	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9708-90	0.009		
			ND*	**1/cm**						
Standard	Standard	0.009	0.009	1/cm	100%		9708-60	0.009	75-125%	
Standard (Dupl)	Standard	0.009	0.009	1/cm	100%		9708-60	0.009	75-125%	
		0.009	**0.009**	**1/cm**	**100%**	**0.0 %**			75-125%	20%
Standard	Standard	0.088	0.090	1/cm	102%		9708-61	0.009	85-115%	
Standard (Dupl)	Standard	0.088	0.090	1/cm	102%		9708-61	0.009	85-115%	
		0.088	**0.090**	**1/cm**	**102%**	**0.0 %**			85-115%	10%

Analysis: UV-ICR (UV-254) **Method:** SM 5910 B

QC Batch ID: 8-0-62

QC Type	Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	Acceptance Criteria 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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Method Blank	Method Blank		ND*	1/cm			9708-127	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9708-127	0.009		
			ND*	**1/cm**						
Method Blank	Method Blank		ND*	1/cm			9708-127	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9708-127	0.009		
			ND*	**1/cm**						
Standard	Standard	0.009	0.009	1/cm	100%		9708-60	0.009	75-125%	
Standard (Dupl)	Standard	0.009	0.009	1/cm	100%		9708-60	0.009	75-125%	
		0.009	**0.009**	**1/cm**	**100%**	**0.0 %**			75-125%	20%
Standard	Standard	0.088	0.090	1/cm	102%		9708-61	0.009	85-115%	
Standard (Dupl)	Standard	0.088	0.090	1/cm	102%		9708-61	0.009	85-115%	
		0.088	**0.090**	**1/cm**	**102%**	**0.0 %**			85-115%	10%

Analysis: UV-ICR (UV-254) **Method:** SM 5910 B

QC Batch ID: 8-0-65

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	RPD
Method Blank	Method Blank		ND*	1/cm			9708-179	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9708-179	0.009		
			ND*	**1/cm**						
Method Blank	Method Blank		ND*	1/cm			9708-179	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9708-179	0.009		
			ND*	**1/cm**						
Standard	Standard	0.009	0.009	1/cm	100%		9708-60	0.009	75-125%	
Standard (Dupl)	Standard	0.009	0.008	1/cm	89%		9708-60	0.009	75-125%	
		0.009	**0.008**	**1/cm**	**89%**	**12.5 %**			75-125%	20%
Standard	Standard	0.088	0.090	1/cm	102%		9708-61	0.009	85-115%	
Standard (Dupl)	Standard	0.088	0.090	1/cm	102%		9708-61	0.009	85-115%	
		0.088	**0.090**	**1/cm**	**102%**	**0.0 %**			85-115%	10%

Analysis: UV-ICR (UV-254) **Method:** SM 5910 B

QC Batch ID: 8-0-66

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	RPD
Method Blank	Method Blank		ND*	1/cm			9708-137	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9708-137	0.009		
			ND*	**1/cm**						
Method Blank	Method Blank		ND*	1/cm			9708-137	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9708-137	0.009		
			ND*	**1/cm**						
Standard	Standard	0.009	0.009	1/cm	100%		9708-60	0.009	75-125%	
Standard (Dupl)	Standard	0.009	0.009	1/cm	100%		9708-60	0.009	75-125%	
		0.009	**0.009**	**1/cm**	**100%**	**0.0 %**			75-125%	20%
Standard	Standard	0.088	0.090	1/cm	102%		9708-61	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	0.090	1/cm	102%		9708-61	0.009	85-115%	
		0.088	**0.090**	**1/cm**	**102%**	**0.0 %**			85-115%	10%

Analysis: UV-ICR (UV-254) **Method:** SM 5910 B

QC Batch ID: 8-0-67

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	RPD
Method Blank	Method Blank		ND*	1/cm			9708-152	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9708-152	0.009		
			ND*	**1/cm**						
Method Blank	Method Blank		ND*	1/cm			9708-152	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9708-152	0.009		
			ND*	**1/cm**						
Standard	Standard	0.009	0.009	1/cm	100%		9708-60	0.009	75-125%	
Standard (Dupl)	Standard	0.009	0.009	1/cm	100%		9708-60	0.009	75-125%	
		0.009	**0.009**	**1/cm**	**100%**	**0.0 %**			75-125%	20%
Standard	Standard	0.088	0.090	1/cm	102%		9708-61	0.009	85-115%	
Standard (Dupl)	Standard	0.088	0.090	1/cm	102%		9708-61	0.009	85-115%	
		0.088	**0.090**	**1/cm**	**102%**	**0.0 %**			85-115%	10%

Analysis: UV-ICR (UV-254) **Method:** SM 5910 B

QC Batch ID: 8-0-68

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	RPD
Method Blank	Method Blank		ND*	1/cm			9708-200	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9708-200	0.009		
			ND*	**1/cm**						
Method Blank	Method Blank		ND*	1/cm			9708-200	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9708-200	0.009		
			ND*	**1/cm**						
Standard	Standard	0.009	0.009	1/cm	100%		9708-60	0.009	75-125%	
Standard (Dupl)	Standard	0.009	0.008	1/cm	89%		9708-60	0.009	75-125%	
		0.009	**0.009**	**1/cm**	**100%**	**11.1 %**			75-125%	20%
Standard	Standard	0.088	0.089	1/cm	101%		9708-61	0.009	85-115%	
Standard (Dupl)	Standard	0.088	0.089	1/cm	101%		9708-61	0.009	85-115%	
		0.088	**0.089**	**1/cm**	**101%**	**0.0 %**			85-115%	10%

Analysis: TOX-ICR (Total Organic Halide) **Method:** SM 5320 B

QC Batch ID: 12-0-39

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	RPD
Matrix Spike	Matrix Spike	200	203	µg Cl-/L	101%		9707-139	25		
Matrix Spike (Dupl)	Matrix Spike	200	174	µg Cl-/L	87%		9707-139	25		
		200	**188**	**µg Cl-/L**	**94%**	**15.4 %**				

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	24	µg Cl-/L	96%		9707-251	25	75-125%	
Standard - TCP Aqueous	Standard	200	178	µg Cl-/L	89%		9707-252	25	85-115%	
System Blank	Blank		ND*	µg Cl-/L			9707-250	25		

Analysis: TOX-ICR (Total Organic Halide) **Method:** SM 5320 B

QC Batch ID: 12-0-46

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	RPD
Standard - TCP Aqueous	Standard	25	24	µg Cl-/L	96%		9708-75	25	75-125%	
Standard - TCP Aqueous	Standard	200	192	µg Cl-/L	96%		9708-76	25	85-115%	
System Blank	Blank		ND*	µg Cl-/L			9708-74	25		

Analysis: TOX-ICR (Total Organic Halide) **Method:** SM 5320 B

QC Batch ID: 12-0-47

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	RPD
Standard - TCP Aqueous	Standard	25	20	µg Cl-/L	80%		9708-103	25	75-125%	
Standard - TCP Aqueous	Standard	200	193	µg Cl-/L	96%		9708-104	25	85-115%	
System Blank	Blank		ND*	µg Cl-/L			9708-102	25		

Analysis: TOX-ICR (Total Organic Halide) **Method:** SM 5320 B

QC Batch ID: 12-0-48

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	RPD
Matrix Spike	Matrix Spike	200	192	µg Cl-/L	96%		9708-59	25		
Matrix Spike (Dupl)	Matrix Spike	200	189	µg Cl-/L	94%		9708-59	25		
		200	**190**	**µg Cl-/L**	**95%**	**1.6 %**				
Standard - TCP Aqueous	Standard	25	27	µg Cl-/L	108%		9708-124	25	75-125%	
Standard - TCP Aqueous	Standard	200	192	µg Cl-/L	96%		9708-125	25	85-115%	
System Blank	Blank		ND*	µg Cl-/L			9708-123	25		

Analysis: TOX-ICR (Total Organic Halide) **Method:** SM 5320 B

QC Batch ID: 12-0-49

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	RPD
Standard - TCP Aqueous	Standard	25	26	µg Cl-/L	104%		9708-166	25	75-125%	
Standard - TCP Aqueous	Standard	200	192	µg Cl-/L	96%		9708-167	25	85-115%	
System Blank	Blank		ND*	µg Cl-/L			9708-165	25		

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: TOX-ICR (Total Organic Halide) **Method:** SM 5320 B

QC Batch ID: 12-0-50

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	RPD
Standard - TCP Aqueous	Standard	25	23	µg Cl-/L	92%		9708-182	25	75-125%	
Standard - TCP Aqueous	Standard	200	189	µg Cl-/L	94%		9708-183	25	85-115%	
System Blank	Blank		ND*	µg Cl-/L			9708-181	25		

Analysis: TOX-ICR (Total Organic Halide) **Method:** SM 5320 B

QC Batch ID: 12-0-52

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	RPD
Matrix Spike	Matrix Spike	800	764	µg Cl-/L	95%		9708-203	25		
Matrix Spike (Dupl)	Matrix Spike	800	775	µg Cl-/L	97%		9708-203	25		
		800	**769**	**µg Cl-/L**	**96%**	**1.3 %**				
Standard - TCP Aqueous	Standard	25	21	µg Cl-/L	84%		9708-242	25	75-125%	
Standard - TCP Aqueous	Standard	200	190	µg Cl-/L	95%		9708-243	25	85-115%	
System Blank	Blank		ND*	µg Cl-/L			9708-241	25		

Analysis: CaHard (Calcium Hardness) **Method:** SM 3500-Ca D

QC Batch ID: 33-0-4

QC Type		Spike	Recovery	Unit	Yield	RPD	Date Run	S&H ID	MRL	Acceptance Criteria Range	RPD
Method Blank	Method Blank		ND*	mg/L CaCO3			07/15/97	9707-172	5		
Matrix Spike	Matrix Spike	91	90	mg/L CaCO3	99%		07/19/97	9707-195	5		
Method Blank	Method Blank		ND*	mg/L CaCO3			07/19/97	9707-206	5		
Standard	Standard	100	98	mg/L CaCO3	98%		07/19/97	9707-210	5	90-110%	
Matrix Spike	Matrix Spike	92	92	mg/L CaCO3	100%		07/24/97	9707-261	5		
Method Blank	Method Blank		ND*	mg/L CaCO3			07/24/97	9707-292	5		
Standard	Standard	100	98	mg/L CaCO3	98%		07/24/97	9707-295	5	90-110%	

Analysis: CaHard (Calcium Hardness) **Method:** SM 3500-Ca D

QC Batch ID: 33-0-5

QC Type		Spike	Recovery	Unit	Yield	RPD	Date Run	S&H ID	MRL	Acceptance Criteria Range	RPD
Matrix Spike	Matrix Spike	93	92	mg/L CaCO3	99%		07/31/97	9707-339	10		
Matrix Spike (Dupl)	Matrix Spike	93	90	mg/L CaCO3	97%		07/31/97	9707-339	10		
		93	**91**	**mg/L CaCO3**	**98%**	**2.2 %**					
Method Blank	Method Blank		ND*	mg/L CaCO3			07/31/97	9707-354	10		
Standard	Standard	100	96	mg/L CaCO3	96%		07/31/97	9707-358	10	90-110%	
Standard (Dupl)	Standard	100	96	mg/L CaCO3	96%		07/31/97	9707-358	10	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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Mr. John Zackasee
Mahoning Valley Sanitary District

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		100	**96**	**mg/L CaCO3**	**96%**	**0.0 %**				90-110%	10%
Matrix Spike	Matrix Spike	138	143	mg/L CaCO3	104%		08/02/97	9708-10	10		
Method Blank	Method Blank		ND*	mg/L CaCO3			08/02/97	9708-26	10		
Standard	Standard	100	100	mg/L CaCO3	100%		08/02/97	9708-29	10	90-110%	
Standard (Dupl)	Standard	100	97	mg/L CaCO3	97%		08/02/97	9708-29	10	90-110%	
		100	**98**	**mg/L CaCO3**	**98%**	**3.1 %**				90-110%	10%
Method Blank	Method Blank		ND*	mg/L CaCO3			08/06/97	9708-79	10		
Standard	Standard	100	101	mg/L CaCO3	101%		08/06/97	9708-82	10	90-110%	
Standard (Dupl)	Standard	100	101	mg/L CaCO3	101%		08/06/97	9708-82	10	90-110%	
		100	**101**	**mg/L CaCO3**	**101%**	**0.0 %**				90-110%	10%

Analysis: CaHard (Calcium Hardness) **Method:** SM 3500-Ca D

QC Batch ID: 33-0-6

QC Type		Spike	Recovery	Unit	Yield	RPD	Date Run	S&H ID	MRL	Acceptance Criteria Range	RPD
Matrix Spike	Matrix Spike	111	109	mg/L CaCO3	98%		08/07/97	9708-105	10		
Matrix Spike (Dupl)	Matrix Spike	111	107	mg/L CaCO3	96%		08/07/97	9708-105	10		
		111	**108**	**mg/L CaCO3**	**97%**	**1.9 %**					
Method Blank	Method Blank		ND*	mg/L CaCO3			08/07/97	9708-109	10		
Standard	Standard	100	96	mg/L CaCO3	96%		08/07/97	9708-112	10	90-110%	
Standard (Dupl)	Standard	100	97	mg/L CaCO3	97%		08/07/97	9708-112	10	90-110%	
		100	**97**	**mg/L CaCO3**	**97%**	**1.0 %**				90-110%	10%

Analysis: THM-ICR (Trihalomethanes (ICR)) **Method:** EPA 551.1

QC Batch ID: 0-29-0

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	RPD
Bromodichloromethane	Duplicate	6.8	6.8	µg/L		0.0%	9707-216	1		
Bromodichloromethane	Matrix Spike	20.0	18.9	µg/L	94%		9707-169	1		
Bromodichloromethane	Method Blank		ND*	µg/L			9707-253	1		
Bromodichloromethane	Standard	20.0	21.2	µg/L	106%		9707-254	1	80-120%	
Bromodichloromethane	Standard	20.0	21.2	µg/L	106%		9707-254	1	80-120%	
Bromodichloromethane	Standard	40.0	39.0	µg/L	97%		9707-255	1	80-120%	
Bromoform	Duplicate	3.0	3.1	µg/L		3.3%	9707-216	1		
Bromoform	Matrix Spike	20.0	20.3	µg/L	102%		9707-169	1		
Bromoform	Method Blank		ND*	µg/L			9707-253	1		
Bromoform	Standard	20.0	20.4	µg/L	102%		9707-254	1	80-120%	
Bromoform	Standard	20.0	20.7	µg/L	103%		9707-254	1	80-120%	
Bromoform	Standard	40.0	40.1	µg/L	100%		9707-255	1	80-120%	
Chloroform	Duplicate	2.6	2.6	µg/L		0.0%	9707-216	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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Chloroform	Matrix Spike	20.0	15.6	µg/L	78%		9707-169	1	
Chloroform	Method Blank		ND*	µg/L			9707-253	1	
Chloroform	Standard	20.0	20.0	µg/L	100%		9707-254	1	80-120%
Chloroform	Standard	20.0	21.2	µg/L	106%		9707-254	1	80-120%
Chloroform	Standard	40.0	41.4	µg/L	103%		9707-255	1	80-120%
Dibromochloromethane	Duplicate	8.9	9.1	µg/L		2.2%	9707-216	1	
Dibromochloromethane	Matrix Spike	20.0	20.7	µg/L	103%		9707-169	1	
Dibromochloromethane	Method Blank		ND*	µg/L			9707-253	1	
Dibromochloromethane	Standard	20.0	21.5	µg/L	108%		9707-254	1	80-120%
Dibromochloromethane	Standard	20.0	21.5	µg/L	108%		9707-254	1	80-120%
Dibromochloromethane	Standard	40.0	39.7	µg/L	99%		9707-255	1	80-120%

Analysis: THM-ICR (Trihalomethanes (ICR)) **Method:** EPA 551.1

QC Batch ID: 0-32-0

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	Acceptance Criteria RPD
Bromodichloromethane	Duplicate	16.9	17.5	µg/L		3.5%	9708-41	1		
Bromodichloromethane	Matrix Spike	20.0	20.5	µg/L	102%		9708-36	1		
Bromodichloromethane	Method Blank		ND*	µg/L			9708-96	1		
Bromodichloromethane	Secondary Source Std	20.0	21.7	µg/L	109%		9708-99	1	70-130%	
Bromodichloromethane	Standard	20.0	19.8	µg/L	99%		9708-97	1	80-120%	
Bromodichloromethane	Standard	20.0	19.3	µg/L	97%		9708-97	1	80-120%	
Bromodichloromethane	Standard	40.0	39.9	µg/L	100%		9708-98	1	80-120%	
Bromodichloromethane	Standard	40.0	40.8	µg/L	102%		9708-98	1	80-120%	
Bromoform	Duplicate	ND	ND	µg/L		NA	9708-41	1		
Bromoform	Matrix Spike	20.0	19.5	µg/L	97%		9708-36	1		
Bromoform	Method Blank		ND*	µg/L			9708-96	1		
Bromoform	Secondary Source Std	20.0	19.2	µg/L	96%		9708-99	1	70-130%	
Bromoform	Standard	20.0	18.8	µg/L	94%		9708-97	1	80-120%	
Bromoform	Standard	20.0	18.7	µg/L	93%		9708-97	1	80-120%	
Bromoform	Standard	40.0	37.3	µg/L	93%		9708-98	1	80-120%	
Bromoform	Standard	40.0	41.8	µg/L	104%		9708-98	1	80-120%	
Chloroform	Duplicate	28.5	29.5	µg/L		3.4%	9708-41	1		
Chloroform	Matrix Spike	20.0	21.2	µg/L	106%		9708-36	1		
Chloroform	Method Blank		ND*	µg/L			9708-96	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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Chloroform	Secondary Source Std	20.0	22.7	µg/L	114%		9708-99	1	70-130%
Chloroform	Standard	20.0	19.2	µg/L	96%		9708-97	1	80-120%
Chloroform	Standard	20.0	18.4	µg/L	92%		9708-97	1	80-120%
Chloroform	Standard	40.0	40.1	µg/L	100%		9708-98	1	80-120%
Chloroform	Standard	40.0	41.6	µg/L	104%		9708-98	1	80-120%
Dibromochloromethane	Duplicate	8.7	8.8	µg/L		1.1%	9708-41	1	
Dibromochloromethane	Matrix Spike	20.0	20.8	µg/L	104%		9708-36	1	
Dibromochloromethane	Method Blank		ND*	µg/L			9708-96	1	
Dibromochloromethane	Secondary Source Std	20.0	21.2	µg/L	106%		9708-99	1	70-130%
Dibromochloromethane	Standard	20.0	20.0	µg/L	100%		9708-97	1	80-120%
Dibromochloromethane	Standard	20.0	20.0	µg/L	100%		9708-97	1	80-120%
Dibromochloromethane	Standard	40.0	40.5	µg/L	101%		9708-98	1	80-120%
Dibromochloromethane	Standard	40.0	41.3	µg/L	103%		9708-98	1	80-120%

Analysis: THM-ICR (Trihalomethanes (ICR)) **Method:** EPA 551.1

QC Batch ID: 0-39-0

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	Acceptance Criteria RPD
Bromodichloromethane	Duplicate	19.0	18.5	µg/L		2.7%	9708-89	1		
Bromodichloromethane	Matrix Spike	40.0	42.0	µg/L	105%		9708-126	1		
Bromodichloromethane	Method Blank		ND*	µg/L			9708-184	1		
Bromodichloromethane	Secondary Source Std	20.0	22.9	µg/L	115%		9708-185	1	70-130%	
Bromodichloromethane	Standard	20.0	19.6	µg/L	98%		9708-186	1	80-120%	
Bromodichloromethane	Standard	20.0	19.4	µg/L	97%		9708-186	1	80-120%	
Bromodichloromethane	Standard	40.0	40.6	µg/L	102%		9708-187	1	80-120%	
Bromodichloromethane	Standard	40.0	41.4	µg/L	103%		9708-187	1	80-120%	
Bromoform	Duplicate	ND	ND	µg/L		NA	9708-89	1		
Bromoform	Matrix Spike	40.0	45.9	µg/L	115%		9708-126	1		
Bromoform	Method Blank		ND*	µg/L			9708-184	1		
Bromoform	Secondary Source Std	20.0	21.2	µg/L	106%		9708-185	1	70-130%	
Bromoform	Standard	20.0	20.0	µg/L	100%		9708-186	1	80-120%	
Bromoform	Standard	20.0	20.9	µg/L	104%		9708-186	1	80-120%	
Bromoform	Standard	40.0	40.7	µg/L	102%		9708-187	1	80-120%	
Bromoform	Standard	40.0	41.6	µg/L	104%		9708-187	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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Chloroform	Duplicate	49.6	47.9	µg/L		3.5%	9708-89	1	
Chloroform	Matrix Spike	40.0	43.4	µg/L	109%		9708-126	1	
Chloroform	Method Blank		ND*	µg/L			9708-184	1	
Chloroform	Secondary Source Std	20.0	23.6	µg/L	118%		9708-185	1	70-130%
Chloroform	Standard	20.0	19.8	µg/L	99%		9708-186	1	80-120%
Chloroform	Standard	20.0	19.5	µg/L	97%		9708-186	1	80-120%
Chloroform	Standard	40.0	41.1	µg/L	103%		9708-187	1	80-120%
Chloroform	Standard	40.0	40.4	µg/L	101%		9708-187	1	80-120%
Dibromochloromethane	Duplicate	7.2	7.3	µg/L		1.4%	9708-89	1	
Dibromochloromethane	Matrix Spike	40.0	41.9	µg/L	105%		9708-126	1	
Dibromochloromethane	Method Blank		ND*	µg/L			9708-184	1	
Dibromochloromethane	Secondary Source Std	20.0	22.2	µg/L	111%		9708-185	1	70-130%
Dibromochloromethane	Standard	20.0	19.8	µg/L	99%		9708-186	1	80-120%
Dibromochloromethane	Standard	20.0	19.9	µg/L	99%		9708-186	1	80-120%
Dibromochloromethane	Standard	40.0	41.2	µg/L	103%		9708-187	1	80-120%
Dibromochloromethane	Standard	40.0	42.0	µg/L	105%		9708-187	1	80-120%

Analysis: THM-ICR (Trihalomethanes (ICR)) **Method:** EPA 551.1

QC Batch ID: 0-41-0

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	Acceptance Criteria RPD
Bromodichloromethane	Duplicate	21.1	21.5	µg/L		1.9%	9708-191	1		
Bromodichloromethane	Matrix Spike	40.0	44.8	µg/L	112%		9708-178	1		
Bromodichloromethane	Method Blank		ND*	µg/L			9708-244	1		
Bromodichloromethane	Standard	20.0	21.7	µg/L	109%		9708-245	1	80-120%	
Bromodichloromethane	Standard	20.0	21.9	µg/L	110%		9708-245	1	80-120%	
Bromodichloromethane	Standard	40.0	42.7	µg/L	107%		9708-187	1	80-120%	
Bromoform	Duplicate	ND	ND	µg/L		NA	9708-191	1		
Bromoform	Matrix Spike	40.0	46.8	µg/L	117%		9708-178	1		
Bromoform	Method Blank		ND*	µg/L			9708-244	1		
Bromoform	Standard	20.0	21.3	µg/L	106%		9708-245	1	80-120%	
Bromoform	Standard	20.0	21.1	µg/L	106%		9708-245	1	80-120%	
Bromoform	Standard	40.0	45.6	µg/L	114%		9708-187	1	80-120%	
Chloroform	Duplicate	51.8	51.4	µg/L		0.8%	9708-191	1		
Chloroform	Matrix Spike	40.0	46.5	µg/L	116%		9708-178	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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Chloroform	Method Blank		ND*	µg/L			9708-244	1	
Chloroform	Standard	20.0	21.9	µg/L	110%		9708-245	1	80-120%
Chloroform	Standard	20.0	21.9	µg/L	110%		9708-245	1	80-120%
Chloroform	Standard	40.0	40.8	µg/L	102%		9708-187	1	80-120%
Dibromochloromethane	Duplicate	7.9	8.1	µg/L		2.5%	9708-191	1	
Dibromochloromethane	Matrix Spike	40.0	44.6	µg/L	112%		9708-178	1	
Dibromochloromethane	Method Blank		ND*	µg/L			9708-244	1	
Dibromochloromethane	Standard	20.0	21.4	µg/L	107%		9708-245	1	80-120%
Dibromochloromethane	Standard	20.0	22.0	µg/L	110%		9708-245	1	80-120%
Dibromochloromethane	Standard	40.0	44.1	µg/L	110%		9708-187	1	80-120%

End of quality control report

ND: non-detect. *Recovery is below 1/2 minimum reporting level (MRL). NA (not applicable): RPD calculation is not applicable.

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QC Results from Montgomery Watson Laboratories

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Phone: 330-652-3614 Fax: 330-652-6293

Study#: 66
Study Title: ICR RSSCT #3

QC Batch ID: 65283 **Report #:** 35501

Analysis: @HALOAC **Method:** ML/S6251B

QC	Analyte	Spike	Recovery	Yield	RPD	Acceptance Criteria Range
DUP	Bromochloroacetic acid	3.6	3.6		0.0%	(0 - 20)
LCS1	Bromochloroacetic acid	1	1.2	120.0%		(50 - 150)
LCS2	Bromochloroacetic acid	20	19	95.0%		(80 - 120)
MBLK	Bromochloroacetic acid	ND	ND			
MS	Bromochloroacetic acid	20	20	100.0%		(70 - 130)
DUP	Bromodichloroacetic acid	1.3	1.3		0.0%	(0 - 20)
LCS1	Bromodichloroacetic acid	1	1.4	140.0%		(50 - 150)
LCS2	Bromodichloroacetic acid	20	21	105.0%		(80 - 120)
MBLK	Bromodichloroacetic acid	ND	ND			
MS	Bromodichloroacetic acid	20	23	115.0%		(70 - 130)
DUP	Chlorodibromoacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Chlorodibromoacetic acid	2	1.8	90.0%		(50 - 150)
LCS2	Chlorodibromoacetic acid	20	21	105.0%		(80 - 120)
MBLK	Chlorodibromoacetic acid	ND	ND			
MS	Chlorodibromoacetic acid	20	25	125.0%		(70 - 130)
DUP	Dibromoacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Dibromoacetic acid	1	1.2	120.0%		(50 - 150)
LCS2	Dibromoacetic acid	20	19	95.0%		(80 - 120)
MBLK	Dibromoacetic acid	ND	ND			
MS	Dibromoacetic acid	20	20	100.0%		(70 - 130)
DUP	Dichloroacetic acid	20	20		0.0%	(0 - 20)
LCS1	Dichloroacetic acid	1	1.1	110.0%		(50 - 150)
LCS2	Dichloroacetic acid	20	19	95.0%		(80 - 120)
MBLK	Dichloroacetic acid	ND	ND			
MS	Dichloroacetic acid	20	21	105.0%		(70 - 130)
DUP	Monobromoacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Monobromoacetic acid	1	1.1	110.0%		(50 - 150)
LCS2	Monobromoacetic acid	20	20	100.0%		(80 - 120)
MBLK	Monobromoacetic acid	ND	ND			
MS	Monobromoacetic acid	20	20	100.0%		(70 - 130)

ND (non-detect): Result is below 1/2 minimum reporting level (MRL).

QC Results from Montgomery Watson Laboratories

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DUP	Monochloroacetic acid	2	2.1		5.0%	(0 - 20)
LCS1	Monochloroacetic acid	2	2.2	110.0%		(50 - 150)
LCS2	Monochloroacetic acid	20	20	100.0%		(80 - 120)
MBLK	Monochloroacetic acid	ND	ND			
MS	Monochloroacetic acid	20	20	100.0%		(70 - 130)
DUP	Tribromoacetic acid	NR	NR		0.0%	(0 - 20)
LCS1	Tribromoacetic acid	4	1.1	28.0%		(50 - 150)
LCS2	Tribromoacetic acid	20	22	110.0%		(80 - 120)
MBLK	Tribromoacetic acid	ND	ND			
MS	Tribromoacetic acid	20	NR			(70 - 130)
DUP	Trichloroacetic acid	2.5	2.5		0.0%	(0 - 20)
LCS1	Trichloroacetic acid	1	1.1	110.0%		(50 - 150)
LCS2	Trichloroacetic acid	20	19	95.0%		(80 - 120)
MBLK	Trichloroacetic acid	ND	ND			
MS	Trichloroacetic acid	20	19	95.0%		(70 - 130)

QC Batch ID: 65553 **Report #:** 36054

Analysis: BR **Method:** ML/EPA 300

QC	Analyte	Spike	Recovery	Yield	RPD	Acceptance Criteria Range
LCS1	Bromide	0.020	0.019	95.0%		(50 - 150)
LCS2	Bromide	0.100	0.097	97.0%		(90 - 110)
MBLK	Bromide	ND	ND			(70 - 130)
MS	Bromide	0.1	0.114	114.0%		(80 - 120)
MSD	Bromide	0.1	0.116	116.0%		(80 - 120)

QC Batch ID: 65558 **Report #:** 36054

Analysis: @HALOAC **Method:** ML/S6251B

QC	Analyte	Spike	Recovery	Yield	RPD	Acceptance Criteria Range
DUP	Bromochloroacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Bromochloroacetic acid	1.0	1.0	100.0%		(50 - 150)
LCS2	Bromochloroacetic acid	20	20	100.0%		(80 - 120)
MBLK	Bromochloroacetic acid	ND	ND			
MS	Bromochloroacetic acid	20	20	100.0%		(70 - 130)
DUP	Bromodichloroacetic acid	1.1	1.0		10.0%	(0 - 20)
LCS1	Bromodichloroacetic acid	1.0	1.3	130.0%		(50 - 150)
LCS2	Bromodichloroacetic acid	20	21	105.0%		(80 - 120)
MBLK	Bromodichloroacetic acid	ND	ND			
MS	Bromodichloroacetic acid	20	20	100.0%		(70 - 130)

ND (non-detect): Result is below 1/2 minimum reporting level (MRL).

QC Results from Montgomery Watson Laboratories

Mr. John Zackasee
Mahoning Valley Sanitary District

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DUP	Chlorodibromoacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Chlorodibromoacetic acid	2.0	1.6	80.0%		(50 - 150)
LCS2	Chlorodibromoacetic acid	20	21	105.0%		(80 - 120)
MBLK	Chlorodibromoacetic acid	ND	ND			
MS	Chlorodibromoacetic acid	20	22	110.0%		(70 - 130)
DUP	Dibromoacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Dibromoacetic acid	1.0	1.0	100.0%		(50 - 150)
LCS2	Dibromoacetic acid	20	20	100.0%		(80 - 120)
MBLK	Dibromoacetic acid	ND	ND			
MS	Dibromoacetic acid	20	20	100.0%		(70 - 130)
DUP	Dichloroacetic acid	7.2	7.3		1.0%	(0 - 20)
LCS1	Dichloroacetic acid	1.0	1.1	110.0%		(50 - 150)
LCS2	Dichloroacetic acid	20	20	100.0%		(80 - 120)
MBLK	Dichloroacetic acid	ND	ND			
MS	Dichloroacetic acid	20	19	95.0%		(70 - 130)
DUP	Monobromoacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Monobromoacetic acid	1.0	1.1	110.0%		(50 - 150)
LCS2	Monobromoacetic acid	20	20	100.0%		(80 - 120)
MBLK	Monobromoacetic acid	ND	ND			
MS	Monobromoacetic acid	20	19	95.0%		(70 - 130)
DUP	Monochloroacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Monochloroacetic acid	2.0	2.0	100.0%		(50 - 150)
LCS2	Monochloroacetic acid	20	20	100.0%		(80 - 120)
MBLK	Monochloroacetic acid	ND	ND			
MS	Monochloroacetic acid	20	20	100.0%		(70 - 130)
DUP	Tribromoacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Tribromoacetic acid	4.0	2.3	58.0%		(50 - 150)
LCS2	Tribromoacetic acid	20	22	110.0%		(80 - 120)
MBLK	Tribromoacetic acid	ND	ND			
MS	Tribromoacetic acid	20	23	115.0%		(70 - 130)
DUP	Trichloroacetic acid	10	10		0.0%	(0 - 20)
LCS1	Trichloroacetic acid	1.0	1.0	100.0%		(50 - 150)
LCS2	Trichloroacetic acid	20	20	100.0%		(80 - 120)
MBLK	Trichloroacetic acid	ND	ND			
MS	Trichloroacetic acid	20	19	95.0%		(70 - 130)

ND (non-detect): Result is below 1/2 minimum reporting level (MRL).

QC Results from Montgomery Watson Laboratories

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 66
Study Title: ICR RSSCT #3

QC Batch ID: 65578 **Report #:** 36054

Analysis: NH3 **Method:** ML/EPA 350.1

QC	Analyte	Spike	Recovery	Yield	RPD	Acceptance Criteria Range
LCS1	Ammonia Nitrogen	1.00	1.02	102.0%		(80 - 120)
LCS2	Ammonia Nitrogen	1.00	0.984	98.0%		(80 - 120)
MBLK	Ammonia Nitrogen	ND	ND			
MS	Ammonia Nitrogen	1.00	1.17	117.0%		(80 - 120)
MSD	Ammonia Nitrogen	1.00	1.18	118.0%		(80 - 120)

QC Batch ID: 65580 **Report #:** 36150

Analysis: NH3 **Method:** ML/EPA 350.1

QC	Analyte	Spike	Recovery	Yield	RPD	Acceptance Criteria Range
LCS1	Ammonia Nitrogen	1.00	0.972	97.0%		(80 - 120)
LCS2	Ammonia Nitrogen	1.00	0.978	98.0%		(80 - 120)
MBLK	Ammonia Nitrogen	ND	ND			
MS	Ammonia Nitrogen	1.00	1.09	109.0%		(80 - 120)
MSD	Ammonia Nitrogen	1.00	1.09	109.0%		(80 - 120)

QC Batch ID: 65867 **Report #:** 36150

Analysis: @HALOAC **Method:** ML/S6251B

QC	Analyte	Spike	Recovery	Yield	RPD	Acceptance Criteria Range
DUP	Bromochloroacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Bromochloroacetic acid	1.0	1.0	100.0%		(50 - 150)
LCS2	Bromochloroacetic acid	20	20	100.0%		(80 - 120)
MBLK	Bromochloroacetic acid	ND	ND			
MS	Bromochloroacetic acid	20	20	100.0%		(70 - 130)
DUP	Bromodichloroacetic acid	5.6	5.7		2.0%	(0 - 20)
LCS1	Bromodichloroacetic acid	1.0	1.2	120.0%		(50 - 150)
LCS2	Bromodichloroacetic acid	20	20	100.0%		(80 - 120)
MBLK	Bromodichloroacetic acid	ND	ND			
MS	Bromodichloroacetic acid	20	20	100.0%		(70 - 130)
DUP	Chlorodibromoacetic acid	2.8	2.9		4.0%	(0 - 20)
LCS1	Chlorodibromoacetic acid	2.0	1.7	85.0%		(50 - 150)
LCS2	Chlorodibromoacetic acid	20	20	100.0%		(80 - 120)
MBLK	Chlorodibromoacetic acid	ND	ND			
MS	Chlorodibromoacetic acid	20	20	100.0%		(70 - 130)
DUP	Dibromoacetic acid	ND	ND		0.0%	(0 - 20)

ND (non-detect): Result is below 1/2 minimum reporting level (MRL).

