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# Study Design and Analytical Results Used to Evaluate Stability of Volatile Organic Compounds in Water Matrices

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# FOREWORD

The mission of the U.S. Geological Survey (USGS) is to assess the quantity and quality of the earth resources of the Nation and to provide information that will assist resource managers and policy-makers at Federal, State, and local levels in making sound decisions. Assessment of water-quality conditions and trends is an important part of this overall mission.

One of the greatest challenges faced by water-resources scientists is acquiring reliable information that will guide the use and protection of the Nation's water resources. That challenge is being addressed by Federal, State, interstate, and local water-resource agencies and by many academic institutions. These organizations are collecting water-quality data for a host of purposes that include: compliance with permits and water-supply standards; development of remediation plans for a specific contamination problem; operational decisions on industrial, wastewater, or water-supply facilities; and research on factors that affect water quality. An additional need for water-quality information is to provide a basis on which regional and national-level policy decisions can be based. Wise decisions must be based on sound information. As a society we need to know whether certain types of water-quality problems are isolated or ubiquitous, whether there are significant differences in conditions among regions, whether the conditions are changing over time, and why these conditions change from place to place and over time. The information can be used to help determine the efficacy of existing water-quality policies and to help analysts determine the need for and likely consequences of new policies.

To address these needs, the Congress appropriated funds in 1986 for the USGS to begin a pilot program in seven project areas to develop and refine the National Water-Quality Assessment (NAWQA) Program. In 1991, the USGS began full implementation of the program. The NAWQA Program builds upon an existing base of water-quality studies of the USGS, as well as those of other Federal, State, and local agencies. The objectives of the NAWQA Program are to:

- Describe current water-quality conditions for a large part of the Nation's freshwater streams, rivers, and aquifers.

- Describe how water quality is changing over time.

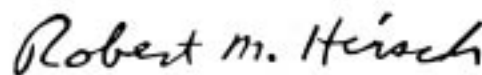
- Improve understanding of the primary natural and human factors that affect water-quality conditions.

This information will help support the development and evaluation of management, regulatory, and monitoring decisions by other Federal, State, and local agencies to protect, use, and enhance water resources.

The goals of the NAWQA Program are being achieved through ongoing and proposed investigations of 59 of the Nation's most important river basins and aquifer systems, which are referred to as Study Units. These Study Units are distributed throughout the Nation and cover a diversity of hydrogeologic settings. More than two-thirds of the Nation's freshwater use occurs within the 59 Study Units and more than two-thirds of the people served by public water-supply systems live within their boundaries.

National synthesis of data analysis, based on aggregation of comparable information obtained from the Study Units, is a major component of the program. This effort focuses on selected water-quality topics using nationally consistent information. Comparative studies will explain differences and similarities in observed water-quality conditions among study areas and will identify changes and trends and their causes. The first topics addressed by the national synthesis are pesticides, nutrients, volatile organic compounds, and aquatic biology. Discussions on these and other water-quality topics will be published in periodic summaries of the quality of the Nation's ground and surface water as the information becomes available.

This report is an element of the comprehensive body of information developed as part of the NAWQA Program. The program depends heavily on the advice, cooperation, and information from many Federal, State, interstate, Tribal, and local agencies and the public. The assistance and suggestions of all are greatly appreciated.



Robert M. Hirsch  
Chief Hydrologist

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## CONVERSION FACTORS

	<b>Multiply</b>	<b>By</b>	<b>To obtain</b>
	liter (L)	0.2642	gallon
	microgram per liter (µg/L)	1.0	part per billion

Temperature can be converted to degrees Celsius (°C) or degrees Fahrenheit (°F) by the following equations:

$$^{\circ}\text{C} = (^{\circ}\text{F} - 32) / 1.8$$

$$^{\circ}\text{F} = (1.8 \times ^{\circ}\text{C}) + 32$$

# Study Design and Analytical Results Used to Evaluate Stability of Volatile Organic Compounds in Water Matrices

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## ABSTRACT

A surface- and a ground-water matrix were spiked with 87 volatile organic compounds (VOCs) to achieve a theoretical concentration of 0.5 microgram per liter for most VOCs. Five replicate spike samples from each water matrix were stored and analyzed at selected time intervals up to 216 days. To assess daily analytical variability, three replicate continuing calibration verification standards were analyzed at the same times as the spiked water matrices. The results of this study provide information about the stability of low concentrations of VOCs in water samples preserved with hydrochloric acid, chilled at 4 degrees Celsius, and kept in the dark prior to analysis. This report describes the study design and presents the results of samples analyzed on day 0, 14, 28, 37, 47, 56, 112, 156, and 216.

## INTRODUCTION

Due to unforeseen technical difficulties with analytical equipment used for volatile organic compound (VOC) analyses at the U.S. Geological Survey (USGS) National Water-Quality Laboratory (NWQL) in Arvada, Colorado, approximately 150 to 200 VOC samples in the summer of 1996 exceeded the maximum U.S. Environmental Protection Agency (USEPA) pre-analytical holding-time requirement of 14 days (Munch, 1995). The maximum holding time for the water samples that exceeded 14 days was 41 days, with a median holding time of 27 days. The samples were

preserved in the field with hydrochloric acid (HCl), kept chilled at 4°C, and analyzed as soon as the analytical equipment became operational. These data were subsequently released. However, the quality of the data was uncertain because little information exists on the stability of low concentrations of VOCs in water samples preserved with HCl that are held beyond 14 days.

It is unknown how 14 days was chosen by the USEPA for a maximum pre-analytical holding time for VOC analysis. Maskarinec and others (1990) addressed the holding-time issue and suggested that the maximum holding time of VOCs in water could be increased to at least 56 days if the water samples are preserved with HCl to a pH of 2.0 or less and chilled at 4°C. However, the concentrations of VOCs used in Maskarinec's preservation study, 100 µg/L, were much higher than those found in most environmental samples collected by the USGS and submitted for analysis at the NWQL.

Water samples submitted to the NWQL during and after the timeframe that the 150 to 200 VOC samples exceeded the USEPA's holding time requirement were analyzed for 87 VOCs (table 1). The 87 VOCs were divided into two groups—target analytes (55 compounds) and other analytes (32 compounds). The target analytes were selected because of their known human-health and (or) aquatic-life concern or because of their high frequency of occurrence in surface and ground water (John Zogorski, USGS, written commun., 1994). The other analytes were included because they are on the USEPA's list for analysis using their revised method for drinking-water samples (Eichelberger and Budde, 1989).

**Table 1.** Volatile organic compounds analyzed during this study

[Compounds are identified by the following: PCODE, U.S. Geological Survey data base parameter code; CAS no., Chemical Abstract Services number; IUPAC, International Union of Pure and Applied Chemistry]

PCODE	CAS no.	IUPAC compound name (chemical formula) (common name(s))	PCODE	CAS no.	IUPAC compound name (chemical formula) (common name(s))
<b>Target analytes</b>					
34030	71-43-2	Benzene (C <sub>6</sub> H <sub>6</sub> )	34541	78-87-5	1,2-Dichloropropane (C <sub>3</sub> H <sub>6</sub> Cl <sub>2</sub> ) (propylene dichloride)
32101	75-27-4	Bromodichloromethane (CHBrCl <sub>2</sub> ) (dichlorobromomethane)	34704	10061-01-5	<i>cis</i> -1,3-Dichloropropene (C <sub>3</sub> H <sub>4</sub> Cl <sub>2</sub> ) ((Z)-1,3-dichloropropene)
50002	593-60-2	Bromoethene (C <sub>2</sub> H <sub>3</sub> Br) (vinyl bromide)	34699	10061-02-6	<i>trans</i> -1,3-Dichloropropene (C <sub>3</sub> H <sub>4</sub> Cl <sub>2</sub> ) ((E)-1,3-dichloropropene)
34413	74-83-9	Bromomethane (CH <sub>3</sub> Br) (methyl bromide)	77135	95-47-6	1,2-Dimethylbenzene (C <sub>8</sub> H <sub>10</sub> ) ( <i>o</i> -xylene)
77342	104-51-8	<i>n</i> -Butylbenzene (C <sub>10</sub> H <sub>14</sub> ) (1-phenylbutane)	85795	108-38-3	1,3-Dimethylbenzene (C <sub>8</sub> H <sub>10</sub> ) ( <i>m</i> -xylene) and
34301	108-90-7	Chlorobenzene (C <sub>6</sub> H <sub>5</sub> Cl) (monochlorobenzene)	106-42-3	106-42-3	1,4-Dimethylbenzene (C <sub>8</sub> H <sub>10</sub> ) ( <i>p</i> -xylene)
34311	75-00-3	Chloroethane (C <sub>2</sub> H <sub>5</sub> Cl) (ethyl chloride)	77128	100-42-5	Ethylbenzene (C <sub>8</sub> H <sub>8</sub> ) (styrene)
39175	75-01-4	Chloroethene (C <sub>2</sub> H <sub>3</sub> Cl) (vinyl chloride)	50004	637-92-3	2-Ethoxy-2-methylpropane (C <sub>6</sub> H <sub>14</sub> O) (ethyl <i>tert</i> -butyl ether, ETBE)
34418	74-87-3	Chloromethane (CH <sub>3</sub> Cl) (methyl chloride)	34371	100-41-4	Ethylbenzene (C <sub>8</sub> H <sub>10</sub> ) (phenylethane)
82625	96-12-8	1,2-Dibromo-3-chloropropane (C <sub>3</sub> H <sub>5</sub> Br <sub>2</sub> Cl) (dibromochloropropane, DBCP)	39702	87-68-3	1,1,2,3,4,4-Hexachloro-1,3-butadiene (C <sub>4</sub> Cl <sub>6</sub> ) (hexachlorobutadiene)
32105	124-48-1	Chlorodibromomethane (CHBr <sub>2</sub> Cl) (chlorodibromomethane)	34396	67-72-1	1,1,1,2,2,2-Hexachloroethane (C <sub>2</sub> Cl <sub>6</sub> ) (carbon hexachloride)
77651	106-93-4	1,2-Dibromoethane (C <sub>2</sub> H <sub>4</sub> Br <sub>2</sub> ) (ethylene dibromide, EDB)	50005	994-05-8	2-Methoxy-2-methylbutane (C <sub>6</sub> H <sub>14</sub> O) ( <i>tert</i> -amyl methyl ether, TAME)
34536	95-50-1	1,2-Dichlorobenzene (C <sub>6</sub> H <sub>4</sub> Cl <sub>2</sub> ) ( <i>o</i> -dichlorobenzene)	78032	1634-04-4	2-Methoxy-2-methylpropane (C <sub>5</sub> H <sub>12</sub> O) (methyl <i>tert</i> -butyl ether, MTBE)
34566	541-73-1	1,3-Dichlorobenzene (C <sub>6</sub> H <sub>4</sub> Cl <sub>2</sub> ) ( <i>m</i> -dichlorobenzene)	34010	108-88-3	Methylbenzene (C <sub>7</sub> H <sub>8</sub> ) (toluene)
34571	106-46-7	1,4-Dichlorobenzene (C <sub>6</sub> H <sub>4</sub> Cl <sub>2</sub> ) ( <i>p</i> -dichlorobenzene)	77223	98-82-8	(1-Methylethyl)benzene (C <sub>9</sub> H <sub>12</sub> ) (isopropylbenzene)
34668	75-71-8	Dichlorodifluoromethane (CCl <sub>2</sub> F <sub>2</sub> ) (CFC 12)	34696	91-20-3	Naphthalene (C <sub>10</sub> H <sub>8</sub> )
34496	75-34-3	1,1-Dichloroethane (C <sub>2</sub> H <sub>4</sub> Cl <sub>2</sub> ) (ethylidene chloride)	81577	108-20-3	2,2'-Oxybis[propane] (C <sub>6</sub> H <sub>14</sub> O) (diisopropyl ether, DIPE)
32103	107-06-2	1,2-Dichloroethane (C <sub>2</sub> H <sub>4</sub> Cl <sub>2</sub> ) (ethylene dichloride)	34210	107-02-8	2-Propenal (C <sub>3</sub> H <sub>4</sub> O) (acrolein)
34501	75-35-4	1,1-Dichloroethene (C <sub>2</sub> H <sub>2</sub> Cl <sub>2</sub> ) (vinylidene chloride)	34215	107-13-1	2-Propenenitrile (C <sub>3</sub> H <sub>3</sub> N) (acrylonitrile)
77093	156-59-2	<i>cis</i> -1,2-Dichloroethene (C <sub>2</sub> H <sub>2</sub> Cl <sub>2</sub> ) ((Z)-1,2-dichloroethene)	77224	103-65-1	<i>n</i> -Propylbenzene (C <sub>9</sub> H <sub>12</sub> ) (1-phenylpropane)
34546	156-60-5	<i>trans</i> -1,2-Dichloroethene (C <sub>2</sub> H <sub>2</sub> Cl <sub>2</sub> ) ((E)-1,2-dichloroethene)	34475	127-18-4	Tetrachloroethene (C <sub>2</sub> Cl <sub>4</sub> ) (perchloroethene, PCE)
34423	75-09-2	Dichloromethane (CH <sub>2</sub> Cl <sub>2</sub> ) (methylene chloride)	32102	56-23-5	Tetrachloromethane (CCl <sub>4</sub> ) (carbon tetrachloride)