QC Results from Montgomery Watson Laboratories

Mr. John Zackasee
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Study#: 66
Study Title: ICR RSSCT #3

LCS1	Dibromoacetic acid	1.0	0.9	90.0%		(50 - 150)
LCS2	Dibromoacetic acid	20	20	100.0%		(80 - 120)
MBLK	Dibromoacetic acid	ND	ND			
MS	Dibromoacetic acid	20	20	100.0%		(70 - 130)
DUP	Dichloroacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Dichloroacetic acid	1.0	0.9	90.0%		(50 - 150)
LCS2	Dichloroacetic acid	20	20	100.0%		(80 - 120)
MBLK	Dichloroacetic acid	ND	ND			
MS	Dichloroacetic acid	20	20	100.0%		(70 - 130)
DUP	Monobromoacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Monobromoacetic acid	1.0	0.9	90.0%		(50 - 150)
LCS2	Monobromoacetic acid	20	19	95.0%		(80 - 120)
MBLK	Monobromoacetic acid	ND	ND			
MS	Monobromoacetic acid	20	20	100.0%		(70 - 130)
DUP	Monochloroacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Monochloroacetic acid	2.0	1.9	95.0%		(50 - 150)
LCS2	Monochloroacetic acid	20	19	95.0%		(80 - 120)
MBLK	Monochloroacetic acid	ND	ND			
MS	Monochloroacetic acid	20	21	105.0%		(70 - 130)
DUP	Tribromoacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Tribromoacetic acid	4.0	2.5	62.0%		(50 - 150)
LCS2	Tribromoacetic acid	20	20	100.0%		(80 - 120)
MBLK	Tribromoacetic acid	ND	ND			
MS	Tribromoacetic acid	20	23	115.0%		(70 - 130)
DUP	Trichloroacetic acid	2.0	2.0		0.0%	(0 - 20)
LCS1	Trichloroacetic acid	1.0	0.9	90.0%		(50 - 150)
LCS2	Trichloroacetic acid	20	19	95.0%		(80 - 120)
MBLK	Trichloroacetic acid	ND	ND			
MS	Trichloroacetic acid	20	20	100.0%		(70 - 130)

QC Batch ID: 65882 **Report #:** 36054

Analysis: @HALOAC **Method:** ML/S6251B

QC	Analyte	Spike	Recovery	Yield	RPD	Acceptance Criteria Range
DUP	Bromochloroacetic acid	3.2	3.3		3.0%	(0 - 20)
LCS1	Bromochloroacetic acid	1.0	1.0	100.0%		(50 - 150)
LCS2	Bromochloroacetic acid	20	21	105.0%		(80 - 120)
MBLK	Bromochloroacetic acid	ND	ND			
MS	Bromochloroacetic acid	1.0	0.5	50.0%		(70 - 130)

ND (non-detect): Result is below 1/2 minimum reporting level (MRL).

QC Results from Montgomery Watson Laboratories

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DUP	Bromodichloroacetic acid	1.7	1.8		6.0%	(0 - 20)
LCS1	Bromodichloroacetic acid	1.0	1.3	130.0%		(50 - 150)
LCS2	Bromodichloroacetic acid	20	21	105.0%		(80 - 120)
MBLK	Bromodichloroacetic acid	ND	ND			
MS	Bromodichloroacetic acid	1.0	0.9	90.0%		(70 - 130)
DUP	Chlorodibromoacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Chlorodibromoacetic acid	2.0	1.7	85.0%		(50 - 150)
LCS2	Chlorodibromoacetic acid	20	21	105.0%		(80 - 120)
MBLK	Chlorodibromoacetic acid	ND	ND			
MS	Chlorodibromoacetic acid	2.0	2.4	120.0%		(70 - 130)
DUP	Dibromoacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Dibromoacetic acid	1.0	1.2	120.0%		(50 - 150)
LCS2	Dibromoacetic acid	20	21	105.0%		(80 - 120)
MBLK	Dibromoacetic acid	ND	ND			
MS	Dibromoacetic acid	1.0	0.8	80.0%		(70 - 130)
DUP	Dichloroacetic acid	11	11		0.0%	(0 - 20)
LCS1	Dichloroacetic acid	1.0	0.9	90.0%		(50 - 150)
LCS2	Dichloroacetic acid	20	20	100.0%		(80 - 120)
MBLK	Dichloroacetic acid	ND	ND			
MS	Dichloroacetic acid	1.0	1.0	100.0%		(70 - 130)
DUP	Monobromoacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Monobromoacetic acid	1.0	1.2	120.0%		(50 - 150)
LCS2	Monobromoacetic acid	20	24	120.0%		(80 - 120)
MBLK	Monobromoacetic acid	ND	ND			
MS	Monobromoacetic acid	1.0	1.2	120.0%		(70 - 130)
DUP	Monochloroacetic acid	6.6	7.8		17.0%	(0 - 20)
LCS1	Monochloroacetic acid	2.0	2.2	110.0%		(50 - 150)
LCS2	Monochloroacetic acid	20	21	105.0%		(80 - 120)
MBLK	Monochloroacetic acid	ND	ND			
MS	Monochloroacetic acid	2.0	5.7	285.0%		(70 - 130)
DUP	Tribromoacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Tribromoacetic acid	4.0	3.6	90.0%		(50 - 150)
LCS2	Tribromoacetic acid	20	21	105.0%		(80 - 120)
MBLK	Tribromoacetic acid	ND	ND			
MS	Tribromoacetic acid	4.0	4.0	100.0%		(70 - 130)
DUP	Trichloroacetic acid	3.1	3.0		3.0%	(0 - 20)
LCS1	Trichloroacetic acid	1.0	1.2	120.0%		(50 - 150)

ND (non-detect): Result is below 1/2 minimum reporting level (MRL).

QC Results from Montgomery Watson Laboratories

Mr. John Zackasee
Mahoning Valley Sanitary District

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LCS2	Trichloroacetic acid	20	22	110.0%		(80 - 120)
MBLK	Trichloroacetic acid	ND	ND			
MS	Trichloroacetic acid	1.0	1.2	120.0%		(70 - 130)

QC Batch ID: 65939 **Report #:** 36054

Analysis: @HALOAC **Method:** ML/S6251B

QC	Analyte	Spike	Recovery	Yield	RPD	Acceptance Criteria Range
DUP	Bromochloroacetic acid	5.4	5.5		2.0%	(0 - 20)
LCS1	Bromochloroacetic acid	1.0	1.0	100.0%		(50 - 150)
LCS2	Bromochloroacetic acid	20	20	100.0%		(80 - 120)
MBLK	Bromochloroacetic acid	ND	ND			
MS	Bromochloroacetic acid	32	32	100.0%		(70 - 130)
DUP	Bromodichloroacetic acid	4.2	4.6		9.0%	(0 - 20)
LCS1	Bromodichloroacetic acid	1.0	1.4	140.0%		(50 - 150)
LCS2	Bromodichloroacetic acid	20	20	100.0%		(80 - 120)
MBLK	Bromodichloroacetic acid	ND	ND			
MS	Bromodichloroacetic acid	32	35	109.0%		(70 - 130)
DUP	Chlorodibromoacetic acid	2.7	2.7		0.0%	(0 - 20)
LCS1	Chlorodibromoacetic acid	2.0	2.0	100.0%		(50 - 150)
LCS2	Chlorodibromoacetic acid	20	19	95.0%		(80 - 120)
MBLK	Chlorodibromoacetic acid	ND	ND			
MS	Chlorodibromoacetic acid	32	35	109.0%		(70 - 130)
DUP	Dibromoacetic acid	2.1	2.0		5.0%	(0 - 20)
LCS1	Dibromoacetic acid	1.0	1.1	110.0%		(50 - 150)
LCS2	Dibromoacetic acid	20	20	100.0%		(80 - 120)
MBLK	Dibromoacetic acid	ND	ND			
MS	Dibromoacetic acid	32	32	100.0%		(70 - 130)
DUP	Dichloroacetic acid	12	12		0.0%	(0 - 20)
LCS1	Dichloroacetic acid	1.0	1.0	100.0%		(50 - 150)
LCS2	Dichloroacetic acid	20	19	95.0%		(80 - 120)
MBLK	Dichloroacetic acid	ND	ND			
MS	Dichloroacetic acid	32	26	81.0%		(70 - 130)
DUP	Monobromoacetic acid	ND	1.1		0.0%	(0 - 20)
LCS1	Monobromoacetic acid	1.0	1.0	100.0%		(50 - 150)
LCS2	Monobromoacetic acid	20	20	100.0%		(80 - 120)
MBLK	Monobromoacetic acid	ND	ND			
MS	Monobromoacetic acid	32	34	106.0%		(70 - 130)
DUP	Monochloroacetic acid	4.2	3.0		33.0%	(0 - 20)

ND (non-detect): Result is below 1/2 minimum reporting level (MRL).

QC Results from Montgomery Watson Laboratories

Mr. John Zackasee
Mahoning Valley Sanitary District

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LCS1	Monochloroacetic acid	2.0	2.2	110.0%		(50 - 150)
LCS2	Monochloroacetic acid	20	19	95.0%		(80 - 120)
MBLK	Monochloroacetic acid	ND	ND			
MS	Monochloroacetic acid	32	31	97.0%		(70 - 130)
DUP	Tribromoacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Tribromoacetic acid	4.0	2.6	65.0%		(50 - 150)
LCS2	Tribromoacetic acid	20	19	95.0%		(80 - 120)
MBLK	Tribromoacetic acid	ND	ND			
MS	Tribromoacetic acid	32	36	112.0%		(70 - 130)
DUP	Trichloroacetic acid	4.8	4.8		0.0%	(0 - 20)
LCS1	Trichloroacetic acid	1.0	1.2	120.0%		(50 - 150)
LCS2	Trichloroacetic acid	20	20	100.0%		(80 - 120)
MBLK	Trichloroacetic acid	ND	ND			
MS	Trichloroacetic acid	32	32	100.0%		(70 - 130)

QC Batch ID: 65950 **Report #:** 36150

Analysis: BR **Method:** ML/EPA 300

QC	Analyte	Spike	Recovery	Yield	RPD	Acceptance Criteria Range
LCS1	Bromide	0.020	0.018	90.0%		(50 - 150)
LCS2	Bromide	0.100	0.102	102.0%		(90 - 110)
MBLK	Bromide	ND	ND			(70 - 130)
MS	Bromide	0.3	0.309	103.0%		(80 - 120)
MSD	Bromide	0.3	0.312	104.0%		(80 - 120)

QC Batch ID: 66127 **Report #:** 36396

Analysis: @HALOAC **Method:** ML/S6251B

QC	Analyte	Spike	Recovery	Yield	RPD	Acceptance Criteria Range
DUP	Bromochloroacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Bromochloroacetic acid	1.0	1.2	120.0%		(50 - 150)
LCS2	Bromochloroacetic acid	20	22	110.0%		(80 - 120)
MBLK	Bromochloroacetic acid	ND	ND			
MS	Bromochloroacetic acid	1.0	0.8	80.0%		(70 - 130)
DUP	Bromodichloroacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Bromodichloroacetic acid	1.0	1.5	150.0%		(50 - 150)
LCS2	Bromodichloroacetic acid	20	23	115.0%		(80 - 120)
MBLK	Bromodichloroacetic acid	ND	ND			
MS	Bromodichloroacetic acid	1.0	1.6	160.0%		(70 - 130)
DUP	Chlorodibromoacetic acid	ND	ND		0.0%	(0 - 20)

ND (non-detect): Result is below 1/2 minimum reporting level (MRL).

QC Results from Montgomery Watson Laboratories

Mr. John Zackasee
Mahoning Valley Sanitary District

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Study Title: ICR RSSCT #3

LCS1	Chlorodibromoacetic acid	2.0	2.1	105.0%		(50 - 150)
LCS2	Chlorodibromoacetic acid	20	23	115.0%		(80 - 120)
MBLK	Chlorodibromoacetic acid	ND	ND			
MS	Chlorodibromoacetic acid	2.0	1.4	70.0%		(70 - 130)
DUP	Dibromoacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Dibromoacetic acid	1.0	1.1	110.0%		(50 - 150)
LCS2	Dibromoacetic acid	20	21	105.0%		(80 - 120)
MBLK	Dibromoacetic acid	ND	ND			
MS	Dibromoacetic acid	1.0	0.8	80.0%		(70 - 130)
DUP	Dichloroacetic acid	4.4	4.4		0.0%	(0 - 20)
LCS1	Dichloroacetic acid	1.0	1.0	100.0%		(50 - 150)
LCS2	Dichloroacetic acid	20	20	100.0%		(80 - 120)
MBLK	Dichloroacetic acid	ND	ND			
MS	Dichloroacetic acid	1.0	1.1	110.0%		(70 - 130)
DUP	Monobromoacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Monobromoacetic acid	1.0	1.0	100.0%		(50 - 150)
LCS2	Monobromoacetic acid	20	21	105.0%		(80 - 120)
MBLK	Monobromoacetic acid	ND	ND			
MS	Monobromoacetic acid	1.0	1.2	120.0%		(70 - 130)
DUP	Monochloroacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Monochloroacetic acid	2.0	1.6	80.0%		(50 - 150)
LCS2	Monochloroacetic acid	20	21	105.0%		(80 - 120)
MBLK	Monochloroacetic acid	ND	ND			
MS	Monochloroacetic acid	2.0	2.0	100.0%		(70 - 130)
DUP	Tribromoacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Tribromoacetic acid	4.0	3.4	85.0%		(50 - 150)
LCS2	Tribromoacetic acid	20	21	105.0%		(80 - 120)
MBLK	Tribromoacetic acid	ND	ND			
MS	Tribromoacetic acid	4.0	4.0	100.0%		(70 - 130)
DUP	Trichloroacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Trichloroacetic acid	1.0	1.2	120.0%		(50 - 150)
LCS2	Trichloroacetic acid	20	21	105.0%		(80 - 120)
MBLK	Trichloroacetic acid	ND	ND			
MS	Trichloroacetic acid	1.0	0.9	90.0%		(70 - 130)

QC Batch ID: 66194 **Report #:** 36396

Analysis: @HALOAC **Method:** ML/S6251B

QC	Analyte	Spike	Recovery	Yield	RPD	Acceptance Criteria Range

ND (non-detect): Result is below 1/2 minimum reporting level (MRL).

QC Results from Montgomery Watson Laboratories

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Mahoning Valley Sanitary District

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DUP	Bromochloroacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Bromochloroacetic acid	1.0	1.0	100.0%		(50 - 150)
LCS2	Bromochloroacetic acid	20	20	100.0%		(80 - 120)
MBLK	Bromochloroacetic acid	ND	ND			
MS	Bromochloroacetic acid	32	33	103.0%		(70 - 130)
DUP	Bromodichloroacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Bromodichloroacetic acid	1.0	1.4	140.0%		(50 - 150)
LCS2	Bromodichloroacetic acid	20	21	105.0%		(80 - 120)
MBLK	Bromodichloroacetic acid	ND	ND			
MS	Bromodichloroacetic acid	32	24	75.0%		(70 - 130)
DUP	Chlorodibromoacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Chlorodibromoacetic acid	2.0	2.2	110.0%		(50 - 150)
LCS2	Chlorodibromoacetic acid	20	21	105.0%		(80 - 120)
MBLK	Chlorodibromoacetic acid	ND	ND			
MS	Chlorodibromoacetic acid	32	25	78.0%		(70 - 130)
DUP	Dibromoacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Dibromoacetic acid	1.0	1.2	120.0%		(50 - 150)
LCS2	Dibromoacetic acid	20	20	100.0%		(80 - 120)
MBLK	Dibromoacetic acid	ND	ND			
MS	Dibromoacetic acid	32	33	103.0%		(70 - 130)
DUP	Dichloroacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Dichloroacetic acid	1.0	0.8	80.0%		(50 - 150)
LCS2	Dichloroacetic acid	20	19	95.0%		(80 - 120)
MBLK	Dichloroacetic acid	ND	ND			
MS	Dichloroacetic acid	32	32	100.0%		(70 - 130)
DUP	Monobromoacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Monobromoacetic acid	1.0	1.0	100.0%		(50 - 150)
LCS2	Monobromoacetic acid	20	19	95.0%		(80 - 120)
MBLK	Monobromoacetic acid	ND	ND			
MS	Monobromoacetic acid	32	35	109.0%		(70 - 130)
DUP	Monochloroacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Monochloroacetic acid	2.0	2.1	105.0%		(50 - 150)
LCS2	Monochloroacetic acid	20	19	95.0%		(80 - 120)
MBLK	Monochloroacetic acid	ND	ND			
MS	Monochloroacetic acid	32	34	106.0%		(70 - 130)
DUP	Tribromoacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Tribromoacetic acid	4.0	3.6	90.0%		(50 - 150)

ND (non-detect): Result is below 1/2 minimum reporting level (MRL).

QC Results from Montgomery Watson Laboratories

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 66
Study Title: ICR RSSCT #3

LCS2	Tribromoacetic acid	20	21	105.0%		(80 - 120)
MBLK	Tribromoacetic acid	ND	ND			
MS	Tribromoacetic acid	32	39	122.0%		(70 - 130)
DUP	Trichloroacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Trichloroacetic acid	1.0	1.1	110.0%		(50 - 150)
LCS2	Trichloroacetic acid	20	20	100.0%		(80 - 120)
MBLK	Trichloroacetic acid	ND	ND			
MS	Trichloroacetic acid	32	33	103.0%		(70 - 130)

QC Batch ID: 66249 **Report #:** 36534

Analysis: @HALOAC **Method:** ML/S6251B

QC	Analyte	Spike	Recovery	Yield	RPD	Acceptance Criteria Range
DUP	Bromochloroacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Bromochloroacetic acid	1.0	1.2	120.0%		(50 - 150)
LCS2	Bromochloroacetic acid	20	19	95.0%		(80 - 120)
MBLK	Bromochloroacetic acid	ND	ND			
MS	Bromochloroacetic acid	32	32	100.0%		(70 - 130)
DUP	Bromodichloroacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Bromodichloroacetic acid	1.0	1.3	130.0%		(50 - 150)
LCS2	Bromodichloroacetic acid	20	20	100.0%		(80 - 120)
MBLK	Bromodichloroacetic acid	ND	ND			
MS	Bromodichloroacetic acid	32	33	103.0%		(70 - 130)
DUP	Chlorodibromoacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Chlorodibromoacetic acid	2.0	2.1	105.0%		(50 - 150)
LCS2	Chlorodibromoacetic acid	20	20	100.0%		(80 - 120)
MBLK	Chlorodibromoacetic acid	ND	ND			
MS	Chlorodibromoacetic acid	32	32	100.0%		(70 - 130)
DUP	Dibromoacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Dibromoacetic acid	1.0	1.0	100.0%		(50 - 150)
LCS2	Dibromoacetic acid	20	19	95.0%		(80 - 120)
MBLK	Dibromoacetic acid	ND	ND			
MS	Dibromoacetic acid	32	32	100.0%		(70 - 130)
DUP	Dichloroacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Dichloroacetic acid	1.0	0.7	70.0%		(50 - 150)
LCS2	Dichloroacetic acid	20	19	95.0%		(80 - 120)
MBLK	Dichloroacetic acid	ND	ND			
MS	Dichloroacetic acid	32	32	100.0%		(70 - 130)
DUP	Monobromoacetic acid	ND	ND		0.0%	(0 - 20)

ND (non-detect): Result is below 1/2 minimum reporting level (MRL).

QC Results from Montgomery Watson Laboratories

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 66
Study Title: ICR RSSCT #3

LCS1	Monobromoacetic acid	1.0	1.0	100.0%		(50 - 150)
LCS2	Monobromoacetic acid	20	19	95.0%		(80 - 120)
MBLK	Monobromoacetic acid	ND	ND			
MS	Monobromoacetic acid	32	32	100.0%		(70 - 130)
DUP	Monochloroacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Monochloroacetic acid	2.0	1.9	95.0%		(50 - 150)
LCS2	Monochloroacetic acid	20	19	95.0%		(80 - 120)
MBLK	Monochloroacetic acid	ND	ND			
MS	Monochloroacetic acid	32	31	97.0%		(70 - 130)
DUP	Tribromoacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Tribromoacetic acid	4.0	3.4	85.0%		(50 - 150)
LCS2	Tribromoacetic acid	20	20	100.0%		(80 - 120)
MBLK	Tribromoacetic acid	ND	ND			
MS	Tribromoacetic acid	32	33	103.0%		(70 - 130)
DUP	Trichloroacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Trichloroacetic acid	1.0	0.9	90.0%		(50 - 150)
LCS2	Trichloroacetic acid	20	20	100.0%		(80 - 120)
MBLK	Trichloroacetic acid	ND	ND			
MS	Trichloroacetic acid	32	32	100.0%		(70 - 130)

End of MW QC report

ND (non-detect): Result is below 1/2 minimum reporting level (MRL).

Summers & Hooper, Inc.
6 Knollcrest Drive
Cincinnati, OH 45237
Phone: (513) 679-2200
Fax: (513) 679-2201

Comments

Mr. John Zackasee
Superintendent-Purification
Mahoning Valley Sanitary District
P.O. Box 4119
Youngstown, OH 44515

Phone: 330-652-3614 Fax: 330-652-6293

Study#: 66
Study Title: ICR RSSCT #3

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.

Turbidity Range	Report to Nearest
0-1.0	0.05
1-10	0.1
10-40	1
40-100	5
100-400	10
400-1000	50
> 1000	100

QC comments

QCBatch: 0-185-0 **Description:** MW Labs Report # 35501

HAA for sample 9707-169, from MW Labs: "Sample extracted one day past HT. Sample results reported as NR for tribromoacetic acid due to QC failure on LCS recovery. Chlorodibromoacetic acid and Bromodichloroacetic acid are reported as NR due to HT exceedance of 14 days. Other HAAs are reported in light of HT studies supporting a 28 Hold Time (HT)."

End of comments

Summers & Hooper, Inc.
6 Knollcrest Drive
Cincinnati, OH 45237
Phone: (513) 679-2200
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Laboratory Report

Client:

Mr. John Zackasee
Superintendant-Purification
Mahoning Valley Sanitation District
P.O. Box 4119
Youngstown, OH 44515

Phone: 330-652-3614 Fax: 330-652-6293

Study Title: ICR RSSCT #4

Study #: 92

Reviewed By: _____
Stuart M. Hooper

Date Reviewed: 7/12/99

Electronic copies of the results and quality control data are available upon request.

Summers & Hooper, Inc.
6 Knollcrest Drive
Cincinnati, OH 45237
Phone: (513) 679-2200
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Laboratory Test Results

Mr. John Zackasee
Superintendent-Purification
Mahoning Valley Sanitary District
P.O. Box 4119
Youngstown, OH 44515

Phone: 330-652-3614 Fax: 330-652-6293

Study#: 92
Study Title: ICR RSSCT #4

Sample ID: Settled Water **S&H ID:** 9710-271 **Date Sampled:** 10/22/97 11:15:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
1	ALK	Alkalinity	53	mg/L	SM 2320 B	1	5	10/22/97		10/23/97	1-0-10
2	ALK	Alkalinity (Dupl)	53	mg/L	SM 2320 B	1	5	10/22/97		10/23/97	1-0-10
			53	**mg/L**	**0.0 % RPD**						
3	CaHard	Calcium Hardness	79	mg/L CaCO3	SM 3500-Ca D	1	10	10/22/97		10/23/97	33-0-10
4	CaHard	Calcium Hardness (Dupl)	80	mg/L CaCO3	SM 3500-Ca D	1	10	10/22/97		10/23/97	33-0-10
			80	**mg/L CaCO3**	**1.3 % RPD**						
5	HAA	Bromochloroacetic acid	ND	µg/L	SM 6251 B	1	1.0	10/22/97	10/26/97	10/30/97	MW68490
6	HAA	Bromodichloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	10/22/97	10/26/97	10/30/97	MW68490
7	HAA	Chlorodibromoacetic acid	ND	µg/L	SM 6251 B	1	2.0	10/22/97	10/26/97	10/30/97	MW68490
8	HAA	Dibromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	10/22/97	10/26/97	10/30/97	MW68490
9	HAA	Dichloroacetic acid	ND	µg/L	SM 6251 B	1	1.0	10/22/97	10/26/97	10/30/97	MW68490
10	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	10/22/97	10/26/97	10/30/97	MW68490
11	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	1.0	10/22/97	10/26/97	10/30/97	MW68490
12	HAA	Trichloroacetic acid	ND	µg/L	SM 6251 B	1	1.0	10/22/97	10/26/97	10/30/97	MW68490
13	pH	pH	10.8	Unit	SM 4500-H+ B	1	n/a	10/22/97		10/23/97	n/a
14	TotHard	Total Hardness	99	mg/L CaCO3	SM 2340 C	1	5	10/22/97		10/23/97	3-0-10
15	TotHard	Total Hardness (Dupl)	99	mg/L CaCO3	SM 2340 C	1	5	10/22/97		10/23/97	3-0-10
			99	**mg/L CaCO3**	**0.0 % RPD**						
16	TOC-ICR	TOC	3.91	mg/L	SM 5310 C	1	0.50	10/22/97		10/23/97	7-0-133
17	TOC-ICR	TOC (Dupl)	4.02	mg/L	SM 5310 C	1	0.50	10/22/97		10/23/97	7-0-133
			3.96	**mg/L**	**2.8 % RPD**						
18	TOX-ICR	TOX	ND	µg Cl-/L	SM 5320 B	1	25	10/22/97		10/23/97	12-0-70
19	TOX-ICR	TOX (Dupl)	ND	µg Cl-/L	SM 5320 B	1	25	10/22/97		10/23/97	12-0-70
			ND	**µg Cl-/L**							
20	THM-ICR	1,2,3-Trichloropropane (Surrogate)	108.4	%	EPA 551.1	1	1.0	10/22/97	10/29/97	10/29/97	0-58-0
21	THM-ICR	Bromodichloromethane	ND	µg/L	EPA 551.1	1	1.0	10/22/97	10/29/97	10/29/97	0-58-0
22	THM-ICR	Bromoform	ND	µg/L	EPA 551.1	1	1.0	10/22/97	10/29/97	10/29/97	0-58-0
23	THM-ICR	Chloroform	ND	µg/L	EPA 551.1	1	1.0	10/22/97	10/29/97	10/29/97	0-58-0
24	THM-ICR	Dibromochloromethane	ND	µg/L	EPA 551.1	1	1.0	10/22/97	10/29/97	10/29/97	0-58-0
25	TURB	Turbidity	8.10	ntu	SM 2130 B	1	0.05	10/22/97		10/23/97	9-0-6

Sample ID: Settled Water Barrel 6 **S&H ID:** 9710-296 **Date Sampled:** 10/24/97 11:10:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 92
Study Title: ICR RSSCT #4

26	TOC-ICR	TOC	3.62	mg/L	SM 5310 C	1	0.50	10/24/97		10/24/97	7-0-134
27	TOC-ICR	TOC (Dupl)	3.67	mg/L	SM 5310 C	1	0.50	10/24/97		10/24/97	7-0-134
			3.65	**mg/L**	**1.4 % RPD**						

Sample ID: Settled Water Barrel 1 **S&H ID:** 9710-297 **Date Sampled:** 10/24/97 11:50:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
28	TOC-ICR	TOC	3.70	mg/L	SM 5310 C	1	0.50	10/24/97		10/24/97	7-0-134
29	TOC-ICR	TOC (Dupl)	3.70	mg/L	SM 5310 C	1	0.50	10/24/97		10/24/97	7-0-134
			3.70	**mg/L**	**0.0 % RPD**						

Sample ID: 92.20.E-1 **S&H ID:** 9710-373 **Date Sampled:** 10/31/97 3:41:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
30	Cl2Dose	Chlorine Dose	2.59	mg/L as Cl2	SM 4500-Cl B	1	n/a	11/5/97		11/5/97	n/a
31	Cl2Res	Chlorine Residual	0.84	mg/L as Cl2	SM 4500-Cl F	1	0.10	11/5/97		11/6/97	n/a
32	pH	Cl2 pH - Final	9.1	Unit	SM 4500-H+ B	1	n/a	11/5/97		11/6/97	n/a
33	pH	Cl2 pH - Initial	9.1	Unit	SM 4500-H+ B	1	n/a	11/5/97		11/5/97	n/a
34	pH	pH	8.6	Unit	SM 4500-H+ B	1	n/a	10/31/97		10/31/97	n/a
35	TEMP	Cl2 Temperature	15.0	ºC	SM 2550 B	1	n/a	11/5/97		11/6/97	n/a
36	TEMP	Temperature	24.5	ºC	SM 2550 B	1	n/a	10/31/97		10/31/97	n/a
37	TIME	Cl2 Incubation Time	24.3	hrs	n/a	1	n/a	11/5/97		11/6/97	n/a
38	TOC-ICR	TOC	ND	mg/L	SM 5310 C	1	0.50	10/31/97		10/31/97	7-0-138
39	TOC-ICR	TOC (Dupl)	ND	mg/L	SM 5310 C	1	0.50	10/31/97		10/31/97	7-0-138
			ND	**mg/L**							
40	TOX-ICR	TOX	ND	µg Cl-/L	SM 5320 B	1	25	11/6/97		11/6/97	12-0-79
41	TOX-ICR	TOX (Dupl)	ND	µg Cl-/L	SM 5320 B	1	25	11/6/97		11/6/97	12-0-79
			ND	**µg Cl-/L**							
42	THM-ICR	1,2,3-Trichloropropane (Surrogate)	103.2	%	EPA 551.1	1	1.0	11/6/97	11/17/97	11/17/97	0-63-0
43	THM-ICR	Bromodichloromethane	ND	µg/L	EPA 551.1	1	1.0	11/6/97	11/17/97	11/17/97	0-63-0
44	THM-ICR	Bromoform	ND	µg/L	EPA 551.1	1	1.0	11/6/97	11/17/97	11/17/97	0-63-0
45	THM-ICR	Chloroform	ND	µg/L	EPA 551.1	1	1.0	11/6/97	11/17/97	11/17/97	0-63-0
46	THM-ICR	Dibromochloromethane	ND	µg/L	EPA 551.1	1	1.0	11/6/97	11/17/97	11/17/97	0-63-0
47	UV-ICR	UV	ND	1/cm	SM 5910 B	1	0.009	10/31/97		11/1/97	8-0-98
48	UV-ICR	UV (Dupl)	ND	1/cm	SM 5910 B	1	0.009	10/31/97		11/1/97	8-0-98
			ND	**1/cm**							

Sample ID: 92.10.E-1 **S&H ID:** 9710-374 **Date Sampled:** 10/31/97 4:07:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
49	Cl2Dose	Chlorine Dose	2.59	mg/L as Cl2	SM 4500-Cl B	1	n/a	11/5/97		11/5/97	n/a
50	Cl2Res	Chlorine Residual	0.74	mg/L as Cl2	SM 4500-Cl F	1	0.10	11/5/97		11/6/97	n/a

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 92
Study Title: ICR RSSCT #4

51	HAA	Bromochloroacetic acid	ND	µg/L	SM 6251 B	1	1.0	11/6/97	11/18/97	11/22/97	MW69819
52	HAA	Bromodichloroacetic acid	ND	µg/L	SM 6251 B	1	1.0	11/6/97	11/18/97	11/22/97	MW69819
53	HAA	Chlorodibromoacetic acid	ND	µg/L	SM 6251 B	1	2.0	11/6/97	11/18/97	11/22/97	MW69819
54	HAA	Dibromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	11/6/97	11/18/97	11/22/97	MW69819
55	HAA	Dichloroacetic acid	ND	µg/L	SM 6251 B	1	1.0	11/6/97	11/18/97	11/22/97	MW69819
56	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	11/6/97	11/18/97	11/22/97	MW69819
57	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	11/6/97	11/18/97	11/22/97	MW69819
58	HAA	Trichloroacetic acid	ND	µg/L	SM 6251 B	1	1.0	11/6/97	11/18/97	11/22/97	MW69819
59	pH	Cl2 pH - Final	9.1	Unit	SM 4500-H+ B	1	n/a	11/5/97		11/6/97	n/a
60	pH	Cl2 pH - Initial	9.0	Unit	SM 4500-H+ B	1	n/a	11/5/97		11/5/97	n/a
61	pH	pH	8.6	Unit	SM 4500-H+ B	1	n/a	10/31/97		10/31/97	n/a
62	TEMP	Cl2 Temperature	14.9	ºC	SM 2550 B	1	n/a	11/5/97		11/6/97	n/a
63	TEMP	Temperature	24.5	ºC	SM 2550 B	1	n/a	10/31/97		10/31/97	n/a
64	TIME	Cl2 Incubation Time	24.2	hrs	n/a	1	n/a	11/5/97		11/6/97	n/a
65	TOC-ICR	TOC	ND	mg/L	SM 5310 C	1	0.50	10/31/97		10/31/97	7-0-138
66	TOC-ICR	TOC (Dupl)	ND	mg/L	SM 5310 C	1	0.50	10/31/97		10/31/97	7-0-138
			ND	**mg/L**							
67	TOX-ICR	TOX	ND	µg Cl-/L	SM 5320 B	1	25	11/6/97		11/6/97	12-0-79
68	TOX-ICR	TOX (Dupl)	ND	µg Cl-/L	SM 5320 B	1	25	11/6/97		11/6/97	12-0-79
			ND	**µg Cl-/L**							
69	THM-ICR	1,2,3-Trichloropropane (Surrogate)	104.8	%	EPA 551.1	1	1.0	11/6/97	11/17/97	11/17/97	0-63-0
70	THM-ICR	Bromodichloromethane	ND	µg/L	EPA 551.1	1	1.0	11/6/97	11/17/97	11/17/97	0-63-0
71	THM-ICR	Bromoform	ND	µg/L	EPA 551.1	1	1.0	11/6/97	11/17/97	11/17/97	0-63-0
72	THM-ICR	Chloroform	ND	µg/L	EPA 551.1	1	1.0	11/6/97	11/17/97	11/17/97	0-63-0
73	THM-ICR	Dibromochloromethane	ND	µg/L	EPA 551.1	1	1.0	11/6/97	11/17/97	11/17/97	0-63-0
74	UV-ICR	UV	ND	1/cm	SM 5910 B	1	0.009	10/31/97		11/1/97	8-0-98
75	UV-ICR	UV (Dupl)	ND	1/cm	SM 5910 B	1	0.009	10/31/97		11/1/97	8-0-98
			ND	**1/cm**							

Sample ID: 92.Inf.A-1 **S&H ID:** 9710-375 **Date Sampled:** 10/31/97 4:30:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
76	ALK	Alkalinity	27	mg/L	SM 2320 B	1	5	10/31/97		11/1/97	1-0-10
77	ALK	Alkalinity (Dupl)	27	mg/L	SM 2320 B	1	5	10/31/97		11/1/97	1-0-10
			27	**mg/L**	**0.0 % RPD**						
78	NH3	Ammonia Nitrogen	0.20	mg/L	EPA 350.1	1	0.05	10/31/97		11/17/97	MW69275
79	BR	Bromide	0.040	mg/L	EPA 300.0 A	1	0.020	10/31/97		11/10/97	MW68994
80	CaHard	Calcium Hardness	78	mg/L CaCO3	SM 3500-Ca D	1	10	10/31/97		11/1/97	33-0-10
81	CaHard	Calcium Hardness (Dupl)	75	mg/L CaCO3	SM 3500-Ca D	1	10	10/31/97		11/1/97	33-0-10
			77	**mg/L CaCO3**	**3.9 % RPD**						

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 92
Study Title: ICR RSSCT #4

82	TotHard	Total Hardness	96	mg/L CaCO3	SM 2340 C	1	5	10/31/97		11/1/97	3-0-10
83	TotHard	Total Hardness (Dupl)	100	mg/L CaCO3	SM 2340 C	1	5	10/31/97		11/1/97	3-0-10
			98	**mg/L CaCO3**	**4.1 % RPD**						

Sample ID: 92.Inf.B-1 **S&H ID:** 9711-8 **Date Sampled:** 11/1/97 2:40:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
84	Cl2Dose	Chlorine Dose	4.45	mg/L as Cl2	SM 4500-Cl B	1	n/a	11/5/97		11/5/97	n/a
85	Cl2Res	Chlorine Residual	0.64	mg/L as Cl2	SM 4500-Cl F	1	0.10	11/5/97		11/6/97	n/a
86	HAA	Bromochloroacetic acid	5.0	µg/L	SM 6251 B	1	1.0	11/6/97	11/18/97	11/22/97	MW69819
87	HAA	Bromodichloroacetic acid	2.9	µg/L	SM 6251 B	1	1.0	11/6/97	11/18/97	11/22/97	MW69819
88	HAA	Chlorodibromoacetic acid	ND	µg/L	SM 6251 B	1	2.0	11/6/97	11/18/97	11/22/97	MW69819
89	HAA	Dibromoacetic acid	1.2	µg/L	SM 6251 B	1	1.0	11/6/97	11/18/97	11/22/97	MW69819
90	HAA	Dichloroacetic acid	18.0	µg/L	SM 6251 B	1	1.0	11/6/97	11/18/97	11/22/97	MW69819
91	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	11/6/97	11/18/97	11/22/97	MW69819
92	HAA	Monochloroacetic acid	2.6	µg/L	SM 6251 B	1	2.0	11/6/97	11/18/97	11/22/97	MW69819
93	HAA	Trichloroacetic acid	9.1	µg/L	SM 6251 B	1	1.0	11/6/97	11/18/97	11/22/97	MW69819
94	pH	Cl2 pH - Final	9.1	Unit	SM 4500-H+ B	1	n/a	11/5/97		11/6/97	n/a
95	pH	Cl2 pH - Initial	9.1	Unit	SM 4500-H+ B	1	n/a	11/5/97		11/5/97	n/a
96	pH	pH	9.1	Unit	SM 4500-H+ B	1	n/a	11/1/97		11/1/97	n/a
97	TEMP	Cl2 Temperature	15.0	ºC	SM 2550 B	1	n/a	11/5/97		11/6/97	n/a
98	TEMP	Temperature	17.0	ºC	SM 2550 B	1	n/a	11/1/97		11/1/97	n/a
99	TIME	Cl2 Incubation Time	24.3	hrs	n/a	1	n/a	11/5/97		11/6/97	n/a
100	TOC-ICR	TOC	3.42	mg/L	SM 5310 C	1	0.50	11/1/97		11/4/97	7-0-141
101	TOC-ICR	TOC	3.31	mg/L	SM 5310 C	1	0.50	11/1/97		11/2/97	7-0-139
102	TOC-ICR	TOC (Dupl)	3.38	mg/L	SM 5310 C	1	0.50	11/1/97		11/4/97	7-0-141
103	TOC-ICR	TOC (Dupl)	3.29	mg/L	SM 5310 C	1	0.50	11/1/97		11/2/97	7-0-139
			3.35	**mg/L**	**1.8 % RPD**						
104	TOX-ICR	TOX	236	µg Cl-/L	SM 5320 B	1	25	11/6/97		11/6/97	12-0-79
105	TOX-ICR	TOX (Dupl)	235	µg Cl-/L	SM 5320 B	1	25	11/6/97		11/6/97	12-0-79
			236	**µg Cl-/L**	**0.4 % RPD**						
106	THM-ICR	1,2,3-Trichloropropane (Surrogate)	103.2	%	EPA 551.1	1	1.0	11/6/97	11/17/97	11/17/97	0-63-0
107	THM-ICR	Bromodichloromethane	20.6	µg/L	EPA 551.1	1	1.0	11/6/97	11/17/97	11/17/97	0-63-0
108	THM-ICR	Bromoform	ND	µg/L	EPA 551.1	1	1.0	11/6/97	11/17/97	11/17/97	0-63-0
109	THM-ICR	Chloroform	66.5	µg/L	EPA 551.1	1	1.0	11/6/97	11/17/97	11/17/97	0-63-0
110	THM-ICR	Dibromochloromethane	6.1	µg/L	EPA 551.1	1	1.0	11/6/97	11/17/97	11/17/97	0-63-0
111	TURB	Turbidity	0.10	ntu	SM 2130 B	1	0.05	11/1/97		11/1/97	9-0-6
112	UV-ICR	UV	0.063	1/cm	SM 5910 B	1	0.009	11/1/97		11/1/97	8-0-98
113	UV-ICR	UV (Dupl)	0.063	1/cm	SM 5910 B	1	0.009	11/1/97		11/1/97	8-0-98
			0.063	**1/cm**	**0.0 % RPD**						

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Summers & Hooper, Inc.
6 Knollcrest Drive
Cincinnati, OH 45237

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 92
Study Title: ICR RSSCT #4

Sample ID: 92.10.E-2 **S&H ID:** 9711-10 **Date Sampled:** 11/1/97 4:19:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
114	Cl2Dose	Chlorine Dose	2.66	mg/L as Cl2	SM 4500-Cl B	1	n/a	11/6/97		11/6/97	n/a
115	Cl2Res	Chlorine Residual	0.57	mg/L as Cl2	SM 4500-Cl F	1	0.10	11/6/97		11/7/97	n/a
116	pH	Cl2 pH - Final	9.1	Unit	SM 4500-H+ B	1	n/a	11/6/97		11/7/97	n/a
117	pH	Cl2 pH - Initial	9.0	Unit	SM 4500-H+ B	1	n/a	11/6/97		11/6/97	n/a
118	pH	pH	8.4	Unit	SM 4500-H+ B	1	n/a	11/1/97		11/1/97	n/a
119	TEMP	Cl2 Temperature	15.0	ºC	SM 2550 B	1	n/a	11/6/97		11/7/97	n/a
120	TEMP	Temperature	22.3	ºC	SM 2550 B	1	n/a	11/1/97		11/1/97	n/a
121	TIME	Cl2 Incubation Time	24.1	hrs	n/a	1	n/a	11/6/97		11/7/97	n/a
122	TOC-ICR	TOC	ND	mg/L	SM 5310 C	1	0.50	11/1/97		11/2/97	7-0-139
123	TOC-ICR	TOC (Dupl)	ND	mg/L	SM 5310 C	1	0.50	11/1/97		11/2/97	7-0-139
			ND	**mg/L**							
124	TOX-ICR	TOX	ND	µg Cl-/L	SM 5320 B	1	25	11/7/97		11/10/97	12-0-80
125	TOX-ICR	TOX (Dupl)	ND	µg Cl-/L	SM 5320 B	1	25	11/7/97		11/10/97	12-0-80
			ND	**µg Cl-/L**							
126	THM-ICR	1,2,3-Trichloropropane (Surrogate)	100.8	%	EPA 551.1	1	1.0	11/7/97	11/17/97	11/17/97	0-63-0
127	THM-ICR	Bromodichloromethane	2.0	µg/L	EPA 551.1	1	1.0	11/7/97	11/17/97	11/17/97	0-63-0
128	THM-ICR	Bromoform	2.4	µg/L	EPA 551.1	1	1.0	11/7/97	11/17/97	11/17/97	0-63-0
129	THM-ICR	Chloroform	1.1	µg/L	EPA 551.1	1	1.0	11/7/97	11/17/97	11/17/97	0-63-0
130	THM-ICR	Dibromochloromethane	3.4	µg/L	EPA 551.1	1	1.0	11/7/97	11/17/97	11/17/97	0-63-0
131	UV-ICR	UV	ND	1/cm	SM 5910 B	1	0.009	11/1/97		11/2/97	8-0-99
132	UV-ICR	UV (Dupl)	ND	1/cm	SM 5910 B	1	0.009	11/1/97		11/2/97	8-0-99
			ND	**1/cm**							

Sample ID: 92.10.E-3 **S&H ID:** 9711-12 **Date Sampled:** 11/2/97 1:22:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
133	Cl2Dose	Chlorine Dose	2.72	mg/L as Cl2	SM 4500-Cl B	1	n/a	11/5/97		11/5/97	n/a
134	Cl2Res	Chlorine Residual	0.58	mg/L as Cl2	SM 4500-Cl F	1	0.10	11/5/97		11/6/97	n/a
135	HAA	Bromochloroacetic acid	1.4	µg/L	SM 6251 B	1	1.0	11/6/97	11/18/97	11/22/97	MW69819
136	HAA	Bromodichloroacetic acid	ND	µg/L	SM 6251 B	1	1.0	11/6/97	11/18/97	11/22/97	MW69819
137	HAA	Chlorodibromoacetic acid	ND	µg/L	SM 6251 B	1	2.0	11/6/97	11/18/97	11/22/97	MW69819
138	HAA	Dibromoacetic acid	1.7	µg/L	SM 6251 B	1	1.0	11/6/97	11/18/97	11/22/97	MW69819
139	HAA	Dichloroacetic acid	ND	µg/L	SM 6251 B	1	1.0	11/6/97	11/18/97	11/22/97	MW69819
140	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	11/6/97	11/18/97	11/22/97	MW69819
141	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	11/6/97	11/18/97	11/22/97	MW69819
142	HAA	Trichloroacetic acid	ND	µg/L	SM 6251 B	1	1.0	11/6/97	11/18/97	11/22/97	MW69819

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 92
Study Title: ICR RSSCT #4

143	pH	Cl2 pH - Final	9.1	Unit	SM 4500-H+ B	1	n/a	11/5/97		11/6/97	n/a
144	pH	Cl2 pH - Initial	9.0	Unit	SM 4500-H+ B	1	n/a	11/5/97		11/5/97	n/a
145	pH	pH	8.4	Unit	SM 4500-H+ B	1	n/a	11/2/97		11/2/97	n/a
146	TEMP	Cl2 Temperature	15.0	ºC	SM 2550 B	1	n/a	11/5/97		11/6/97	n/a
147	TEMP	Temperature	21.2	ºC	SM 2550 B	1	n/a	11/2/97		11/2/97	n/a
148	TIME	Cl2 Incubation Time	24.3	hrs	n/a	1	n/a	11/5/97		11/6/97	n/a
149	TOC-ICR	TOC	0.61	mg/L	SM 5310 C	1	0.50	11/2/97		11/2/97	7-0-139
150	TOC-ICR	TOC (Dupl)	0.61	mg/L	SM 5310 C	1	0.50	11/2/97		11/2/97	7-0-139
			0.61	**mg/L**	**0.0 % RPD**						
151	TOX-ICR	TOX	ND	µg Cl-/L	SM 5320 B	1	25	11/6/97		11/6/97	12-0-79
152	TOX-ICR	TOX (Dupl)	ND	µg Cl-/L	SM 5320 B	1	25	11/6/97		11/6/97	12-0-79
			ND	**µg Cl-/L**							
153	THM-ICR	1,2,3-Trichloropropane (Surrogate)	100.4	%	EPA 551.1	1	1.0	11/6/97	11/17/97	11/17/97	0-63-0
154	THM-ICR	Bromodichloromethane	4.7	µg/L	EPA 551.1	1	1.0	11/6/97	11/17/97	11/17/97	0-63-0
155	THM-ICR	Bromoform	3.3	µg/L	EPA 551.1	1	1.0	11/6/97	11/17/97	11/17/97	0-63-0
156	THM-ICR	Chloroform	2.4	µg/L	EPA 551.1	1	1.0	11/6/97	11/17/97	11/17/97	0-63-0
157	THM-ICR	Dibromochloromethane	6.7	µg/L	EPA 551.1	1	1.0	11/6/97	11/17/97	11/17/97	0-63-0
158	UV-ICR	UV	ND	1/cm	SM 5910 B	1	0.009	11/2/97		11/2/97	8-0-99
159	UV-ICR	UV (Dupl)	ND	1/cm	SM 5910 B	1	0.009	11/2/97		11/2/97	8-0-99
			ND	**1/cm**							

Sample ID: 92.10.E-4 **S&H ID:** 9711-13 **Date Sampled:** 11/2/97 10:37:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
160	Cl2Dose	Chlorine Dose	2.96	mg/L as Cl2	SM 4500-Cl B	1	n/a	11/6/97		11/6/97	n/a
161	Cl2Res	Chlorine Residual	0.66	mg/L as Cl2	SM 4500-Cl F	1	0.10	11/6/97		11/7/97	n/a
162	HAA	Bromochloroacetic acid	2.3	µg/L	SM 6251 B	1	1.0	11/7/97	11/18/97	11/22/97	MW69819
163	HAA	Bromodichloroacetic acid	1.0	µg/L	SM 6251 B	1	1.0	11/7/97	11/18/97	11/22/97	MW69819
164	HAA	Chlorodibromoacetic acid	ND	µg/L	SM 6251 B	1	2.0	11/7/97	11/18/97	11/22/97	MW69819
165	HAA	Dibromoacetic acid	2.2	µg/L	SM 6251 B	1	1.0	11/7/97	11/18/97	11/22/97	MW69819
166	HAA	Dichloroacetic acid	2.1	µg/L	SM 6251 B	1	1.0	11/7/97	11/18/97	11/22/97	MW69819
167	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	11/7/97	11/18/97	11/22/97	MW69819
168	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	11/7/97	11/18/97	11/22/97	MW69819
169	HAA	Trichloroacetic acid	1.0	µg/L	SM 6251 B	1	1.0	11/7/97	11/18/97	11/22/97	MW69819
170	pH	Cl2 pH - Final	9.1	Unit	SM 4500-H+ B	1	n/a	11/6/97		11/7/97	n/a
171	pH	Cl2 pH - Initial	9.1	Unit	SM 4500-H+ B	1	n/a	11/6/97		11/6/97	n/a
172	pH	pH	8.3	Unit	SM 4500-H+ B	1	n/a	11/2/97		11/2/97	n/a
173	TEMP	Cl2 Temperature	15.0	ºC	SM 2550 B	1	n/a	11/6/97		11/7/97	n/a
174	TEMP	Temperature	21.4	ºC	SM 2550 B	1	n/a	11/2/97		11/2/97	n/a
175	TIME	Cl2 Incubation Time	24.1	hrs	n/a	1	n/a	11/6/97		11/7/97	n/a

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 92
Study Title: ICR RSSCT #4

176	TOC-ICR	TOC	0.96	mg/L	SM 5310 C	1	0.50	11/2/97		11/2/97	7-0-139
177	TOC-ICR	TOC (Dupl)	0.96	mg/L	SM 5310 C	1	0.50	11/2/97		11/2/97	7-0-139
			0.96	**mg/L**	**0.0 % RPD**						
178	TOX-ICR	TOX	40	µg Cl-/L	SM 5320 B	1	25	11/7/97		11/10/97	12-0-80
179	TOX-ICR	TOX (Dupl)	43	µg Cl-/L	SM 5320 B	1	25	11/7/97		11/10/97	12-0-80
			42	**µg Cl-/L**	**7.1 % RPD**						
180	THM-ICR	1,2,3-Trichloropropane (Surrogate)	98.0	%	EPA 551.1	1	1.0	11/7/97	11/17/97	11/17/97	0-63-0
181	THM-ICR	Bromodichloromethane	8.6	µg/L	EPA 551.1	1	1.0	11/7/97	11/17/97	11/17/97	0-63-0
182	THM-ICR	Bromoform	2.9	µg/L	EPA 551.1	1	1.0	11/7/97	11/17/97	11/17/97	0-63-0
183	THM-ICR	Chloroform	5.6	µg/L	EPA 551.1	1	1.0	11/7/97	11/17/97	11/17/97	0-63-0
184	THM-ICR	Dibromochloromethane	9.3	µg/L	EPA 551.1	1	1.0	11/7/97	11/17/97	11/17/97	0-63-0
185	UV-ICR	UV	0.012	1/cm	SM 5910 B	1	0.009	11/2/97		11/2/97	8-0-99
186	UV-ICR	UV (Dupl)	0.012	1/cm	SM 5910 B	1	0.009	11/2/97		11/2/97	8-0-99
			0.012	**1/cm**	**0.0 % RPD**						

Sample ID: 92.10.E-4d **S&H ID:** 9711-14 **Date Sampled:** 11/2/97 10:37:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
187	Cl2Dose	Chlorine Dose	2.97	mg/L as Cl2	SM 4500-Cl B	1	n/a	11/6/97		11/6/97	n/a
188	Cl2Res	Chlorine Residual	0.79	mg/L as Cl2	SM 4500-Cl F	1	0.10	11/6/97		11/7/97	n/a
189	HAA	Bromochloroacetic acid	2.3	µg/L	SM 6251 B	1	1.0	11/7/97	11/18/97	11/22/97	MW69819
190	HAA	Bromodichloroacetic acid	1.0	µg/L	SM 6251 B	1	1.0	11/7/97	11/18/97	11/22/97	MW69819
191	HAA	Chlorodibromoacetic acid	ND	µg/L	SM 6251 B	1	2.0	11/7/97	11/18/97	11/22/97	MW69819
192	HAA	Dibromoacetic acid	1.9	µg/L	SM 6251 B	1	1.0	11/7/97	11/18/97	11/22/97	MW69819
193	HAA	Dichloroacetic acid	2.1	µg/L	SM 6251 B	1	1.0	11/7/97	11/18/97	11/22/97	MW69819
194	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	11/7/97	11/18/97	11/22/97	MW69819
195	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	11/7/97	11/18/97	11/22/97	MW69819
196	HAA	Trichloroacetic acid	1.0	µg/L	SM 6251 B	1	1.0	11/7/97	11/18/97	11/22/97	MW69819
197	pH	Cl2 pH - Final	9.1	Unit	SM 4500-H+ B	1	n/a	11/6/97		11/7/97	n/a
198	pH	Cl2 pH - Initial	9.1	Unit	SM 4500-H+ B	1	n/a	11/6/97		11/6/97	n/a
199	pH	pH	8.3	Unit	SM 4500-H+ B	1	n/a	11/2/97		11/2/97	n/a
200	TEMP	Cl2 Temperature	15.0	ºC	SM 2550 B	1	n/a	11/6/97		11/7/97	n/a
201	TEMP	Temperature	21.4	ºC	SM 2550 B	1	n/a	11/2/97		11/2/97	n/a
202	TIME	Cl2 Incubation Time	24.1	hrs	n/a	1	n/a	11/6/97		11/7/97	n/a
203	TOC-ICR	TOC	0.96	mg/L	SM 5310 C	1	0.50	11/2/97		11/2/97	7-0-139
204	TOC-ICR	TOC (Dupl)	0.98	mg/L	SM 5310 C	1	0.50	11/2/97		11/2/97	7-0-139
			0.97	**mg/L**	**2.1 % RPD**						
205	TOX-ICR	TOX	43	µg Cl-/L	SM 5320 B	1	25	11/7/97		11/10/97	12-0-80
206	TOX-ICR	TOX (Dupl)	41	µg Cl-/L	SM 5320 B	1	25	11/7/97		11/10/97	12-0-80
			42	**µg Cl-/L**	**4.8 % RPD**						

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 92
Study Title: ICR RSSCT #4

207	THM-ICR	1,2,3-Trichloropropane (Surrogate)	101.6	%	EPA 551.1	1	1.0	11/7/97	11/17/97	11/17/97	0-63-0
208	THM-ICR	Bromodichloromethane	8.4	µg/L	EPA 551.1	1	1.0	11/7/97	11/17/97	11/17/97	0-63-0
209	THM-ICR	Bromoform	2.8	µg/L	EPA 551.1	1	1.0	11/7/97	11/17/97	11/17/97	0-63-0
210	THM-ICR	Chloroform	5.5	µg/L	EPA 551.1	1	1.0	11/7/97	11/17/97	11/17/97	0-63-0
211	THM-ICR	Dibromochloromethane	9.1	µg/L	EPA 551.1	1	1.0	11/7/97	11/17/97	11/17/97	0-63-0
212	UV-ICR	UV	0.012	1/cm	SM 5910 B	1	0.009	11/2/97		11/2/97	8-0-99
213	UV-ICR	UV (Dupl)	0.012	1/cm	SM 5910 B	1	0.009	11/2/97		11/2/97	8-0-99
			0.012	**1/cm**	**0.0 % RPD**						

Sample ID: 92.10.E-5 **S&H ID:** 9711-16 **Date Sampled:** 11/2/97 1:44:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
214	Cl2Dose	Chlorine Dose	3.03	mg/L as Cl2	SM 4500-Cl B	1	n/a	11/6/97		11/6/97	n/a
215	Cl2Res	Chlorine Residual	0.70	mg/L as Cl2	SM 4500-Cl F	1	0.10	11/6/97		11/7/97	n/a
216	HAA	Bromochloroacetic acid	2.7	µg/L	SM 6251 B	1	1.0	11/7/97	11/18/97	11/22/97	MW69819
217	HAA	Bromodichloroacetic acid	1.2	µg/L	SM 6251 B	1	1.0	11/7/97	11/18/97	11/22/97	MW69819
218	HAA	Chlorodibromoacetic acid	ND	µg/L	SM 6251 B	1	2.0	11/7/97	11/18/97	11/22/97	MW69819
219	HAA	Dibromoacetic acid	2.3	µg/L	SM 6251 B	1	1.0	11/7/97	11/18/97	11/22/97	MW69819
220	HAA	Dichloroacetic acid	2.9	µg/L	SM 6251 B	1	1.0	11/7/97	11/18/97	11/22/97	MW69819
221	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	11/7/97	11/18/97	11/22/97	MW69819
222	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	11/7/97	11/18/97	11/22/97	MW69819
223	HAA	Trichloroacetic acid	1.2	µg/L	SM 6251 B	1	1.0	11/7/97	11/18/97	11/22/97	MW69819
224	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	11/6/97		11/7/97	n/a
225	pH	Cl2 pH - Initial	9.1	Unit	SM 4500-H+ B	1	n/a	11/6/97		11/6/97	n/a
226	pH	pH	8.3	Unit	SM 4500-H+ B	1	n/a	11/2/97		11/2/97	n/a
227	TEMP	Cl2 Temperature	15.0	ºC	SM 2550 B	1	n/a	11/6/97		11/7/97	n/a
228	TEMP	Temperature	21.6	ºC	SM 2550 B	1	n/a	11/2/97		11/2/97	n/a
229	TIME	Cl2 Incubation Time	24.2	hrs	n/a	1	n/a	11/6/97		11/7/97	n/a
230	TOC-ICR	TOC	1.09	mg/L	SM 5310 C	1	0.50	11/2/97		11/2/97	7-0-139
231	TOC-ICR	TOC (Dupl)	1.11	mg/L	SM 5310 C	1	0.50	11/2/97		11/2/97	7-0-139
			1.10	**mg/L**	**1.8 % RPD**						
232	TOX-ICR	TOX	53	µg Cl-/L	SM 5320 B	1	25	11/7/97		11/10/97	12-0-80
233	TOX-ICR	TOX (Dupl)	51	µg Cl-/L	SM 5320 B	1	25	11/7/97		11/10/97	12-0-80
			52	**µg Cl-/L**	**3.8 % RPD**						
234	THM-ICR	1,2,3-Trichloropropane (Surrogate)	99.6	%	EPA 551.1	1	1.0	11/7/97	11/17/97	11/17/97	0-63-0
235	THM-ICR	Bromodichloromethane	10.2	µg/L	EPA 551.1	1	1.0	11/7/97	11/17/97	11/17/97	0-63-0
236	THM-ICR	Bromoform	2.7	µg/L	EPA 551.1	1	1.0	11/7/97	11/17/97	11/17/97	0-63-0
237	THM-ICR	Chloroform	7.2	µg/L	EPA 551.1	1	1.0	11/7/97	11/17/97	11/17/97	0-63-0
238	THM-ICR	Dibromochloromethane	10.1	µg/L	EPA 551.1	1	1.0	11/7/97	11/17/97	11/17/97	0-63-0

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 92
Study Title: ICR RSSCT #4

239	UV-ICR	UV	0.014	1/cm	SM 5910 B	1	0.009	11/2/97		11/2/97	8-0-99
240	UV-ICR	UV (Dupl)	0.015	1/cm	SM 5910 B	1	0.009	11/2/97		11/2/97	8-0-99
			0.014	**1/cm**	**7.1 % RPD**						

Sample ID: 92.10.E-7 **S&H ID:** 9711-20 **Date Sampled:** 11/2/97 10:55:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
241	Cl2Dose	Chlorine Dose	3.13	mg/L as Cl2	SM 4500-Cl B	1	n/a	11/7/97		11/7/97	n/a
242	Cl2Res	Chlorine Residual	0.70	mg/L as Cl2	SM 4500-Cl F	1	0.10	11/7/97		11/8/97	n/a
243	HAA	Bromochloroacetic acid	3.9	µg/L	SM 6251 B	1	1.0	11/8/97	11/14/97	11/17/97	MW69314
244	HAA	Bromodichloroacetic acid	2.2	µg/L	SM 6251 B	1	1.0	11/8/97	11/14/97	11/17/97	MW69314
245	HAA	Chlorodibromoacetic acid	2.3	µg/L	SM 6251 B	1	2.0	11/8/97	11/14/97	11/17/97	MW69314
246	HAA	Dibromoacetic acid	2.2	µg/L	SM 6251 B	1	1.0	11/8/97	11/14/97	11/17/97	MW69314
247	HAA	Dichloroacetic acid	4.8	µg/L	SM 6251 B	1	1.0	11/8/97	11/14/97	11/17/97	MW69314
248	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	11/8/97	11/14/97	11/17/97	MW69314
249	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	11/8/97	11/14/97	11/17/97	MW69314
250	HAA	Trichloroacetic acid	2.2	µg/L	SM 6251 B	1	1.0	11/8/97	11/14/97	11/17/97	MW69314
251	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	11/7/97		11/8/97	n/a
252	pH	Cl2 pH - Initial	9.0	Unit	SM 4500-H+ B	1	n/a	11/7/97		11/7/97	n/a
253	pH	pH	8.4	Unit	SM 4500-H+ B	1	n/a	11/2/97		11/2/97	n/a
254	TEMP	Cl2 Temperature	14.9	ºC	SM 2550 B	1	n/a	11/7/97		11/8/97	n/a
255	TEMP	Temperature	21.2	ºC	SM 2550 B	1	n/a	11/2/97		11/2/97	n/a
256	TIME	Cl2 Incubation Time	24.1	hrs	n/a	1	n/a	11/7/97		11/8/97	n/a
257	TOC-ICR	TOC	1.31	mg/L	SM 5310 C	1	0.50	11/2/97		11/3/97	7-0-140
258	TOC-ICR	TOC (Dupl)	1.29	mg/L	SM 5310 C	1	0.50	11/2/97		11/3/97	7-0-140
			1.30	**mg/L**	**1.5 % RPD**						
259	TOX-ICR	TOX	65	µg Cl-/L	SM 5320 B	1	25	11/8/97		11/11/97	12-0-81
260	TOX-ICR	TOX (Dupl)	67	µg Cl-/L	SM 5320 B	1	25	11/8/97		11/11/97	12-0-81
			66	**µg Cl-/L**	**3.0 % RPD**						
261	THM-ICR	1,2,3-Trichloropropane (Surrogate)	99.6	%	EPA 551.1	1	1.0	11/8/97	11/17/97	11/17/97	0-63-0
262	THM-ICR	Bromodichloromethane	12.6	µg/L	EPA 551.1	1	1.0	11/8/97	11/17/97	11/17/97	0-63-0
263	THM-ICR	Bromoform	2.1	µg/L	EPA 551.1	1	1.0	11/8/97	11/17/97	11/17/97	0-63-0
264	THM-ICR	Chloroform	11.5	µg/L	EPA 551.1	1	1.0	11/8/97	11/17/97	11/17/97	0-63-0
265	THM-ICR	Dibromochloromethane	10.2	µg/L	EPA 551.1	1	1.0	11/8/97	11/17/97	11/17/97	0-63-0
266	UV-ICR	UV	0.019	1/cm	SM 5910 B	1	0.009	11/2/97		11/3/97	8-0-100
267	UV-ICR	UV (Dupl)	0.019	1/cm	SM 5910 B	1	0.009	11/2/97		11/3/97	8-0-100
			0.019	**1/cm**	**0.0 % RPD**						

Sample ID: 92.10.E-8 **S&H ID:** 9711-21 **Date Sampled:** 11/3/97 5:04:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 92
Study Title: ICR RSSCT #4

268	Cl2Dose	Chlorine Dose	3.19	mg/L as Cl2	SM 4500-Cl B	1	n/a	11/7/97		11/7/97	n/a
269	Cl2Res	Chlorine Residual	0.70	mg/L as Cl2	SM 4500-Cl F	1	0.10	11/7/97		11/8/97	n/a
270	HAA	Bromochloroacetic acid	3.6	µg/L	SM 6251 B	1	1.0	11/8/97	11/14/97	11/18/97	MW69314
271	HAA	Bromodichloroacetic acid	2.3	µg/L	SM 6251 B	1	1.0	11/8/97	11/14/97	11/18/97	MW69314
272	HAA	Chlorodibromoacetic acid	2.3	µg/L	SM 6251 B	1	2.0	11/8/97	11/14/97	11/18/97	MW69314
273	HAA	Dibromoacetic acid	2.2	µg/L	SM 6251 B	1	1.0	11/8/97	11/14/97	11/18/97	MW69314
274	HAA	Dichloroacetic acid	5.5	µg/L	SM 6251 B	1	1.0	11/8/97	11/14/97	11/18/97	MW69314
275	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	11/8/97	11/14/97	11/18/97	MW69314
276	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	11/8/97	11/14/97	11/18/97	MW69314
277	HAA	Trichloroacetic acid	2.3	µg/L	SM 6251 B	1	1.0	11/8/97	11/14/97	11/18/97	MW69314
278	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	11/7/97		11/8/97	n/a
279	pH	Cl2 pH - Initial	9.0	Unit	SM 4500-H+ B	1	n/a	11/7/97		11/7/97	n/a
280	pH	pH	8.4	Unit	SM 4500-H+ B	1	n/a	11/3/97		11/3/97	n/a
281	TEMP	Cl2 Temperature	14.8	ºC	SM 2550 B	1	n/a	11/7/97		11/8/97	n/a
282	TEMP	Temperature	21.0	ºC	SM 2550 B	1	n/a	11/3/97		11/3/97	n/a
283	TIME	Cl2 Incubation Time	24.1	hrs	n/a	1	n/a	11/7/97		11/8/97	n/a
284	TOC-ICR	TOC	1.42	mg/L	SM 5310 C	1	0.50	11/3/97		11/3/97	7-0-140
285	TOC-ICR	TOC (Dupl)	1.42	mg/L	SM 5310 C	1	0.50	11/3/97		11/3/97	7-0-140
			1.42	**mg/L**	**0.0 % RPD**						
286	TOX-ICR	TOX	83	µg Cl-/L	SM 5320 B	1	25	11/8/97		11/11/97	12-0-81
287	TOX-ICR	TOX (Dupl)	76	µg Cl-/L	SM 5320 B	1	25	11/8/97		11/11/97	12-0-81
			80	**µg Cl-/L**	**8.7 % RPD**						
288	THM-ICR	1,2,3-Trichloropropane (Surrogate)	99.6	%	EPA 551.1	1	1.0	11/8/97	11/17/97	11/17/97	0-63-0
289	THM-ICR	Bromodichloromethane	13.3	µg/L	EPA 551.1	1	1.0	11/8/97	11/17/97	11/17/97	0-63-0
290	THM-ICR	Bromoform	1.9	µg/L	EPA 551.1	1	1.0	11/8/97	11/17/97	11/17/97	0-63-0
291	THM-ICR	Chloroform	13.1	µg/L	EPA 551.1	1	1.0	11/8/97	11/17/97	11/17/97	0-63-0
292	THM-ICR	Dibromochloromethane	9.9	µg/L	EPA 551.1	1	1.0	11/8/97	11/17/97	11/17/97	0-63-0
293	UV-ICR	UV	0.020	1/cm	SM 5910 B	1	0.009	11/3/97		11/3/97	8-0-100
294	UV-ICR	UV (Dupl)	0.020	1/cm	SM 5910 B	1	0.009	11/3/97		11/3/97	8-0-100
			0.020	**1/cm**	**0.0 % RPD**						

Sample ID: 92.10.E-8d **S&H ID:** 9711-22 **Date Sampled:** 11/3/97 5:04:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
295	Cl2Dose	Chlorine Dose	3.19	mg/L as Cl2	SM 4500-Cl B	1	n/a	11/7/97		11/7/97	n/a
296	Cl2Res	Chlorine Residual	0.65	mg/L as Cl2	SM 4500-Cl F	1	0.10	11/7/97		11/8/97	n/a
297	HAA	Bromochloroacetic acid	4.0	µg/L	SM 6251 B	1	1.0	11/8/97	11/14/97	11/18/97	MW69314
298	HAA	Bromodichloroacetic acid	2.3	µg/L	SM 6251 B	1	1.0	11/8/97	11/14/97	11/18/97	MW69314
299	HAA	Chlorodibromoacetic acid	2.3	µg/L	SM 6251 B	1	2.0	11/8/97	11/14/97	11/18/97	MW69314
300	HAA	Dibromoacetic acid	2.1	µg/L	SM 6251 B	1	1.0	11/8/97	11/14/97	11/18/97	MW69314

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 92
Study Title: ICR RSSCT #4

301	HAA	Dichloroacetic acid	5.3	µg/L	SM 6251 B	1	1.0	11/8/97	11/14/97	11/18/97	MW69314
302	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	11/8/97	11/14/97	11/18/97	MW69314
303	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	11/8/97	11/14/97	11/18/97	MW69314
304	HAA	Trichloroacetic acid	2.5	µg/L	SM 6251 B	1	1.0	11/8/97	11/14/97	11/18/97	MW69314
305	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	11/7/97		11/8/97	n/a
306	pH	Cl2 pH - Initial	9.0	Unit	SM 4500-H+ B	1	n/a	11/7/97		11/7/97	n/a
307	pH	pH	8.4	Unit	SM 4500-H+ B	1	n/a	11/3/97		11/3/97	n/a
308	TEMP	Cl2 Temperature	14.5	ºC	SM 2550 B	1	n/a	11/7/97		11/8/97	n/a
309	TEMP	Temperature	21.1	ºC	SM 2550 B	1	n/a	11/3/97		11/3/97	n/a
310	TIME	Cl2 Incubation Time	24.1	hrs	n/a	1	n/a	11/7/97		11/8/97	n/a
311	TOC-ICR	TOC	1.42	mg/L	SM 5310 C	1	0.50	11/3/97		11/3/97	7-0-140
312	TOC-ICR	TOC (Dupl)	1.41	mg/L	SM 5310 C	1	0.50	11/3/97		11/3/97	7-0-140
			1.42	**mg/L**	**0.7 % RPD**						
313	TOX-ICR	TOX	73	µg Cl-/L	SM 5320 B	1	25	11/8/97		11/12/97	12-0-82
314	TOX-ICR	TOX (Dupl)	71	µg Cl-/L	SM 5320 B	1	25	11/8/97		11/12/97	12-0-82
			72	**µg Cl-/L**	**2.8 % RPD**						
315	THM-ICR	1,2,3-Trichloropropane (Surrogate)	101.2	%	EPA 551.1	1	1.0	11/8/97	11/17/97	11/17/97	0-63-0
316	THM-ICR	Bromodichloromethane	13.5	µg/L	EPA 551.1	1	1.0	11/8/97	11/17/97	11/17/97	0-63-0
317	THM-ICR	Bromoform	1.8	µg/L	EPA 551.1	1	1.0	11/8/97	11/17/97	11/17/97	0-63-0
318	THM-ICR	Chloroform	13.7	µg/L	EPA 551.1	1	1.0	11/8/97	11/17/97	11/17/97	0-63-0
319	THM-ICR	Dibromochloromethane	9.9	µg/L	EPA 551.1	1	1.0	11/8/97	11/17/97	11/17/97	0-63-0
320	UV-ICR	UV	0.020	1/cm	SM 5910 B	1	0.009	11/3/97		11/3/97	8-0-100
321	UV-ICR	UV (Dupl)	0.020	1/cm	SM 5910 B	1	0.009	11/3/97		11/3/97	8-0-100
			0.020	**1/cm**	**0.0 % RPD**						