**Table 1.** Volatile organic compounds analyzed during this study—Continued

[Compounds are identified by the following: PCODE, U.S. Geological Survey data base parameter code; CAS no., Chemical Abstract Services number; IUPAC, International Union of Pure and Applied Chemistry]

PCODE	CAS no.	IUPAC compound name (chemical formula) (common name(s))	PCODE	CAS no.	IUPAC compound name (chemical formula) (common name(s))
<b>Target analytes—Continued</b>					
32104	75-25-2	Tribromomethane (CHBr <sub>3</sub> ) (bromoform)	39180	79-01-6	Trichloroethene (C <sub>2</sub> HCl <sub>3</sub> ) (trichloroethylene, TCE)
77652	76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane (C <sub>2</sub> Cl <sub>3</sub> F <sub>3</sub> ) (CFC 113)	34488	75-69-4	Trichlorofluoromethane (CCl <sub>3</sub> F) (CFC 11)
77613	87-61-6	1,2,3-Trichlorobenzene (C <sub>6</sub> H <sub>3</sub> Cl <sub>3</sub> )	32106	67-66-3	Trichloromethane (CHCl <sub>3</sub> ) (chloroform)
34551	120-82-1	1,2,4-Trichlorobenzene (C <sub>6</sub> H <sub>3</sub> Cl <sub>3</sub> )	77443	96-18-4	1,2,3-Trichloropropane (C <sub>3</sub> H <sub>5</sub> Cl <sub>3</sub> ) (allyl trichloride)
34506	71-55-6	1,1,1-Trichloroethane (C <sub>2</sub> H <sub>3</sub> Cl <sub>3</sub> ) (methyl chloroform)	77222	95-63-6	1,2,4-Trimethylbenzene (C <sub>9</sub> H <sub>12</sub> ) (pseudocumene)
34511	79-00-5	1,1,2-Trichloroethane (C <sub>2</sub> H <sub>3</sub> Cl <sub>3</sub> ) (vinyl trichloride)			
<b>Other analytes</b>					
81555	108-86-1	Bromobenzene (C <sub>6</sub> H <sub>5</sub> Br) (phenyl bromide)	77103	591-78-6	2-Hexanone (C <sub>6</sub> H <sub>12</sub> O) (butyl methyl ketone, MBK)
77297	74-97-5	Bromochloromethane (CH <sub>2</sub> BrCl) (methylene chlorobromide)	77424	74-88-4	Iodomethane (CH <sub>3</sub> I) (methyl iodide)
81595	78-93-3	2-Butanone (C <sub>4</sub> H <sub>8</sub> O) (methyl ethyl ketone, MEK)	77356	99-87-6	1-Isopropyl-4-methylbenzene (C <sub>10</sub> H <sub>14</sub> ) ( <i>p</i> -isopropyltoluene)
77041	75-15-0	Carbon disulfide (CS <sub>2</sub> )	81597	80-62-6	Methyl 2-methyl-2-propenoate (C <sub>5</sub> H <sub>8</sub> O <sub>2</sub> ) (methyl methacrylate)
77275	95-49-8	1-Chloro-2-methylbenzene (C <sub>7</sub> H <sub>7</sub> Cl) ( <i>o</i> -chlorotoluene)	78133	108-10-1	4-Methyl-2-pentanone (C <sub>6</sub> H <sub>12</sub> O) (isobutyl methyl ketone, MIK)
77277	106-43-4	1-Chloro-4-methylbenzene (C <sub>7</sub> H <sub>7</sub> Cl) ( <i>p</i> -chlorotoluene)	81593	126-98-7	2-Methyl-2-propenenitrile (C <sub>4</sub> H <sub>5</sub> N) (methyl acrylonitrile)
78109	107-05-1	3-Chloro-1-propene (C <sub>3</sub> H <sub>5</sub> Cl) (allyl chloride)	49991	96-33-3	Methyl-2-propenoate (C <sub>4</sub> H <sub>6</sub> O <sub>2</sub> ) (methyl acrylate)
30217	74-95-3	Dibromomethane (CH <sub>2</sub> Br <sub>2</sub> ) (methylene bromide)	77350	135-98-8	(1-Methylpropyl)benzene (C <sub>10</sub> H <sub>14</sub> ) ( <i>sec</i> -butylbenzene)
73547	110-57-6	<i>trans</i> -1,4-Dichloro-2-butene (C <sub>4</sub> H <sub>6</sub> Cl <sub>2</sub> ) ( <i>E</i> )-1,4-dichloro-2-butene)	81576	60-29-7	1,1'-Oxybisethane (C <sub>4</sub> H <sub>10</sub> O) (diethyl ether)
77173	142-28-9	1,3-Dichloropropane (C <sub>3</sub> H <sub>6</sub> Cl <sub>2</sub> ) (trimethylene dichloride)	81552	67-64-1	2-Propanone (C <sub>3</sub> H <sub>6</sub> O) (acetone)
77170	594-20-7	2,2-Dichloropropane (C <sub>3</sub> H <sub>6</sub> Cl <sub>2</sub> )	77562	630-20-6	1,1,1,2-Tetrachloroethane (C <sub>2</sub> H <sub>2</sub> Cl <sub>4</sub> )
77168	563-58-6	1,1-Dichloropropene (C <sub>3</sub> H <sub>4</sub> Cl <sub>2</sub> )	34516	79-34-5	1,1,2,2-Tetrachloroethane (C <sub>2</sub> H <sub>2</sub> Cl <sub>4</sub> )
77353	98-06-6	(1,1-Dimethylethyl)benzene (C <sub>10</sub> H <sub>14</sub> ) ( <i>tert</i> -butylbenzene)	49999	488-23-3	1,2,3,4-Tetramethylbenzene (C <sub>10</sub> H <sub>14</sub> ) (prehitene)
81607	109-99-9	1,4-Epoxybutane (C <sub>4</sub> H <sub>8</sub> O) (tetrahydrofuran)	50000	527-53-7	1,2,3,5-Tetramethylbenzene (C <sub>10</sub> H <sub>14</sub> ) (isodurene)
77220	611-14-3	1-Ethyl-2-methylbenzene (C <sub>9</sub> H <sub>12</sub> ) (2-ethyltoluene)	77221	526-73-8	1,2,3-Trimethylbenzene (C <sub>9</sub> H <sub>12</sub> ) (hemimellitene)
73570	97-63-2	Ethyl 2-methyl-2-propenoate (C <sub>6</sub> H <sub>10</sub> O <sub>2</sub> ) (ethyl methacrylate)	77226	108-67-8	1,3,5-Trimethylbenzene (C <sub>9</sub> H <sub>12</sub> ) (mesitylene)

The purpose of this report is twofold: (1) to document the study design used to evaluate the stability of low concentrations of VOCs in two different water matrices, and (2) to report the respective analytical results. A surface- and a ground-water matrix were spiked with 87 VOCs to achieve a theoretical concentration of 0.5 µg/L for most VOCs. Five replicate spike samples from each water matrix were analyzed at selected time intervals up to 216 days along with continuing calibration verification standards (CCVS). Continuing calibration verification standards are prepared daily from volatile-grade blank water spiked with all 87 VOCs included in this study at a concentration of approximately 1.0 µg/L for most VOCs.

## ACKNOWLEDGMENTS

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## STUDY DESIGN

The study used a design similar to that outlined in the American Society for Testing and Materials (1988), "Standard Practice for Estimation of Holding Time for Water Samples Containing Organic and Inorganic Constituents." The stability of VOCs in water is compound specific and may also depend on the water matrix. Data to characterize the stability of the 87 VOCs presented in table 1 were determined using replicate analyses at discrete time intervals. The water matrices examined included a surface-water sample collected from Bear Creek near Interstate Highway 470 in Morrison, Colorado, and a ground-water sample collected from a private well near Conifer, Colorado. The sample holding-time intervals used for this study were 0, 14, 28, 37, 47, 56, 112, 156, and 216 days. On day 0, an unspiked sample from each water matrix was analyzed to measure VOC concentrations in the original matrix. Five replicate spike samples from each

water matrix were subsequently analyzed on a random basis at each time interval.

The number of replicate spike samples was selected on the basis of laboratory precision data. A set of NWQL spiked sample data was used to characterize laboratory precision, which in turn, determined the number of replicate spike samples needed (American Society for Testing and Materials, 1988). The NWQL spiked samples were reagent water to which 87 VOCs were added to achieve a theoretical concentration of 0.5 µg/L for most of the VOCs. These samples are hereafter referred to as set spike samples. The replicate spike samples of each water matrix used to characterize the stability of VOCs in this study were also spiked with 87 VOCs to achieve a concentration of 0.5 µg/L for most of the VOCs.

## Determination of the Number of Replicate Spike Samples

A set of concentration data from 60 set spike samples was obtained from the NWQL and used to document laboratory precision and to subsequently determine the number of replicate spike samples to be analyzed in the VOC stability study. The set spike samples were analyzed using multiple instruments and operators at the NWQL over a 6-month period. Summary statistics were calculated from this set of data, and the number of replicate spike samples to be analyzed in the VOC stability study were calculated using the following equation (American Society for Testing and Materials, 1988).

$$N = (t \times RSD_{ss}/D)^2, \quad (1)$$

where

$N$  = minimum number of replicate spike samples required in the stability study;

$t$  = Student's  $t$  (determined on the basis of set spike samples);

$RSD_{ss}$  = relative standard deviation of the set spike data, in percent; and

$D$  = 20 percent (maximum variation from mean concentration to be tolerated).

Table 2 lists the summary statistics for each VOC for the 60 set spike samples and the number of replicate spike samples required for each holding-time interval, as calculated using equation 1.



**Table 2.** Summary statistics for 60 spiked reagent-water samples (set spikes) used to calculate the number of replicate spike samples needed to determine volatile organic compound (VOC) stability at the 99-percent confidence interval

[ $\mu\text{g/L}$ , micrograms per liter;  $s$ , standard deviation (in concentration terms) calculated from the set spike samples;  $RSD_{ss}$ , relative standard deviation of data from the set spike samples; %, percent;  $N$ , number of replicate spike samples required for each holding-time interval]

VOC	U.S. Geological Survey data base parameter code	Mean concentration ( $\mu\text{g/L}$ )	$s$ ( $\mu\text{g/L}$ )	$RSD_{ss}$ (%)	$N$
<b>Target analytes</b>					
Benzene	34030	0.49	0.04	7.4	1
Bromodichloromethane	32101	.47	.04	8.9	2
Bromoethene	50002	.46	.04	9.5	2
Bromomethane	34413	.47	.11	23.2	10
<i>n</i> -Butylbenzene	77342	.44	.06	13.1	3
Chlorobenzene	34301	.48	.03	5.8	1
Chloroethane	34311	.48	.08	16.1	5
Chloroethene	39175	.55	.13	23.3	10
Chloromethane	34418	.53	.13	24.1	11
1,2-Dibromo-3-chloropropane	82625	.43	.13	29.0	15
Dibromochloromethane	32105	.46	.04	8.8	2
1,2-Dibromoethane	77651	.48	.04	7.7	1
1,2-Dichlorobenzene	34536	.48	.07	14.9	4
1,3-Dichlorobenzene	34566	.47	.07	14.8	4
1,4-Dichlorobenzene	34571	.46	.07	15.5	5
Dichlorodifluoromethane	34668	.52	.13	25.0	12
1,1-Dichloroethane	34496	.50	.04	8.8	2
1,2-Dichloroethane	32103	.50	.05	9.5	2
1,1-Dichloroethene	34501	.49	.08	15.4	5
<i>cis</i> -1,2-Dichloroethene	77093	.47	.03	7.3	1
<i>trans</i> -1,2-Dichloroethene	34546	.48	.03	7.1	1
Dichloromethane	34423	.54	.07	13.0	3
1,2-Dichloropropane	34541	.49	.04	8.9	2
<i>cis</i> -1,3-Dichloropropene	34704	.44	.04	9.4	2
<i>trans</i> -1,3-Dichloropropene	34699	.44	.06	12.7	3
1,2-Dimethylbenzene	77135	.48	.03	7.2	1
1,3- and 1,4-Dimethylbenzene	85795	.94	.06	6.8	1
Ethynylbenzene	77128	.46	.03	7.4	1
2-Ethoxy-2-methylpropane	50004	.42	.07	15.8	5
Ethylbenzene	34371	.47	.03	6.8	1

**Table 2.** Summary statistics for 60 spiked reagent-water samples (set spikes) used to calculate the number of replicate spike samples needed to determine volatile organic compound (VOC) stability at the 99-percent confidence interval—Continued

[ $\mu\text{g/L}$ , micrograms per liter;  $s$ , standard deviation (in concentration terms) calculated from the set spike samples;  $RSD_{ss}$ , relative standard deviation of data from the set spike samples; %, percent;  $N$ , number of replicate spike samples required for each holding-time interval]

VOC	U.S. Geological Survey data base parameter code	Mean concentration ( $\mu\text{g/L}$ )	$s$ ( $\mu\text{g/L}$ )	$RSD_{ss}$ (%)	$N$
<b>Target analytes—Continued</b>					
1,1,2,3,4,4-Hexachloro-1,3-butadiene	39702	0.47	0.07	14.5	4
1,1,1,2,2,2-Hexachloroethane	34396	.48	.07	15.3	5
2-Methoxy-2-methylbutane	50005	.41	.05	11.0	3
2-Methoxy-2-methylpropane	78032	.44	.05	11.3	3
Methylbenzene	34010	.49	.03	5.9	1
(1-Methylethyl)benzene	77223	.49	.04	7.2	1
Naphthalene	34696	.48	.08	17.2	6
2,2'-Oxybis[propane]	81577	.40	.06	14.7	4
2-Propenal	34210	19.0	3.0	15.5	5
2-Propenenitrile	34215	9.9	1.2	12.4	3
<i>n</i> -Propylbenzene	77224	.47	.03	6.4	1
Tetrachloroethene	34475	.48	.06	13.4	4
Tetrachloromethane	32102	.48	.04	8.2	2
Tribromomethane	32104	.46	.05	11.6	3
1,1,2-Trichloro-1,2,2-trifluoroethane	77652	.46	.07	14.8	4
1,2,3-Trichlorobenzene	77613	.46	.08	16.5	5
1,2,4-Trichlorobenzene	34551	.44	.07	16.6	5
1,1,1-Trichloroethane	34506	.49	.03	6.1	1
1,1,2-Trichloroethane	34511	.49	.04	8.6	2
Trichloroethene	39180	.47	.03	5.9	1
Trichlorofluoromethane	34488	.47	.07	14.3	4
Trichloromethane	32106	.51	.06	12.4	3
1,2,3-Trichloropropane	77443	.47	.05	11.1	3
1,2,4-Trimethylbenzene	77222	.46	.04	9.4	2
<b>Other analytes</b>					
Bromobenzene	81555	.46	.07	15.0	4
Bromochloromethane	77297	.50	.03	5.2	1
2-Butanone	81595	5.1	.57	11.2	3
Carbon disulfide	77041	.52	.12	22.2	9
1-Chloro-2-methylbenzene	77275	.46	.07	14.4	4

**Table 2.** Summary statistics for 60 spiked reagent-water samples (set spikes) used to calculate the number of replicate spike samples needed to determine volatile organic compound (VOC) stability at the 99-percent confidence interval—Continued

[ $\mu\text{g/L}$ , micrograms per liter;  $s$ , standard deviation (in concentration terms) calculated from the set spike samples;  $RSD_{ss}$ , relative standard deviation of data from the set spike samples; %, percent;  $N$ , number of replicate spike samples required for each holding-time interval]

VOC	U.S. Geological Survey data base parameter code	Mean concentration ( $\mu\text{g/L}$ )	$s$ ( $\mu\text{g/L}$ )	$RSD_{ss}$ (%)	$N$
<b>Other analytes—Continued</b>					
1-Chloro-4-methylbenzene	77277	0.48	0.03	7.2	1
3-Chloro-1-propene	78109	.86	.07	8.5	2
Dibromomethane	30217	.49	.04	7.9	2
<i>trans</i> -1,4-Dichloro-2-butene	73547	4.3	.69	16.1	5
1,3-Dichloropropane	77173	.47	.04	9.1	2
2,2-Dichloropropane	77170	.49	.04	7.3	1
1,1-Dichloropropene	77168	.48	.03	6.7	1
(1,1-Dimethylethyl)benzene	77353	.46	.04	9.2	2
1,4-Epoxybutane	81607	4.5	.53	11.8	3
1-Ethyl-2-methylbenzene	77220	.38	.03	8.1	2
Ethyl 2-methyl-2-propenoate	73570	2.27	.17	7.4	1
2-Hexanone	77103	4.8	.61	12.8	3
Iodomethane	77424	.47	.11	22.7	10
1-Isopropyl-4-methylbenzene	77356	.44	.07	16.4	5
Methyl 2-methyl-2-propenoate	81597	2.6	.25	9.9	2
4-Methyl-2-pentanone	78133	4.8	.54	11.4	3
2-Methyl-2-propenenitrile	81593	2.4	.22	9.1	2
Methyl-2-propenoate	49991	2.3	.22	9.8	2
(1-Methylpropyl)benzene	77350	.46	.05	10.3	2
1,1'-Oxybisethane	81576	.94	.16	17.3	6
2-Propanone	81552	5.6	1.6	27.9	14
1,1,1,2-Tetrachloroethane	77562	.48	.07	15.2	5
1,1,2,2-Tetrachloroethane	34516	.47	.08	16.0	5
1,2,3,4-Tetramethylbenzene	49999	.44	.07	16.3	5
1,2,3,5-Tetramethylbenzene	50000	.38	.04	10.8	3
1,2,3-Trimethylbenzene	77221	.35	.04	10.6	2
1,3,5-Trimethylbenzene	77226	.46	.03	7.5	1
Vinyl acetate	77057	4.4	.65	14.9	4

The value of 20 percent was chosen as the maximum variation from the mean concentration to avoid the need to analyze an unrealistic number of replicate spike samples and 20 percent reflects a maximum variation of 0.1 µg/L for most VOCs. The value of the Student's *t* statistic for a two-tailed 99-percent confidence interval determined on the basis of the 60 set spike samples analyzed by the NWQL is 2.660 (Dougherty, 1990). Note that the number of required replicate spike samples was rounded up to the nearest whole number (table 2). The number of replicate spike samples (*N*) required to determine VOC sample stability ranged from 1 to 15. Analysis of 15 replicate spike samples at each selected time interval was unrealistic and cost prohibitive for the stability study. Thus, the number of replicate spike samples required for this study was selected such that it was sufficient for most VOCs listed in table 1. Table 3 lists the percentage of VOCs that satisfy the conditions of equation 1 for various assumed numbers of replicate spike samples. Five replicate spike samples were selected for this study because approximately 89 percent (77 of 87 VOCs) of the VOCs listed in table 1 satisfied the conditions of equation 1 to evaluate sample stability (table 3). The VOCs that did not satisfy the conditions of equation 1 using five replicate spike samples include: bromomethane, carbon disulfide, chloroethene, chloromethane, 1,2-dibromo-3-chloropropane, dichlorodifluoromethane, iodomethane, naphthalene, 1,1'-oxybisethane, and 2-propanone. Some of the 10 VOCs that did not satisfy the conditions of equation 1 are possible laboratory contaminants that randomly appear in the reagent water used for the 60 set spike samples or are known contaminants in the HCl used to preserve the replicate spike samples.

## Study Methods

Maskarinec and others (1990) reported that the analytical precision and aliquot-to-aliquot variability were less than 5 percent when preparing samples from stock VOC solution held in a Tedlar sampling bag. No VOC loss from the Tedlar sampling bag was indicated over a 24-hour period. Thus, Tedlar sampling bags were used in this VOC stability study to transfer the spiked water matrices preserved with HCl to volatile organic analysis vials. Two sampling bags were used—one for each water matrix. Three liters of surface water were added to one sampling bag and 3 L of ground water were added to the second sampling bag.

**Table 3.** Number and percentage of volatile organic compounds (VOCs) that satisfy the conditions of equation 1 for assumed numbers of replicate spike samples

Assumed number of replicate spike samples	Number of VOCs included	Percentage of VOCs included
3	54	62
4	64	74
5	77	89
6	79	91
7	79	91
8	79	91
9	80	92
10	83	95

Each bag was stored in a dedicated refrigerator for 2 days to allow for any degassing that might occur. Headspace acquired after 2 days was removed from each sampling bag and HCl was added to each bag to achieve a pH of 2.0. Stock solution containing the VOCs listed in table 1 was added to each sampling bag to achieve a theoretical concentration of 0.5 µg/L for most of the 87 VOCs. Teflon tubing was attached to the on/off valve on each bag. Fifty volatile organic analysis vials were filled randomly from each sampling bag by filling each vial from the bottom up.

Ten samples known to be VOC free were prepared prior to any spiking procedures and placed in the same refrigerator that all other samples for this study were stored. The VOC-free samples contained water that was boiled, purged with nitrogen, and preserved with two drops of 1:1 HCl to achieve a pH less than 2.0. These samples are referred to as refrigerator blanks. The refrigerator was purchased new, and no additional samples of any type were kept in it during the period of this study.

Five spiked time-zero ( $t_0$ ) samples for each water matrix were analyzed immediately. All samples for this study were analyzed using purge and trap gas chromatography/mass spectrometry (P+T GC/MS). P+T GC/MS provides both very reliable identification and quantification for VOCs. The remaining samples were stored in a refrigerator at 4°C until they were ready to be analyzed. All five replicate spike samples for each water matrix were analyzed on the same days as part of

the normal NWQL analysis routine for VOCs (Connor and others, 1998).

## ANALYTICAL RESULTS

Analytical results for the surface- and ground-water matrices are presented in Section A (table 4) of the Supplemental Information section at the end of this report. Table 4 includes replicate-sample data for each spiked-water matrix, for all 87 VOCs included in this study. Five replicate spike samples of each water matrix were analyzed along with one refrigerator blank sample on days 0, 14, 28, 37, 47, 56, 112, 156, and 216. On day 0, an unspiked sample from each water matrix was analyzed to measure VOC concentrations in the original matrix. Concentration data are presented graphically in Section B from day 0 through day 216. The surface- and ground-water matrices appear together for comparison purposes.

Analytical results for CCVS are presented graphically in Section B and tabularly in Section C (table 5). Three replicate CCVS were analyzed on days 0, 14, 28, 37, 47, 56, 112, 156, and 216 to confirm that calibration was consistent (Connor and others, 1998). The CCVS percent-recovery data are provided to help determine if trends in VOC concentrations in the surface- and ground-water matrices are due to instrument variation over time or due to chemical instability.