Sample ID: 92.20.E-5 **S&H ID:** 9711-30 **Date Sampled:** 11/3/97 9:45:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
322	Cl2Dose	Chlorine Dose	2.68	mg/L as Cl2	SM 4500-Cl B	1	n/a	11/6/97		11/6/97	n/a
323	Cl2Res	Chlorine Residual	0.70	mg/L as Cl2	SM 4500-Cl F	1	0.10	11/6/97		11/7/97	n/a
324	HAA	Bromochloroacetic acid	ND	µg/L	SM 6251 B	1	1.0	11/7/97	11/18/97	11/22/97	MW69819
325	HAA	Bromodichloroacetic acid	ND	µg/L	SM 6251 B	1	1.0	11/7/97	11/18/97	11/22/97	MW69819
326	HAA	Chlorodibromoacetic acid	ND	µg/L	SM 6251 B	1	2.0	11/7/97	11/18/97	11/22/97	MW69819
327	HAA	Dibromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	11/7/97	11/18/97	11/22/97	MW69819
328	HAA	Dichloroacetic acid	ND	µg/L	SM 6251 B	1	1.0	11/7/97	11/18/97	11/22/97	MW69819
329	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	11/7/97	11/18/97	11/22/97	MW69819
330	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	11/7/97	11/18/97	11/22/97	MW69819
331	HAA	Trichloroacetic acid	ND	µg/L	SM 6251 B	1	1.0	11/7/97	11/18/97	11/22/97	MW69819
332	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	11/6/97		11/7/97	n/a
333	pH	Cl2 pH - Initial	9.1	Unit	SM 4500-H+ B	1	n/a	11/6/97		11/6/97	n/a

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 92
Study Title: ICR RSSCT #4

334	pH	pH	8.3	Unit	SM 4500-H+ B	1	n/a	11/3/97		11/3/97	n/a
335	TEMP	Cl2 Temperature	15.0	ºC	SM 2550 B	1	n/a	11/6/97		11/7/97	n/a
336	TEMP	Temperature	21.4	ºC	SM 2550 B	1	n/a	11/3/97		11/3/97	n/a
337	TIME	Cl2 Incubation Time	24.2	hrs	n/a	1	n/a	11/6/97		11/7/97	n/a
338	TOC-ICR	TOC	ND	mg/L	SM 5310 C	1	0.50	11/3/97		11/3/97	7-0-140
339	TOC-ICR	TOC (Dupl)	ND	mg/L	SM 5310 C	1	0.50	11/3/97		11/3/97	7-0-140
			ND	**mg/L**							
340	TOX-ICR	TOX	ND	µg Cl-/L	SM 5320 B	1	25	11/7/97		11/10/97	12-0-80
341	TOX-ICR	TOX (Dupl)	ND	µg Cl-/L	SM 5320 B	1	25	11/7/97		11/10/97	12-0-80
			ND	**µg Cl-/L**							
342	THM-ICR	1,2,3-Trichloropropane (Surrogate)	101.2	%	EPA 551.1	1	1.0	11/7/97	11/17/97	11/17/97	0-63-0
343	THM-ICR	Bromodichloromethane	2.2	µg/L	EPA 551.1	1	1.0	11/7/97	11/17/97	11/17/97	0-63-0
344	THM-ICR	Bromoform	2.6	µg/L	EPA 551.1	1	1.0	11/7/97	11/17/97	11/17/97	0-63-0
345	THM-ICR	Chloroform	1.1	µg/L	EPA 551.1	1	1.0	11/7/97	11/17/97	11/17/97	0-63-0
346	THM-ICR	Dibromochloromethane	3.9	µg/L	EPA 551.1	1	1.0	11/7/97	11/17/97	11/17/97	0-63-0
347	UV-ICR	UV	ND	1/cm	SM 5910 B	1	0.009	11/3/97		11/3/97	8-0-100
348	UV-ICR	UV (Dupl)	ND	1/cm	SM 5910 B	1	0.009	11/3/97		11/3/97	8-0-100
			ND	**1/cm**							

Sample ID: 92.10.E-10 **S&H ID:** 9711-32 **Date Sampled:** 11/3/97 1:39:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
349	Cl2Dose	Chlorine Dose	3.30	mg/L as Cl2	SM 4500-Cl B	1	n/a	11/7/97		11/7/97	n/a
350	Cl2Res	Chlorine Residual	0.74	mg/L as Cl2	SM 4500-Cl F	1	0.10	11/7/97		11/8/97	n/a
351	HAA	Bromochloroacetic acid	4.6	µg/L	SM 6251 B	1	1.0	11/8/97	11/14/97	11/17/97	MW69314
352	HAA	Bromodichloroacetic acid	2.4	µg/L	SM 6251 B	1	1.0	11/8/97	11/14/97	11/17/97	MW69314
353	HAA	Chlorodibromoacetic acid	2.3	µg/L	SM 6251 B	1	2.0	11/8/97	11/14/97	11/17/97	MW69314
354	HAA	Dibromoacetic acid	2.1	µg/L	SM 6251 B	1	1.0	11/8/97	11/14/97	11/17/97	MW69314
355	HAA	Dichloroacetic acid	6.4	µg/L	SM 6251 B	1	1.0	11/8/97	11/14/97	11/17/97	MW69314
356	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	11/8/97	11/14/97	11/17/97	MW69314
357	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	11/8/97	11/14/97	11/17/97	MW69314
358	HAA	Trichloroacetic acid	2.9	µg/L	SM 6251 B	1	1.0	11/8/97	11/14/97	11/17/97	MW69314
359	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	11/7/97		11/8/97	n/a
360	pH	Cl2 pH - Initial	9.0	Unit	SM 4500-H+ B	1	n/a	11/7/97		11/7/97	n/a
361	pH	pH	8.3	Unit	SM 4500-H+ B	1	n/a	11/3/97		11/3/97	n/a
362	TEMP	Cl2 Temperature	14.6	ºC	SM 2550 B	1	n/a	11/7/97		11/8/97	n/a
363	TEMP	Temperature	21.1	ºC	SM 2550 B	1	n/a	11/3/97		11/3/97	n/a
364	TIME	Cl2 Incubation Time	24.2	hrs	n/a	1	n/a	11/7/97		11/8/97	n/a
365	TOC-ICR	TOC	1.63	mg/L	SM 5310 C	1	0.50	11/3/97		11/3/97	7-0-140

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 92
Study Title: ICR RSSCT #4

366	TOC-ICR	TOC (Dupl)	1.64	mg/L	SM 5310 C	1	0.50	11/3/97		11/3/97	7-0-140
			1.63	**mg/L**	**0.6 % RPD**						
367	TOX-ICR	TOX	80	µg Cl-/L	SM 5320 B	1	25	11/8/97		11/12/97	12-0-82
368	TOX-ICR	TOX (Dupl)	85	µg Cl-/L	SM 5320 B	1	25	11/8/97		11/12/97	12-0-82
			83	**µg Cl-/L**	**6.0 % RPD**						
369	THM-ICR	1,2,3-Trichloropropane (Surrogate)	100.4	%	EPA 551.1	1	1.0	11/8/97	11/17/97	11/17/97	0-63-0
370	THM-ICR	Bromodichloromethane	14.1	µg/L	EPA 551.1	1	1.0	11/8/97	11/17/97	11/17/97	0-63-0
371	THM-ICR	Bromoform	1.4	µg/L	EPA 551.1	1	1.0	11/8/97	11/17/97	11/17/97	0-63-0
372	THM-ICR	Chloroform	16.0	µg/L	EPA 551.1	1	1.0	11/8/97	11/17/97	11/17/97	0-63-0
373	THM-ICR	Dibromochloromethane	9.6	µg/L	EPA 551.1	1	1.0	11/8/97	11/17/97	11/17/97	0-63-0
374	UV-ICR	UV	0.023	1/cm	SM 5910 B	1	0.009	11/3/97		11/3/97	8-0-100
375	UV-ICR	UV (Dupl)	0.022	1/cm	SM 5910 B	1	0.009	11/3/97		11/3/97	8-0-100
			0.022	**1/cm**	**4.5 % RPD**						

Sample ID: 92.10.E-12 **S&H ID:** 9711-43 **Date Sampled:** 11/3/97 10:44:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
376	Cl2Dose	Chlorine Dose	3.20	mg/L as Cl2	SM 4500-Cl B	1	n/a	11/5/97		11/5/97	n/a
377	Cl2Res	Chlorine Residual	0.56	mg/L as Cl2	SM 4500-Cl F	1	0.10	11/5/97		11/6/97	n/a
378	HAA	Bromochloroacetic acid	4.1	µg/L	SM 6251 B	1	1.0	11/6/97	11/18/97	11/22/97	MW69819
379	HAA	Bromodichloroacetic acid	1.8	µg/L	SM 6251 B	1	1.0	11/6/97	11/18/97	11/22/97	MW69819
380	HAA	Chlorodibromoacetic acid	ND	µg/L	SM 6251 B	1	2.0	11/6/97	11/18/97	11/22/97	MW69819
381	HAA	Dibromoacetic acid	2.0	µg/L	SM 6251 B	1	1.0	11/6/97	11/18/97	11/22/97	MW69819
382	HAA	Dichloroacetic acid	6.6	µg/L	SM 6251 B	1	1.0	11/6/97	11/18/97	11/22/97	MW69819
383	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	11/6/97	11/18/97	11/22/97	MW69819
384	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	11/6/97	11/18/97	11/22/97	MW69819
385	HAA	Trichloroacetic acid	2.8	µg/L	SM 6251 B	1	1.0	11/6/97	11/18/97	11/22/97	MW69819
386	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	11/5/97		11/6/97	n/a
387	pH	Cl2 pH - Initial	9.0	Unit	SM 4500-H+ B	1	n/a	11/5/97		11/5/97	n/a
388	pH	pH	8.3	Unit	SM 4500-H+ B	1	n/a	11/3/97		11/3/97	n/a
389	TEMP	Cl2 Temperature	15.0	ºC	SM 2550 B	1	n/a	11/5/97		11/6/97	n/a
390	TEMP	Temperature	20.9	ºC	SM 2550 B	1	n/a	11/3/97		11/3/97	n/a
391	TIME	Cl2 Incubation Time	24.3	hrs	n/a	1	n/a	11/5/97		11/6/97	n/a
392	TOC-ICR	TOC	1.81	mg/L	SM 5310 C	1	0.50	11/3/97		11/4/97	7-0-141
393	TOC-ICR	TOC (Dupl)	1.87	mg/L	SM 5310 C	1	0.50	11/3/97		11/4/97	7-0-141
			1.84	**mg/L**	**3.3 % RPD**						
394	TOX-ICR	TOX	93	µg Cl-/L	SM 5320 B	1	25	11/6/97		11/6/97	12-0-79
395	TOX-ICR	TOX (Dupl)	93	µg Cl-/L	SM 5320 B	1	25	11/6/97		11/6/97	12-0-79
			93	**µg Cl-/L**	**0.0 % RPD**						
396	THM-ICR	1,2,3-Trichloropropane (Surrogate)	100.8	%	EPA 551.1	1	1.0	11/6/97	11/17/97	11/17/97	0-63-0

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

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397	THM-ICR	Bromodichloromethane	15.1	µg/L	EPA 551.1	1	1.0	11/6/97	11/17/97	11/17/97	0-63-0
398	THM-ICR	Bromoform	1.5	µg/L	EPA 551.1	1	1.0	11/6/97	11/17/97	11/17/97	0-63-0
399	THM-ICR	Chloroform	19.6	µg/L	EPA 551.1	1	1.0	11/6/97	11/17/97	11/17/97	0-63-0
400	THM-ICR	Dibromochloromethane	9.7	µg/L	EPA 551.1	1	1.0	11/6/97	11/17/97	11/17/97	0-63-0
401	UV-ICR	UV	0.025	1/cm	SM 5910 B	1	0.009	11/3/97		11/4/97	8-0-101
402	UV-ICR	UV (Dupl)	0.025	1/cm	SM 5910 B	1	0.009	11/3/97		11/4/97	8-0-101
			0.025	**1/cm**	**0.0 % RPD**						

Sample ID: 92.20.E-7 **S&H ID:** 9711-46 **Date Sampled:** 11/3/97 10:17:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
403	Cl2Dose	Chlorine Dose	2.78	mg/L as Cl2	SM 4500-Cl B	1	n/a	11/6/97		11/6/97	n/a
404	Cl2Res	Chlorine Residual	0.72	mg/L as Cl2	SM 4500-Cl F	1	0.10	11/6/97		11/7/97	n/a
405	HAA	Bromochloroacetic acid	1.2	µg/L	SM 6251 B	1	1.0	11/7/97	11/18/97	11/22/97	MW69819
406	HAA	Bromodichloroacetic acid	ND	µg/L	SM 6251 B	1	1.0	11/7/97	11/18/97	11/22/97	MW69819
407	HAA	Chlorodibromoacetic acid	ND	µg/L	SM 6251 B	1	2.0	11/7/97	11/18/97	11/22/97	MW69819
408	HAA	Dibromoacetic acid	1.3	µg/L	SM 6251 B	1	1.0	11/7/97	11/18/97	11/22/97	MW69819
409	HAA	Dichloroacetic acid	ND	µg/L	SM 6251 B	1	1.0	11/7/97	11/18/97	11/22/97	MW69819
410	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	11/7/97	11/18/97	11/22/97	MW69819
411	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	11/7/97	11/18/97	11/22/97	MW69819
412	HAA	Trichloroacetic acid	ND	µg/L	SM 6251 B	1	1.0	11/7/97	11/18/97	11/22/97	MW69819
413	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	11/6/97		11/7/97	n/a
414	pH	Cl2 pH - Initial	9.0	Unit	SM 4500-H+ B	1	n/a	11/6/97		11/6/97	n/a
415	pH	pH	8.3	Unit	SM 4500-H+ B	1	n/a	11/3/97		11/3/97	n/a
416	TEMP	Cl2 Temperature	15.0	ºC	SM 2550 B	1	n/a	11/6/97		11/7/97	n/a
417	TEMP	Temperature	21.0	ºC	SM 2550 B	1	n/a	11/3/97		11/3/97	n/a
418	TIME	Cl2 Incubation Time	24.3	hrs	n/a	1	n/a	11/6/97		11/7/97	n/a
419	TOC-ICR	TOC	0.60	mg/L	SM 5310 C	1	0.50	11/3/97		11/5/97	7-0-142
420	TOC-ICR	TOC (Dupl)	0.60	mg/L	SM 5310 C	1	0.50	11/3/97		11/5/97	7-0-142
			0.60	**mg/L**	**0.0 % RPD**						
421	TOX-ICR	TOX	25	µg Cl-/L	SM 5320 B	1	25	11/7/97		11/10/97	12-0-80
422	TOX-ICR	TOX (Dupl)	ND	µg Cl-/L	SM 5320 B	1	25	11/7/97		11/10/97	12-0-80
			ND	**µg Cl-/L**							
423	THM-ICR	1,2,3-Trichloropropane (Surrogate)	101.6	%	EPA 551.1	1	1.0	11/7/97	11/17/97	11/17/97	0-63-0
424	THM-ICR	Bromodichloromethane	3.8	µg/L	EPA 551.1	1	1.0	11/7/97	11/17/97	11/17/97	0-63-0
425	THM-ICR	Bromoform	3.2	µg/L	EPA 551.1	1	1.0	11/7/97	11/17/97	11/17/97	0-63-0
426	THM-ICR	Chloroform	1.7	µg/L	EPA 551.1	1	1.0	11/7/97	11/17/97	11/17/97	0-63-0
427	THM-ICR	Dibromochloromethane	6.0	µg/L	EPA 551.1	1	1.0	11/7/97	11/17/97	11/17/97	0-63-0
428	UV-ICR	UV	ND	1/cm	SM 5910 B	1	0.009	11/3/97		11/4/97	8-0-101
429	UV-ICR	UV (Dupl)	ND	1/cm	SM 5910 B	1	0.009	11/3/97		11/4/97	8-0-101

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 92
Study Title: ICR RSSCT #4

		ND	**1/cm**	

Sample ID: 92.20.E-7d **S&H ID:** 9711-47 **Date Sampled:** 11/3/97 10:17:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
430	Cl2Dose	Chlorine Dose	2.79	mg/L as Cl2	SM 4500-Cl B	1	n/a	11/6/97		11/6/97	n/a
431	Cl2Res	Chlorine Residual	0.71	mg/L as Cl2	SM 4500-Cl F	1	0.10	11/6/97		11/7/97	n/a
432	HAA	Bromochloroacetic acid	1.2	µg/L	SM 6251 B	1	1.0	11/7/97	11/18/97	11/22/97	MW69819
433	HAA	Bromodichloroacetic acid	ND	µg/L	SM 6251 B	1	1.0	11/7/97	11/18/97	11/22/97	MW69819
434	HAA	Chlorodibromoacetic acid	ND	µg/L	SM 6251 B	1	2.0	11/7/97	11/18/97	11/22/97	MW69819
435	HAA	Dibromoacetic acid	1.3	µg/L	SM 6251 B	1	1.0	11/7/97	11/18/97	11/22/97	MW69819
436	HAA	Dichloroacetic acid	ND	µg/L	SM 6251 B	1	1.0	11/7/97	11/18/97	11/22/97	MW69819
437	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	11/7/97	11/18/97	11/22/97	MW69819
438	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	11/7/97	11/18/97	11/22/97	MW69819
439	HAA	Trichloroacetic acid	ND	µg/L	SM 6251 B	1	1.0	11/7/97	11/18/97	11/22/97	MW69819
440	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	11/6/97		11/7/97	n/a
441	pH	Cl2 pH - Initial	9.0	Unit	SM 4500-H+ B	1	n/a	11/6/97		11/6/97	n/a
442	pH	pH	8.4	Unit	SM 4500-H+ B	1	n/a	11/3/97		11/3/97	n/a
443	TEMP	Cl2 Temperature	15.0	ºC	SM 2550 B	1	n/a	11/6/97		11/7/97	n/a
444	TEMP	Temperature	21.0	ºC	SM 2550 B	1	n/a	11/3/97		11/3/97	n/a
445	TIME	Cl2 Incubation Time	24.3	hrs	n/a	1	n/a	11/6/97		11/7/97	n/a
446	TOC-ICR	TOC	0.63	mg/L	SM 5310 C	1	0.50	11/3/97		11/5/97	7-0-142
447	TOC-ICR	TOC (Dupl)	0.60	mg/L	SM 5310 C	1	0.50	11/3/97		11/5/97	7-0-142
			0.61	**mg/L**	**4.9 % RPD**						
448	TOX-ICR	TOX	ND	µg Cl-/L	SM 5320 B	1	25	11/7/97		11/10/97	12-0-80
449	TOX-ICR	TOX (Dupl)	ND	µg Cl-/L	SM 5320 B	1	25	11/7/97		11/10/97	12-0-80
			ND	**µg Cl-/L**							
450	THM-ICR	1,2,3-Trichloropropane (Surrogate)	102.4	%	EPA 551.1	1	1.0	11/7/97	11/17/97	11/17/97	0-63-0
451	THM-ICR	Bromodichloromethane	3.9	µg/L	EPA 551.1	1	1.0	11/7/97	11/17/97	11/17/97	0-63-0
452	THM-ICR	Bromoform	3.2	µg/L	EPA 551.1	1	1.0	11/7/97	11/17/97	11/17/97	0-63-0
453	THM-ICR	Chloroform	1.8	µg/L	EPA 551.1	1	1.0	11/7/97	11/17/97	11/17/97	0-63-0
454	THM-ICR	Dibromochloromethane	6.1	µg/L	EPA 551.1	1	1.0	11/7/97	11/17/97	11/17/97	0-63-0
455	UV-ICR	UV	ND	1/cm	SM 5910 B	1	0.009	11/3/97		11/4/97	8-0-101
456	UV-ICR	UV (Dupl)	ND	1/cm	SM 5910 B	1	0.009	11/3/97		11/4/97	8-0-101
			ND	**1/cm**							

Sample ID: 92.20.E-9 **S&H ID:** 9711-50 **Date Sampled:** 11/4/97 1:23:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
457	Cl2Dose	Chlorine Dose	2.89	mg/L as Cl2	SM 4500-Cl B	1	n/a	11/7/97		11/7/97	n/a

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

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458	Cl2Res	Chlorine Residual	0.81	mg/L as Cl2	SM 4500-Cl F	1	0.10	11/7/97		11/8/97	n/a
459	HAA	Bromochloroacetic acid	2.2	µg/L	SM 6251 B	1	1.0	11/8/97	11/14/97	11/18/97	MW69314
460	HAA	Bromodichloroacetic acid	1.5	µg/L	SM 6251 B	1	1.0	11/8/97	11/14/97	11/18/97	MW69314
461	HAA	Chlorodibromoacetic acid	2.1	µg/L	SM 6251 B	1	2.0	11/8/97	11/14/97	11/18/97	MW69314
462	HAA	Dibromoacetic acid	1.9	µg/L	SM 6251 B	1	1.0	11/8/97	11/14/97	11/18/97	MW69314
463	HAA	Dichloroacetic acid	1.7	µg/L	SM 6251 B	1	1.0	11/8/97	11/14/97	11/18/97	MW69314
464	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	11/8/97	11/14/97	11/18/97	MW69314
465	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	11/8/97	11/14/97	11/18/97	MW69314
466	HAA	Trichloroacetic acid	ND	µg/L	SM 6251 B	1	1.0	11/8/97	11/14/97	11/18/97	MW69314
467	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	11/7/97		11/8/97	n/a
468	pH	Cl2 pH - Initial	9.1	Unit	SM 4500-H+ B	1	n/a	11/7/97		11/7/97	n/a
469	pH	pH	8.3	Unit	SM 4500-H+ B	1	n/a	11/4/97		11/4/97	n/a
470	TEMP	Cl2 Temperature	15.0	ºC	SM 2550 B	1	n/a	11/7/97		11/8/97	n/a
471	TEMP	Temperature	21.1	ºC	SM 2550 B	1	n/a	11/4/97		11/4/97	n/a
472	TIME	Cl2 Incubation Time	24.2	hrs	n/a	1	n/a	11/7/97		11/8/97	n/a
473	TOC-ICR	TOC	0.83	mg/L	SM 5310 C	1	0.50	11/4/97		11/5/97	7-0-142
474	TOC-ICR	TOC (Dupl)	0.81	mg/L	SM 5310 C	1	0.50	11/4/97		11/5/97	7-0-142
			0.82	**mg/L**	**2.4 % RPD**						
475	TOX-ICR	TOX	37	µg Cl-/L	SM 5320 B	1	25	11/8/97		11/12/97	12-0-82
476	TOX-ICR	TOX (Dupl)	36	µg Cl-/L	SM 5320 B	1	25	11/8/97		11/12/97	12-0-82
			37	**µg Cl-/L**	**2.7 % RPD**						
477	THM-ICR	1,2,3-Trichloropropane (Surrogate)	100.4	%	EPA 551.1	1	1.0	11/8/97	11/17/97	11/17/97	0-63-0
478	THM-ICR	Bromodichloromethane	6.4	µg/L	EPA 551.1	1	1.0	11/8/97	11/17/97	11/17/97	0-63-0
479	THM-ICR	Bromoform	3.5	µg/L	EPA 551.1	1	1.0	11/8/97	11/17/97	11/17/97	0-63-0
480	THM-ICR	Chloroform	3.2	µg/L	EPA 551.1	1	1.0	11/8/97	11/17/97	11/17/97	0-63-0
481	THM-ICR	Dibromochloromethane	8.4	µg/L	EPA 551.1	1	1.0	11/8/97	11/17/97	11/17/97	0-63-0
482	UV-ICR	UV	0.010	1/cm	SM 5910 B	1	0.009	11/4/97		11/4/97	8-0-101
483	UV-ICR	UV (Dupl)	0.010	1/cm	SM 5910 B	1	0.009	11/4/97		11/4/97	8-0-101
			0.010	**1/cm**	**0.0 % RPD**						

Sample ID: 92.10.E-15 **S&H ID:** 9711-51 **Date Sampled:** 11/4/97 1:47:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
484	Cl2Dose	Chlorine Dose	3.46	mg/L as Cl2	SM 4500-Cl B	1	n/a	11/7/97		11/7/97	n/a
485	Cl2Res	Chlorine Residual	0.70	mg/L as Cl2	SM 4500-Cl F	1	0.10	11/7/97		11/8/97	n/a
486	HAA	Bromochloroacetic acid	4.5	µg/L	SM 6251 B	1	1.0	11/8/97	11/14/97	11/18/97	MW69314
487	HAA	Bromodichloroacetic acid	2.9	µg/L	SM 6251 B	1	1.0	11/8/97	11/14/97	11/18/97	MW69314
488	HAA	Chlorodibromoacetic acid	2.4	µg/L	SM 6251 B	1	2.0	11/8/97	11/14/97	11/18/97	MW69314
489	HAA	Dibromoacetic acid	2.0	µg/L	SM 6251 B	1	1.0	11/8/97	11/14/97	11/18/97	MW69314
490	HAA	Dichloroacetic acid	8.5	µg/L	SM 6251 B	1	1.0	11/8/97	11/14/97	11/18/97	MW69314

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 92
Study Title: ICR RSSCT #4

491	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	11/8/97	11/14/97	11/18/97	MW69314
492	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	11/8/97	11/14/97	11/18/97	MW69314
493	HAA	Trichloroacetic acid	4.3	µg/L	SM 6251 B	1	1.0	11/8/97	11/14/97	11/18/97	MW69314
494	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	11/7/97		11/8/97	n/a
495	pH	Cl2 pH - Initial	9.0	Unit	SM 4500-H+ B	1	n/a	11/7/97		11/7/97	n/a
496	pH	pH	8.2	Unit	SM 4500-H+ B	1	n/a	11/4/97		11/4/97	n/a
497	TEMP	Cl2 Temperature	15.0	ºC	SM 2550 B	1	n/a	11/7/97		11/8/97	n/a
498	TEMP	Temperature	20.8	ºC	SM 2550 B	1	n/a	11/4/97		11/4/97	n/a
499	TIME	Cl2 Incubation Time	24.3	hrs	n/a	1	n/a	11/7/97		11/8/97	n/a
500	TOC-ICR	TOC	1.95	mg/L	SM 5310 C	1	0.50	11/4/97		11/5/97	7-0-142
501	TOC-ICR	TOC (Dupl)	1.98	mg/L	SM 5310 C	1	0.50	11/4/97		11/5/97	7-0-142
			1.96	**mg/L**	**1.5 % RPD**						
502	TOX-ICR	TOX	118	µg Cl-/L	SM 5320 B	1	25	11/8/97		11/12/97	12-0-82
503	TOX-ICR	TOX (Dupl)	110	µg Cl-/L	SM 5320 B	1	25	11/8/97		11/12/97	12-0-82
			114	**µg Cl-/L**	**7.0 % RPD**						
504	THM-ICR	1,2,3-Trichloropropane (Surrogate)	100.8	%	EPA 551.1	1	1.0	11/8/97	11/17/97	11/17/97	0-63-0
505	THM-ICR	Bromodichloromethane	16.4	µg/L	EPA 551.1	1	1.0	11/8/97	11/17/97	11/17/97	0-63-0
506	THM-ICR	Bromoform	1.3	µg/L	EPA 551.1	1	1.0	11/8/97	11/17/97	11/17/97	0-63-0
507	THM-ICR	Chloroform	24.1	µg/L	EPA 551.1	1	1.0	11/8/97	11/17/97	11/17/97	0-63-0
508	THM-ICR	Dibromochloromethane	9.3	µg/L	EPA 551.1	1	1.0	11/8/97	11/17/97	11/17/97	0-63-0
509	UV-ICR	UV	0.029	1/cm	SM 5910 B	1	0.009	11/4/97		11/4/97	8-0-101
510	UV-ICR	UV (Dupl)	0.029	1/cm	SM 5910 B	1	0.009	11/4/97		11/4/97	8-0-101
			0.029	**1/cm**	**0.0 % RPD**						

Sample ID: 92.10.E-16 **S&H ID:** 9711-55 **Date Sampled:** 11/4/97 7:52:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
511	Cl2Dose	Chlorine Dose	3.57	mg/L as Cl2	SM 4500-Cl B	1	n/a	11/7/97		11/7/97	n/a
512	Cl2Res	Chlorine Residual	0.74	mg/L as Cl2	SM 4500-Cl F	1	0.10	11/7/97		11/8/97	n/a
513	HAA	Bromochloroacetic acid	4.6	µg/L	SM 6251 B	1	1.0	11/8/97	11/14/97	11/18/97	MW69314
514	HAA	Bromodichloroacetic acid	3.0	µg/L	SM 6251 B	1	1.0	11/8/97	11/14/97	11/18/97	MW69314
515	HAA	Chlorodibromoacetic acid	2.3	µg/L	SM 6251 B	1	2.0	11/8/97	11/14/97	11/18/97	MW69314
516	HAA	Dibromoacetic acid	2.0	µg/L	SM 6251 B	1	1.0	11/8/97	11/14/97	11/18/97	MW69314
517	HAA	Dichloroacetic acid	9.1	µg/L	SM 6251 B	1	1.0	11/8/97	11/14/97	11/18/97	MW69314
518	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	11/8/97	11/14/97	11/18/97	MW69314
519	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	11/8/97	11/14/97	11/18/97	MW69314
520	HAA	Trichloroacetic acid	4.6	µg/L	SM 6251 B	1	1.0	11/8/97	11/14/97	11/18/97	MW69314
521	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	11/7/97		11/8/97	n/a
522	pH	Cl2 pH - Initial	9.1	Unit	SM 4500-H+ B	1	n/a	11/7/97		11/7/97	n/a
523	pH	pH	8.2	Unit	SM 4500-H+ B	1	n/a	11/4/97		11/4/97	n/a

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 92
Study Title: ICR RSSCT #4

524	TEMP	Cl2 Temperature	15.0	ºC	SM 2550 B	1	n/a	11/7/97		11/8/97	n/a
525	TEMP	Temperature	21.9	ºC	SM 2550 B	1	n/a	11/4/97		11/4/97	n/a
526	TIME	Cl2 Incubation Time	24.3	hrs	n/a	1	n/a	11/7/97		11/8/97	n/a
527	TOC-ICR	TOC	2.20	mg/L	SM 5310 C	1	0.50	11/4/97		11/5/97	7-0-142
528	TOC-ICR	TOC (Dupl)	2.17	mg/L	SM 5310 C	1	0.50	11/4/97		11/5/97	7-0-142
			2.19	**mg/L**	**1.4 % RPD**						
529	TOX-ICR	TOX	123	µg Cl-/L	SM 5320 B	1	25	11/8/97		11/11/97	12-0-81
530	TOX-ICR	TOX (Dupl)	122	µg Cl-/L	SM 5320 B	1	25	11/8/97		11/11/97	12-0-81
			123	**µg Cl-/L**	**0.8 % RPD**						
531	THM-ICR	1,2,3-Trichloropropane (Surrogate)	100.4	%	EPA 551.1	1	1.0	11/8/97	11/17/97	11/17/97	0-63-0
532	THM-ICR	Bromodichloromethane	17.0	µg/L	EPA 551.1	1	1.0	11/8/97	11/17/97	11/17/97	0-63-0
533	THM-ICR	Bromoform	1.2	µg/L	EPA 551.1	1	1.0	11/8/97	11/17/97	11/17/97	0-63-0
534	THM-ICR	Chloroform	26.9	µg/L	EPA 551.1	1	1.0	11/8/97	11/17/97	11/17/97	0-63-0
535	THM-ICR	Dibromochloromethane	9.2	µg/L	EPA 551.1	1	1.0	11/8/97	11/17/97	11/17/97	0-63-0
536	UV-ICR	UV	0.031	1/cm	SM 5910 B	1	0.009	11/4/97		11/6/97	8-0-102
537	UV-ICR	UV (Dupl)	0.031	1/cm	SM 5910 B	1	0.009	11/4/97		11/6/97	8-0-102
			0.031	**1/cm**	**0.0 % RPD**						

Sample ID: 92.10.E-16d **S&H ID:** 9711-56 **Date Sampled:** 11/4/97 7:52:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
538	Cl2Dose	Chlorine Dose	3.57	mg/L as Cl2	SM 4500-Cl B	1	n/a	11/7/97		11/7/97	n/a
539	Cl2Res	Chlorine Residual	0.74	mg/L as Cl2	SM 4500-Cl F	1	0.10	11/7/97		11/8/97	n/a
540	HAA	Bromochloroacetic acid	5.1	µg/L	SM 6251 B	1	1.0	11/8/97	11/14/97	11/18/97	MW69314
541	HAA	Bromodichloroacetic acid	3.0	µg/L	SM 6251 B	1	1.0	11/8/97	11/14/97	11/18/97	MW69314
542	HAA	Chlorodibromoacetic acid	2.4	µg/L	SM 6251 B	1	2.0	11/8/97	11/14/97	11/18/97	MW69314
543	HAA	Dibromoacetic acid	1.9	µg/L	SM 6251 B	1	1.0	11/8/97	11/14/97	11/18/97	MW69314
544	HAA	Dichloroacetic acid	9.0	µg/L	SM 6251 B	1	1.0	11/8/97	11/14/97	11/18/97	MW69314
545	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	11/8/97	11/14/97	11/18/97	MW69314
546	HAA	Monochloroacetic acid	2.0	µg/L	SM 6251 B	1	2.0	11/8/97	11/14/97	11/18/97	MW69314
547	HAA	Trichloroacetic acid	4.6	µg/L	SM 6251 B	1	1.0	11/8/97	11/14/97	11/18/97	MW69314
548	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	11/7/97		11/8/97	n/a
549	pH	Cl2 pH - Initial	9.1	Unit	SM 4500-H+ B	1	n/a	11/7/97		11/7/97	n/a
550	pH	pH	8.3	Unit	SM 4500-H+ B	1	n/a	11/4/97		11/4/97	n/a
551	TEMP	Cl2 Temperature	15.0	ºC	SM 2550 B	1	n/a	11/7/97		11/8/97	n/a
552	TEMP	Temperature	22.1	ºC	SM 2550 B	1	n/a	11/4/97		11/4/97	n/a
553	TIME	Cl2 Incubation Time	24.3	hrs	n/a	1	n/a	11/7/97		11/8/97	n/a
554	TOC-ICR	TOC	2.19	mg/L	SM 5310 C	1	0.50	11/4/97		11/5/97	7-0-142
555	TOC-ICR	TOC (Dupl)	2.23	mg/L	SM 5310 C	1	0.50	11/4/97		11/5/97	7-0-142
			2.21	**mg/L**	**1.8 % RPD**						

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 92
Study Title: ICR RSSCT #4