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## SUPPLEMENTAL INFORMATION

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Section A - Analytical Results for Surface- and  
Ground-Water Matrices

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**Table 4. Concentrations of volatile organic compounds (VOCs) in surface- and ground-water matrices determined for stability study**

[IUPAC, International Union of Pure and Applied Chemistry; holding time, the amount of time samples were held prior to laboratory analysis; µg/L, micrograms per liter; E, estimated; <, VOC not detected; --, sample not analyzed]

IUPAC compound name	Holding time (days)	Concentration in surface-water matrix (µg/L)					Concentration in ground-water matrix (µg/L)					Refrigerator blank (µg/L)			
		Unspiked sample	1	2	3	4	5	Unspiked sample	1	2	3		4	5	
Benzene	0	E0.06	0.61	0.61	0.61	0.61	0.61	E0.01	0.56	0.57	0.57	0.57	0.57	0.56	<0.05
	14	--	.63	.62	.61	.61	.62	--	.57	.57	.57	.57	.57	.58	<.05
	28	--	.63	.64	.62	.63	.62	--	.58	.58	.58	.58	.58	.58	<.05
	37	--	.62	.62	.62	.63	.62	--	.57	.58	.56	.56	.56	.57	<.05
	47	--	.63	.63	.64	.64	.65	--	.59	.59	.59	.58	.58	.59	E.01
	56	--	.67	.67	.67	.67	.68	--	.61	.63	.61	.61	.62	.61	<.05
	112	--	.66	.66	.66	.66	.66	--	.62	.61	.60	.60	.61	.60	<.03
	156	--	.63	.63	.61	.63	.62	--	.58	.57	.57	.57	.58	.57	<.03
	216	--	.63	.63	.64	.64	.62	--	.57	.58	.58	.58	.56	.57	<.03
	0	<.10	.56	.54	.55	.55	.54	<.10	.55	.56	.56	.56	.57	.56	<.10
Bromodichloromethane	14	--	.58	.58	.59	.59	.60	--	.58	.58	.58	.58	.59	.60	<.10
	28	--	.54	.55	.54	.56	.54	--	.56	.54	.56	.56	.54	.54	<.10
	37	--	.59	.60	.59	.62	.59	--	.59	.59	.57	.57	.59	.60	<.10
	47	--	.63	.64	.62	.64	.64	--	.63	.62	.63	.63	.64	.64	<.10
	56	--	.62	.63	.64	.64	.63	--	.61	.60	.60	.62	.62	.59	<.10
	112	--	.58	.59	.58	.58	.57	--	.58	.56	.57	.57	.57	.56	<.05
	156	--	.57	.58	.57	.59	.58	--	.59	.56	.56	.56	.56	.58	<.05
	216	--	.60	.60	.61	.60	.59	--	.58	.61	.61	.59	.59	.59	<.05
	0	<.10	.49	.49	.49	.49	.50	<.10	.49	.50	.50	.50	.50	.48	<.10
	14	--	.52	.53	.52	.52	.53	--	.52	.52	.53	.53	.52	.54	<.10
Bromoethene	28	--	.56	.54	.53	.54	.55	--	.53	.55	.54	.54	.55	.55	<.10
	37	--	.59	.58	.59	.58	.60	--	.59	.58	.57	.57	.58	.60	<.10
	47	--	.60	.60	.62	.62	.62	--	.62	.62	.62	.62	.62	.62	<.10
	56	--	.66	.67	.65	.67	.66	--	.63	.66	.66	.64	.64	.66	<.10
	112	--	.56	.57	.57	.56	.53	--	.56	.54	.54	.55	.57	.55	<.10
	156	--	.50	.51	.50	.51	.50	--	.49	.49	.49	.50	.49	.50	<.10
	216	--	.45	.47	.48	.46	.45	--	.44	.46	.44	.44	.43	.45	<.10



**Table 4. Concentrations of volatile organic compounds (VOCs) in surface- and ground-water matrices determined for stability study—Continued**

[IUPAC, International Union of Pure and Applied Chemistry; holding time, the amount of time samples were held prior to laboratory analysis; µg/L, micrograms per liter; E, estimated; <, VOC not detected; --, sample not analyzed]

IUPAC compound name	Holding time (days)	Concentration in surface-water matrix (µg/L)					Concentration in ground-water matrix (µg/L)					Refrigerator blank (µg/L)		
		Unspiked sample		Spiked replicate sample number			Unspiked sample		Spiked replicate sample number					
		1	2	1	2	3	4	5	1	2	3		4	5
Bromomethane	0	<0.10	0.52	0.52	0.52	0.49	0.53	<0.10	0.55	0.51	0.51	0.53	0.54	<0.10
	14	--	.46	.45	.44	.46	.44	--	.50	.48	.49	.48	.47	<0.10
	28	--	.42	.36	.38	.40	.40	--	.41	.39	.43	.44	.44	<0.10
	37	--	.49	.49	.45	.55	.55	--	.57	.60	.60	.59	.58	<0.10
	47	--	.51	.49	.53	.52	.50	--	.53	.55	.54	.56	.56	<0.10
	56	--	E.36	E.36	E.32	E.38	E.37	--	E.36	E.40	E.39	E.37	E.38	<0.10
	112	--	E.34	E.39	E.32	E.36	E.35	--	E.38	E.42	E.44	E.43	E.43	<0.15
<i>n</i> -Butylbenzene	156	--	E.29	E.32	E.34	E.32	E.30	--	E.37	E.38	E.38	E.39	E.42	<0.15
	216	--	E.26	E.28	E.28	E.26	E.30	--	E.33	E.37	E.35	E.34	E.35	<0.15
	0	<0.05	.51	.50	.51	.50	.50	<0.05	.48	.51	.51	.50	.49	<0.05
	14	--	.47	.48	.47	.46	.46	--	.45	.46	.45	.44	.45	<0.05
	28	--	.48	.49	.46	.44	.44	--	.46	.46	.47	.45	.48	<0.05
	37	--	.42	.42	.39	.42	.39	--	.41	.39	.39	.39	.40	<0.05
	47	--	.45	.47	.46	.46	.43	--	.44	.43	.45	.44	.43	<0.05
Chlorobenzene	56	--	.45	.44	.40	.44	.45	--	.43	.43	.43	.44	.43	<0.05
	112	--	.36	.38	.39	.33	.31	--	.37	.35	.35	.36	.36	<0.19
	156	--	E.20	E.30	E.21	E.09	E.27	--	E.18	E.11	E.18	E.15	E.25	<0.19
	216	--	.39	.49	.48	.49	.33	--	.43	.52	.42	.40	.37	<0.19
	0	<0.05	.56	.56	.56	.56	.56	<0.05	.56	.56	.56	.56	.57	<0.05
	14	--	.56	.57	.56	.57	.57	--	.56	.56	.57	.56	.57	<0.05
	28	--	.56	.57	.55	.57	.56	--	.56	.57	.57	.56	.56	<0.05
Chlorobenzene	37	--	.54	.56	.55	.56	.55	--	.56	.56	.54	.55	.54	<0.05
	47	--	.55	.56	.57	.57	.57	--	.57	.56	.56	.57	.57	<0.05
	56	--	.61	.61	.60	.61	.61	--	.59	.60	.59	.60	.59	<0.05
	112	--	.55	.56	.56	.55	.54	--	.56	.54	.54	.55	.54	<0.03
	156	--	.51	.54	.53	.55	.54	--	.54	.53	.54	.54	.53	<0.03
	216	--	.55	.57	.57	.55	.55	--	.56	.57	.54	.56	.56	<0.03

**Table 4. Concentrations of volatile organic compounds (VOCs) in surface- and ground-water matrices determined for stability study—Continued**

[IUPAC, International Union of Pure and Applied Chemistry; holding time, the amount of time samples were held prior to laboratory analysis; µg/L, micrograms per liter; E, estimated; <, VOC not detected; --, sample not analyzed]

IUPAC compound name	Holding time (days)	Concentration in surface-water matrix (µg/L)					Concentration in ground-water matrix (µg/L)					Refrigerator blank (µg/L)		
		Unspiked sample		Spiked replicate sample number			Unspiked sample		Spiked replicate sample number					
		1	2	3	4	5	1	2	3	4	5			
Chloroethane	0	<0.10	0.45	0.47	0.47	0.45	0.44	<0.10	0.47	0.46	0.48	0.48	0.49	<0.10
	14	--	.50	.51	.49	.48	.49	--	.51	.50	.50	.50	.50	<0.10
	28	--	.49	.48	.48	.50	.50	--	.48	.50	.50	.50	.50	<0.10
	37	--	.48	.48	.48	.47	.48	--	.49	.50	.49	.50	.50	<0.10
	47	--	.49	.51	.50	.49	.49	--	.52	.50	.52	.50	.50	<0.10
	56	--	.50	.52	.51	.51	.51	--	.50	.52	.50	.52	.51	<0.10
	112	--	E.53	E.52	E.53	E.54	E.53	--	E.53	E.52	E.55	E.52	E.52	<0.12
	156	--	.43	.43	.42	.44	.43	--	.42	.44	.43	.43	.45	<0.12
	216	--	.38	.39	.40	.40	.38	--	.38	.41	.40	.40	.39	<0.12
	0	<.10	.46	.48	.46	.47	.47	<.10	.49	.50	.50	.49	.50	<.10
	14	--	.51	.50	.50	.50	.50	--	.53	.52	.54	.52	.53	<.10
	28	--	.50	.51	.50	.52	.51	--	.53	.52	.52	.54	.54	<.10
37	--	.50	.50	.49	.50	.49	--	.51	.52	.50	.52	.51	<.10	
47	--	.50	.50	.51	.50	.50	--	.52	.52	.53	.53	.52	<.10	
56	--	.49	.48	.47	.49	.48	--	.49	.48	.47	.48	.49	<.10	
112	--	.44	.47	.47	.44	.43	--	.46	.45	.45	.47	.46	<.11	
156	--	.41	.44	.44	.45	.45	--	.43	.42	.44	.46	.44	<.11	
216	--	.30	.33	.33	.32	.33	--	.30	.33	.30	.31	.33	<.11	
Chloromethane	0	<.20	.50	.52	.51	.49	.50	<.20	.52	.51	.52	.52	.51	<.20
	14	--	.52	.49	.49	.47	.49	--	.53	.51	.53	.52	.52	<.20
	28	--	.49	.49	.48	.51	.52	--	.51	.50	.53	.52	.53	<.20
	37	--	.48	.47	.46	.46	.47	--	.49	.48	.49	.48	.49	<.20
	47	--	.48	.49	.49	.49	.48	--	.49	.49	.49	.51	.50	<.20
	56	--	.57	.59	.58	.57	.57	--	.53	.55	.53	.57	.58	<.20
	112	--	E.46	E.48	E.49	E.47	E.45	--	E.47	E.46	E.46	E.47	E.46	<.25
	156	--	E.47	E.50	E.49	E.49	E.48	--	E.53	E.54	E.55	E.55	E.55	<.25
	216	--	E.26	E.29	E.30	E.26	E.28	--	E.31	E.33	E.31	E.34	E.33	<.25

**Table 4. Concentrations of volatile organic compounds (VOCs) in surface- and ground-water matrices determined for stability study—Continued**

[IUPAC, International Union of Pure and Applied Chemistry; holding time, the amount of time samples were held prior to laboratory analysis; µg/L, micrograms per liter; E, estimated; <, VOC not detected; --, sample not analyzed]

IUPAC compound name	Holding time (days)	Concentration in surface-water matrix (µg/L)					Concentration in ground-water matrix (µg/L)					Refrigerator blank (µg/L)		
		Unspiked sample	Spiked replicate sample number				Unspiked sample	Spiked replicate sample number						
			1	2	3	4		5	1	2	3		4	5
Target analytes—Continued														
1,2-Dibromo-3-chloro-propane	0	<0.50	0.54	0.56	0.53	0.54	0.56	<0.50	0.57	0.55	0.57	0.57	0.57	<0.50
	14	--	.53	.57	.58	.56	.60	--	.56	.56	.52	.52	.54	<.50
	28	--	.51	.54	.54	.54	.53	--	.54	.50	.55	.55	.53	<.50
	37	--	.58	.61	.60	.63	.58	--	.55	.55	.58	.58	.56	<.50
	47	--	.59	.66	.65	.64	.62	--	.60	.56	.62	.60	.62	<.50
	56	--	.59	.58	.59	.59	.63	--	.54	.58	.56	.56	.53	<.50
	112	--	.42	.41	.42	.38	.39	--	.38	.38	.40	.41	.38	<.21
	156	--	.42	.47	.44	.43	.45	--	.46	.43	.40	.39	.42	<.21
	216	--	E.40	E.44	E.45	E.42	E.45	--	E.46	E.43	E.45	E.36	E.42	<.21
Dibromochloromethane	0	<.10	.54	.56	.55	.56	.57	<.10	.56	.57	.56	.56	.57	<.10
	14	--	.56	.56	.58	.58	.57	--	.56	.54	.55	.56	.58	<.10
	28	--	.50	.50	.52	.51	.50	--	.52	.51	.52	.51	.52	<.10
	37	--	.55	.56	.58	.58	.58	--	.56	.58	.57	.57	.58	<.10
	47	--	.62	.62	.62	.63	.62	--	.63	.60	.61	.62	.63	<.10
	56	--	.59	.62	.62	.61	.63	--	.59	.60	.60	.60	.58	<.10
	112	--	.49	.50	.50	.48	.48	--	.49	.48	.48	.49	.47	<.18
	156	--	.48	.53	.51	.52	.51	--	.53	.52	.52	.52	.51	<.18
	216	--	.54	.55	.55	.54	.54	--	.57	.57	.56	.56	.55	<.18
1,2-Dibromoethane	0	<.10	.54	.55	.56	.57	.55	<.10	.57	.58	.57	.57	.57	<.10
	14	--	.59	.59	.59	.60	.60	--	.58	.58	.58	.56	.59	<.10
	28	--	.54	.55	.55	.55	.56	--	.55	.54	.57	.54	.55	<.10
	37	--	.58	.60	.60	.61	.59	--	.58	.59	.58	.58	.58	<.10
	47	--	.59	.60	.61	.60	.60	--	.62	.58	.59	.59	.60	<.10
	56	--	.63	.65	.63	.64	.65	--	.60	.61	.61	.63	.61	<.10
	112	--	.56	.57	.57	.55	.55	--	.56	.55	.55	.54	.55	<.04
	156	--	.51	.56	.55	.58	.55	--	.56	.56	.56	.54	.56	<.04
	216	--	.54	.54	.58	.57	.56	--	.55	.57	.56	.54	.56	<.04

**Table 4. Concentrations of volatile organic compounds (VOCs) in surface- and ground-water matrices determined for stability study—Continued**

[IUPAC, International Union of Pure and Applied Chemistry; holding time, the amount of time samples were held prior to laboratory analysis; µg/L, micrograms per liter; E, estimated; <, VOC not detected; --, sample not analyzed]

IUPAC compound name	Holding time (days)	Concentration in surface-water matrix (µg/L)					Concentration in ground-water matrix (µg/L)					Refrigerator blank (µg/L)		
		Unspiked sample		Spiked replicate sample number			Unspiked sample		Spiked replicate sample number					
		1	2	3	4	5	1	2	3	4	5			
1,2-Dichlorobenzene	0	<0.05	0.56	0.57	0.57	0.56	0.58	0.59	0.58	0.58	0.58	0.58	0.58	<0.05
	14	--	.58	.59	.58	.59	.58	.59	.58	.58	.58	.56	.58	<.05
	28	--	.57	.58	.58	.57	.57	.57	.58	.57	.58	.57	.58	<.05
	37	--	.56	.57	.58	.60	.58	.58	.57	.56	.56	.57	.57	<.05
	47	--	.58	.60	.60	.61	.59	.60	.59	.60	.59	.60	.60	<.05
	56	--	.63	.62	.62	.62	.65	.60	.60	.59	.59	.61	.60	<.05
	112	--	.50	.51	.52	.50	.48	.50	.49	.50	.49	.49	.49	<.05
	156	--	.49	.54	.51	.46	.52	.52	.48	.52	.51	.51	.52	<.05
	216	--	.54	.56	.58	.56	.54	.54	.58	.54	.54	.54	.55	<.05
	0	<.05	.56	.57	.57	.57	.57	<.05	.58	.58	.58	.57	.58	<.05
1,3-Dichlorobenzene	14	--	.57	.57	.57	.56	.57	.57	.55	.57	.56	.56	.58	<.05
	28	--	.57	.57	.54	.55	.55	.56	.54	.54	.55	.55	.55	<.05
	37	--	.54	.56	.54	.57	.55	.54	.54	.54	.54	.54	.55	<.05
	47	--	.56	.58	.56	.56	.55	.56	.56	.56	.55	.56	.57	<.05
	56	--	.59	.60	.58	.58	.61	.57	.57	.57	.57	.58	.57	<.05
	112	--	.47	.48	.48	.45	.44	.47	.44	.44	.46	.46	.46	<.05
	156	--	.45	.51	.48	.45	.50	.49	.46	.46	.48	.48	.49	<.05
	216	--	.51	.54	.55	.52	.50	.52	.54	.50	.50	.50	.50	<.05
	0	<.05	.56	.55	.55	.55	.56	<.05	.56	.57	.57	.57	.56	<.05
	14	--	.54	.56	.54	.55	.54	.54	.54	.54	.54	.55	.55	<.05
1,4-Dichlorobenzene	28	--	.52	.52	.52	.52	.52	.54	.54	.54	.54	.54	.54	<.05
	37	--	.55	.54	.53	.56	.52	.54	.53	.52	.52	.54	.53	<.05
	47	--	.55	.56	.56	.56	.54	.56	.55	.55	.55	.56	.58	<.05
	56	--	.57	.59	.56	.57	.58	.57	.57	.57	.57	.57	.56	<.05
	112	--	.45	.46	.47	.44	.42	.47	.46	.46	.46	.46	.46	<.05
	156	--	.44	.48	.46	.37	.49	.44	.41	.41	.46	.46	.47	E.01
	216	--	.50	.52	.54	.52	.51	.50	.54	.48	.48	.48	.51	E.01

**Table 4. Concentrations of volatile organic compounds (VOCs) in surface- and ground-water matrices determined for stability study—Continued**

[IUPAC, International Union of Pure and Applied Chemistry; holding time, the amount of time samples were held prior to laboratory analysis; µg/L, micrograms per liter; E, estimated; <, VOC not detected; --, sample not analyzed]

IUPAC compound name	Holding time (days)	Concentration in surface-water matrix (µg/L)					Concentration in ground-water matrix (µg/L)					Refrigerator blank (µg/L)		
		Unspiked sample		Spiked replicate sample number			Unspiked sample		Spiked replicate sample number					
		1	2	3	4	5	1	2	3	4	5			
Dichlorodifluoromethane	0	<0.20	0.40	0.41	0.40	0.41	<0.20	0.48	0.47	0.47	0.48	0.48	0.48	<0.20
	14	--	E.42	E.41	E.42	E.41	--	E.48	E.48	E.48	E.49	E.49	E.49	<20
	28	--	.44	.42	.42	.41	--	.51	.47	.51	.49	.50	.50	<20
	37	--	E.36	E.35	E.36	E.36	--	.42	.42	.40	.42	.42	.42	<20
	47	--	.38	.38	.38	.36	--	.44	.43	.42	.43	.42	.42	<20
	56	--	E.38	E.36	E.38	E.38	--	E.42	E.44	E.44	E.43	E.44	E.44	<20
	112	--	E.28	E.29	E.29	E.27	E.25	--	E.32	E.32	E.31	E.33	E.31	<10
1,1-Dichloroethane	156	--	E.59	E.64	E.66	E.63	--	E.68	E.68	E.73	E.72	E.71	E.71	<10
	216	--	E.19	E.21	E.20	E.20	--	E.22	E.23	E.20	E.22	E.23	E.23	<10
	0	<.05	.56	.56	.56	.56	<.05	.56	.56	.57	.57	.57	.56	<.05
	14	--	.60	.59	.58	.59	--	.59	.59	.59	.59	.59	.59	<.05
	28	--	.58	.59	.58	.59	--	.58	.58	.60	.58	.59	.58	<.05
	37	--	.57	.58	.58	.58	--	.57	.58	.57	.57	.57	.57	<.05
	47	--	.58	.57	.59	.60	.59	--	.59	.58	.59	.59	.58	<.05
1,2-Dichloroethane	56	--	.63	.64	.63	.64	--	.61	.63	.62	.63	.63	.63	<.05
	112	--	.68	.68	.68	.67	--	.68	.67	.67	.67	.66	.66	<.07
	156	--	.59	.60	.59	.59	--	.60	.59	.59	.60	.59	.59	<.07
	216	--	.58	.60	.60	.59	.59	--	.58	.59	.59	.59	.59	<.07
	0	<.05	.56	.57	.56	.57	<.05	.59	.59	.58	.58	.56	.56	<.05
	14	--	.59	.58	.58	.59	.60	--	.58	.57	.59	.60	.60	<.05
	28	--	.56	.56	.56	.57	.56	--	.54	.55	.56	.55	.55	<.05
1,2-Dichloroethane	37	--	.58	.58	.58	.59	.61	--	.59	.57	.56	.58	.57	<.05
	47	--	.58	.60	.59	.58	.57	--	.59	.58	.57	.58	.60	<.05
	56	--	.62	.63	.63	.61	.64	--	.64	.60	.62	.64	.61	<.05
	112	--	.72	.74	.72	.70	.69	--	.72	.69	.69	.70	.70	<.13
	156	--	.58	.60	.60	.60	.60	--	.59	.57	.58	.57	.59	<.13
	216	--	.57	.58	.58	.59	.59	--	.58	.58	.57	.57	.57	<.13
	216	--	.57	.58	.58	.59	.59	--	.58	.58	.57	.57	.57	<.13

**Table 4.** Concentrations of volatile organic compounds (VOCs) in surface- and ground-water matrices determined for stability study—Continued

[IUPAC, International Union of Pure and Applied Chemistry; holding time, the amount of time samples were held prior to laboratory analysis; µg/L, micrograms per liter; E, estimated; <, VOC not detected; --, sample not analyzed]

IUPAC compound name	Holding time (days)	Concentration in surface-water matrix (µg/L)					Concentration in ground-water matrix (µg/L)					Refrigerator blank (µg/L)	
		Unspiked sample		Spiked replicate sample number			Unspiked sample		Spiked replicate sample number				
		1	2	3	4	5	1	2	3	4	5		
1,1-Dichloroethene	0	<0.10	.52	.52	.52	.53	<0.10	.52	.52	.52	.52	.52	<0.10
	14	--	.57	.58	.56	.57	--	.57	.58	.57	.57	.57	<0.10
	28	--	.59	.60	.57	.58	--	.57	.56	.58	.56	.57	<0.10
	37	--	.56	.56	.54	.57	--	.55	.55	.52	.53	.54	<0.10
	47	--	.57	.58	.59	.58	--	.55	.54	.55	.54	.55	<0.10
	56	--	.63	.64	.61	.62	--	.56	.59	.54	.56	.58	<0.10
	112	--	.51	.53	.52	.51	.48	--	.49	.47	.46	.47	<0.04
<i>cis</i> -1,2-Dichloroethene	156	--	.45	.46	.45	.47	.48	--	.44	.39	.43	.42	<0.04
	216	--	.48	.47	.48	.47	.47	--	.42	.43	.41	.38	<0.04
	0	<.05	.54	.53	.53	.52	.53	<.05	.53	.52	.54	.53	<.05
	14	--	.55	.56	.55	.56	.56	--	.56	.56	.55	.57	<.05
	28	--	.56	.56	.55	.58	.55	--	.57	.55	.58	.56	<.05
	37	--	.54	.54	.53	.55	.53	--	.55	.54	.54	.54	<.05
	47	--	.54	.55	.56	.56	.55	--	.55	.56	.56	.55	<.05
<i>trans</i> -1,2-Dichloroethene	56	--	.59	.60	.58	.59	.59	--	.60	.60	.60	.60	<.05
	112	--	.52	.52	.52	.51	.51	--	.52	.53	.54	.54	<.04
	156	--	.54	.52	.52	.53	.53	--	.54	.55	.54	.55	<.04
	216	--	.52	.53	.54	.52	.53	--	.54	.55	.53	.54	<.04
	0	<.05	.52	.51	.52	.52	.52	<.05	.52	.52	.53	.52	<.05
	14	--	.59	.58	.58	.56	.56	--	.57	.58	.59	.57	<.05
	28	--	.60	.59	.59	.58	.56	--	.58	.57	.58	.58	<.05
	37	--	.55	.54	.51	.55	.53	--	.54	.54	.51	.54	<.05
	47	--	.56	.57	.58	.56	.56	--	.55	.54	.55	.57	<.05
	56	--	.59	.59	.57	.60	.59	--	.56	.58	.56	.56	<.05
	112	--	.48	.49	.49	.46	.43	--	.48	.45	.46	.48	<.03
	156	--	.49	.50	.49	.51	.51	--	.49	.45	.48	.49	<.03
	216	--	.47	.48	.48	.45	.46	--	.46	.47	.41	.41	<.03