556	TOX-ICR	TOX	124	µg Cl-/L	SM 5320 B	1	25	11/8/97		11/11/97	12-0-81
557	TOX-ICR	TOX (Dupl)	124	µg Cl-/L	SM 5320 B	1	25	11/8/97		11/11/97	12-0-81
			124	**µg Cl-/L**	**0.0 % RPD**						
558	THM-ICR	1,2,3-Trichloropropane (Surrogate)	98.8	%	EPA 551.1	1	1.0	11/8/97	11/17/97	11/17/97	0-63-0
559	THM-ICR	Bromodichloromethane	16.9	µg/L	EPA 551.1	1	1.0	11/8/97	11/17/97	11/17/97	0-63-0
560	THM-ICR	Bromoform	1.1	µg/L	EPA 551.1	1	1.0	11/8/97	11/17/97	11/17/97	0-63-0
561	THM-ICR	Chloroform	27.2	µg/L	EPA 551.1	1	1.0	11/8/97	11/17/97	11/17/97	0-63-0
562	THM-ICR	Dibromochloromethane	9.2	µg/L	EPA 551.1	1	1.0	11/8/97	11/17/97	11/17/97	0-63-0
563	UV-ICR	UV	0.032	1/cm	SM 5910 B	1	0.009	11/4/97		11/6/97	8-0-102
564	UV-ICR	UV (Dupl)	0.032	1/cm	SM 5910 B	1	0.009	11/4/97		11/6/97	8-0-102
			0.032	**1/cm**	**0.0 % RPD**						

Sample ID: 92.20.E-10 **S&H ID:** 9711-60 **Date Sampled:** 11/4/97 7:17:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
565	Cl2Dose	Chlorine Dose	3.01	mg/L as Cl2	SM 4500-Cl B	1	n/a	11/7/97		11/7/97	n/a
566	Cl2Res	Chlorine Residual	0.79	mg/L as Cl2	SM 4500-Cl F	1	0.10	11/7/97		11/8/97	n/a
567	HAA	Bromochloroacetic acid	2.7	µg/L	SM 6251 B	1	1.0	11/8/97	11/14/97	11/18/97	MW69314
568	HAA	Bromodichloroacetic acid	1.6	µg/L	SM 6251 B	1	1.0	11/8/97	11/14/97	11/18/97	MW69314
569	HAA	Chlorodibromoacetic acid	2.2	µg/L	SM 6251 B	1	2.0	11/8/97	11/14/97	11/18/97	MW69314
570	HAA	Dibromoacetic acid	2.1	µg/L	SM 6251 B	1	1.0	11/8/97	11/14/97	11/18/97	MW69314
571	HAA	Dichloroacetic acid	2.1	µg/L	SM 6251 B	1	1.0	11/8/97	11/14/97	11/18/97	MW69314
572	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	11/8/97	11/14/97	11/18/97	MW69314
573	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	11/8/97	11/14/97	11/18/97	MW69314
574	HAA	Trichloroacetic acid	ND	µg/L	SM 6251 B	1	1.0	11/8/97	11/14/97	11/18/97	MW69314
575	pH	Cl2 pH - Final	9.1	Unit	SM 4500-H+ B	1	n/a	11/7/97		11/8/97	n/a
576	pH	Cl2 pH - Initial	9.1	Unit	SM 4500-H+ B	1	n/a	11/7/97		11/7/97	n/a
577	pH	pH	8.4	Unit	SM 4500-H+ B	1	n/a	11/4/97		11/4/97	n/a
578	TEMP	Cl2 Temperature	15.0	ºC	SM 2550 B	1	n/a	11/7/97		11/8/97	n/a
579	TEMP	Temperature	22.0	ºC	SM 2550 B	1	n/a	11/4/97		11/4/97	n/a
580	TIME	Cl2 Incubation Time	23.9	hrs	n/a	1	n/a	11/7/97		11/8/97	n/a
581	TOC-ICR	TOC	1.06	mg/L	SM 5310 C	1	0.50	11/4/97		11/5/97	7-0-142
582	TOC-ICR	TOC (Dupl)	1.06	mg/L	SM 5310 C	1	0.50	11/4/97		11/5/97	7-0-142
			1.06	**mg/L**	**0.0 % RPD**						
583	TOX-ICR	TOX	39	µg Cl-/L	SM 5320 B	1	25	11/8/97		11/11/97	12-0-81
584	TOX-ICR	TOX (Dupl)	41	µg Cl-/L	SM 5320 B	1	25	11/8/97		11/11/97	12-0-81
			40	**µg Cl-/L**	**5.0 % RPD**						
585	THM-ICR	1,2,3-Trichloropropane (Surrogate)	96.4	%	EPA 551.1	1	1.0	11/8/97	11/17/97	11/17/97	0-63-0
586	THM-ICR	Bromodichloromethane	8.3	µg/L	EPA 551.1	1	1.0	11/8/97	11/17/97	11/17/97	0-63-0

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 92
Study Title: ICR RSSCT #4

587	THM-ICR	Bromoform	3.1	µg/L	EPA 551.1	1	1.0	11/8/97	11/17/97	11/17/97	0-63-0
588	THM-ICR	Chloroform	4.3	µg/L	EPA 551.1	1	1.0	11/8/97	11/17/97	11/17/97	0-63-0
589	THM-ICR	Dibromochloromethane	9.3	µg/L	EPA 551.1	1	1.0	11/8/97	11/17/97	11/17/97	0-63-0
590	UV-ICR	UV	0.012	1/cm	SM 5910 B	1	0.009	11/4/97		11/6/97	8-0-102
591	UV-ICR	UV (Dupl)	0.012	1/cm	SM 5910 B	1	0.009	11/4/97		11/6/97	8-0-102
			0.012	**1/cm**	**0.0 % RPD**						

Sample ID: 92.20.E-13 **S&H ID:** 9711-70 **Date Sampled:** 11/5/97 8:51:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
592	Cl2Dose	Chlorine Dose	3.11	mg/L as Cl2	SM 4500-Cl B	1	n/a	11/7/97		11/7/97	n/a
593	Cl2Res	Chlorine Residual	0.78	mg/L as Cl2	SM 4500-Cl F	1	0.10	11/7/97		11/8/97	n/a
594	HAA	Bromochloroacetic acid	3.3	µg/L	SM 6251 B	1	1.0	11/8/97	11/14/97	11/18/97	MW69314
595	HAA	Bromodichloroacetic acid	1.9	µg/L	SM 6251 B	1	1.0	11/8/97	11/14/97	11/18/97	MW69314
596	HAA	Chlorodibromoacetic acid	2.3	µg/L	SM 6251 B	1	2.0	11/8/97	11/14/97	11/18/97	MW69314
597	HAA	Dibromoacetic acid	2.2	µg/L	SM 6251 B	1	1.0	11/8/97	11/14/97	11/18/97	MW69314
598	HAA	Dichloroacetic acid	4.2	µg/L	SM 6251 B	1	1.0	11/8/97	11/14/97	11/18/97	MW69314
599	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	11/8/97	11/14/97	11/18/97	MW69314
600	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	11/8/97	11/14/97	11/18/97	MW69314
601	HAA	Trichloroacetic acid	1.5	µg/L	SM 6251 B	1	1.0	11/8/97	11/14/97	11/18/97	MW69314
602	pH	Cl2 pH - Final	9.1	Unit	SM 4500-H+ B	1	n/a	11/7/97		11/8/97	n/a
603	pH	Cl2 pH - Initial	9.1	Unit	SM 4500-H+ B	1	n/a	11/7/97		11/7/97	n/a
604	pH	pH	8.2	Unit	SM 4500-H+ B	1	n/a	11/5/97		11/5/97	n/a
605	TEMP	Cl2 Temperature	15.0	ºC	SM 2550 B	1	n/a	11/7/97		11/8/97	n/a
606	TEMP	Temperature	22.5	ºC	SM 2550 B	1	n/a	11/5/97		11/5/97	n/a
607	TIME	Cl2 Incubation Time	23.9	hrs	n/a	1	n/a	11/7/97		11/8/97	n/a
608	TOC-ICR	TOC	1.26	mg/L	SM 5310 C	1	0.50	11/5/97		11/6/97	7-0-143
609	TOC-ICR	TOC (Dupl)	1.25	mg/L	SM 5310 C	1	0.50	11/5/97		11/6/97	7-0-143
			1.25	**mg/L**	**0.8 % RPD**						
610	TOX-ICR	TOX	60	µg Cl-/L	SM 5320 B	1	25	11/8/97		11/11/97	12-0-81
611	TOX-ICR	TOX (Dupl)	62	µg Cl-/L	SM 5320 B	1	25	11/8/97		11/11/97	12-0-81
			61	**µg Cl-/L**	**3.3 % RPD**						
612	THM-ICR	1,2,3-Trichloropropane (Surrogate)	104.8	%	EPA 551.1	1	1.0	11/8/97	11/17/97	11/17/97	0-63-0
613	THM-ICR	Bromodichloromethane	11.8	µg/L	EPA 551.1	1	1.0	11/8/97	11/17/97	11/17/97	0-63-0
614	THM-ICR	Bromoform	2.7	µg/L	EPA 551.1	1	1.0	11/8/97	11/17/97	11/17/97	0-63-0
615	THM-ICR	Chloroform	8.7	µg/L	EPA 551.1	1	1.0	11/8/97	11/17/97	11/17/97	0-63-0
616	THM-ICR	Dibromochloromethane	10.7	µg/L	EPA 551.1	1	1.0	11/8/97	11/17/97	11/17/97	0-63-0
617	UV-ICR	UV	0.016	1/cm	SM 5910 B	1	0.009	11/5/97		11/6/97	8-0-102
618	UV-ICR	UV (Dupl)	0.016	1/cm	SM 5910 B	1	0.009	11/5/97		11/6/97	8-0-102
			0.016	**1/cm**	**0.0 % RPD**						

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Summers & Hooper, Inc.
6 Knollcrest Drive
Cincinnati, OH 45237

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 92
Study Title: ICR RSSCT #4

Sample ID: 92.10.E-21 **S&H ID:** 9711-79 **Date Sampled:** 11/6/97 12:01:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
619	Cl2Dose	Chlorine Dose	3.70	mg/L as Cl2	SM 4500-Cl B	1	n/a	11/7/97		11/7/97	n/a
620	Cl2Res	Chlorine Residual	0.71	mg/L as Cl2	SM 4500-Cl F	1	0.10	11/7/97		11/8/97	n/a
621	HAA	Bromochloroacetic acid	5.5	µg/L	SM 6251 B	1	1.0	11/8/97	11/14/97	11/18/97	MW69314
622	HAA	Bromodichloroacetic acid	3.2	µg/L	SM 6251 B	1	1.0	11/8/97	11/14/97	11/18/97	MW69314
623	HAA	Chlorodibromoacetic acid	2.3	µg/L	SM 6251 B	1	2.0	11/8/97	11/14/97	11/18/97	MW69314
624	HAA	Dibromoacetic acid	1.9	µg/L	SM 6251 B	1	1.0	11/8/97	11/14/97	11/18/97	MW69314
625	HAA	Dichloroacetic acid	11.0	µg/L	SM 6251 B	1	1.0	11/8/97	11/14/97	11/18/97	MW69314
626	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	11/8/97	11/14/97	11/18/97	MW69314
627	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	11/8/97	11/14/97	11/18/97	MW69314
628	HAA	Trichloroacetic acid	5.6	µg/L	SM 6251 B	1	1.0	11/8/97	11/14/97	11/18/97	MW69314
629	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	11/7/97		11/8/97	n/a
630	pH	Cl2 pH - Initial	9.0	Unit	SM 4500-H+ B	1	n/a	11/7/97		11/7/97	n/a
631	pH	pH	8.2	Unit	SM 4500-H+ B	1	n/a	11/6/97		11/6/97	n/a
632	TEMP	Cl2 Temperature	15.0	ºC	SM 2550 B	1	n/a	11/7/97		11/8/97	n/a
633	TEMP	Temperature	21.8	ºC	SM 2550 B	1	n/a	11/6/97		11/6/97	n/a
634	TIME	Cl2 Incubation Time	24.0	hrs	n/a	1	n/a	11/7/97		11/8/97	n/a
635	TOC-ICR	TOC	2.45	mg/L	SM 5310 C	1	0.50	11/6/97		11/6/97	7-0-143
636	TOC-ICR	TOC (Dupl)	2.45	mg/L	SM 5310 C	1	0.50	11/6/97		11/6/97	7-0-143
			2.45	**mg/L**	**0.0 % RPD**						
637	TOX-ICR	TOX	149	µg Cl-/L	SM 5320 B	1	25	11/8/97		11/11/97	12-0-81
638	TOX-ICR	TOX (Dupl)	145	µg Cl-/L	SM 5320 B	1	25	11/8/97		11/11/97	12-0-81
			147	**µg Cl-/L**	**2.7 % RPD**						
639	THM-ICR	1,2,3-Trichloropropane (Surrogate)	105.6	%	EPA 551.1	1	1.0	11/8/97	11/17/97	11/17/97	0-63-0
640	THM-ICR	1,2,3-Trichloropropane (Surrogate) (Lab Dupl)	98.4	%	EPA 551.1	1	1.0	11/8/97	11/17/97	11/17/97	0-63-0
			102.0	**%**	**7.1 % RPD**						
641	THM-ICR	Bromodichloromethane	20.0	µg/L	EPA 551.1	1	1.0	11/8/97	11/17/97	11/17/97	0-63-0
642	THM-ICR	Bromodichloromethane (Lab Dupl)	19.6	µg/L	EPA 551.1	1	1.0	11/8/97	11/17/97	11/17/97	0-63-0
			19.8	**µg/L**	**2.0 % RPD**						
643	THM-ICR	Bromoform	1.1	µg/L	EPA 551.1	1	1.0	11/8/97	11/17/97	11/17/97	0-63-0
644	THM-ICR	Bromoform (Lab Dupl)	1.0	µg/L	EPA 551.1	1	1.0	11/8/97	11/17/97	11/17/97	0-63-0
			1.1	**µg/L**	**9.1 % RPD**						
645	THM-ICR	Chloroform	38.8	µg/L	EPA 551.1	1	1.0	11/8/97	11/17/97	11/17/97	0-63-0
646	THM-ICR	Chloroform (Lab Dupl)	37.1	µg/L	EPA 551.1	1	1.0	11/8/97	11/17/97	11/17/97	0-63-0
			38.0	**µg/L**	**4.5 % RPD**						
647	THM-ICR	Dibromochloromethane	9.2	µg/L	EPA 551.1	1	1.0	11/8/97	11/17/97	11/17/97	0-63-0
648	THM-ICR	Dibromochloromethane (Lab Dupl)	8.9	µg/L	EPA 551.1	1	1.0	11/8/97	11/17/97	11/17/97	0-63-0

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 92
Study Title: ICR RSSCT #4

			9.1	**µg/L**	**3.3 % RPD**						
649	UV-ICR	UV	0.036	1/cm	SM 5910 B	1	0.009	11/6/97		11/7/97	8-0-103
650	UV-ICR	UV (Dupl)	0.036	1/cm	SM 5910 B	1	0.009	11/6/97		11/7/97	8-0-103
			0.036	**1/cm**	**0.0 % RPD**						

Sample ID: 92.20.E-17 **S&H ID:** 9711-82 **Date Sampled:** 11/6/97 6:29:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
651	Cl2Dose	Chlorine Dose	3.22	mg/L as Cl2	SM 4500-Cl B	1	n/a	11/10/97		11/10/97	n/a
652	Cl2Res	Chlorine Residual	0.72	mg/L as Cl2	SM 4500-Cl F	1	0.10	11/10/97		11/11/97	n/a
653	HAA	Bromochloroacetic acid	3.5	µg/L	SM 6251 B	1	1.0	11/11/97	11/17/97	11/21/97	MW69859
654	HAA	Bromodichloroacetic acid	1.4	µg/L	SM 6251 B	1	1.0	11/11/97	11/17/97	11/21/97	MW69859
655	HAA	Dibromoacetic acid	2.6	µg/L	SM 6251 B	1	1.0	11/11/97	11/17/97	11/21/97	MW69859
656	HAA	Dichloroacetic acid	4.6	µg/L	SM 6251 B	1	1.0	11/11/97	11/17/97	11/21/97	MW69859
657	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	11/11/97	11/17/97	11/21/97	MW69859
658	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	11/11/97	11/17/97	11/21/97	MW69859
659	HAA	Trichloroacetic acid	1.8	µg/L	SM 6251 B	1	1.0	11/11/97	11/17/97	11/21/97	MW69859
660	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	11/10/97		11/11/97	n/a
661	pH	Cl2 pH - Initial	9.1	Unit	SM 4500-H+ B	1	n/a	11/10/97		11/10/97	n/a
662	pH	pH	8.3	Unit	SM 4500-H+ B	1	n/a	11/6/97		11/6/97	n/a
663	TEMP	Cl2 Temperature	15.1	ºC	SM 2550 B	1	n/a	11/10/97		11/11/97	n/a
664	TEMP	Temperature	22.2	ºC	SM 2550 B	1	n/a	11/6/97		11/6/97	n/a
665	TIME	Cl2 Incubation Time	24.1	hrs	n/a	1	n/a	11/10/97		11/11/97	n/a
666	TOC-ICR	TOC	1.43	mg/L	SM 5310 C	1	0.50	11/6/97		11/7/97	7-0-144
667	TOC-ICR	TOC (Dupl)	1.41	mg/L	SM 5310 C	1	0.50	11/6/97		11/7/97	7-0-144
			1.42	**mg/L**	**1.4 % RPD**						
668	TOX-ICR	TOX	66	µg Cl-/L	SM 5320 B	1	25	11/11/97		11/12/97	12-0-82
669	TOX-ICR	TOX (Dupl)	62	µg Cl-/L	SM 5320 B	1	25	11/11/97		11/12/97	12-0-82
			64	**µg Cl-/L**	**6.3 % RPD**						
670	THM-ICR	1,2,3-Trichloropropane (Surrogate)	104.0	%	EPA 551.1	1	1.0	11/11/97	11/17/97	11/17/97	0-63-0
671	THM-ICR	Bromodichloromethane	13.7	µg/L	EPA 551.1	1	1.0	11/11/97	11/17/97	11/17/97	0-63-0
672	THM-ICR	Bromoform	2.2	µg/L	EPA 551.1	1	1.0	11/11/97	11/17/97	11/17/97	0-63-0
673	THM-ICR	Chloroform	12.6	µg/L	EPA 551.1	1	1.0	11/11/97	11/17/97	11/17/97	0-63-0
674	THM-ICR	Dibromochloromethane	11.2	µg/L	EPA 551.1	1	1.0	11/11/97	11/17/97	11/17/97	0-63-0
675	UV-ICR	UV	0.018	1/cm	SM 5910 B	1	0.009	11/6/97		11/7/97	8-0-103
676	UV-ICR	UV (Dupl)	0.018	1/cm	SM 5910 B	1	0.009	11/6/97		11/7/97	8-0-103
			0.018	**1/cm**	**0.0 % RPD**						

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Summers & Hooper, Inc.
6 Knollcrest Drive
Cincinnati, OH 45237

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 92
Study Title: ICR RSSCT #4

Sample ID: 92.20.E-17d **S&H ID:** 9711-83 **Date Sampled:** 11/6/97 6:29:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
677	Cl2Dose	Chlorine Dose	3.23	mg/L as Cl2	SM 4500-Cl B	1	n/a	11/10/97		11/10/97	n/a
678	Cl2Res	Chlorine Residual	0.69	mg/L as Cl2	SM 4500-Cl F	1	0.10	11/10/97		11/11/97	n/a
679	HAA	Bromochloroacetic acid	3.1	µg/L	SM 6251 B	1	1.0	11/11/97	11/17/97	11/21/97	MW69859
680	HAA	Bromodichloroacetic acid	1.2	µg/L	SM 6251 B	1	1.0	11/11/97	11/17/97	11/21/97	MW69859
681	HAA	Dibromoacetic acid	2.4	µg/L	SM 6251 B	1	1.0	11/11/97	11/17/97	11/21/97	MW69859
682	HAA	Dichloroacetic acid	4.2	µg/L	SM 6251 B	1	1.0	11/11/97	11/17/97	11/21/97	MW69859
683	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	11/11/97	11/17/97	11/21/97	MW69859
684	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	11/11/97	11/17/97	11/21/97	MW69859
685	HAA	Trichloroacetic acid	1.5	µg/L	SM 6251 B	1	1.0	11/11/97	11/17/97	11/21/97	MW69859
686	pH	Cl2 pH - Final	9.1	Unit	SM 4500-H+ B	1	n/a	11/10/97		11/11/97	n/a
687	pH	Cl2 pH - Initial	9.1	Unit	SM 4500-H+ B	1	n/a	11/10/97		11/10/97	n/a
688	pH	pH	8.3	Unit	SM 4500-H+ B	1	n/a	11/6/97		11/6/97	n/a
689	TEMP	Cl2 Temperature	15.1	ºC	SM 2550 B	1	n/a	11/10/97		11/11/97	n/a
690	TEMP	Temperature	22.2	ºC	SM 2550 B	1	n/a	11/6/97		11/6/97	n/a
691	TIME	Cl2 Incubation Time	24.0	hrs	n/a	1	n/a	11/10/97		11/11/97	n/a
692	TOC-ICR	TOC	1.42	mg/L	SM 5310 C	1	0.50	11/6/97		11/7/97	7-0-144
693	TOC-ICR	TOC (Dupl)	1.46	mg/L	SM 5310 C	1	0.50	11/6/97		11/7/97	7-0-144
			1.44	**mg/L**	**2.8 % RPD**						
694	TOX-ICR	TOX	65	µg Cl-/L	SM 5320 B	1	25	11/11/97		11/12/97	12-0-82
695	TOX-ICR	TOX (Dupl)	67	µg Cl-/L	SM 5320 B	1	25	11/11/97		11/12/97	12-0-82
			66	**µg Cl-/L**	**3.0 % RPD**						
696	THM-ICR	1,2,3-Trichloropropane (Surrogate)	98.0	%	EPA 551.1	1	1.0	11/11/97	11/17/97	11/17/97	0-63-0
697	THM-ICR	Bromodichloromethane	13.3	µg/L	EPA 551.1	1	1.0	11/11/97	11/17/97	11/17/97	0-63-0
698	THM-ICR	Bromoform	2.2	µg/L	EPA 551.1	1	1.0	11/11/97	11/17/97	11/17/97	0-63-0
699	THM-ICR	Chloroform	12.9	µg/L	EPA 551.1	1	1.0	11/11/97	11/17/97	11/17/97	0-63-0
700	THM-ICR	Dibromochloromethane	10.8	µg/L	EPA 551.1	1	1.0	11/11/97	11/17/97	11/17/97	0-63-0
701	UV-ICR	UV	0.018	1/cm	SM 5910 B	1	0.009	11/6/97		11/7/97	8-0-103
702	UV-ICR	UV (Dupl)	0.018	1/cm	SM 5910 B	1	0.009	11/6/97		11/7/97	8-0-103
			0.018	**1/cm**	**0.0 % RPD**						

Sample ID: 92.INF.A-2 **S&H ID:** 9711-85 **Date Sampled:** 11/7/97 9:50:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
703	ALK	Alkalinity	22	mg/L	SM 2320 B	1	5	11/7/97		11/7/97	1-0-11
704	ALK	Alkalinity (Dupl)	22	mg/L	SM 2320 B	1	5	11/7/97		11/7/97	1-0-11
			22	**mg/L**	**0.0 % RPD**						
705	NH3	Ammonia Nitrogen	0.20	mg/L	EPA 350.1	1	0.05	11/7/97		11/20/97	MW69527
706	BR	Bromide	0.043	mg/L	EPA 300.0 A	1	0.020	11/7/97		11/18/97	MW69402

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 92
Study Title: ICR RSSCT #4

707	CaHard	Calcium Hardness	77	mg/L CaCO3	SM 3500-Ca D	1	10	11/7/97		11/7/97	33-0-11
708	CaHard	Calcium Hardness (Dupl)	75	mg/L CaCO3	SM 3500-Ca D	1	10	11/7/97		11/7/97	33-0-11
			76	**mg/L CaCO3**	**2.6 % RPD**						
709	TotHard	Total Hardness	95	mg/L CaCO3	SM 2340 C	1	5	11/7/97		11/7/97	3-0-11
710	TotHard	Total Hardness (Dupl)	95	mg/L CaCO3	SM 2340 C	1	5	11/7/97		11/7/97	3-0-11
			95	**mg/L CaCO3**	**0.0 % RPD**						

Sample ID: 92.INF.B-4 **S&H ID:** 9711-86 **Date Sampled:** 11/7/97 10:00:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
711	Cl2Dose	Chlorine Dose	4.54	mg/L as Cl2	SM 4500-Cl B	1	n/a	11/10/97		11/10/97	n/a
712	Cl2Res	Chlorine Residual	0.65	mg/L as Cl2	SM 4500-Cl F	1	0.10	11/10/97		11/11/97	n/a
713	HAA	Bromochloroacetic acid	4.7	µg/L	SM 6251 B	1	1.0	11/11/97	11/17/97	11/21/97	MW69859
714	HAA	Bromodichloroacetic acid	2.8	µg/L	SM 6251 B	1	1.0	11/11/97	11/17/97	11/21/97	MW69859
715	HAA	Dibromoacetic acid	1.3	µg/L	SM 6251 B	1	1.0	11/11/97	11/17/97	11/21/97	MW69859
716	HAA	Dichloroacetic acid	17.0	µg/L	SM 6251 B	1	1.0	11/11/97	11/17/97	11/21/97	MW69859
717	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	11/11/97	11/17/97	11/21/97	MW69859
718	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	11/11/97	11/17/97	11/21/97	MW69859
719	HAA	Trichloroacetic acid	8.7	µg/L	SM 6251 B	1	1.0	11/11/97	11/17/97	11/21/97	MW69859
720	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	11/10/97		11/11/97	n/a
721	pH	Cl2 pH - Initial	9.1	Unit	SM 4500-H+ B	1	n/a	11/10/97		11/10/97	n/a
722	pH	pH	9.0	Unit	SM 4500-H+ B	1	n/a	11/7/97		11/7/97	n/a
723	TEMP	Cl2 Temperature	15.1	ºC	SM 2550 B	1	n/a	11/10/97		11/11/97	n/a
724	TEMP	Temperature	14.0	ºC	SM 2550 B	1	n/a	11/7/97		11/7/97	n/a
725	TIME	Cl2 Incubation Time	24.1	hrs	n/a	1	n/a	11/10/97		11/11/97	n/a
726	TOC-ICR	TOC	3.52	mg/L	SM 5310 C	1	0.50	11/7/97		11/7/97	7-0-144
727	TOC-ICR	TOC (Dupl)	3.52	mg/L	SM 5310 C	1	0.50	11/7/97		11/7/97	7-0-144
			3.52	**mg/L**	**0.0 % RPD**						
728	TOX-ICR	TOX	239	µg Cl-/L	SM 5320 B	1	25	11/11/97		11/13/97	12-0-83
729	TOX-ICR	TOX (Dupl)	228	µg Cl-/L	SM 5320 B	1	25	11/11/97		11/13/97	12-0-83
			234	**µg Cl-/L**	**4.7 % RPD**						
730	THM-ICR	1,2,3-Trichloropropane (Surrogate)	98.0	%	EPA 551.1	1	1.0	11/11/97	11/17/97	11/17/97	0-63-0
731	THM-ICR	Bromodichloromethane	22.9	µg/L	EPA 551.1	1	1.0	11/11/97	11/17/97	11/17/97	0-63-0
732	THM-ICR	Bromoform	ND	µg/L	EPA 551.1	1	1.0	11/11/97	11/17/97	11/17/97	0-63-0
733	THM-ICR	Chloroform	71.9	µg/L	EPA 551.1	1	1.0	11/11/97	11/17/97	11/17/97	0-63-0
734	THM-ICR	Dibromochloromethane	6.9	µg/L	EPA 551.1	1	1.0	11/11/97	11/17/97	11/17/97	0-63-0
735	TURB	Turbidity	0.10	ntu	SM 2130 B	1	0.05	11/7/97		11/7/97	9-0-6
736	UV-ICR	UV	0.063	1/cm	SM 5910 B	1	0.009	11/7/97		11/7/97	8-0-103
737	UV-ICR	UV (Dupl)	0.063	1/cm	SM 5910 B	1	0.009	11/7/97		11/7/97	8-0-103
			0.063	**1/cm**	**0.0 % RPD**						

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Summers & Hooper, Inc.
6 Knollcrest Drive
Cincinnati, OH 45237

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 92
Study Title: ICR RSSCT #4

Sample ID: 92.20.E-19d **S&H ID:** 9711-95 **Date Sampled:** 11/7/97 12:39:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
738	Cl2Dose	Chlorine Dose	3.31	mg/L as Cl2	SM 4500-Cl B	1	n/a	11/10/97		11/10/97	n/a
739	Cl2Res	Chlorine Residual	0.69	mg/L as Cl2	SM 4500-Cl F	1	0.10	11/10/97		11/11/97	n/a
740	HAA	Bromochloroacetic acid	3.6	µg/L	SM 6251 B	1	1.0	11/11/97	11/17/97	11/21/97	MW69859
741	HAA	Bromodichloroacetic acid	1.4	µg/L	SM 6251 B	1	1.0	11/11/97	11/17/97	11/21/97	MW69859
742	HAA	Dibromoacetic acid	2.3	µg/L	SM 6251 B	1	1.0	11/11/97	11/17/97	11/21/97	MW69859
743	HAA	Dichloroacetic acid	5.0	µg/L	SM 6251 B	1	1.0	11/11/97	11/17/97	11/21/97	MW69859
744	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	11/11/97	11/17/97	11/21/97	MW69859
745	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	11/11/97	11/17/97	11/21/97	MW69859
746	HAA	Trichloroacetic acid	2.0	µg/L	SM 6251 B	1	1.0	11/11/97	11/17/97	11/21/97	MW69859
747	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	11/10/97		11/11/97	n/a
748	pH	Cl2 pH - Initial	9.0	Unit	SM 4500-H+ B	1	n/a	11/10/97		11/10/97	n/a
749	pH	pH	8.0	Unit	SM 4500-H+ B	1	n/a	11/7/97		11/7/97	n/a
750	TEMP	Cl2 Temperature	15.1	ºC	SM 2550 B	1	n/a	11/10/97		11/11/97	n/a
751	TEMP	Temperature	22.1	ºC	SM 2550 B	1	n/a	11/7/97		11/7/97	n/a
752	TIME	Cl2 Incubation Time	24.0	hrs	n/a	1	n/a	11/10/97		11/11/97	n/a
753	TOC-ICR	TOC	1.62	mg/L	SM 5310 C	1	0.50	11/7/97		11/7/97	7-0-144
754	TOC-ICR	TOC (Dupl)	1.62	mg/L	SM 5310 C	1	0.50	11/7/97		11/7/97	7-0-144
			1.62	**mg/L**	**0.0 % RPD**						
755	TOX-ICR	TOX	73	µg Cl-/L	SM 5320 B	1	25	11/11/97		11/12/97	12-0-82
756	TOX-ICR	TOX (Dupl)	75	µg Cl-/L	SM 5320 B	1	25	11/11/97		11/12/97	12-0-82
			74	**µg Cl-/L**	**2.7 % RPD**						
757	THM-ICR	1,2,3-Trichloropropane (Surrogate)	100.8	%	EPA 551.1	1	1.0	11/11/97	11/17/97	11/17/97	0-63-0
758	THM-ICR	Bromodichloromethane	14.9	µg/L	EPA 551.1	1	1.0	11/11/97	11/17/97	11/17/97	0-63-0
759	THM-ICR	Bromoform	2.0	µg/L	EPA 551.1	1	1.0	11/11/97	11/17/97	11/17/97	0-63-0
760	THM-ICR	Chloroform	15.6	µg/L	EPA 551.1	1	1.0	11/11/97	11/17/97	11/17/97	0-63-0
761	THM-ICR	Dibromochloromethane	10.7	µg/L	EPA 551.1	1	1.0	11/11/97	11/17/97	11/17/97	0-63-0
762	UV-ICR	UV	0.021	1/cm	SM 5910 B	1	0.009	11/7/97		11/8/97	8-0-104
763	UV-ICR	UV (Dupl)	0.020	1/cm	SM 5910 B	1	0.009	11/7/97		11/8/97	8-0-104
			0.021	**1/cm**	**4.8 % RPD**						

Sample ID: 92.10.E-22 **S&H ID:** 9711-99 **Date Sampled:** 11/8/97 9:24:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
764	pH	pH	8.2	Unit	SM 4500-H+ B	1	n/a	11/8/97		11/8/97	n/a
765	TEMP	Temperature	21.0	ºC	SM 2550 B	1	n/a	11/8/97		11/8/97	n/a
766	TOC-ICR	TOC	2.61	mg/L	SM 5310 C	1	0.50	11/8/97		11/8/97	7-0-145

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 92
Study Title: ICR RSSCT #4

767	TOC-ICR	TOC (Dupl)	2.59	mg/L	SM 5310 C	1	0.50	11/8/97		11/8/97	7-0-145
			2.60	**mg/L**	**0.8 % RPD**						

Sample ID: 92.20.E-24 **S&H ID:** 9711-107 **Date Sampled:** 11/9/97 6:51:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
768	Cl2Dose	Chlorine Dose	3.41	mg/L as Cl2	SM 4500-Cl B	1	n/a	11/10/97		11/10/97	n/a
769	Cl2Res	Chlorine Residual	0.66	mg/L as Cl2	SM 4500-Cl F	1	0.10	11/10/97		11/11/97	n/a
770	HAA	Bromochloroacetic acid	4.1	µg/L	SM 6251 B	1	1.0	11/11/97	11/17/97	11/21/97	MW69859
771	HAA	Bromodichloroacetic acid	1.7	µg/L	SM 6251 B	1	1.0	11/11/97	11/17/97	11/21/97	MW69859
772	HAA	Dibromoacetic acid	2.4	µg/L	SM 6251 B	1	1.0	11/11/97	11/17/97	11/21/97	MW69859
773	HAA	Dichloroacetic acid	6.5	µg/L	SM 6251 B	1	1.0	11/11/97	11/17/97	11/21/97	MW69859
774	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	11/11/97	11/17/97	11/21/97	MW69859
775	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	11/11/97	11/17/97	11/21/97	MW69859
776	HAA	Trichloroacetic acid	2.9	µg/L	SM 6251 B	1	1.0	11/11/97	11/17/97	11/21/97	MW69859
777	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	11/10/97		11/11/97	n/a
778	pH	Cl2 pH - Initial	9.1	Unit	SM 4500-H+ B	1	n/a	11/10/97		11/10/97	n/a
779	pH	pH	8.3	Unit	SM 4500-H+ B	1	n/a	11/9/97		11/9/97	n/a
780	TEMP	Cl2 Temperature	15.1	ºC	SM 2550 B	1	n/a	11/10/97		11/11/97	n/a
781	TEMP	Temperature	20.8	ºC	SM 2550 B	1	n/a	11/9/97		11/9/97	n/a
782	TIME	Cl2 Incubation Time	24.1	hrs	n/a	1	n/a	11/10/97		11/11/97	n/a
783	TOC-ICR	TOC	1.79	mg/L	SM 5310 C	1	0.50	11/9/97		11/10/97	7-0-147
784	TOC-ICR	TOC (Dupl)	1.84	mg/L	SM 5310 C	1	0.50	11/9/97		11/10/97	7-0-147
			1.81	**mg/L**	**2.8 % RPD**						
785	TOX-ICR	TOX	94	µg Cl-/L	SM 5320 B	1	25	11/11/97		11/13/97	12-0-83
786	TOX-ICR	TOX (Dupl)	90	µg Cl-/L	SM 5320 B	1	25	11/11/97		11/13/97	12-0-83
			92	**µg Cl-/L**	**4.3 % RPD**						
787	THM-ICR	1,2,3-Trichloropropane (Surrogate)	101.2	%	EPA 551.1	1	1.0	11/11/97	11/17/97	11/17/97	0-63-0
788	THM-ICR	Bromodichloromethane	16.5	µg/L	EPA 551.1	1	1.0	11/11/97	11/17/97	11/17/97	0-63-0
789	THM-ICR	Bromoform	1.4	µg/L	EPA 551.1	1	1.0	11/11/97	11/17/97	11/17/97	0-63-0
790	THM-ICR	Chloroform	22.9	µg/L	EPA 551.1	1	1.0	11/11/97	11/17/97	11/17/97	0-63-0
791	THM-ICR	Dibromochloromethane	10.4	µg/L	EPA 551.1	1	1.0	11/11/97	11/17/97	11/17/97	0-63-0
792	UV-ICR	UV	0.025	1/cm	SM 5910 B	1	0.009	11/9/97		11/11/97	8-0-105
793	UV-ICR	UV (Dupl)	0.024	1/cm	SM 5910 B	1	0.009	11/9/97		11/11/97	8-0-105
			0.025	**1/cm**	**4.0 % RPD**						