**Table 4. Concentrations of volatile organic compounds (VOCs) in surface- and ground-water matrices determined for stability study—Continued**

[IUPAC, International Union of Pure and Applied Chemistry; holding time, the amount of time samples were held prior to laboratory analysis; µg/L, micrograms per liter; E, estimated; <, VOC not detected; --, sample not analyzed]

IUPAC compound name	Holding time (days)	Concentration in surface-water matrix (µg/L)					Concentration in ground-water matrix (µg/L)					Refrigerator blank (µg/L)			
		Unspiked sample		Spiked replicate sample number			Unspiked sample		Spiked replicate sample number						
		1	2	1	2	3	4	5	1	2	3		4	5	
Dichloromethane	0	<0.10	0.60	0.61	0.61	0.60	0.62	<0.14	0.61	0.61	0.62	0.61	0.61	0.61	<0.10
	14	--	.63	.63	.64	.64	.64	--	.63	.63	.63	.64	.64	.64	<0.10
	28	--	.62	.62	.62	.63	.62	--	.63	.62	.63	.63	.63	.62	<0.10
	37	--	.62	.64	.63	.63	.62	--	.64	.63	.62	.63	.63	.64	<0.10
	47	--	.64	.65	.63	.65	.65	--	.65	.64	.64	.65	.65	.64	<0.10
	56	--	.70	.70	.70	.69	.71	--	.68	.71	.68	.68	.68	.68	<0.10
	112	--	.63	.63	.62	.63	.64	--	.62	.63	.62	.63	.63	.62	<0.38
	156	--	.64	.62	.62	.63	.62	--	.64	.63	.63	.63	.63	.64	<0.38
	216	--	.63	.65	.66	.64	.63	--	.61	.65	.65	.64	.64	.64	<0.38
	0	<0.05	.56	.56	.56	.56	.56	<0.05	.56	.57	.57	.57	.57	.58	<0.05
1,2-Dichloropropane	14	--	.57	.58	.58	.56	.57	--	.57	.56	.56	.56	.56	.57	<0.05
	28	--	.55	.55	.55	.56	.55	--	.54	.55	.55	.54	.54	.54	<0.05
	37	--	.55	.56	.55	.57	.55	--	.54	.56	.55	.56	.56	.55	<0.05
	47	--	.55	.57	.56	.56	.56	--	.56	.56	.56	.56	.56	.56	<0.05
	56	--	.61	.61	.62	.62	.62	--	.59	.61	.61	.59	.59	.61	<0.05
	112	--	.68	.69	.69	.68	.67	--	.68	.65	.66	.68	.68	.67	<0.07
	156	--	.57	.58	.56	.58	.56	--	.57	.56	.56	.57	.57	.57	<0.07
	216	--	.59	.59	.59	.59	.58	--	.58	.58	.58	.58	.56	.57	<0.07
	0	<0.10	.54	.53	.55	.57	.54	<0.10	.55	.57	.54	.55	.55	.56	<0.10
	14	--	.56	.55	.56	.55	.58	--	.54	.55	.55	.54	.54	.56	<0.10
<i>cis</i> -1,3-Dichloropropene	28	--	.49	.50	.48	.50	.53	--	.51	.49	.48	.48	.48	.50	<0.10
	37	--	.50	.49	.51	.52	.50	--	.49	.50	.47	.48	.48	.50	<0.10
	47	--	.49	.50	.50	.49	.50	--	.48	.51	.53	.49	.51	.49	<0.10
	56	--	.50	.50	.55	.53	.54	--	.50	.48	.49	.51	.49	.49	<0.10
	112	--	.36	.37	.36	.35	.35	--	.36	.36	.36	.39	.38	.38	<0.09
	156	--	.31	.32	.31	.31	.34	--	.33	.34	.34	.32	.32	.34	<0.09
	216	--	.24	.23	.24	.24	.25	--	.26	.28	.27	.27	.27	.27	<0.09

**Table 4. Concentrations of volatile organic compounds (VOCs) in surface- and ground-water matrices determined for stability study—Continued**

[IUPAC, International Union of Pure and Applied Chemistry; holding time, the amount of time samples were held prior to laboratory analysis; µg/L, micrograms per liter; E, estimated; <, VOC not detected; --, sample not analyzed]

IUPAC compound name	Holding time (days)	Concentration in surface-water matrix (µg/L)					Concentration in ground-water matrix (µg/L)					Refrigerator blank (µg/L)		
		Unspiked sample		Spiked replicate sample number			Unspiked sample		Spiked replicate sample number					
		1	2	3	4	5	1	2	3	4	5			
<i>trans</i> -1,3-Dichloropropene	0	<0.10	0.53	0.55	0.54	0.52	0.55	<0.10	0.55	0.52	0.54	0.54	0.55	<0.10
	14	--	.55	.56	.58	.58	.56	--	.52	.54	.53	.55	.54	<0.10
	28	--	.50	.52	.48	.53	.50	--	.49	.48	.47	.50	.49	<0.10
	37	--	.50	.52	.50	.57	.55	--	.52	.50	.48	.49	.50	<0.10
	47	--	.52	.52	.54	.53	.50	--	.49	.51	.50	.53	.53	<0.10
	56	--	.50	.51	.52	.52	.53	--	.49	.48	.52	.50	.51	<0.10
	112	--	.32	.37	.35	.34	.35	--	.35	.37	.36	.35	.36	<.13
1,2-Dimethylbenzene	156	--	.30	.33	.32	.32	.32	--	.32	.34	.32	.33	.32	<.13
	216	--	.22	.24	.24	.26	.25	--	.27	.27	.24	.24	.28	<.13
	0	<.05	.57	.58	.56	.57	.57	<.05	.56	.56	.56	.57	.56	<.05
	14	--	.58	.58	.57	.58	.58	--	.56	.56	.56	.56	.57	<.05
	28	--	.56	.57	.55	.57	.55	--	.56	.55	.56	.55	.55	<.05
1,3-Dimethylbenzene and 1,4-Dimethylbenzene	37	--	.56	.56	.56	.57	.57	--	.55	.55	.53	.54	.54	<.05
	47	--	.57	.58	.58	.59	.57	--	.56	.56	.56	.57	.57	<.05
	56	--	.62	.62	.62	.62	.63	--	.59	.59	.58	.59	.60	<.05
	112	--	.56	.58	.57	.57	.55	--	.55	.55	.54	.55	.55	<.06
	156	--	.53	.55	.55	.56	.56	--	.54	.52	.53	.53	.54	<.06
	216	--	.55	.56	.58	.57	.56	--	.54	.58	.55	.53	.53	<.06
	0	E.02	1.1	1.1	1.1	1.1	1.1	<.05	1.1	1.1	1.1	1.1	1.1	<.05
	14	--	1.1	1.1	1.1	1.1	1.1	--	1.1	1.1	1.1	1.1	1.1	<.05
	28	--	1.1	1.1	1.1	1.1	1.1	--	1.0	1.0	1.0	1.0	1.0	<.05
	37	--	1.1	1.1	1.0	1.1	1.0	--	1.0	1.0	.97	.10	1.0	<.05
47	--	1.1	1.1	1.1	1.1	1.1	--	1.0	1.0	1.0	1.1	1.0	<.05	
56	--	1.2	1.1	1.1	1.2	1.2	--	1.1	1.1	1.1	1.1	1.1	<.05	
112	--	1.0	1.0	1.0	1.0	.99	--	1.0	.97	.99	1.0	1.0	<.06	
156	--	.94	1.0	.98	1.0	1.0	--	1.0	.93	.99	1.0	1.0	<.06	
216	--	1.0	1.0	1.0	.98	1.0	--	1.0	1.1	.99	.94	1.0	<.06	



**Table 4. Concentrations of volatile organic compounds (VOCs) in surface- and ground-water matrices determined for stability study—Continued**

[IUPAC, International Union of Pure and Applied Chemistry; holding time, the amount of time samples were held prior to laboratory analysis; µg/L, micrograms per liter; E, estimated; <, VOC not detected; --, sample not analyzed]

IUPAC compound name	Holding time (days)	Concentration in surface-water matrix (µg/L)					Concentration in ground-water matrix (µg/L)					Refrigerator blank (µg/L)		
		Unspiked sample		Spiked replicate sample number			Unspiked sample		Spiked replicate sample number					
		1	2	3	4	5	1	2	3	4	5			
Ethylbenzene	0	<0.05	0.54	0.53	0.53	0.54	0.55	<0.05	0.55	0.55	0.54	0.54	0.55	<0.05
	14	--	.50	.53	.51	.51	.52	--	.46	.48	.43	.43	.48	<0.05
	28	--	.50	.49	.49	.49	.48	--	.41	.42	.40	.40	.41	<0.05
	37	--	.49	.51	.50	.50	.50	--	.43	.40	.39	.39	.43	<0.05
	47	--	.50	.51	.51	.51	.51	--	.38	.40	.40	.40	.42	<0.05
	56	--	.53	.50	.55	.54	.54	--	.36	.43	.31	.36	.43	<0.05
	112	--	.46	.47	.48	.47	.47	--	.35	.32	.30	.31	.34	E.01
	156	--	.42	.46	.46	.47	.47	--	.34	.22	.33	.33	.30	E.01
	216	--	.38	.45	.43	.30	.14	--	.34	.37	.34	.18	.32	<0.04
	0	<.10	.56	.56	.56	.56	.57	<.10	.58	.58	.58	.59	.57	<.10
2-Ethoxy-2-methylpropane	14	--	.59	.59	.60	.60	.62	--	.59	.60	.59	.59	.60	<.10
	28	--	.53	.54	.54	.56	.53	--	.55	.53	.54	.52	.52	<.10
	37	--	.58	.60	.60	.62	.60	--	.60	.60	.60	.60	.59	<.10
	47	--	.59	.60	.61	.61	.61	--	.62	.58	.60	.61	.62	<.10
	56	--	.64	.64	.67	.62	.65	--	.61	.62	.62	.64	.62	<.10
	112	--	.71	.72	.71	.70	.68	--	.68	.68	.67	.69	.69	<.05
	156	--	.58	.59	.58	.59	.58	--	.60	.58	.57	.58	.58	<.05
	216	--	.61	.61	.64	.63	.62	--	.60	.63	.63	.61	.62	<.05
	0	E.01	.56	.56	.56	.56	.57	<.05	.56	.55	.56	.56	.56	<.05
	14	--	.57	.57	.56	.56	.56	--	.55	.56	.56	.54	.56	<.05
Ethylbenzene	28	--	.57	.56	.55	.56	.56	--	.56	.54	.55	.55	.56	<.05
	37	--	.55	.55	.55	.56	.55	--	.54	.54	.52	.54	.54	<.05
	47	--	.56	.58	.56	.57	.56	--	.56	.55	.55	.55	.55	<.05
	56	--	.59	.59	.58	.59	.60	--	.57	.59	.58	.58	.58	<.05
	112	--	.54	.55	.55	.53	.52	--	.54	.52	.53	.54	.54	<.03
	156	--	.49	.53	.52	.53	.54	--	.54	.52	.53	.53	.53	<.03
	216	--	.54	.53	.55	.53	.54	--	.55	.58	.55	.53	.53	<.03

**Table 4. Concentrations of volatile organic compounds (VOCs) in surface- and ground-water matrices determined for stability study—Continued**

[IUPAC, International Union of Pure and Applied Chemistry; holding time, the amount of time samples were held prior to laboratory analysis; µg/L, micrograms per liter; E, estimated; <, VOC not detected; --, sample not analyzed]

IUPAC compound name	Holding time (days)	Concentration in surface-water matrix (µg/L)					Concentration in ground-water matrix (µg/L)					Refrigerator blank (µg/L)		
		Unspiked sample		Spiked replicate sample number			Unspiked sample		Spiked replicate sample number					
		1	2	3	4	5	1	2	3	4	5			
1,1,2,3,4-Hexachloro-1,3-butadiene	0	<0.20	0.56	0.59	0.59	0.60	0.61	<0.20	0.57	0.57	0.59	0.59	0.58	<0.20
	14	--	.52	.55	.52	.55	.53	--	.52	.54	.54	.54	.53	<20
	28	--	.53	.55	.53	.53	.53	--	.52	.54	.56	.54	.55	<20
	37	--	.49	.51	.49	.51	.48	--	.48	.49	.48	.49	.49	<20
	47	--	.51	.53	.53	.52	.50	--	.49	.49	.52	.52	.51	<20
	56	--	.52	.53	.49	.54	.56	--	.48	.49	.50	.51	.51	<20
	112	--	.34	.38	.37	.33	.31	--	.35	.33	.35	.34	.36	<14
1,1,1,2,2,2-Hexachloroethane	0	<0.05	.60	.60	.60	.63	.60	<0.05	.58	.60	.59	.58	.60	<0.05
	14	--	.61	.61	.60	.61	.60	--	.60	.60	.60	.60	.61	<0.05
	28	--	.63	.62	.62	.62	.62	--	.62	.61	.62	.62	.64	<0.05
	37	--	.61	.65	.64	.63	.61	--	.61	.62	.61	.62	.64	<0.05
	47	--	.70	.70	.70	.71	.69	--	.70	.68	.69	.69	.71	<0.05
	56	--	.56	.58	.56	.55	.58	--	.55	.56	.56	.58	.58	<0.05
	112	--	.45	.47	.47	.46	.45	--	.46	.45	.46	.44	.45	<0.05
2-Methoxy-2-methylbutane	0	<0.10	.56	.56	.58	.57	.57	<0.10	.57	.59	.57	.59	.58	<0.10
	14	--	.60	.60	.61	.61	.62	--	.59	.59	.58	.59	.61	<0.10
	28	--	.54	.56	.56	.56	.55	--	.54	.53	.54	.53	.53	<0.10
	37	--	.59	.60	.61	.63	.59	--	.61	.60	.58	.58	.59	<0.10
	47	--	.60	.61	.59	.63	.62	--	.60	.58	.58	.60	.62	<0.10
	56	--	.62	.64	.66	.62	.66	--	.60	.62	.61	.62	.60	<0.10
	112	--	.66	.68	.67	.66	.64	--	.64	.63	.63	.64	.63	<0.10
156	--	.58	.59	.57	.58	.58	--	.59	.58	.55	.59	.58	<0.10	
216	--	.56	.57	.58	.57	.57	--	.54	.57	.55	.55	.56	<0.10	

**Table 4. Concentrations of volatile organic compounds (VOCs) in surface- and ground-water matrices determined for stability study—Continued**

[IUPAC, International Union of Pure and Applied Chemistry; holding time, the amount of time samples were held prior to laboratory analysis; µg/L, micrograms per liter; E, estimated; <, VOC not detected; --, sample not analyzed]

IUPAC compound name	Holding time (days)	Concentration in surface-water matrix (µg/L)					Concentration in ground-water matrix (µg/L)					Refrigerator blank (µg/L)						
		Unspiked sample		Spiked replicate sample number			Unspiked sample		Spiked replicate sample number									
		1	2	1	2	3	4	5	1	2	3		4	5				
2-Methoxy-2-methylpropane	0	1.5	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	<0.10	0.63	0.64	0.63	0.66	0.64	<0.10	
	14	--	2.2	2.2	2.2	2.3	2.3	2.4	2.4	2.4	--	.64	.65	.65	.66	.67	<0.10	
	28	--	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	--	.61	.60	.61	.60	.60	<0.10	
	37	--	2.3	2.3	2.3	2.4	2.4	2.3	2.3	2.3	--	.68	.67	.67	.66	.68	<0.10	
	47	--	2.3	2.4	2.4	2.3	2.4	2.3	2.3	2.3	--	.70	.66	.67	.69	.69	<0.10	
	56	--	2.4	2.5	2.5	2.4	2.4	2.5	2.5	2.5	--	.67	.69	.68	.71	.66	<0.10	
	112	--	2.4	2.4	2.4	2.4	2.3	2.2	2.2	2.2	--	.67	.68	.67	.69	.68	<0.10	
	156	--	2.1	2.2	2.1	2.2	2.1	2.2	2.1	2.1	--	.65	.63	.62	.63	.64	<0.10	
	216	--	2.0	2.0	2.1	2.0	2.1	2.0	2.0	2.0	--	.59	.64	.61	.58	.60	<0.10	
	0	E.05	.62	.63	.62	.62	.62	.62	.62	.62	.62	<.05	.59	.58	.59	.58	.59	<.05
Methylbenzene	14	--	.63	.62	.61	.61	.61	.61	.61	.61	--	.58	.58	.58	.58	.59	<.05	
	28	--	.62	.62	.61	.63	.61	.61	.61	.61	--	.59	.58	.59	.58	.59	<.05	
	37	--	.61	.61	.60	.62	.60	.60	.60	.60	--	.57	.57	.56	.56	.56	<.05	
	47	--	.62	.64	.63	.63	.63	.63	.62	.62	--	.59	.58	.59	.59	.59	<.05	
	56	--	.64	.64	.63	.63	.64	.64	.64	.64	--	.59	.60	.58	.59	.59	<.05	
	112	--	.62	.64	.63	.63	.62	.62	.61	.61	--	.59	.58	.58	.59	.58	<.04	
	156	--	.58	.61	.60	.61	.60	.61	.62	.62	--	.58	.56	.56	.56	.56	<.04	
	216	--	.64	.63	.66	.63	.66	.63	.63	.63	--	.59	.60	.59	.59	.59	E.01	
	0	<.05	.60	.61	.61	.60	.61	.60	.61	.61	.61	<.05	.60	.60	.60	.61	.60	<.05
	14	--	.56	.56	.55	.55	.55	.55	.55	.55	.55	--	.55	.56	.55	.55	.56	<.05
(1-Methylethyl)benzene	28	--	.56	.55	.54	.55	.54	.54	.54	.54	--	.55	.55	.55	.55	.55	<.05	
	37	--	.53	.55	.53	.53	.53	.54	.54	.54	--	.53	.53	.52	.53	.53	<.05	
	47	--	.55	.56	.56	.56	.56	.56	.54	.54	--	.55	.56	.55	.55	.55	<.05	
	56	--	.58	.58	.57	.58	.57	.58	.59	.59	--	.57	.57	.57	.57	.58	<.05	
	112	--	.54	.54	.54	.54	.54	.54	.52	.52	--	.54	.53	.53	.54	.53	<.03	
	156	--	.48	.52	.51	.50	.51	.50	.52	.52	--	.51	.48	.50	.50	.50	<.03	
	216	--	.53	.54	.56	.53	.56	.53	.53	.53	--	.53	.56	.52	.51	.53	<.03	

**Table 4. Concentrations of volatile organic compounds (VOCs) in surface- and ground-water matrices determined for stability study—Continued**

[IUPAC, International Union of Pure and Applied Chemistry; holding time, the amount of time samples were held prior to laboratory analysis; µg/L, micrograms per liter; E, estimated; <, VOC not detected; --, sample not analyzed]

IUPAC compound name	Holding time (days)	Concentration in surface-water matrix (µg/L)					Concentration in ground-water matrix (µg/L)					Refrigerator blank (µg/L)
		Unspiked sample		Spiked replicate sample number			Unspiked sample		Spiked replicate sample number			
		1	2	3	4	5	1	2	3	4	5	
Naphthalene	0	<0.20	0.50	0.51	0.51	0.45	<0.20	0.42	0.50	0.49	0.47	<0.20
	14	--	.65	.67	.64	.74	--	.50	.52	.52	.53	<20
	28	--	.56	.64	.64	.64	--	.46	.48	.44	.49	<20
	37	--	.57	.63	.67	.57	--	.50	.39	.43	.52	<20
	47	--	E.73	E.76	E.72	E.76	--	E.56	E.58	E.62	E.62	<20
	56	--	.64	.64	.65	.70	--	.46	.49	.47	.48	<20
	112	--	.43	.50	.50	.45	--	.33	.31	.31	.34	<25
2,2'-Oxybis[propane]	156	--	E.24	E.38	E.31	E.37	--	E.19	E.21	E.16	E.23	<25
	216	--	.46	.55	.61	.52	--	.34	.44	<.25	.33	<25
	0	<.10	.60	.62	.60	.60	<.10	.61	.59	.62	.61	<.10
	14	--	.62	.58	.58	.60	--	.60	.60	.62	.61	<.10
	28	--	.54	.56	.57	.57	--	.57	.56	.54	.55	<.10
	37	--	.59	.62	.65	.62	--	.62	.63	.62	.61	<.10
	47	--	.63	.63	.61	.64	.63	--	.63	.63	.63	<.10
2-Propenal	56	--	.71	.76	.73	.74	--	.68	.70	.69	.66	<.10
	112	--	.75	.75	.73	.70	--	.72	.71	.70	.70	<.10
	156	--	.63	.64	.64	.64	--	.63	.62	.63	.61	<.10
	216	--	.61	.60	.62	.60	--	.61	.64	.64	.58	<.10
	0	<2.0	E30.1	E29.7	E30.2	E30.8	<2.0	E31.3	E32.1	E31.9	E32.0	<2.0
	14	--	14.8	16.8	16.7	17.8	--	21.9	22.3	22.1	22.6	<2.0
	28	--	3.5	3.5	3.7	4.8	--	15.9	16.2	16.6	16.6	<2.0
2-Propenal	37	--	1.6	2.1	2.1	1.1	--	21.6	21.8	22.6	23.0	<2.0
	47	--	<2.0	<2.0	<2.0	<2.0	--	E22.2	E21.8	E22.9	E22.9	<2.0
	56	--	<2.0	<2.0	<2.0	<2.0	--	17.4	18.3	18.1	18.2	<2.0
2-Propenal	112	--	<1.4	<1.4	<1.4	<1.4	--	E14.7	E14.4	E14.2	E14.3	<1.4
	156	--	<1.4	<1.4	<1.4	<1.4	--	E8.2	E7.9	E7.9	E7.8	<1.4
	216	--	<1.4	<1.4	<1.4	<1.4	--	E4.4	E6.7	E5.7	E6.3	<1.4

**Table 4. Concentrations of volatile organic compounds (VOCs) in surface- and ground-water matrices determined for stability study—Continued**

[IUPAC, International Union of Pure and Applied Chemistry; holding time, the amount of time samples were held prior to laboratory analysis; µg/L, micrograms per liter; E, estimated; <, VOC not detected; --, sample not analyzed]