Sample ID: 92.20.E-26 **S&H ID:** 9711-116 **Date Sampled:** 11/11/97 6:56:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
794	Cl2Dose	Chlorine Dose	3.53	mg/L as Cl2	SM 4500-Cl B	1	n/a	11/12/97		11/12/97	n/a

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 92
Study Title: ICR RSSCT #4

795	Cl2Res	Chlorine Residual	0.70	mg/L as Cl2	SM 4500-Cl F	1	0.10	11/12/97		11/13/97	n/a
796	HAA	Bromochloroacetic acid	5.0	µg/L	SM 6251 B	1	1.0	11/13/97	11/18/97	11/22/97	MW69664
797	HAA	Bromodichloroacetic acid	2.8	µg/L	SM 6251 B	1	1.0	11/13/97	11/18/97	11/22/97	MW69664
798	HAA	Chlorodibromoacetic acid	ND	µg/L	SM 6251 B	1	2.0	11/13/97	11/18/97	11/22/97	MW69664
799	HAA	Dibromoacetic acid	2.0	µg/L	SM 6251 B	1	1.0	11/13/97	11/18/97	11/22/97	MW69664
800	HAA	Dichloroacetic acid	8.6	µg/L	SM 6251 B	1	1.0	11/13/97	11/18/97	11/22/97	MW69664
801	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	11/13/97	11/18/97	11/22/97	MW69664
802	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	11/13/97	11/18/97	11/22/97	MW69664
803	HAA	Trichloroacetic acid	4.3	µg/L	SM 6251 B	1	1.0	11/13/97	11/18/97	11/22/97	MW69664
804	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	11/12/97		11/13/97	n/a
805	pH	Cl2 pH - Initial	9.0	Unit	SM 4500-H+ B	1	n/a	11/12/97		11/12/97	n/a
806	pH	pH	8.3	Unit	SM 4500-H+ B	1	n/a	11/11/97		11/11/97	n/a
807	TEMP	Cl2 Temperature	15.3	ºC	SM 2550 B	1	n/a	11/12/97		11/13/97	n/a
808	TEMP	Temperature	21.5	ºC	SM 2550 B	1	n/a	11/11/97		11/11/97	n/a
809	TIME	Cl2 Incubation Time	24.1	hrs	n/a	1	n/a	11/12/97		11/13/97	n/a
810	TOC-ICR	TOC	1.98	mg/L	SM 5310 C	1	0.50	11/11/97		11/11/97	7-0-148
811	TOC-ICR	TOC (Dupl)	2.05	mg/L	SM 5310 C	1	0.50	11/11/97		11/11/97	7-0-148
			2.01	**mg/L**	**3.5 % RPD**						
812	TOX-ICR	TOX	109	µg Cl-/L	SM 5320 B	1	25	11/13/97		11/13/97	12-0-83
813	TOX-ICR	TOX (Dupl)	106	µg Cl-/L	SM 5320 B	1	25	11/13/97		11/13/97	12-0-83
			108	**µg Cl-/L**	**2.8 % RPD**						
814	THM-ICR	1,2,3-Trichloropropane (Surrogate)	98.0	%	EPA 551.1	1	1.0	11/13/97	11/17/97	11/18/97	0-63-0
815	THM-ICR	Bromodichloromethane	18.5	µg/L	EPA 551.1	1	1.0	11/13/97	11/17/97	11/18/97	0-63-0
816	THM-ICR	Bromoform	1.3	µg/L	EPA 551.1	1	1.0	11/13/97	11/17/97	11/18/97	0-63-0
817	THM-ICR	Chloroform	27.4	µg/L	EPA 551.1	1	1.0	11/13/97	11/17/97	11/18/97	0-63-0
818	THM-ICR	Dibromochloromethane	10.2	µg/L	EPA 551.1	1	1.0	11/13/97	11/17/97	11/18/97	0-63-0
819	UV-ICR	UV	0.028	1/cm	SM 5910 B	1	0.009	11/11/97		11/11/97	8-0-105
820	UV-ICR	UV (Dupl)	0.029	1/cm	SM 5910 B	1	0.009	11/11/97		11/11/97	8-0-105
			0.029	**1/cm**	**3.4 % RPD**						

Sample ID: 92.20.E-29 **S&H ID:** 9711-137 **Date Sampled:** 11/13/97 6:39:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
821	Cl2Dose	Chlorine Dose	3.63	mg/L as Cl2	SM 4500-Cl B	1	n/a	11/14/97		11/14/97	n/a
822	Cl2Res	Chlorine Residual	0.55	mg/L as Cl2	SM 4500-Cl F	1	0.10	11/14/97		11/15/97	n/a
823	HAA	Bromochloroacetic acid	5.5	µg/L	SM 6251 B	1	1.0	11/15/97	11/20/97	11/24/97	MW69671
824	HAA	Bromodichloroacetic acid	3.4	µg/L	SM 6251 B	1	1.0	11/15/97	11/20/97	11/24/97	MW69671
825	HAA	Chlorodibromoacetic acid	2.8	µg/L	SM 6251 B	1	2.0	11/15/97	11/20/97	11/24/97	MW69671
826	HAA	Dibromoacetic acid	2.2	µg/L	SM 6251 B	1	1.0	11/15/97	11/20/97	11/24/97	MW69671
827	HAA	Dichloroacetic acid	9.6	µg/L	SM 6251 B	1	1.0	11/15/97	11/20/97	11/24/97	MW69671

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 92
Study Title: ICR RSSCT #4

828	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	11/15/97	11/20/97	11/24/97	MW69671
829	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	11/15/97	11/20/97	11/24/97	MW69671
830	HAA	Trichloroacetic acid	6.3	µg/L	SM 6251 B	1	1.0	11/15/97	11/20/97	11/24/97	MW69671
831	pH	Cl2 pH - Final	8.9	Unit	SM 4500-H+ B	1	n/a	11/14/97		11/15/97	n/a
832	pH	Cl2 pH - Initial	9.0	Unit	SM 4500-H+ B	1	n/a	11/14/97		11/14/97	n/a
833	pH	pH	8.2	Unit	SM 4500-H+ B	1	n/a	11/13/97		11/13/97	n/a
834	TEMP	Cl2 Temperature	15.1	ºC	SM 2550 B	1	n/a	11/14/97		11/15/97	n/a
835	TEMP	Temperature	21.4	ºC	SM 2550 B	1	n/a	11/13/97		11/13/97	n/a
836	TIME	Cl2 Incubation Time	24.6	hrs	n/a	1	n/a	11/14/97		11/15/97	n/a
837	TOC-ICR	TOC	2.25	mg/L	SM 5310 C	1	0.50	11/13/97		11/13/97	7-0-149
838	TOC-ICR	TOC (Dupl)	2.20	mg/L	SM 5310 C	1	0.50	11/13/97		11/13/97	7-0-149
			2.23	**mg/L**	**2.2 % RPD**						
839	TOX-ICR	TOX	137	µg Cl-/L	SM 5320 B	1	25	11/15/97		11/19/97	12-0-84
840	TOX-ICR	TOX (Dupl)	126	µg Cl-/L	SM 5320 B	1	25	11/15/97		11/19/97	12-0-84
			132	**µg Cl-/L**	**8.3 % RPD**						
841	THM-ICR	1,2,3-Trichloropropane (Surrogate)	97.6	%	EPA 551.1	1	1.0	11/15/97	11/17/97	11/18/97	0-63-0
842	THM-ICR	Bromodichloromethane	19.1	µg/L	EPA 551.1	1	1.0	11/15/97	11/17/97	11/18/97	0-63-0
843	THM-ICR	Bromoform	1.0	µg/L	EPA 551.1	1	1.0	11/15/97	11/17/97	11/18/97	0-63-0
844	THM-ICR	Chloroform	33.0	µg/L	EPA 551.1	1	1.0	11/15/97	11/17/97	11/18/97	0-63-0
845	THM-ICR	Dibromochloromethane	9.3	µg/L	EPA 551.1	1	1.0	11/15/97	11/17/97	11/18/97	0-63-0
846	UV-ICR	UV	0.034	1/cm	SM 5910 B	1	0.009	11/13/97		11/14/97	8-0-106
847	UV-ICR	UV (Dupl)	0.034	1/cm	SM 5910 B	1	0.009	11/13/97		11/14/97	8-0-106
			0.034	**1/cm**	**0.0 % RPD**						

Sample ID: 92.20.E-29d **S&H ID:** 9711-138 **Date Sampled:** 11/13/97 6:39:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
848	Cl2Dose	Chlorine Dose	3.63	mg/L as Cl2	SM 4500-Cl B	1	n/a	11/14/97		11/14/97	n/a
849	Cl2Res	Chlorine Residual	0.55	mg/L as Cl2	SM 4500-Cl F	1	0.10	11/14/97		11/15/97	n/a
850	HAA	Bromochloroacetic acid	5.2	µg/L	SM 6251 B	1	1.0	11/15/97	11/20/97	11/24/97	MW69671
851	HAA	Bromodichloroacetic acid	3.3	µg/L	SM 6251 B	1	1.0	11/15/97	11/20/97	11/24/97	MW69671
852	HAA	Chlorodibromoacetic acid	2.7	µg/L	SM 6251 B	1	2.0	11/15/97	11/20/97	11/24/97	MW69671
853	HAA	Dibromoacetic acid	2.2	µg/L	SM 6251 B	1	1.0	11/15/97	11/20/97	11/24/97	MW69671
854	HAA	Dichloroacetic acid	9.5	µg/L	SM 6251 B	1	1.0	11/15/97	11/20/97	11/24/97	MW69671
855	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	11/15/97	11/20/97	11/24/97	MW69671
856	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	11/15/97	11/20/97	11/24/97	MW69671
857	HAA	Trichloroacetic acid	6.0	µg/L	SM 6251 B	1	1.0	11/15/97	11/20/97	11/24/97	MW69671
858	pH	Cl2 pH - Final	8.9	Unit	SM 4500-H+ B	1	n/a	11/14/97		11/15/97	n/a
859	pH	Cl2 pH - Initial	9.0	Unit	SM 4500-H+ B	1	n/a	11/14/97		11/14/97	n/a
860	pH	pH	8.2	Unit	SM 4500-H+ B	1	n/a	11/13/97		11/13/97	n/a

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Summers & Hooper, Inc.
6 Knollcrest Drive
Cincinnati, OH 45237

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 92
Study Title: ICR RSSCT #4

861	TEMP	Cl2 Temperature	15.1	ºC	SM 2550 B	1	n/a	11/14/97		11/15/97	n/a
862	TEMP	Temperature	21.4	ºC	SM 2550 B	1	n/a	11/13/97		11/13/97	n/a
863	TIME	Cl2 Incubation Time	24.7	hrs	n/a	1	n/a	11/14/97		11/15/97	n/a
864	TOC-ICR	TOC	2.21	mg/L	SM 5310 C	1	0.50	11/13/97		11/13/97	7-0-149
865	TOC-ICR	TOC (Dupl)	2.23	mg/L	SM 5310 C	1	0.50	11/13/97		11/13/97	7-0-149
			2.22	**mg/L**	**0.9 % RPD**						
866	TOX-ICR	TOX	134	µg Cl-/L	SM 5320 B	1	25	11/15/97		11/19/97	12-0-84
867	TOX-ICR	TOX (Dupl)	128	µg Cl-/L	SM 5320 B	1	25	11/15/97		11/19/97	12-0-84
			131	**µg Cl-/L**	**4.6 % RPD**						
868	THM-ICR	1,2,3-Trichloropropane (Surrogate)	95.6	%	EPA 551.1	1	1.0	11/15/97	11/18/97	11/18/97	0-64-0
869	THM-ICR	Bromodichloromethane	21.7	µg/L	EPA 551.1	1	1.0	11/15/97	11/18/97	11/18/97	0-64-0
870	THM-ICR	Bromoform	1.1	µg/L	EPA 551.1	1	1.0	11/15/97	11/18/97	11/18/97	0-64-0
871	THM-ICR	Chloroform	34.4	µg/L	EPA 551.1	1	1.0	11/15/97	11/18/97	11/18/97	0-64-0
872	THM-ICR	Dibromochloromethane	10.7	µg/L	EPA 551.1	1	1.0	11/15/97	11/18/97	11/18/97	0-64-0
873	UV-ICR	UV	0.033	1/cm	SM 5910 B	1	0.009	11/13/97		11/14/97	8-0-106
874	UV-ICR	UV (Dupl)	0.033	1/cm	SM 5910 B	1	0.009	11/13/97		11/14/97	8-0-106
			0.033	**1/cm**	**0.0 % RPD**						

Sample ID: 92.INF.B-6 **S&H ID:** 9711-140 **Date Sampled:** 11/16/97 2:30:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
875	Cl2Dose	Chlorine Dose	4.41	mg/L as Cl2	SM 4500-Cl B	1	n/a	11/17/97		11/17/97	n/a
876	Cl2Res	Chlorine Residual	0.68	mg/L as Cl2	SM 4500-Cl F	1	0.10	11/17/97		11/18/97	n/a
877	HAA	Bromochloroacetic acid	6.2	µg/L	SM 6251 B	1	1.0	11/18/97	11/24/97	11/26/97	MW69698
878	HAA	Bromodichloroacetic acid	3.9	µg/L	SM 6251 B	1	1.0	11/18/97	11/24/97	11/26/97	MW69698
879	HAA	Chlorodibromoacetic acid	ND	µg/L	SM 6251 B	1	2.0	11/18/97	11/24/97	11/26/97	MW69698
880	HAA	Dibromoacetic acid	1.5	µg/L	SM 6251 B	1	1.0	11/18/97	11/24/97	11/26/97	MW69698
881	HAA	Dichloroacetic acid	17.0	µg/L	SM 6251 B	1	1.0	11/18/97	11/24/97	11/26/97	MW69698
882	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	11/18/97	11/24/97	11/26/97	MW69698
883	HAA	Monochloroacetic acid	2.0	µg/L	SM 6251 B	1	2.0	11/18/97	11/24/97	11/26/97	MW69698
884	HAA	Trichloroacetic acid	11.0	µg/L	SM 6251 B	1	1.0	11/18/97	11/24/97	11/26/97	MW69698
885	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	11/17/97		11/18/97	n/a
886	pH	Cl2 pH - Initial	9.0	Unit	SM 4500-H+ B	1	n/a	11/17/97		11/17/97	n/a
887	pH	pH	9.0	Unit	SM 4500-H+ B	1	n/a	11/16/97		11/16/97	n/a
888	TEMP	Cl2 Temperature	14.7	ºC	SM 2550 B	1	n/a	11/17/97		11/18/97	n/a
889	TEMP	Temperature	18.7	ºC	SM 2550 B	1	n/a	11/16/97		11/16/97	n/a
890	TIME	Cl2 Incubation Time	24.1	hrs	n/a	1	n/a	11/17/97		11/18/97	n/a
891	TOC-ICR	TOC	3.24	mg/L	SM 5310 C	1	0.50	11/16/97		11/17/97	7-0-150
892	TOC-ICR	TOC (Dupl)	3.32	mg/L	SM 5310 C	1	0.50	11/16/97		11/17/97	7-0-150
			3.28	**mg/L**	**2.4 % RPD**						

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 92
Study Title: ICR RSSCT #4

893	TOX-ICR	TOX	227	µg Cl-/L	SM 5320 B	1	25	11/18/97		11/19/97	12-0-84
894	TOX-ICR	TOX (Dupl)	227	µg Cl-/L	SM 5320 B	1	25	11/18/97		11/19/97	12-0-84
			227	**µg Cl-/L**	**0.0 % RPD**						
895	THM-ICR	1,2,3-Trichloropropane (Surrogate)	96.0	%	EPA 551.1	1	1.0	11/18/97	11/18/97	11/18/97	0-64-0
896	THM-ICR	1,2,3-Trichloropropane (Surrogate) (Lab Dupl)	101.6	%	EPA 551.1	1	1.0	11/18/97	11/18/97	11/18/97	0-64-0
			98.8	**%**	**5.7 % RPD**						
897	THM-ICR	Bromodichloromethane	22.4	µg/L	EPA 551.1	1	1.0	11/18/97	11/18/97	11/18/97	0-64-0
898	THM-ICR	Bromodichloromethane (Lab Dupl)	22.8	µg/L	EPA 551.1	1	1.0	11/18/97	11/18/97	11/18/97	0-64-0
			22.6	**µg/L**	**1.8 % RPD**						
899	THM-ICR	Bromoform	ND	µg/L	EPA 551.1	1	1.0	11/18/97	11/18/97	11/18/97	0-64-0
900	THM-ICR	Bromoform (Lab Dupl)	ND	µg/L	EPA 551.1	1	1.0	11/18/97	11/18/97	11/18/97	0-64-0
			ND	**µg/L**							
901	THM-ICR	Chloroform	70.4	µg/L	EPA 551.1	1	1.0	11/18/97	11/18/97	11/18/97	0-64-0
902	THM-ICR	Chloroform (Lab Dupl)	73.1	µg/L	EPA 551.1	1	1.0	11/18/97	11/18/97	11/18/97	0-64-0
			71.8	**µg/L**	**3.8 % RPD**						
903	THM-ICR	Dibromochloromethane	6.5	µg/L	EPA 551.1	1	1.0	11/18/97	11/18/97	11/18/97	0-64-0
904	THM-ICR	Dibromochloromethane (Lab Dupl)	6.9	µg/L	EPA 551.1	1	1.0	11/18/97	11/18/97	11/18/97	0-64-0
			6.7	**µg/L**	**6.0 % RPD**						
905	TURB	Turbidity	0.10	ntu	SM 2130 B	1	0.05	11/16/97		11/16/97	9-0-6
906	UV-ICR	UV	0.063	1/cm	SM 5910 B	1	0.009	11/16/97		11/17/97	8-0-107
907	UV-ICR	UV (Dupl)	0.063	1/cm	SM 5910 B	1	0.009	11/16/97		11/17/97	8-0-107
			0.063	**1/cm**	**0.0 % RPD**						

Sample ID: 92.20.E-30 **S&H ID:** 9711-142 **Date Sampled:** 11/16/97 6:10:00 PM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
908	Cl2Dose	Chlorine Dose	3.71	mg/L as Cl2	SM 4500-Cl B	1	n/a	11/17/97		11/17/97	n/a
909	Cl2Res	Chlorine Residual	0.60	mg/L as Cl2	SM 4500-Cl F	1	0.10	11/17/97		11/18/97	n/a
910	HAA	Bromochloroacetic acid	5.2	µg/L	SM 6251 B	1	1.0	11/18/97	11/24/97	11/26/97	MW69698
911	HAA	Bromodichloroacetic acid	3.0	µg/L	SM 6251 B	1	1.0	11/18/97	11/24/97	11/26/97	MW69698
912	HAA	Chlorodibromoacetic acid	2.7	µg/L	SM 6251 B	1	2.0	11/18/97	11/24/97	11/26/97	MW69698
913	HAA	Dibromoacetic acid	1.9	µg/L	SM 6251 B	1	1.0	11/18/97	11/24/97	11/26/97	MW69698
914	HAA	Dichloroacetic acid	10.0	µg/L	SM 6251 B	1	1.0	11/18/97	11/24/97	11/26/97	MW69698
915	HAA	Monobromoacetic acid	ND	µg/L	SM 6251 B	1	1.0	11/18/97	11/24/97	11/26/97	MW69698
916	HAA	Monochloroacetic acid	ND	µg/L	SM 6251 B	1	2.0	11/18/97	11/24/97	11/26/97	MW69698
917	HAA	Trichloroacetic acid	5.8	µg/L	SM 6251 B	1	1.0	11/18/97	11/24/97	11/26/97	MW69698
918	pH	Cl2 pH - Final	9.0	Unit	SM 4500-H+ B	1	n/a	11/17/97		11/18/97	n/a
919	pH	Cl2 pH - Initial	9.0	Unit	SM 4500-H+ B	1	n/a	11/17/97		11/17/97	n/a
920	pH	pH	8.3	Unit	SM 4500-H+ B	1	n/a	11/16/97		11/16/97	n/a
921	TEMP	Cl2 Temperature	14.7	ºC	SM 2550 B	1	n/a	11/17/97		11/18/97	n/a

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

Summers & Hooper, Inc.
6 Knollcrest Drive
Cincinnati, OH 45237

Laboratory Test Results

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 92
Study Title: ICR RSSCT #4

922	TEMP	Temperature	21.8	ºC	SM 2550 B	1	n/a	11/16/97		11/16/97	n/a
923	TIME	Cl2 Incubation Time	24.1	hrs	n/a	1	n/a	11/17/97		11/18/97	n/a
924	TOC-ICR	TOC	2.45	mg/L	SM 5310 C	1	0.50	11/16/97		11/17/97	7-0-150
925	TOC-ICR	TOC (Dupl)	2.46	mg/L	SM 5310 C	1	0.50	11/16/97		11/17/97	7-0-150
			2.46	**mg/L**	**0.4 % RPD**						
926	TOX-ICR	TOX	143	µg Cl-/L	SM 5320 B	1	25	11/18/97		11/19/97	12-0-84
927	TOX-ICR	TOX (Dupl)	140	µg Cl-/L	SM 5320 B	1	25	11/18/97		11/19/97	12-0-84
			142	**µg Cl-/L**	**2.1 % RPD**						
928	THM-ICR	1,2,3-Trichloropropane (Surrogate)	97.6	%	EPA 551.1	1	1.0	11/18/97	11/18/97	11/18/97	0-64-0
929	THM-ICR	Bromodichloromethane	20.3	µg/L	EPA 551.1	1	1.0	11/18/97	11/18/97	11/18/97	0-64-0
930	THM-ICR	Bromoform	ND	µg/L	EPA 551.1	1	1.0	11/18/97	11/18/97	11/18/97	0-64-0
931	THM-ICR	Chloroform	40.0	µg/L	EPA 551.1	1	1.0	11/18/97	11/18/97	11/18/97	0-64-0
932	THM-ICR	Dibromochloromethane	9.1	µg/L	EPA 551.1	1	1.0	11/18/97	11/18/97	11/18/97	0-64-0
933	UV-ICR	UV	0.038	1/cm	SM 5910 B	1	0.009	11/16/97		11/17/97	8-0-107
934	UV-ICR	UV (Dupl)	0.038	1/cm	SM 5910 B	1	0.009	11/16/97		11/17/97	8-0-107
			0.038	**1/cm**	**0.0 % RPD**						

Sample ID: 92.20.E-32 **S&H ID:** 9711-150 **Date Sampled:** 11/18/97 10:39:00 AM

#	Analysis	Type	Result	Units	Method	Dilution	MRL	Samp.	Prep.	Anal.	QC Batch
935	pH	pH	8.3	Unit	SM 4500-H+ B	1	n/a	11/18/97		11/18/97	n/a
936	TEMP	Temperature	21.7	ºC	SM 2550 B	1	n/a	11/18/97		11/18/97	n/a
937	TOC-ICR	TOC	2.48	mg/L	SM 5310 C	1	0.50	11/18/97		11/18/97	7-0-151
938	TOC-ICR	TOC (Dupl)	2.56	mg/L	SM 5310 C	1	0.50	11/18/97		11/18/97	7-0-151
			2.52	**mg/L**	**3.2 % RPD**						

End of laboratory test results

ND (non-detect): Result is below mininum reporting level (MRL). NR (not reportable): Result did not meet QC criteria.

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Quality Control Report

Printed on 7/12/99

Mr. John Zackasee
Superintendent-Purification
Mahoning Valley Sanitary District
P.O. Box 4119
Youngstown, OH 44515

Phone: 330-652-3614 Fax: 330-652-6293

Study#: 92
Study Title: ICR RSSCT #4

Analysis: ALK (Alkalinity) **Method:** SM 2320 B

QC Batch ID: 1-0-10

QC Type		Spike	Recovery	Unit	Yield	RPD	Date Run	S&H ID	MRL	Acceptance Criteria Range	Acceptance Criteria RPD
Matrix Spike	Matrix Spike	100	98	mg/L	98%		10/23/97	9710-272	5		
Matrix Spike (Dupl)	Matrix Spike	100	97	mg/L	97%		10/23/97	9710-272	5		
		100	**97**	**mg/L**	**97%**	**1.0 %**					
Method Blank	Method Blank		ND*	mg/L			10/23/97	9710-265	5		
Standard	Standard	100	97	mg/L	97%		10/23/97	9710-268	5		
Standard (Dupl)	Standard	100	98	mg/L	98%		10/23/97	9710-268	5		
		100	**97**	**mg/L**	**97%**	**1.0 %**					
Matrix Spike	Matrix Spike	100	99	mg/L	99%		11/01/97	9710-375	5		
Matrix Spike (Dupl)	Matrix Spike	100	99	mg/L	99%		11/01/97	9710-375	5		
		100	**99**	**mg/L**	**99%**	**0.0 %**					
Method Blank	Method Blank		ND*	mg/L			11/01/97	9711-1	5		
Standard	Standard	100	98	mg/L	98%		11/01/97	9711-4	5		
Standard (Dupl)	Standard	100	99	mg/L	99%		11/01/97	9711-4	5		
		100	**99**	**mg/L**	**99%**	**1.0 %**					

Analysis: ALK (Alkalinity) **Method:** SM 2320 B

QC Batch ID: 1-0-11

QC Type		Spike	Recovery	Unit	Yield	RPD	Date Run	S&H ID	MRL	Acceptance Criteria Range	Acceptance Criteria RPD
Matrix Spike	Matrix Spike	100	96	mg/L	96%		11/07/97	9711-85	5		
Matrix Spike (Dupl)	Matrix Spike	100	95	mg/L	95%		11/07/97	9711-85	5		
		100	**95**	**mg/L**	**95%**	**1.1 %**					
Method Blank	Method Blank		ND*	mg/L			11/07/97	9711-88	5		
Standard	Standard	100	100	mg/L	100%		11/07/97	9711-89	5		
Standard (Dupl)	Standard	100	100	mg/L	100%		11/07/97	9711-89	5		
		100	**100**	**mg/L**	**100%**	**0.0 %**					

Analysis: TotHard (Total Hardness) **Method:** SM 2340 C

QC Batch ID: 3-0-10

QC Type		Spike	Recovery	Unit	Yield	RPD	Date Run	S&H ID	MRL	Acceptance Criteria Range	Acceptance Criteria RPD
Matrix Spike	Matrix Spike	139	138	mg/L CaCO3	99%		10/23/97	9710-272	5		
Matrix Spike (Dupl)	Matrix Spike	139	138	mg/L CaCO3	99%		10/23/97	9710-272	5		
		139	**138**	**mg/L CaCO3**	**99%**	**0.0 %**					

ND: non-detect. *Recovery is below 1/2 minimum reporting level (MRL). NA (not applicable): RPD calculation is not applicable.

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Quality Control Report

Mr. John Zackasee
Mahoning Valley Sanitary District

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Method Blank	Method Blank		ND*	mg/L CaCO3			10/23/97	9710-266	5		
Standard	Standard	100	104	mg/L CaCO3	104%		10/23/97	9710-269	5	90-110%	
Standard (Dupl)	Standard	100	98	mg/L CaCO3	98%		10/23/97	9710-269	5	90-110%	
		100	**101**	**mg/L CaCO3**	**101%**	**5.9 %**				90-110%	10%
Matrix Spike	Matrix Spike	108	107	mg/L CaCO3	99%		11/01/97	9710-375	5		
Matrix Spike (Dupl)	Matrix Spike	108	107	mg/L CaCO3	99%		11/01/97	9710-375	5		
		108	**107**	**mg/L CaCO3**	**99%**	**0.0 %**					
Method Blank	Method Blank		ND*	mg/L CaCO3			11/01/97	9711-2	5		
Standard	Standard	100	99	mg/L CaCO3	99%		11/01/97	9711-5	5	90-110%	
Standard (Dupl)	Standard	100	100	mg/L CaCO3	100%		11/01/97	9711-5	5	90-110%	
		100	**99**	**mg/L CaCO3**	**99%**	**1.0 %**				90-110%	10%

Analysis: TotHard (Total Hardness) **Method:** SM 2340 C

QC Batch ID: 3-0-11

QC Type		Spike	Recovery	Unit	Yield	RPD	Date Run	S&H ID	MRL	Acceptance Criteria Range	RPD
Matrix Spike	Matrix Spike	109	102	mg/L CaCO3	94%		11/07/97	9711-85	5		
Matrix Spike (Dupl)	Matrix Spike	109	108	mg/L CaCO3	99%		11/07/97	9711-85	5		
		109	**105**	**mg/L CaCO3**	**96%**	**5.7 %**					
Method Blank	Method Blank		ND*	mg/L CaCO3			11/07/97	9711-91	5		
Standard	Standard	100	100	mg/L CaCO3	100%		11/07/97	9711-92	5	90-110%	
Standard (Dupl)	Standard	100	102	mg/L CaCO3	102%		11/07/97	9711-92	5	90-110%	
		100	**101**	**mg/L CaCO3**	**101%**	**2.0 %**				90-110%	10%

Analysis: TOC-ICR (Total Organic Carbon) **Method:** SM 5310 C

QC Batch ID: 7-0-133

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	RPD
Matrix Spike	Matrix Spike	4.00	3.99	mg/L	100%		9710-273	0.5		
Matrix Spike (Dupl)	Matrix Spike	4.00	4.08	mg/L	102%		9710-273	0.5		
		4.00	**4.04**	**mg/L**	**101%**	**2.2 %**				
Method Blank	Method Blank		ND*	mg/L			9710-264	0.5		
Method Blank (Dupl)	Method Blank		ND*	mg/L			9710-264	0.5		
			ND*	**mg/L**						
Standard	Standard	0.50	0.55	mg/L	110%		9709-169	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.53	mg/L	106%		9709-169	0.5	50-150%	
		0.50	**0.54**	**mg/L**	**108%**	**3.7 %**			50-150%	20%
Standard	Standard	4.00	4.06	mg/L	101%		9710-136	0.5	90-110%	
Standard (Dupl)	Standard	4.00	4.07	mg/L	102%		9710-136	0.5	90-110%	
		4.00	**4.07**	**mg/L**	**102%**	**0.2 %**			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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Quality Control Report

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 92
Study Title: ICR RSSCT #4

Analysis: TOC-ICR (Total Organic Carbon) **Method:** SM 5310 C

QC Batch ID: 7-0-134

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	Acceptance Criteria RPD
Matrix Spike	Matrix Spike	4.00	4.04	mg/L	101%		9710-295	0.5		
Matrix Spike (Dupl)	Matrix Spike	4.00	4.04	mg/L	101%		9710-295	0.5		
		4.00	**4.04**	**mg/L**	**101%**	**0.0 %**				
Method Blank	Method Blank		ND*	mg/L			9710-289	0.5		
Method Blank (Dupl)	Method Blank		ND*	mg/L			9710-289	0.5		
			ND*	**mg/L**						
Standard	Standard	0.50	0.52	mg/L	104%		9710-284	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.53	mg/L	106%		9710-284	0.5	50-150%	
		0.50	**0.53**	**mg/L**	**106%**	**1.9 %**			50-150%	20%
Standard	Standard	4.00	4.08	mg/L	102%		9710-136	0.5	90-110%	
Standard (Dupl)	Standard	4.00	4.06	mg/L	101%		9710-136	0.5	90-110%	
		4.00	**4.07**	**mg/L**	**102%**	**0.5 %**			90-110%	10%

Analysis: TOC-ICR (Total Organic Carbon) **Method:** SM 5310 C

QC Batch ID: 7-0-138

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	Acceptance Criteria RPD
Matrix Spike	Matrix Spike	4.00	3.77	mg/L	94%		9710-373	0.5		
Matrix Spike (Dupl)	Matrix Spike	4.00	3.79	mg/L	95%		9710-373	0.5		
		4.00	**3.78**	**mg/L**	**94%**	**0.5 %**				
Method Blank	Method Blank		ND*	mg/L			9710-372	0.5		
Method Blank (Dupl)	Method Blank		ND*	mg/L			9710-372	0.5		
			ND*	**mg/L**						
Standard	Standard	0.50	0.67	mg/L	134%		9710-284	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.62	mg/L	124%		9710-284	0.5	50-150%	
		0.50	**0.64**	**mg/L**	**128%**	**7.8 %**			50-150%	20%
Standard	Standard	4.00	3.85	mg/L	96%		9710-316	0.5	90-110%	
Standard (Dupl)	Standard	4.00	3.87	mg/L	97%		9710-316	0.5	90-110%	
		4.00	**3.86**	**mg/L**	**96%**	**0.5 %**			90-110%	10%

Analysis: TOC-ICR (Total Organic Carbon) **Method:** SM 5310 C

QC Batch ID: 7-0-139

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	Acceptance Criteria RPD
Matrix Spike	Matrix Spike	4.00	3.80	mg/L	95%		9711-12	0.5		
Matrix Spike (Dupl)	Matrix Spike	4.00	3.80	mg/L	95%		9711-12	0.5		
		4.00	**3.80**	**mg/L**	**95%**	**0.3 %**				
Method Blank	Method Blank		ND*	mg/L			9711-11	0.5		
Method Blank (Dupl)	Method Blank		ND*	mg/L			9711-11	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.

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Quality Control Report

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Standard	Standard	0.50	0.49	mg/L	98%		9710-284	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.49	mg/L	98%		9710-284	0.5	50-150%	
		0.50	**0.49**	**mg/L**	**98%**	**0.0 %**			50-150%	20%
Standard	Standard	4.00	3.98	mg/L	100%		9710-316	0.5	90-110%	
Standard (Dupl)	Standard	4.00	4.04	mg/L	101%		9710-316	0.5	90-110%	
		4.00	**4.01**	**mg/L**	**100%**	**1.5 %**			90-110%	10%

Analysis: TOC-ICR (Total Organic Carbon) **Method:** SM 5310 C

QC Batch ID: 7-0-140

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	RPD
Matrix Spike	Matrix Spike	4.00	3.80	mg/L	95%		9711-19	0.5		
Matrix Spike (Dupl)	Matrix Spike	4.00	3.79	mg/L	95%		9711-19	0.5		
		4.00	**3.80**	**mg/L**	**95%**	**0.3 %**				
Method Blank	Method Blank		ND*	mg/L			9711-18	0.5		
Method Blank (Dupl)	Method Blank		ND*	mg/L			9711-18	0.5		
			ND*	**mg/L**						
Standard	Standard	0.50	0.47	mg/L	94%		9710-284	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.48	mg/L	96%		9710-284	0.5	50-150%	
		0.50	**0.48**	**mg/L**	**96%**	**2.1 %**			50-150%	20%
Standard	Standard	4.00	3.93	mg/L	98%		9710-316	0.5	90-110%	
Standard (Dupl)	Standard	4.00	3.98	mg/L	100%		9710-316	0.5	90-110%	
		4.00	**3.95**	**mg/L**	**99%**	**1.3 %**			90-110%	10%
Standard	Standard	10.00	9.48	mg/L	95%		9710-312	0.5	90-110%	
Standard (Dupl)	Standard	10.00	9.52	mg/L	95%		9710-312	0.5	90-110%	
		10.00	**9.50**	**mg/L**	**95%**	**0.4 %**			90-110%	10%

Analysis: TOC-ICR (Total Organic Carbon) **Method:** SM 5310 C

QC Batch ID: 7-0-141

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	RPD
Matrix Spike	Matrix Spike	4.00	3.84	mg/L	96%		9711-49	0.5		
Matrix Spike (Dupl)	Matrix Spike	4.00	3.82	mg/L	95%		9711-49	0.5		
		4.00	**3.83**	**mg/L**	**96%**	**0.3 %**				
Method Blank	Method Blank		ND*	mg/L			9711-35	0.5		
Method Blank (Dupl)	Method Blank		ND*	mg/L			9711-35	0.5		
			ND*	**mg/L**						
Standard	Standard	0.50	0.53	mg/L	106%		9710-284	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.51	mg/L	102%		9710-284	0.5	50-150%	
		0.50	**0.52**	**mg/L**	**104%**	**3.8 %**			50-150%	20%
Standard	Standard	4.00	3.94	mg/L	98%		9711-41	0.5	90-110%	
Standard (Dupl)	Standard	4.00	3.96	mg/L	99%		9711-41	0.5	90-110%	
		4.00	**3.95**	**mg/L**	**99%**	**0.5 %**			90-110%	10%
Standard	Standard	10.00	9.74	mg/L	97%		9711-42	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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Quality Control Report

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Mahoning Valley Sanitary District

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Standard (Dupl)	Standard	10.00	9.79	mg/L	98%		9711-42	0.5	90-110%	
		10.00	**9.77**	**mg/L**	**98%**	**0.5 %**			90-110%	10%

Analysis: TOC-ICR (Total Organic Carbon) **Method:** SM 5310 C

QC Batch ID: 7-0-142

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	RPD
Matrix Spike	Matrix Spike	4.00	4.20	mg/L	105%		9711-55	0.5		
Matrix Spike (Dupl)	Matrix Spike	4.00	4.26	mg/L	106%		9711-55	0.5		
		4.00	**4.23**	**mg/L**	**106%**	**1.4 %**				
Method Blank	Method Blank		ND*	mg/L			9711-54	0.5		
Method Blank (Dupl)	Method Blank		ND*	mg/L			9711-54	0.5		
			ND*	**mg/L**						
Standard	Standard	0.50	0.51	mg/L	102%		9710-284	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.50	mg/L	100%		9710-284	0.5	50-150%	
		0.50	**0.50**	**mg/L**	**100%**	**2.0 %**			50-150%	20%
Standard	Standard	4.00	4.11	mg/L	103%		9711-41	0.5	90-110%	
Standard (Dupl)	Standard	4.00	4.14	mg/L	103%		9711-41	0.5	90-110%	
		4.00	**4.12**	**mg/L**	**103%**	**0.7 %**			90-110%	10%
Standard	Standard	10.00	10.26	mg/L	103%		9711-42	0.5	90-110%	
Standard (Dupl)	Standard	10.00	10.26	mg/L	103%		9711-42	0.5	90-110%	
		10.00	**10.26**	**mg/L**	**103%**	**0.0 %**			90-110%	10%

Analysis: TOC-ICR (Total Organic Carbon) **Method:** SM 5310 C

QC Batch ID: 7-0-143

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	RPD
Matrix Spike	Matrix Spike	4.00	4.10	mg/L	102%		9711-71	0.5		
Matrix Spike (Dupl)	Matrix Spike	4.00	4.10	mg/L	102%		9711-71	0.5		
		4.00	**4.10**	**mg/L**	**102%**	**0.0 %**				
Method Blank	Method Blank		ND*	mg/L			9711-73	0.5		
Method Blank (Dupl)	Method Blank		ND*	mg/L			9711-73	0.5		
			ND*	**mg/L**						
Standard	Standard	0.50	0.51	mg/L	102%		9710-284	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.50	mg/L	100%		9710-284	0.5	50-150%	
		0.50	**0.51**	**mg/L**	**102%**	**2.0 %**			50-150%	20%
Standard	Standard	4.00	4.10	mg/L	102%		9711-41	0.5	90-110%	
Standard (Dupl)	Standard	4.00	4.08	mg/L	102%		9711-41	0.5	90-110%	
		4.00	**4.09**	**mg/L**	**102%**	**0.5 %**			90-110%	10%

Analysis: TOC-ICR (Total Organic Carbon) **Method:** SM 5310 C

QC Batch ID: 7-0-144

QC Type	Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria 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	4.23	mg/L	106%		9711-82	0.5		
Matrix Spike (Dupl)	Matrix Spike	4.00	4.23	mg/L	106%		9711-82	0.5		
		4.00	**4.23**	**mg/L**	**106%**	**0.0 %**				
Method Blank	Method Blank		ND*	mg/L			9711-81	0.5		
Method Blank (Dupl)	Method Blank		ND*	mg/L			9711-81	0.5		
			ND*	**mg/L**						
Standard	Standard	0.50	0.53	mg/L	106%		9710-284	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.53	mg/L	106%		9710-284	0.5	50-150%	
		0.50	**0.53**	**mg/L**	**106%**	**0.0 %**			50-150%	20%
Standard	Standard	4.00	4.22	mg/L	105%		9711-41	0.5	90-110%	
Standard (Dupl)	Standard	4.00	4.15	mg/L	104%		9711-41	0.5	90-110%	
		4.00	**4.18**	**mg/L**	**104%**	**1.7 %**			90-110%	10%

Analysis: TOC-ICR (Total Organic Carbon) **Method:** SM 5310 C

QC Batch ID: 7-0-145

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	RPD
Matrix Spike	Matrix Spike	4.00	3.70	mg/L	93%		9711-99	0.5		
Matrix Spike (Dupl)	Matrix Spike	4.00	3.95	mg/L	99%		9711-99	0.5		
		4.00	**3.82**	**mg/L**	**95%**	**6.5 %**				
Method Blank	Method Blank		ND*	mg/L			9711-102	0.5		
Method Blank (Dupl)	Method Blank		ND*	mg/L			9711-102	0.5		
			ND*	**mg/L**						
Standard	Standard	0.50	0.55	mg/L	110%		9710-284	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.54	mg/L	108%		9710-284	0.5	50-150%	
		0.50	**0.55**	**mg/L**	**110%**	**1.8 %**			50-150%	20%
Standard	Standard	4.00	4.16	mg/L	104%		9711-41	0.5	90-110%	
Standard (Dupl)	Standard	4.00	4.15	mg/L	104%		9711-41	0.5	90-110%	
		4.00	**4.15**	**mg/L**	**104%**	**0.2 %**			90-110%	10%

Analysis: TOC-ICR (Total Organic Carbon) **Method:** SM 5310 C

QC Batch ID: 7-0-147

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	RPD
Matrix Spike	Matrix Spike	4.00	4.33	mg/L	108%		9711-108	0.5		
Matrix Spike (Dupl)	Matrix Spike	4.00	4.32	mg/L	108%		9711-108	0.5		
		4.00	**4.33**	**mg/L**	**108%**	**0.2 %**				
Method Blank	Method Blank		ND*	mg/L			9711-113	0.5		
Method Blank (Dupl)	Method Blank		ND*	mg/L			9711-113	0.5		
			ND*	**mg/L**						
Standard	Standard	0.50	0.53	mg/L	106%		9710-284	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.51	mg/L	102%		9710-284	0.5	50-150%	
		0.50	**0.52**	**mg/L**	**104%**	**3.8 %**			50-150%	20%
Standard	Standard	4.00	4.06	mg/L	101%		9711-41	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	4.02	mg/L	100%		9711-41	0.5	90-110%	
		4.00	**4.04**	**mg/L**	**101%**	**1.0 %**			90-110%	10%

Analysis: TOC-ICR (Total Organic Carbon) **Method:** SM 5310 C

QC Batch ID: 7-0-148

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	RPD
Matrix Spike	Matrix Spike	4.00	4.09	mg/L	102%		9711-116	0.5		
Matrix Spike (Dupl)	Matrix Spike	4.00	4.05	mg/L	101%		9711-116	0.5		
		4.00	**4.07**	**mg/L**	**102%**	**1.0 %**				
Method Blank	Method Blank		ND*	mg/L			9711-115	0.5		
Method Blank (Dupl)	Method Blank		ND*	mg/L			9711-115	0.5		
			ND*	**mg/L**						
Standard	Standard	0.50	0.53	mg/L	106%		9710-284	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.52	mg/L	104%		9710-284	0.5	50-150%	
		0.50	**0.52**	**mg/L**	**104%**	**1.9 %**			50-150%	20%
Standard	Standard	4.00	4.11	mg/L	103%		9711-41	0.5	90-110%	
Standard (Dupl)	Standard	4.00	4.13	mg/L	103%		9711-41	0.5	90-110%	
		4.00	**4.12**	**mg/L**	**103%**	**0.5 %**			90-110%	10%

Analysis: TOC-ICR (Total Organic Carbon) **Method:** SM 5310 C

QC Batch ID: 7-0-149

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	RPD
Matrix Spike	Matrix Spike	4.00	4.31	mg/L	108%		9711-132	0.5		
Matrix Spike (Dupl)	Matrix Spike	4.00	4.49	mg/L	112%		9711-132	0.5		
		4.00	**4.40**	**mg/L**	**110%**	**4.3 %**				
Method Blank	Method Blank		ND*	mg/L			9711-128	0.5		
Method Blank (Dupl)	Method Blank		ND*	mg/L			9711-128	0.5		
			ND*	**mg/L**						
Standard	Standard	0.50	0.51	mg/L	102%		9710-284	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.52	mg/L	104%		9710-284	0.5	50-150%	
		0.50	**0.52**	**mg/L**	**104%**	**1.9 %**			50-150%	20%
Standard	Standard	4.00	4.04	mg/L	101%		9711-122	0.5	90-110%	
Standard (Dupl)	Standard	4.00	4.10	mg/L	102%		9711-122	0.5	90-110%	
		4.00	**4.07**	**mg/L**	**102%**	**1.5 %**			90-110%	10%

Analysis: TOC-ICR (Total Organic Carbon) **Method:** SM 5310 C

QC Batch ID: 7-0-150

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	RPD
Matrix Spike	Matrix Spike	4.00	4.06	mg/L	101%		9711-143	0.5		
Matrix Spike (Dupl)	Matrix Spike	4.00	4.10	mg/L	102%		9711-143	0.5		
		4.00	**4.08**	**mg/L**	**102%**	**1.0 %**				

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			9711-141	0.5		
Method Blank (Dupl)	Method Blank		ND*	mg/L			9711-141	0.5		
			ND*	**mg/L**						
Standard	Standard	0.50	0.53	mg/L	106%		9710-284	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.54	mg/L	108%		9710-284	0.5	50-150%	
		0.50	**0.53**	**mg/L**	**106%**	**1.9 %**			50-150%	20%
Standard	Standard	4.00	4.00	mg/L	100%		9711-122	0.5	90-110%	
Standard (Dupl)	Standard	4.00	3.93	mg/L	98%		9711-122	0.5	90-110%	
		4.00	**3.97**	**mg/L**	**99%**	**1.8 %**			90-110%	10%

Analysis: TOC-ICR (Total Organic Carbon) **Method:** SM 5310 C

QC Batch ID: 7-0-151

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	RPD
Matrix Spike	Matrix Spike	4.00	4.40	mg/L	110%		9711-150	0.5		
Matrix Spike (Dupl)	Matrix Spike	4.00	4.31	mg/L	108%		9711-150	0.5		
		4.00	**4.36**	**mg/L**	**109%**	**2.1 %**				
Method Blank	Method Blank		ND*	mg/L			9711-149	0.5		
Method Blank (Dupl)	Method Blank		ND*	mg/L			9711-149	0.5		
			ND*	**mg/L**						
Standard	Standard	0.50	0.56	mg/L	112%		9711-98	0.5	50-150%	
Standard (Dupl)	Standard	0.50	0.54	mg/L	108%		9711-98	0.5	50-150%	
		0.50	**0.55**	**mg/L**	**110%**	**3.6 %**			50-150%	20%
Standard	Standard	4.00	4.12	mg/L	103%		9711-122	0.5	90-110%	
Standard (Dupl)	Standard	4.00	4.15	mg/L	104%		9711-122	0.5	90-110%	
		4.00	**4.13**	**mg/L**	**103%**	**0.7 %**			90-110%	10%

Analysis: UV-ICR (UV-254) **Method:** SM 5910 B

QC Batch ID: 8-0-100

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	RPD
Method Blank	Method Blank		ND*	1/cm			9711-36	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9711-36	0.009		
			ND*	**1/cm**						
Method Blank	Method Blank		ND*	1/cm			9711-36	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9711-36	0.009		
			ND*	**1/cm**						
Standard	Standard	0.009	0.009	1/cm	100%		9710-282	0.009	75-125%	
Standard (Dupl)	Standard	0.009	0.009	1/cm	100%		9710-282	0.009	75-125%	
		0.009	**0.009**	**1/cm**	**100%**	**0.0 %**			75-125%	20%
Standard	Standard	0.088	0.093	1/cm	106%		9710-283	0.009	85-115%	
Standard (Dupl)	Standard	0.088	0.094	1/cm	107%		9710-283	0.009	85-115%	
		0.088	**0.093**	**1/cm**	**106%**	**1.1 %**			85-115%	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: UV-ICR (UV-254) **Method:** SM 5910 B

QC Batch ID: 8-0-101

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	RPD
Method Blank	Method Blank		ND*	1/cm			9711-53	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9711-53	0.009		
			ND*	**1/cm**						
Method Blank	Method Blank		ND*	1/cm			9711-53	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9711-53	0.009		
			ND*	**1/cm**						
Standard	Standard	0.009	0.009	1/cm	100%		9710-282	0.009	75-125%	
Standard (Dupl)	Standard	0.009	0.009	1/cm	100%		9710-282	0.009	75-125%	
		0.009	**0.009**	**1/cm**	**100%**	**0.0 %**			75-125%	20%
Standard	Standard	0.088	0.094	1/cm	107%		9710-283	0.009	85-115%	
Standard (Dupl)	Standard	0.088	0.094	1/cm	107%		9710-283	0.009	85-115%	
		0.088	**0.094**	**1/cm**	**107%**	**0.0 %**			85-115%	10%

Analysis: UV-ICR (UV-254) **Method:** SM 5910 B

QC Batch ID: 8-0-102

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	RPD
Method Blank	Method Blank		ND*	1/cm			9711-74	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9711-74	0.009		
			ND*	**1/cm**						
Method Blank	Method Blank		ND*	1/cm			9711-74	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9711-74	0.009		
			ND*	**1/cm**						
Standard	Standard	0.009	0.008	1/cm	89%		9710-282	0.009	75-125%	
Standard (Dupl)	Standard	0.009	0.008	1/cm	89%		9710-282	0.009	75-125%	
		0.009	**0.008**	**1/cm**	**89%**	**0.0 %**			75-125%	20%
Standard	Standard	0.088	0.093	1/cm	106%		9710-283	0.009	85-115%	
Standard (Dupl)	Standard	0.088	0.093	1/cm	106%		9710-283	0.009	85-115%	
		0.088	**0.093**	**1/cm**	**106%**	**0.0 %**			85-115%	10%

Analysis: UV-ICR (UV-254) **Method:** SM 5910 B

QC Batch ID: 8-0-103

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	RPD
Method Blank	Method Blank		ND*	1/cm			9711-87	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9711-87	0.009		
			ND*	**1/cm**						
Method Blank	Method Blank		ND*	1/cm			9711-87	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9711-87	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%		9710-282	0.009	75-125%	
Standard (Dupl)	Standard	0.009	0.008	1/cm	89%		9710-282	0.009	75-125%	
		0.009	**0.008**	**1/cm**	**89%**	**0.0 %**			75-125%	20%
Standard	Standard	0.088	0.094	1/cm	107%		9710-283	0.009	85-115%	
Standard (Dupl)	Standard	0.088	0.094	1/cm	107%		9710-283	0.009	85-115%	
		0.088	**0.094**	**1/cm**	**107%**	**0.0 %**			85-115%	10%

Analysis: UV-ICR (UV-254) **Method:** SM 5910 B

QC Batch ID: 8-0-104

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	RPD
Method Blank	Method Blank		ND*	1/cm			9711-103	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9711-103	0.009		
			ND*	**1/cm**						
Method Blank	Method Blank		ND*	1/cm			9711-103	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9711-103	0.009		
			ND*	**1/cm**						
Standard	Standard	0.009	0.009	1/cm	100%		9711-96	0.009	75-125%	
Standard (Dupl)	Standard	0.009	0.009	1/cm	100%		9711-96	0.009	75-125%	
		0.009	**0.009**	**1/cm**	**100%**	**0.0 %**			75-125%	20%
Standard	Standard	0.088	0.093	1/cm	106%		9711-97	0.009	85-115%	
Standard (Dupl)	Standard	0.088	0.094	1/cm	107%		9711-97	0.009	85-115%	
		0.088	**0.094**	**1/cm**	**107%**	**1.1 %**			85-115%	10%

Analysis: UV-ICR (UV-254) **Method:** SM 5910 B

QC Batch ID: 8-0-105

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	RPD
Method Blank	Method Blank		ND*	1/cm			9711-114	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9711-114	0.009		
			ND*	**1/cm**						
Method Blank	Method Blank		ND*	1/cm			9711-114	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9711-114	0.009		
			ND*	**1/cm**						
Standard	Standard	0.009	0.008	1/cm	89%		9711-96	0.009	75-125%	
Standard (Dupl)	Standard	0.009	0.009	1/cm	100%		9711-96	0.009	75-125%	
		0.009	**0.008**	**1/cm**	**89%**	**12.5 %**			75-125%	20%
Standard	Standard	0.088	0.092	1/cm	105%		9711-97	0.009	85-115%	
Standard (Dupl)	Standard	0.088	0.092	1/cm	105%		9711-97	0.009	85-115%	
		0.088	**0.092**	**1/cm**	**105%**	**0.0 %**			85-115%	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: UV-ICR (UV-254) **Method:** SM 5910 B

QC Batch ID: 8-0-106

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	Acceptance Criteria RPD
Method Blank	Method Blank		ND*	1/cm			9711-139	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9711-139	0.009		
			ND*	**1/cm**						
Method Blank	Method Blank		ND*	1/cm			9711-139	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9711-139	0.009		
			ND*	**1/cm**						
Standard	Standard	0.009	0.009	1/cm	100%		9711-96	0.009	75-125%	
Standard (Dupl)	Standard	0.009	0.009	1/cm	100%		9711-96	0.009	75-125%	
		0.009	**0.009**	**1/cm**	**100%**	**0.0 %**			75-125%	20%
Standard	Standard	0.088	0.095	1/cm	108%		9711-97	0.009	85-115%	
Standard (Dupl)	Standard	0.088	0.095	1/cm	108%		9711-97	0.009	85-115%	
		0.088	**0.095**	**1/cm**	**108%**	**0.0 %**			85-115%	10%

Analysis: UV-ICR (UV-254) **Method:** SM 5910 B

QC Batch ID: 8-0-107

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	Acceptance Criteria RPD
Method Blank	Method Blank		ND*	1/cm			9711-144	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9711-144	0.009		
			ND*	**1/cm**						
Method Blank	Method Blank		ND*	1/cm			9711-144	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9711-144	0.009		
			ND*	**1/cm**						
Standard	Standard	0.009	0.009	1/cm	100%		9711-96	0.009	75-125%	
Standard (Dupl)	Standard	0.009	0.009	1/cm	100%		9711-96	0.009	75-125%	
		0.009	**0.009**	**1/cm**	**100%**	**0.0 %**			75-125%	20%
Standard	Standard	0.088	0.096	1/cm	109%		9711-97	0.009	85-115%	
Standard (Dupl)	Standard	0.088	0.096	1/cm	109%		9711-97	0.009	85-115%	
		0.088	**0.096**	**1/cm**	**109%**	**0.0 %**			85-115%	10%

Analysis: UV-ICR (UV-254) **Method:** SM 5910 B

QC Batch ID: 8-0-98

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	Acceptance Criteria RPD
Method Blank	Method Blank		ND*	1/cm			9711-9	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9711-9	0.009		
			ND*	**1/cm**						
Method Blank	Method Blank		ND*	1/cm			9711-9	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9711-9	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. John Zackasee
Mahoning Valley Sanitary District

Study#: 92
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Standard	Standard	0.009	0.009	1/cm	100%		9710-282	0.009	75-125%	
Standard (Dupl)	Standard	0.009	0.009	1/cm	100%		9710-282	0.009	75-125%	
		0.009	**0.009**	**1/cm**	**100%**	**0.0 %**			75-125%	20%
Standard	Standard	0.088	0.096	1/cm	109%		9710-283	0.009	85-115%	
Standard (Dupl)	Standard	0.088	0.096	1/cm	109%		9710-283	0.009	85-115%	
		0.088	**0.096**	**1/cm**	**109%**	**0.0 %**			85-115%	10%

Analysis: UV-ICR (UV-254) **Method:** SM 5910 B

QC Batch ID: 8-0-99

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	Acceptance Criteria RPD
Method Blank	Method Blank		ND*	1/cm			9711-17	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9711-17	0.009		
			ND*	**1/cm**						
Method Blank	Method Blank		ND*	1/cm			9711-17	0.009		
Method Blank (Dupl)	Method Blank		ND*	1/cm			9711-17	0.009		
			ND*	**1/cm**						
Standard	Standard	0.009	0.009	1/cm	100%		9710-282	0.009	75-125%	
Standard (Dupl)	Standard	0.009	0.009	1/cm	100%		9710-282	0.009	75-125%	
		0.009	**0.009**	**1/cm**	**100%**	**0.0 %**			75-125%	20%
Standard	Standard	0.088	0.095	1/cm	108%		9710-283	0.009	85-115%	
Standard (Dupl)	Standard	0.088	0.095	1/cm	108%		9710-283	0.009	85-115%	
		0.088	**0.095**	**1/cm**	**108%**	**0.0 %**			85-115%	10%

Analysis: TURB (Turbidity) **Method:** SM 2130 B

QC Batch ID: 9-0-6

QC Type		Spike	Recovery	Unit	Yield	RPD	Date Run	S&H ID	MRL	Acceptance Criteria Range	Acceptance Criteria RPD
Standard	Standard	4.51	4.50	ntu	100%		10/03/97	9902-79	0.05		
Standard	Standard	4.51	4.49	ntu	100%		10/07/97	9902-79	0.05		
Standard	Standard	4.51	4.48	ntu	99%		10/11/97	9902-79	0.05		
Standard	Standard	4.51	4.49	ntu	100%		10/15/97	9902-79	0.05		
Standard	Standard	4.51	4.49	ntu	100%		10/20/97	9902-79	0.05		
Standard	Standard	4.51	4.49	ntu	100%		10/23/97	9902-79	0.05		
Standard	Standard	4.51	4.48	ntu	99%		10/31/97	9902-79	0.05		
Standard	Standard	4.51	4.50	ntu	100%		11/01/97	9902-79	0.05		
Standard	Standard	4.51	4.51	ntu	100%		11/07/97	9902-79	0.05		
Standard	Standard	4.51	4.51	ntu	100%		11/16/97	9902-79	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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Quality Control Report

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 92
Study Title: ICR RSSCT #4

Analysis: TOX-ICR (Total Organic Halide) **Method:** SM 5320 B

QC Batch ID: 12-0-70

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	RPD
Matrix Spike	Matrix Spike	200	192	µg Cl-/L	96%		9710-85	25		
Matrix Spike (Dupl)	Matrix Spike	200	197	µg Cl-/L	98%		9710-85	25		
		200	**194**	**µg Cl-/L**	**97%**	**2.6 %**				
Standard - TCP Aqueous	Standard	25	25	µg Cl-/L	100%		9710-279	25	75-125%	
Standard - TCP Aqueous	Standard	200	194	µg Cl-/L	97%		9710-280	25	85-115%	
Standard - TCP Aqueous	Standard	500	528	µg Cl-/L	106%		9710-281	25	85-115%	
System Blank	Blank		ND*	µg Cl-/L			9710-278	25		

Analysis: TOX-ICR (Total Organic Halide) **Method:** SM 5320 B

QC Batch ID: 12-0-79

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	RPD
Matrix Spike	Matrix Spike	200	198	µg Cl-/L	99%		9711-12	25		
Matrix Spike (Dupl)	Matrix Spike	200	196	µg Cl-/L	98%		9711-12	25		
		200	**197**	**µg Cl-/L**	**98%**	**1.5 %**				
Standard - TCP Aqueous	Standard	25	26	µg Cl-/L	104%		9711-77	25	75-125%	
Standard - TCP Aqueous	Standard	200	208	µg Cl-/L	104%		9711-78	25	85-115%	
System Blank	Blank		ND*	µg Cl-/L			9711-76	25		

Analysis: TOX-ICR (Total Organic Halide) **Method:** SM 5320 B

QC Batch ID: 12-0-80

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	RPD
Standard - TCP Aqueous	Standard	25	26	µg Cl-/L	104%		9711-111	25	75-125%	
Standard - TCP Aqueous	Standard	200	205	µg Cl-/L	102%		9711-112	25	85-115%	
System Blank	Blank		ND*	µg Cl-/L			9711-110	25		

Analysis: TOX-ICR (Total Organic Halide) **Method:** SM 5320 B

QC Batch ID: 12-0-81

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	RPD
Standard - TCP Aqueous	Standard	25	21	µg Cl-/L	84%		9711-120	25	75-125%	
Standard - TCP Aqueous	Standard	200	220	µg Cl-/L	110%		9711-121	25	85-115%	
System Blank	Blank		ND*	µg Cl-/L			9711-119	25		

ND: non-detect. *Recovery is below 1/2 minimum reporting level (MRL). NA (not applicable): RPD calculation is not applicable.

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Quality Control Report

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 92
Study Title: ICR RSSCT #4

Analysis: TOX-ICR (Total Organic Halide) **Method:** SM 5320 B

QC Batch ID: 12-0-82

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	RPD
Standard - TCP Aqueous	Standard	25	26	µg Cl-/L	104%		9711-126	25	75-125%	
Standard - TCP Aqueous	Standard	200	219	µg Cl-/L	110%		9711-127	25	85-115%	
System Blank	Blank		ND*	µg Cl-/L			9711-125	25		

Analysis: TOX-ICR (Total Organic Halide) **Method:** SM 5320 B

QC Batch ID: 12-0-83

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	RPD
Matrix Spike	Matrix Spike	400	391	µg Cl-/L	98%		9711-107	25		
Matrix Spike (Dupl)	Matrix Spike	400	380	µg Cl-/L	95%		9711-107	25		
		400	**385**	**µg Cl-/L**	**96%**	**2.9 %**				
Standard - TCP Aqueous	Standard	25	24	µg Cl-/L	96%		9711-135	25	75-125%	
Standard - TCP Aqueous	Standard	200	192	µg Cl-/L	96%		9711-136	25	85-115%	
System Blank	Blank		ND*	µg Cl-/L			9711-134	25		

Analysis: TOX-ICR (Total Organic Halide) **Method:** SM 5320 B

QC Batch ID: 12-0-84

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	RPD
Standard - TCP Aqueous	Standard	25	26	µg Cl-/L	104%		9711-155	25	75-125%	
Standard - TCP Aqueous	Standard	200	186	µg Cl-/L	93%		9711-156	25	85-115%	
System Blank	Blank		ND*	µg Cl-/L			9711-154	25		

Analysis: CaHard (Calcium Hardness) **Method:** SM 3500-Ca D

QC Batch ID: 33-0-10

QC Type		Spike	Recovery	Unit	Yield	RPD	Date Run	S&H ID	MRL	Acceptance Criteria Range	RPD
Matrix Spike	Matrix Spike	144	145	mg/L CaCO3	101%		10/23/97	9710-272	10		
Matrix Spike (Dupl)	Matrix Spike	144	151	mg/L CaCO3	105%		10/23/97	9710-272	10		
		144	**148**	**mg/L CaCO3**	**103%**	**4.1 %**					
Method Blank	Method Blank		ND*	mg/L CaCO3			10/23/97	9710-267	10		
Standard	Standard	100	98	mg/L CaCO3	98%		10/23/97	9710-270	10	90-110%	
Standard (Dupl)	Standard	100	98	mg/L CaCO3	98%		10/23/97	9710-270	10	90-110%	
		100	**98**	**mg/L CaCO3**	**98%**	**0.0 %**				90-110%	10%
Matrix Spike	Matrix Spike	111	113	mg/L CaCO3	102%		11/01/97	9710-375	10		
Matrix Spike (Dupl)	Matrix Spike	111	114	mg/L CaCO3	103%		11/01/97	9710-375	10		
		111	**114**	**mg/L CaCO3**	**103%**	**0.9 %**					
Method Blank	Method Blank		ND*	mg/L CaCO3			11/01/97	9711-3	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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Standard	Standard	100	99	mg/L CaCO3	99%		11/01/97	9711-6	10	90-110%	
Standard (Dupl)	Standard	100	99	mg/L CaCO3	99%		11/01/97	9711-6	10	90-110%	
		100	**99**	**mg/L CaCO3**	**99%**	**0.0 %**				90-110%	10%

Analysis: CaHard (Calcium Hardness) **Method:** SM 3500-Ca D

QC Batch ID: 33-0-11

QC Type		Spike	Recovery	Unit	Yield	RPD	Date Run	S&H ID	MRL	Acceptance Criteria Range	RPD
Matrix Spike	Matrix Spike	111	118	mg/L CaCO3	106%		11/07/97	9711-85	10		
Matrix Spike (Dupl)	Matrix Spike	111	110	mg/L CaCO3	99%		11/07/97	9711-85	10		
		111	**114**	**mg/L CaCO3**	**103%**	**7.0 %**					
Method Blank	Method Blank		ND*	mg/L CaCO3			11/07/97	9711-93	10		
Standard	Standard	100	102	mg/L CaCO3	102%		11/07/97	9711-94	10	90-110%	
Standard (Dupl)	Standard	100	99	mg/L CaCO3	99%		11/07/97	9711-94	10	90-110%	
		100	**100**	**mg/L CaCO3**	**100%**	**3.0 %**				90-110%	10%

Analysis: THM-ICR (Trihalomethanes (ICR)) **Method:** EPA 551.1

QC Batch ID: 0-58-0

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	RPD
Bromodichloromethane	Duplicate	11.9	12.3	µg/L		3.3%	9710-202	1		
Bromodichloromethane	Matrix Spike	20.0	20.5	µg/L	102%		9710-230	1		
Bromodichloromethane	Method Blank		ND*	µg/L			9710-349	1		
Bromodichloromethane	Standard	20.0	22.4	µg/L	112%		9710-350	1	80-120%	
Bromodichloromethane	Standard	20.0	22.6	µg/L	113%		9710-350	1	80-120%	
Bromodichloromethane	Standard	40.0	38.6	µg/L	97%		9710-351	1	80-120%	
Bromoform	Duplicate	ND	ND	µg/L		NA	9710-202	1		
Bromoform	Matrix Spike	20.0	19.1	µg/L	96%		9710-230	1		
Bromoform	Method Blank		ND*	µg/L			9710-349	1		
Bromoform	Standard	20.0	21.5	µg/L	108%		9710-350	1	80-120%	
Bromoform	Standard	20.0	22.2	µg/L	111%		9710-350	1	80-120%	
Bromoform	Standard	40.0	41.5	µg/L	104%		9710-351	1	80-120%	
Chloroform	Duplicate	19.7	20.0	µg/L		1.5%	9710-202	1		
Chloroform	Matrix Spike	20.0	20.1	µg/L	101%		9710-230	1		
Chloroform	Method Blank		ND*	µg/L			9710-349	1		
Chloroform	Standard	20.0	22.9	µg/L	115%		9710-350	1	80-120%	
Chloroform	Standard	20.0	23.3	µg/L	117%		9710-350	1	80-120%	
Chloroform	Standard	40.0	38.0	µg/L	95%		9710-351	1	80-120%	
Dibromochloromethane	Duplicate	4.4	4.4	µg/L		0.0%	9710-202	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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Dibromochloromethane	Matrix Spike	20.0	21.2	µg/L	106%		9710-230	1	
Dibromochloromethane	Method Blank		ND*	µg/L			9710-349	1	
Dibromochloromethane	Standard	20.0	21.7	µg/L	109%		9710-350	1	80-120%
Dibromochloromethane	Standard	20.0	22.4	µg/L	112%		9710-350	1	80-120%
Dibromochloromethane	Standard	40.0	40.3	µg/L	101%		9710-351	1	80-120%

Analysis: THM-ICR (Trihalomethanes (ICR)) **Method:** EPA 551.1

QC Batch ID: 0-63-0

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	Acceptance Criteria RPD
Bromodichloromethane	Duplicate	20.0	19.6	µg/L		2.0%	9711-79	1		
Bromodichloromethane	Matrix Spike	40.0	39.4	µg/L	98%		9711-107	1		
Bromodichloromethane	Method Blank		ND*	µg/L			9711-145	1		
Bromodichloromethane	Secondary Source Std	20.0	21.6	µg/L	108%		9711-146	1	70-130%	
Bromodichloromethane	Standard	20.0	20.1	µg/L	101%		9711-147	1	80-120%	
Bromodichloromethane	Standard	20.0	21.0	µg/L	105%		9711-147	1	80-120%	
Bromodichloromethane	Standard	40.0	40.0	µg/L	100%		9711-148	1	80-120%	
Bromodichloromethane	Standard	40.0	39.9	µg/L	100%		9711-148	1	80-120%	
Bromoform	Duplicate	1.1	1.0	µg/L		9.5%	9711-79	1		
Bromoform	Matrix Spike	40.0	41.9	µg/L	105%		9711-107	1		
Bromoform	Method Blank		ND*	µg/L			9711-145	1		
Bromoform	Secondary Source Std	20.0	20.7	µg/L	103%		9711-146	1	70-130%	
Bromoform	Standard	20.0	19.6	µg/L	98%		9711-147	1	80-120%	
Bromoform	Standard	20.0	20.2	µg/L	101%		9711-147	1	80-120%	
Bromoform	Standard	40.0	39.2	µg/L	98%		9711-148	1	80-120%	
Bromoform	Standard	40.0	42.2	µg/L	106%		9711-148	1	80-120%	
Chloroform	Duplicate	38.8	37.1	µg/L		4.5%	9711-79	1		
Chloroform	Matrix Spike	40.0	43.6	µg/L	109%		9711-107	1		
Chloroform	Method Blank		ND*	µg/L			9711-145	1		
Chloroform	Secondary Source Std	20.0	21.8	µg/L	109%		9711-146	1	70-130%	
Chloroform	Standard	20.0	19.2	µg/L	96%		9711-147	1	80-120%	
Chloroform	Standard	20.0	21.0	µg/L	105%		9711-147	1	80-120%	
Chloroform	Standard	40.0	39.8	µg/L	99%		9711-148	1	80-120%	
Chloroform	Standard	40.0	40.5	µg/L	101%		9711-148	1	80-120%	
Dibromochloromethane	Duplicate	9.2	8.9	µg/L		3.3%	9711-79	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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Dibromochloromethane	Matrix Spike	40.0	41.7	µg/L	104%		9711-107	1	
Dibromochloromethane	Method Blank		ND*	µg/L			9711-145	1	
Dibromochloromethane	Secondary Source Std	20.0	21.8	µg/L	109%		9711-146	1	70-130%
Dibromochloromethane	Standard	20.0	21.1	µg/L	106%		9711-147	1	80-120%
Dibromochloromethane	Standard	20.0	22.2	µg/L	111%		9711-147	1	80-120%
Dibromochloromethane	Standard	40.0	41.8	µg/L	104%		9711-148	1	80-120%
Dibromochloromethane	Standard	40.0	41.1	µg/L	103%		9711-148	1	80-120%

Analysis: THM-ICR (Trihalomethanes (ICR)) **Method:** EPA 551.1

QC Batch ID: 0-64-0

QC Type		Spike	Recovery	Unit	Yield	RPD	S&H ID	MRL	Acceptance Criteria Range	Acceptance Criteria RPD
Bromodichloromethane	Duplicate	22.4	22.8	µg/L		1.8%	9711-140	1		
Bromodichloromethane	Matrix Spike	40.0	40.3	µg/L	101%		9711-142	1		
Bromodichloromethane	Method Blank		ND*	µg/L			9711-151	1		
Bromodichloromethane	Standard	20.0	21.0	µg/L	105%		9711-152	1	80-120%	
Bromodichloromethane	Standard	40.0	42.5	µg/L	106%		9711-148	1	80-120%	
Bromoform	Duplicate	ND	ND	µg/L		NA	9711-140	1		
Bromoform	Matrix Spike	40.0	44.5	µg/L	111%		9711-142	1		
Bromoform	Method Blank		ND*	µg/L			9711-151	1		
Bromoform	Standard	20.0	22.1	µg/L	111%		9711-152	1	80-120%	
Bromoform	Standard	40.0	43.8	µg/L	110%		9711-148	1	80-120%	
Chloroform	Duplicate	70.4	73.1	µg/L		3.8%	9711-140	1		
Chloroform	Matrix Spike	40.0	43.0	µg/L	108%		9711-142	1		
Chloroform	Method Blank		ND*	µg/L			9711-151	1		
Chloroform	Standard	20.0	21.5	µg/L	108%		9711-152	1	80-120%	
Chloroform	Standard	40.0	44.0	µg/L	110%		9711-148	1	80-120%	
Dibromochloromethane	Duplicate	6.5	6.9	µg/L		6.0%	9711-140	1		
Dibromochloromethane	Matrix Spike	40.0	42.9	µg/L	107%		9711-142	1		
Dibromochloromethane	Method Blank		ND*	µg/L			9711-151	1		
Dibromochloromethane	Standard	20.0	22.0	µg/L	110%		9711-152	1	80-120%	
Dibromochloromethane	Standard	40.0	44.9	µg/L	112%		9711-148	1	80-120%	

End of quality control report

ND: non-detect. *Recovery is below 1/2 minimum reporting level (MRL). NA (not applicable): RPD calculation is not applicable.

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QC Results from Montgomery Watson Laboratories

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Study#: 92
Study Title: ICR RSSCT #4

QC Batch ID: 68490 **Report #:** 38164

Analysis: @HALOAC **Method:** ML/S6251B

QC	Analyte	Spike	Recovery	Yield	RPD	Acceptance Criteria Range
DUP	Bromochloroacetic acid	ND	1.2		0.0%	(0 - 20)
LCS1	Bromochloroacetic acid	1	0.8	80.0%		(50 - 150)
LCS2	Bromochloroacetic acid	20	21	105.0%		(80 - 120)
MBLK	Bromochloroacetic acid	ND	ND			
MS	Bromochloroacetic acid	20	21	105.0%		(70 - 130)
DUP	Bromodichloroacetic acid	2.2	2.2		0.0%	(0 - 20)
LCS1	Bromodichloroacetic acid	1	1.5	150.0%		(50 - 150)
LCS2	Bromodichloroacetic acid	20	21	105.0%		(80 - 120)
MBLK	Bromodichloroacetic acid	ND	ND			
MS	Bromodichloroacetic acid	20	26	130.0%		(70 - 130)
DUP	Chlorodibromoacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Chlorodibromoacetic acid	2	1.6	80.0%		(50 - 150)
LCS2	Chlorodibromoacetic acid	20	20	100.0%		(80 - 120)
MBLK	Chlorodibromoacetic acid	ND	ND			
MS	Chlorodibromoacetic acid	20	25	125.0%		(70 - 130)
DUP	Dibromoacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Dibromoacetic acid	1	1.1	110.0%		(50 - 150)
LCS2	Dibromoacetic acid	20	21	105.0%		(80 - 120)
MBLK	Dibromoacetic acid	ND	ND			
MS	Dibromoacetic acid	20	21	105.0%		(70 - 130)
DUP	Dichloroacetic acid	22	22		0.0%	(0 - 20)
LCS1	Dichloroacetic acid	1	0.8	80.0%		(50 - 150)
LCS2	Dichloroacetic acid	20	20	100.0%		(80 - 120)
MBLK	Dichloroacetic acid	ND	ND			
MS	Dichloroacetic acid	20	23	115.0%		(70 - 130)
DUP	Monobromoacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Monobromoacetic acid	1	0.9	90.0%		(50 - 150)
LCS2	Monobromoacetic acid	20	21	105.0%		(80 - 120)
MBLK	Monobromoacetic acid	ND	ND			
MS	Monobromoacetic acid	20	25	125.0%		(70 - 130)

ND (non-detect): Result is below 1/2 minimum reporting level (MRL).

QC Results from Montgomery Watson Laboratories

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 92
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DUP	Monochloroacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Monochloroacetic acid	2	1.9	95.0%		(50 - 150)
LCS2	Monochloroacetic acid	20	21	105.0%		(80 - 120)
MBLK	Monochloroacetic acid	ND	ND			
MS	Monochloroacetic acid	20	22	110.0%		(70 - 130)
DUP	Tribromoacetic acid	ND	NR		0.0%	(0 - 20)
LCS1	Tribromoacetic acid	4	NR			(50 - 150)
LCS2	Tribromoacetic acid	20	NR			(80 - 120)
MBLK	Tribromoacetic acid	ND	NR			
MS	Tribromoacetic acid	20	NR			(70 - 130)
DUP	Trichloroacetic acid	21	21		0.0%	(0 - 20)
LCS1	Trichloroacetic acid	1	1.1	110.0%		(50 - 150)
LCS2	Trichloroacetic acid	20	21	105.0%		(80 - 120)
MBLK	Trichloroacetic acid	ND	ND			
MS	Trichloroacetic acid	20	22	110.0%		(70 - 130)

QC Batch ID: 68994 **Report #:** 38513

Analysis: BR **Method:** ML/EPA 300

QC	Analyte	Spike	Recovery	Yield	RPD	Acceptance Criteria Range
LCS1	Bromide	0.02	0.016	80.0%		(50 - 150)
LCS2	Bromide	0.1	0.104	104.0%		(90 - 110)
MBLK	Bromide	ND	ND			(70 - 130)
MS	Bromide	0.3	0.302	101.0%		(70 - 130)
MSD	Bromide	0.3	0.299	100.0%		(70 - 130)

QC Batch ID: 69275 **Report #:** 38513

Analysis: NH3 **Method:** ML/EPA 350.1

QC	Analyte	Spike	Recovery	Yield	RPD	Acceptance Criteria Range
LCS1	Ammonia Nitrogen	1	0.992	99.0%		(80 - 120)
LCS2	Ammonia Nitrogen	1	0.987	99.0%		(80 - 120)
MBLK	Ammonia Nitrogen	ND	ND			
MS	Ammonia Nitrogen	1	1	100.0%		(80 - 120)
MSD	Ammonia Nitrogen	1	0.986	99.0%		(80 - 120)

QC Batch ID: 69314 **Report #:** 38554

Analysis: @HALOAC **Method:** ML/S6251B

QC	Analyte	Spike	Recovery	Yield	RPD	Acceptance Criteria Range
DUP	Bromochloroacetic acid	6.4	6.8		6.0%	(0 - 20)

ND (non-detect): Result is below 1/2 minimum reporting level (MRL).

QC Results from Montgomery Watson Laboratories

Mr. John Zackasee
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LCS1	Bromochloroacetic acid	1	0.8	80.0%		(50 - 150)
LCS2	Bromochloroacetic acid	20	19	95.0%		(80 - 120)
MBLK	Bromochloroacetic acid	ND	ND			
MS	Bromochloroacetic acid	20	20	100.0%		(70 - 130)
DUP	Bromodichloroacetic acid	5.3	5.5		4.0%	(0 - 20)
LCS1	Bromodichloroacetic acid	1	1.3	130.0%		(50 - 150)
LCS2	Bromodichloroacetic acid	20	21	105.0%		(80 - 120)
MBLK	Bromodichloroacetic acid	ND	ND			
MS	Bromodichloroacetic acid	20	22	110.0%		(70 - 130)
DUP	Chlorodibromoacetic acid	3.7	3.9		5.0%	(0 - 20)
LCS1	Chlorodibromoacetic acid	2	1.8	90.0%		(50 - 150)
LCS2	Chlorodibromoacetic acid	20	21	105.0%		(80 - 120)
MBLK	Chlorodibromoacetic acid	ND	ND			
MS	Chlorodibromoacetic acid	20	22	110.0%		(70 - 130)
DUP	Dibromoacetic acid	3.4	3.5		3.0%	(0 - 20)
LCS1	Dibromoacetic acid	1	1	100.0%		(50 - 150)
LCS2	Dibromoacetic acid	20	21	105.0%		(80 - 120)
MBLK	Dibromoacetic acid	ND	ND			
MS	Dibromoacetic acid	20	20	100.0%		(70 - 130)
DUP	Dichloroacetic acid	6	6.4		6.0%	(0 - 20)
LCS1	Dichloroacetic acid	1	0.9	90.0%		(50 - 150)
LCS2	Dichloroacetic acid	20	21	105.0%		(80 - 120)
MBLK	Dichloroacetic acid	ND	ND			
MS	Dichloroacetic acid	20	20	100.0%		(70 - 130)
DUP	Monobromoacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Monobromoacetic acid	1	0.8	80.0%		(50 - 150)
LCS2	Monobromoacetic acid	20	22	110.0%		(80 - 120)
MBLK	Monobromoacetic acid	ND	ND			
MS	Monobromoacetic acid	20	23	115.0%		(70 - 130)
DUP	Monochloroacetic acid	2.9	2.6		11.0%	(0 - 20)
LCS1	Monochloroacetic acid	2	1.6	80.0%		(50 - 150)
LCS2	Monochloroacetic acid	20	21	105.0%		(80 - 120)
MBLK	Monochloroacetic acid	ND	ND			
MS	Monochloroacetic acid	20	25	125.0%		(70 - 130)
DUP	Tribromoacetic acid	NR	NR		0.0%	(0 - 20)
LCS1	Tribromoacetic acid	4	NR	72.0%		(50 - 150)
LCS2	Tribromoacetic acid	20	NR	110.0%		(80 - 120)

ND (non-detect): Result is below 1/2 minimum reporting level (MRL).

QC Results from Montgomery Watson Laboratories

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MBLK	Tribromoacetic acid	ND	NR			
MS	Tribromoacetic acid	20	NR			(70 - 130)
DUP	Trichloroacetic acid	4.6	4.7		2.0%	(0 - 20)
LCS1	Trichloroacetic acid	1	1.2	120.0%		(50 - 150)
LCS2	Trichloroacetic acid	20	21	105.0%		(80 - 120)
MBLK	Trichloroacetic acid	ND	ND			
MS	Trichloroacetic acid	20	21	105.0%		(70 - 130)

QC Batch ID: 69402 **Report #:** 38554

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	0.102	102.0%		(90 - 110)
MBLK	Bromide	ND	ND			(70 - 130)
MS	Bromide	0.3	0.298	99.0%		(70 - 130)
MSD	Bromide	0.3	0.299	100.0%		(70 - 130)

QC Batch ID: 69527 **Report #:** 38554

Analysis: NH3 **Method:** ML/EPA 350.1

QC	Analyte	Spike	Recovery	Yield	RPD	Acceptance Criteria Range
LCS1	Ammonia Nitrogen	1	1.01	101.0%		(80 - 120)
LCS2	Ammonia Nitrogen	1	1.01	101.0%		(80 - 120)
MBLK	Ammonia Nitrogen	ND	ND			
MS	Ammonia Nitrogen	1	1.04	104.0%		(80 - 120)
MSD	Ammonia Nitrogen	1	1.04	104.0%		(80 - 120)

QC Batch ID: 69664 **Report #:** 38648

Analysis: @HALOAC **Method:** ML/S6251B

QC	Analyte	Spike	Recovery	Yield	RPD	Acceptance Criteria Range
DUP	Bromochloroacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Bromochloroacetic acid	1	0.9	90.0%		(50 - 150)
LCS2	Bromochloroacetic acid	20	20	100.0%		(80 - 120)
MBLK	Bromochloroacetic acid	ND	ND			
MS	Bromochloroacetic acid	32	35	109.0%		(70 - 130)
DUP	Bromodichloroacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Bromodichloroacetic acid	1	1.2	120.0%		(50 - 150)
LCS2	Bromodichloroacetic acid	20	21	105.0%		(80 - 120)
MBLK	Bromodichloroacetic acid	ND	ND			

ND (non-detect): Result is below 1/2 minimum reporting level (MRL).

QC Results from Montgomery Watson Laboratories

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Study Title: ICR RSSCT #4

MS	Bromodichloroacetic acid	32	36	112.0%		(70 - 130)
DUP	Chlorodibromoacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Chlorodibromoacetic acid	2	1.3	65.0%		(50 - 150)
LCS2	Chlorodibromoacetic acid	20	21	105.0%		(80 - 120)
MBLK	Chlorodibromoacetic acid	ND	ND			
MS	Chlorodibromoacetic acid	32	32	100.0%		(70 - 130)
DUP	Dibromoacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Dibromoacetic acid	1	1	100.0%		(50 - 150)
LCS2	Dibromoacetic acid	20	20	100.0%		(80 - 120)
MBLK	Dibromoacetic acid	ND	ND			
MS	Dibromoacetic acid	32	34	106.0%		(70 - 130)
DUP	Dichloroacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Dichloroacetic acid	1	0.8	80.0%		(50 - 150)
LCS2	Dichloroacetic acid	20	20	100.0%		(80 - 120)
MBLK	Dichloroacetic acid	ND	ND			
MS	Dichloroacetic acid	32	34	106.0%		(70 - 130)
DUP	Monobromoacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Monobromoacetic acid	1	0.9	90.0%		(50 - 150)
LCS2	Monobromoacetic acid	20	21	105.0%		(80 - 120)
MBLK	Monobromoacetic acid	ND	ND			
MS	Monobromoacetic acid	32	35	109.0%		(70 - 130)
DUP	Monochloroacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Monochloroacetic acid	2	1.6	80.0%		(50 - 150)
LCS2	Monochloroacetic acid	20	21	105.0%		(80 - 120)
MBLK	Monochloroacetic acid	ND	ND			
MS	Monochloroacetic acid	32	35	109.0%		(70 - 130)
DUP	Tribromoacetic acid	ND	NR		0.0%	(0 - 20)
LCS1	Tribromoacetic acid	4	NR			(50 - 150)
LCS2	Tribromoacetic acid	20	NR			(80 - 120)
MBLK	Tribromoacetic acid	ND	NR			
MS	Tribromoacetic acid	32	NR			(70 - 130)
DUP	Trichloroacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Trichloroacetic acid	1	1.2	120.0%		(50 - 150)
LCS2	Trichloroacetic acid	20	20	100.0%		(80 - 120)
MBLK	Trichloroacetic acid	ND	ND			
MS	Trichloroacetic acid	32	35	109.0%		(70 - 130)

ND (non-detect): Result is below 1/2 minimum reporting level (MRL).

QC Results from Montgomery Watson Laboratories

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 92
Study Title: ICR RSSCT #4

QC Batch ID: 69671 **Report #:** 38752

Analysis: @HALOAC **Method:** ML/S6251B

QC	Analyte	Spike	Recovery	Yield	RPD	Acceptance Criteria Range
DUP	Bromochloroacetic acid	7.6	7.8		3.0%	(0 - 20)
LCS1	Bromochloroacetic acid	1	1.2	120.0%		(50 - 150)
LCS2	Bromochloroacetic acid	20	20	100.0%		(80 - 120)
MBLK	Bromochloroacetic acid	ND	ND			
MS	Bromochloroacetic acid	20	19	95.0%		(70 - 130)
DUP	Bromodichloroacetic acid	4	4.1		2.0%	(0 - 20)
LCS1	Bromodichloroacetic acid	1	1.4	140.0%		(50 - 150)
LCS2	Bromodichloroacetic acid	20	21	105.0%		(80 - 120)
MBLK	Bromodichloroacetic acid	ND	ND			
MS	Bromodichloroacetic acid	20	23	115.0%		(70 - 130)
DUP	Chlorodibromoacetic acid	8.5	8.7		2.0%	(0 - 20)
LCS1	Chlorodibromoacetic acid	2	2.1	105.0%		(50 - 150)
LCS2	Chlorodibromoacetic acid	20	21	105.0%		(80 - 120)
MBLK	Chlorodibromoacetic acid	ND	ND			
MS	Chlorodibromoacetic acid	20	22	110.0%		(70 - 130)
DUP	Dibromoacetic acid	17	17		0.0%	(0 - 20)
LCS1	Dibromoacetic acid	1	1.2	120.0%		(50 - 150)
LCS2	Dibromoacetic acid	20	20	100.0%		(80 - 120)
MBLK	Dibromoacetic acid	ND	ND			
MS	Dibromoacetic acid	20	21	105.0%		(70 - 130)
DUP	Dichloroacetic acid	2.4	2.5		4.0%	(0 - 20)
LCS1	Dichloroacetic acid	1	1.1	110.0%		(50 - 150)
LCS2	Dichloroacetic acid	20	20	100.0%		(80 - 120)
MBLK	Dichloroacetic acid	ND	ND			
MS	Dichloroacetic acid	20	19	95.0%		(70 - 130)
DUP	Monobromoacetic acid	2.6	2.7		4.0%	(0 - 20)
LCS1	Monobromoacetic acid	1	1	100.0%		(50 - 150)
LCS2	Monobromoacetic acid	20	20	100.0%		(80 - 120)
MBLK	Monobromoacetic acid	ND	ND			
MS	Monobromoacetic acid	20	20	100.0%		(70 - 130)
DUP	Monochloroacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Monochloroacetic acid	2	2	100.0%		(50 - 150)
LCS2	Monochloroacetic acid	20	21	105.0%		(80 - 120)
MBLK	Monochloroacetic acid	ND	ND			

ND (non-detect): Result is below 1/2 minimum reporting level (MRL).

QC Results from Montgomery Watson Laboratories

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Mahoning Valley Sanitary District

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MS	Monochloroacetic acid	20	20	100.0%		(70 - 130)
DUP	Tribromoacetic acid	ND	NR		0.0%	(0 - 20)
LCS1	Tribromoacetic acid	4	NR			(50 - 150)
LCS2	Tribromoacetic acid	20	NR			(80 - 120)
MBLK	Tribromoacetic acid	ND	NR			
MS	Tribromoacetic acid	20	NR			(70 - 130)
DUP	Trichloroacetic acid	1	1.1		10.0%	(0 - 20)
LCS1	Trichloroacetic acid	1	1.4	140.0%		(50 - 150)
LCS2	Trichloroacetic acid	20	20	100.0%		(80 - 120)
MBLK	Trichloroacetic acid	ND	ND			
MS	Trichloroacetic acid	20	19	95.0%		(70 - 130)

QC Batch ID: 69698 **Report #:** 38752

Analysis: @HALOAC **Method:** ML/S6251B

QC	Analyte	Spike	Recovery	Yield	RPD	Acceptance Criteria Range
DUP	Bromochloroacetic acid	2.7	3		11.0%	(0 - 20)
LCS1	Bromochloroacetic acid	1	0.9	90.0%		(50 - 150)
LCS2	Bromochloroacetic acid	20	19	95.0%		(80 - 120)
MBLK	Bromochloroacetic acid	ND	ND			
MS	Bromochloroacetic acid	1	0.8	80.0%		(70 - 130)
DUP	Bromodichloroacetic acid	3.5	4.2		18.0%	(0 - 20)
LCS1	Bromodichloroacetic acid	1	1.2	120.0%		(50 - 150)
LCS2	Bromodichloroacetic acid	20	20	100.0%		(80 - 120)
MBLK	Bromodichloroacetic acid	ND	ND			
MS	Bromodichloroacetic acid	1	0.2	20.0%		(70 - 130)
DUP	Chlorodibromoacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Chlorodibromoacetic acid	2	2	100.0%		(50 - 150)
LCS2	Chlorodibromoacetic acid	20	21	105.0%		(80 - 120)
MBLK	Chlorodibromoacetic acid	ND	ND			
MS	Chlorodibromoacetic acid	2	ND			(70 - 130)
DUP	Dibromoacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Dibromoacetic acid	1	1	100.0%		(50 - 150)
LCS2	Dibromoacetic acid	20	20	100.0%		(80 - 120)
MBLK	Dibromoacetic acid	ND	ND			
MS	Dibromoacetic acid	1	0.6	60.0%		(70 - 130)
DUP	Dichloroacetic acid	10	10		0.0%	(0 - 20)
LCS1	Dichloroacetic acid	1	0.9	90.0%		(50 - 150)
LCS2	Dichloroacetic acid	20	20	100.0%		(80 - 120)

ND (non-detect): Result is below 1/2 minimum reporting level (MRL).

QC Results from Montgomery Watson Laboratories

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Mahoning Valley Sanitary District

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MBLK	Dichloroacetic acid	ND	ND			
MS	Dichloroacetic acid	1	0.8	80.0%		(70 - 130)
DUP	Monobromoacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Monobromoacetic acid	1	0.9	90.0%		(50 - 150)
LCS2	Monobromoacetic acid	20	20	100.0%		(80 - 120)
MBLK	Monobromoacetic acid	ND	ND			
MS	Monobromoacetic acid	1	0.8	80.0%		(70 - 130)
DUP	Monochloroacetic acid	ND	2.2		0.0%	(0 - 20)
LCS1	Monochloroacetic acid	2	1.6	80.0%		(50 - 150)
LCS2	Monochloroacetic acid	20	20	100.0%		(80 - 120)
MBLK	Monochloroacetic acid	ND	ND			
MS	Monochloroacetic acid	2	1.7	85.0%		(70 - 130)
DUP	Tribromoacetic acid	ND	NR		0.0%	(0 - 20)
LCS1	Tribromoacetic acid	4	NR			(50 - 150)
LCS2	Tribromoacetic acid	20	NR			(80 - 120)
MBLK	Tribromoacetic acid	ND	NR			
MS	Tribromoacetic acid	4	NR			(70 - 130)
DUP	Trichloroacetic acid	12	14		15.0%	(0 - 20)
LCS1	Trichloroacetic acid	1	1.2	120.0%		(50 - 150)
LCS2	Trichloroacetic acid	20	20	100.0%		(80 - 120)
MBLK	Trichloroacetic acid	ND	ND			
MS	Trichloroacetic acid	1	1.1	110.0%		(70 - 130)

QC Batch ID: 69819 **Report #:** 38513
38554

Analysis: @HALOAC **Method:** ML/S6251B

QC	Analyte	Spike	Recovery	Yield	RPD	Acceptance Criteria Range
DUP	Bromochloroacetic acid	3.3	3.3		0.0%	(0 - 20)
LCS1	Bromochloroacetic acid	1	1	100.0%		(50 - 150)
LCS2	Bromochloroacetic acid	20	19	95.0%		(80 - 120)
MBLK	Bromochloroacetic acid	ND	ND			
MS	Bromochloroacetic acid	1	0.8	80.0%		(70 - 130)
DUP	Bromodichloroacetic acid	5.4	5.4		0.0%	(0 - 20)
LCS1	Bromodichloroacetic acid	1	0.9	90.0%		(50 - 150)
LCS2	Bromodichloroacetic acid	20	19	95.0%		(80 - 120)
MBLK	Bromodichloroacetic acid	ND	ND			
MS	Bromodichloroacetic acid	1	0.7	70.0%		(70 - 130)
DUP	Chlorodibromoacetic acid	ND	ND		0.0%	(0 - 20)

ND (non-detect): Result is below 1/2 minimum reporting level (MRL).

QC Results from Montgomery Watson Laboratories

Mr. John Zackasee
Mahoning Valley Sanitary District

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LCS1	Chlorodibromoacetic acid	2	1.2	60.0%		(50 - 150)
LCS2	Chlorodibromoacetic acid	20	19	95.0%		(80 - 120)
MBLK	Chlorodibromoacetic acid	ND	ND			
MS	Chlorodibromoacetic acid	2	2.3	115.0%		(70 - 130)
DUP	Dibromoacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Dibromoacetic acid	1	1	100.0%		(50 - 150)
LCS2	Dibromoacetic acid	20	19	95.0%		(80 - 120)
MBLK	Dibromoacetic acid	ND	ND			
MS	Dibromoacetic acid	1	0.8	80.0%		(70 - 130)
DUP	Dichloroacetic acid	29	29		0.0%	(0 - 20)
LCS1	Dichloroacetic acid	1	0.9	90.0%		(50 - 150)
LCS2	Dichloroacetic acid	20	19	95.0%		(80 - 120)
MBLK	Dichloroacetic acid	ND	ND			
MS	Dichloroacetic acid	1	0.1	10.0%		(70 - 130)
DUP	Monobromoacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Monobromoacetic acid	1	1	100.0%		(50 - 150)
LCS2	Monobromoacetic acid	20	19	95.0%		(80 - 120)
MBLK	Monobromoacetic acid	ND	ND			
MS	Monobromoacetic acid	1	0.4	40.0%		(70 - 130)
DUP	Monochloroacetic acid	5.9	7.6		25.0%	(0 - 20)
LCS1	Monochloroacetic acid	2	1.9	95.0%		(50 - 150)
LCS2	Monochloroacetic acid	20	20	100.0%		(80 - 120)
MBLK	Monochloroacetic acid	ND	ND			
MS	Monochloroacetic acid	2	ND			(70 - 130)
DUP	Tribromoacetic acid	ND	NR		0.0%	(0 - 20)
LCS1	Tribromoacetic acid	4	NR			(50 - 150)
LCS2	Tribromoacetic acid	20	NR			(80 - 120)
MBLK	Tribromoacetic acid	ND	NR			
MS	Tribromoacetic acid	4	NR			(70 - 130)
DUP	Trichloroacetic acid	37	37		0.0%	(0 - 20)
LCS1	Trichloroacetic acid	1	1	100.0%		(50 - 150)
LCS2	Trichloroacetic acid	20	19	95.0%		(80 - 120)
MBLK	Trichloroacetic acid	ND	ND			
MS	Trichloroacetic acid	1	1	100.0%		(70 - 130)

QC Batch ID: 69859 **Report #:** 38648

Analysis: @HALOAC **Method:** ML/S6251B

QC	Analyte	Spike	Recovery	Yield	RPD	Acceptance Criteria Range

ND (non-detect): Result is below 1/2 minimum reporting level (MRL).

QC Results from Montgomery Watson Laboratories

Mr. John Zackasee
Mahoning Valley Sanitary District

Study#: 92
Study Title: ICR RSSCT #4

DUP	Bromochloroacetic acid	3.8	3.6		5.0%	(0 - 20)
LCS1	Bromochloroacetic acid	1	1	100.0%		(50 - 150)
LCS2	Bromochloroacetic acid	20	20	100.0%		(80 - 120)
MBLK	Bromochloroacetic acid	ND	ND			
MS	Bromochloroacetic acid	32	32	100.0%		(70 - 130)
DUP	Bromodichloroacetic acid	5	5		0.0%	(0 - 20)
LCS1	Bromodichloroacetic acid	1	1	100.0%		(50 - 150)
LCS2	Bromodichloroacetic acid	20	20	100.0%		(80 - 120)
MBLK	Bromodichloroacetic acid	ND	ND			
MS	Bromodichloroacetic acid	32	32	100.0%		(70 - 130)
DUP	Chlorodibromoacetic acid	NR	NR		0.0%	(0 - 20)
LCS1	Chlorodibromoacetic acid	2	NR			(50 - 150)
LCS2	Chlorodibromoacetic acid	20	NR			(80 - 120)
MBLK	Chlorodibromoacetic acid	ND	NR			
MS	Chlorodibromoacetic acid	32	NR			(70 - 130)
DUP	Dibromoacetic acid	1.2	1.2		0.0%	(0 - 20)
LCS1	Dibromoacetic acid	1	1	100.0%		(50 - 150)
LCS2	Dibromoacetic acid	20	20	100.0%		(80 - 120)
MBLK	Dibromoacetic acid	ND	ND			
MS	Dibromoacetic acid	32	32	100.0%		(70 - 130)
DUP	Dichloroacetic acid	6.6	6.8		3.0%	(0 - 20)
LCS1	Dichloroacetic acid	1	0.9	90.0%		(50 - 150)
LCS2	Dichloroacetic acid	20	19	95.0%		(80 - 120)
MBLK	Dichloroacetic acid	ND	ND			
MS	Dichloroacetic acid	32	32	100.0%		(70 - 130)
DUP	Monobromoacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Monobromoacetic acid	1	1.3	130.0%		(50 - 150)
LCS2	Monobromoacetic acid	20	18	90.0%		(80 - 120)
MBLK	Monobromoacetic acid	ND	ND			
MS	Monobromoacetic acid	32	30	94.0%		(70 - 130)
DUP	Monochloroacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Monochloroacetic acid	2	2.2	110.0%		(50 - 150)
LCS2	Monochloroacetic acid	20	20	100.0%		(80 - 120)
MBLK	Monochloroacetic acid	ND	ND			
MS	Monochloroacetic acid	32	41	128.0%		(70 - 130)
DUP	Tribromoacetic acid	NR	NR		0.0%	(0 - 20)
LCS1	Tribromoacetic acid	4	NR			(50 - 150)

ND (non-detect): Result is below 1/2 minimum reporting level (MRL).

QC Results from Montgomery Watson Laboratories

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LCS2	Tribromoacetic acid	20	NR			(80 - 120)
MBLK	Tribromoacetic acid	ND	NR			
MS	Tribromoacetic acid	32	NR			(70 - 130)
DUP	Trichloroacetic acid	6.1	6.4		5.0%	(0 - 20)
LCS1	Trichloroacetic acid	1	1.1	110.0%		(50 - 150)
LCS2	Trichloroacetic acid	20	20	100.0%		(80 - 120)
MBLK	Trichloroacetic acid	ND	ND			
MS	Trichloroacetic acid	32	32	100.0%		(70 - 130)

QC Batch ID: 70155 **Report #:** 38513
38554

Analysis: @HALOAC **Method:** ML/S6251B

QC	Analyte	Spike	Recovery	Yield	RPD	Acceptance Criteria Range
DUP	Bromochloroacetic acid	1.7	1.8		6.0%	(0 - 20)
LCS1	Bromochloroacetic acid	1	1	100.0%		(50 - 150)
LCS2	Bromochloroacetic acid	20	20	100.0%		(80 - 120)
MBLK	Bromochloroacetic acid	ND	ND			
MS	Bromochloroacetic acid	20	20	100.0%		(70 - 130)
DUP	Bromodichloroacetic acid	NR	NR		0.0%	(0 - 20)
LCS1	Bromodichloroacetic acid	1	NR			(50 - 150)
LCS2	Bromodichloroacetic acid	20	NR			(80 - 120)
MBLK	Bromodichloroacetic acid	ND	NR			
MS	Bromodichloroacetic acid	20	NR			(70 - 130)
DUP	Chlorodibromoacetic acid	NR	NR		0.0%	(0 - 20)
LCS1	Chlorodibromoacetic acid	2	NR			(50 - 150)
LCS2	Chlorodibromoacetic acid	20	NR			(80 - 120)
MBLK	Chlorodibromoacetic acid	ND	NR			
MS	Chlorodibromoacetic acid	20	NR			(70 - 130)
DUP	Dibromoacetic acid	3.2	4		22.0%	(0 - 20)
LCS1	Dibromoacetic acid	1	1.1	110.0%		(50 - 150)
LCS2	Dibromoacetic acid	20	21	105.0%		(80 - 120)
MBLK	Dibromoacetic acid	ND	ND			
MS	Dibromoacetic acid	20	24	120.0%		(70 - 130)
DUP	Dichloroacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Dichloroacetic acid	1	0.9	90.0%		(50 - 150)
LCS2	Dichloroacetic acid	20	20	100.0%		(80 - 120)
MBLK	Dichloroacetic acid	ND	ND			
MS	Dichloroacetic acid	20	22	110.0%		(70 - 130)

ND (non-detect): Result is below 1/2 minimum reporting level (MRL).

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DUP	Monobromoacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Monobromoacetic acid	1	0.8	80.0%		(50 - 150)
LCS2	Monobromoacetic acid	20	20	100.0%		(80 - 120)
MBLK	Monobromoacetic acid	ND	ND			
MS	Monobromoacetic acid	20	22	110.0%		(70 - 130)
DUP	Monochloroacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Monochloroacetic acid	2	1.5	75.0%		(50 - 150)
LCS2	Monochloroacetic acid	20	20	100.0%		(80 - 120)
MBLK	Monochloroacetic acid	ND	ND			
MS	Monochloroacetic acid	20	26	130.0%		(70 - 130)
DUP	Tribromoacetic acid	NR	NR		0.0%	(0 - 20)
LCS1	Tribromoacetic acid	4	NR			(50 - 150)
LCS2	Tribromoacetic acid	20	NR			(80 - 120)
MBLK	Tribromoacetic acid	ND	NR			
MS	Tribromoacetic acid	20	NR			(70 - 130)
DUP	Trichloroacetic acid	ND	ND		0.0%	(0 - 20)
LCS1	Trichloroacetic acid	1	1	100.0%		(50 - 150)
LCS2	Trichloroacetic acid	20	20	100.0%		(80 - 120)
MBLK	Trichloroacetic acid	ND	ND			
MS	Trichloroacetic acid	20	13	65.0%		(70 - 130)

End of MW QC report

ND (non-detect): Result is below 1/2 minimum reporting level (MRL).

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Comments

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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.

Turbidity Range	Report to Nearest
0-1.0	0.05
1-10	0.1
10-40	1
40-100	5
100-400	10
400-1000	50
> 1000	100

QC comments

QCBatch: 0-69-0 **Description:** MW Labs Report # 38164

HAA QC batch MW68490. From MW Labs: "TBAA recovery outside on LLFB."

QCBatch: 0-71-0 **Description:** MW Labs Report # 38513

HAA not reported for sample 9710-373. From MW Labs: "Surrogate outside range."

HAA TBAAA not reported for samples 9710-374, 9711-8, 9711-12, and 9711-43. From MW Labs: "Recoveries outside range on LFBs."

QCBatch: 0-72-0 **Description:** MW Labs Report # 38554

HAA not reported for sample 9711-10. From MW Labs: "Surrogate outside range."

HAA TBAAA not reported for samples 9711-13, 9711-14, 9711-16, 9711-30, 9711-46, 9711-47, 9711-20, 9711-32, 9711-56, 9711-51, 9711-70, 9711-60, 9711-21, 9711-22, 9711-50, 9711-55, and 9711-79. From MW Labs: "Recoveries outside range on LFBs."

QCBatch: 0-73-0 **Description:** MW Labs Report # 38648

HAA QC batch MW69859 and MW69664. From MW Labs: "CDBAA, TBAA recoveries outside range on LFBs."

QCBatch: 0-74-0 **Description:** MW Labs Report # 38752

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HAA QC batch MW69671 and MW69698. From MW Labs: "TBAA recoveries outside range on LFBs."

End of comments