IUPAC compound name	Holding time (days)	Concentration in surface-water matrix (µg/L)					Concentration in ground-water matrix (µg/L)					Refrigerator blank (µg/L)			
		Unspiked sample		Spiked replicate sample number			Unspiked sample		Spiked replicate sample number						
		1	2	3	4	5	1	2	3	4	5				
2-Propenenitrile	0	<2.0	15.1	14.9	15.2	15.4	15.4	15.4	<2.0	15.6	15.5	15.6	15.6	15.6	<2.0
	14	--	E16.8	E17.0	E17.4	E17.2	E17.7	--	E16.6	E16.4	E16.7	E16.7	E16.9	<2.0	
	28	--	14.8	15.0	15.1	15.4	15.1	--	14.8	14.7	15.0	14.8	14.6	<2.0	
	37	--	11.4	12.0	12.1	12.3	12.0	--	11.4	11.5	11.4	11.6	11.8	<2.0	
	47	--	11.5	12.1	11.8	12.2	12.1	--	11.9	11.5	11.5	11.8	12.0	<2.0	
	56	--	14.4	14.6	15.1	14.1	14.7	--	13.4	14.0	13.6	14.0	13.8	<2.0	
	112	--	12.8	12.9	12.8	12.6	12.6	--	12.4	12.3	12.2	12.6	12.5	<1.2	
	156	--	12.3	12.5	12.5	12.3	12.3	--	12.3	12.3	12.0	12.0	12.0	<1.2	
	216	--	16.3	15.6	17.1	16.0	16.0	--	15.5	15.8	16.2	15.7	15.8	<1.2	
	0	<.05	.53	.54	.53	.53	.54	.54	<.05	.53	.54	.53	.54	.53	<.05
14	--	.51	.53	.51	.52	.51	.51	--	.51	.51	.50	.51	.52	<.05	
28	--	.52	.51	.51	.52	.50	.50	--	.50	.52	.52	.49	.52	<.05	
37	--	.50	.50	.49	.50	.50	.50	--	.48	.49	.48	.48	.49	<.05	
47	--	.51	.51	.53	.53	.50	.50	--	.50	.50	.51	.51	.51	<.05	
56	--	.54	.51	.52	.54	.53	.53	--	.52	.52	.50	.52	.52	<.05	
112	--	.47	.48	.48	.46	.44	.44	--	.48	.46	.46	.47	.46	<.04	
156	--	.40	.44	.43	.31	.44	.44	--	.43	.38	.41	.42	.44	<.04	
216	--	.44	.47	.48	.47	.43	.43	--	.47	.50	.46	.44	.47	<.04	
0	<.05	.55	.55	.54	.54	.55	.55	<.05	.55	.56	.56	.56	.55	<.05	
14	--	.55	.55	.55	.55	.53	.53	--	.53	.55	.55	.55	.55	<.05	
28	--	.55	.57	.54	.56	.55	.55	--	.55	.56	.56	.56	.56	<.05	
37	--	.53	.53	.51	.53	.51	.51	--	.52	.52	.52	.51	.53	<.05	
47	--	.52	.54	.54	.52	.51	.51	--	.52	.52	.54	.52	.51	<.05	
56	--	.57	.57	.55	.57	.56	.56	--	.55	.55	.56	.54	.55	<.05	
112	--	.44	.46	.45	.42	.42	.42	--	.45	.44	.44	.46	.44	<.04	
156	--	.46	.49	.49	.51	.49	.49	--	.50	.48	.50	.49	.49	<.04	
216	--	.47	.46	.48	.45	.47	.47	--	.46	.47	.43	.45	.46	<.04	

**Table 4.** Concentrations of volatile organic compounds (VOCs) in surface- and ground-water matrices determined for stability study—Continued

[IUPAC, International Union of Pure and Applied Chemistry; holding time, the amount of time samples were held prior to laboratory analysis; µg/L, micrograms per liter; E, estimated; <, VOC not detected; --, sample not analyzed]

IUPAC compound name	Holding time (days)	Concentration in surface-water matrix (µg/L)					Concentration in ground-water matrix (µg/L)					Refrigerator blank (µg/L)
		Unspiked sample		Spiked replicate sample number			Unspiked sample		Spiked replicate sample number			
		1	2	3	4	5	1	2	3	4	5	
Tetrachloromethane	0	<0.05	0.56	0.56	0.55	0.56	<0.05	0.56	0.56	0.55	0.55	<0.05
	14	--	.58	.58	.57	.59	--	.55	.57	.56	.58	<0.05
	28	--	.56	.55	.56	.56	--	.57	.56	.56	.56	<0.05
	37	--	.56	.57	.55	.57	--	.55	.57	.56	.56	<0.05
	47	--	.60	.61	.61	.62	--	.58	.59	.59	.60	<0.05
	56	--	.60	.61	.60	.61	--	.57	.59	.58	.59	<0.05
	112	--	.56	.57	.57	.55	--	.57	.54	.56	.55	<0.09
Tribromomethane	156	--	.55	.55	.54	.56	--	.54	.54	.54	.53	<0.09
	216	--	.57	.56	.57	.58	--	.56	.56	.55	.55	<0.09
	0	<.20	.59	.57	.58	.60	<.20	.58	.59	.58	.58	<.20
	14	--	.56	.56	.57	.58	--	.54	.54	.56	.56	<.20
	28	--	.49	.51	.51	.53	--	.51	.50	.50	.50	<.20
	37	--	.64	.66	.64	.68	--	.61	.63	.62	.62	<.20
	47	--	.72	.70	.72	.74	--	.76	.72	.69	.71	<.20
1,1,2-Trichloro-1,2,2-trifluoroethane	56	--	.60	.64	.63	.58	--	.59	.60	.61	.62	<.20
	112	--	.40	.42	.43	.41	--	.41	.40	.40	.40	<.10
	156	--	.46	.49	.49	.49	--	.50	.48	.46	.47	<.10
	216	--	E.45	E.50	.52	E.50	--	E.49	.51	.50	E.49	<.10
	0	<.05	.60	.62	.60	.59	<.05	.59	.60	.60	.62	<.05
	14	--	.66	.68	.65	.66	--	.65	.66	.66	.67	<.05
	28	--	E.67	E.68	E.64	E.65	--	E.67	E.66	E.68	E.67	<.05
1,1,2-Trichloro-1,2,2-trifluoroethane	37	--	.66	.66	.62	.66	--	.66	.66	.67	.66	<.05
	47	--	E.68	E.72	E.71	E.70	--	E.68	E.69	E.69	E.68	<.05
	56	--	E.70	E.68	E.67	E.70	--	E.69	E.70	E.70	E.71	<.05
	112	--	.50	.50	.49	.46	--	.49	.46	.45	.48	<.03
	156	--	.50	.52	.51	.53	--	.50	.48	.50	.50	<.03
	216	--	.45	.44	.47	.44	--	.43	.43	.41	.44	<.03

**Table 4. Concentrations of volatile organic compounds (VOCs) in surface- and ground-water matrices determined for stability study—Continued**

[IUPAC, International Union of Pure and Applied Chemistry; holding time, the amount of time samples were held prior to laboratory analysis; µg/L, micrograms per liter; E, estimated; <, VOC not detected; --, sample not analyzed]

IUPAC compound name	Holding time (days)	Concentration in surface-water matrix (µg/L)					Concentration in ground-water matrix (µg/L)					Refrigerator blank (µg/L)		
		Unspiked sample		Spiked replicate sample number			Unspiked sample		Spiked replicate sample number					
		1	2	1	2	3	4	5	1	2	3		4	5
1,1,3-Trichlorobenzene	0	<0.20	0.52	0.54	0.55	0.57	0.54	<0.20	0.51	0.56	0.56	0.55	0.54	<0.20
	14	--	.57	.58	.58	.59	.59	--	.53	.55	.55	.54	.56	<0.20
	28	--	.54	.60	.58	.56	.57	--	.53	.57	.55	.54	.56	<0.20
	37	--	.55	.56	.58	.59	.53	--	.53	.53	.50	.52	.54	<0.20
	47	--	.60	.65	.62	.65	.63	--	.60	.56	.60	.61	.62	<0.20
	56	--	.61	.62	.63	.62	.63	--	.57	.60	.59	.63	.57	<0.20
	112	--	.44	.48	.49	.46	.43	--	.43	.43	.43	.42	.44	<0.20
	156	--	E.27	E.42	E.31	E.18	E.39	--	E.26	E.19	E.26	E.21	E.33	<0.20
	216	--	.47	.59	.65	.63	.50	--	.50	.64	.54	.50	.48	<0.20
	0	<0.20	.52	.53	.53	.54	.52	<0.20	.48	.56	.52	.55	.52	<0.20
1,2,4-Trichlorobenzene	14	--	.50	.52	.51	.54	.54	--	.49	.50	.49	.50	.52	<0.20
	28	--	.51	.54	.52	.51	.51	--	.50	.51	.51	.51	.52	<0.20
	37	--	.48	.50	.50	.53	.47	--	.48	.47	.45	.46	.49	<0.20
	47	--	.54	.58	.56	.57	.54	--	.53	.52	.55	.55	.55	<0.20
	56	--	.52	.56	.52	.54	.57	--	.48	.51	.51	.53	.50	<0.20
	112	--	.39	.42	.43	.39	.36	--	.38	.38	.37	.39	.38	<0.19
	156	--	E.23	E.37	E.27	E.15	E.34	--	E.22	E.16	E.22	E.18	E.30	<0.19
	216	--	.43	.54	.53	.54	.43	--	.43	.54	.45	.43	.42	<0.19
	0	<0.05	.55	.56	.55	.56	.55	<0.05	.55	.56	.55	.56	.54	<0.05
	14	--	.57	.57	.57	.57	.58	--	.58	.57	.56	.57	.58	<0.05
1,1,1-Trichloroethane	28	--	.59	.58	.59	.59	.58	--	.59	.59	.59	.58	.59	<0.05
	37	--	.57	.55	.56	.57	.56	--	.57	.55	.55	.56	.56	<0.05
	47	--	.58	.57	.58	.58	.58	--	.57	.57	.56	.59	.58	<0.05
	56	--	.61	.61	.63	.61	.60	--	.58	.60	.61	.59	.60	<0.05
	112	--	.58	.59	.58	.59	.58	--	.58	.57	.57	.59	.57	<0.03
	156	--	.57	.57	.56	.56	.57	--	.57	.56	.57	.56	.56	<0.03
	216	--	.57	.58	.57	.56	.57	--	.56	.57	.56	.55	.56	<0.03

**Table 4. Concentrations of volatile organic compounds (VOCs) in surface- and ground-water matrices determined for stability study—Continued**

[IUPAC, International Union of Pure and Applied Chemistry; holding time, the amount of time samples were held prior to laboratory analysis; µg/L, micrograms per liter; E, estimated; <, VOC not detected; --, sample not analyzed]

IUPAC compound name	Holding time (days)	Concentration in surface-water matrix (µg/L)					Concentration in ground-water matrix (µg/L)					Refrigerator blank (µg/L)
		Unspiked sample		Spiked replicate sample number			Unspiked sample		Spiked replicate sample number			
		1	2	3	4	5	1	2	3	4	5	
1,1,2-Trichloroethane	0	<0.10	.56	.56	.58	.58	<0.10	.60	.57	.60	.58	<0.10
	14	--	.59	.58	.61	.60	--	.56	.59	.60	.59	<0.10
	28	--	.54	.56	.57	.56	--	.56	.53	.54	.54	<0.10
	37	--	.59	.59	.60	.60	--	.59	.58	.58	.59	<0.10
	47	--	.59	.60	.61	.60	--	.61	.59	.62	.62	<0.10
	56	--	.62	.66	.65	.64	--	.61	.63	.64	.62	<0.10
	112	--	.58	.59	.58	.57	--	.56	.56	.56	.56	<0.06
	156	--	.54	.57	.57	.57	--	.58	.56	.56	.56	<0.06
	216	--	.57	.57	.60	.59	--	.58	.62	.57	.58	<0.06
	0	<0.05	.55	.54	.54	.54	<0.05	.53	.54	.55	.54	<0.05
Trichloroethene	14	--	.58	.57	.58	.56	--	.55	.56	.56	.57	<0.05
	28	--	.57	.56	.57	.57	--	.56	.56	.56	.56	<0.05
	37	--	.55	.55	.55	.56	--	.54	.54	.54	.54	<0.05
	47	--	.56	.56	.57	.56	--	.56	.55	.56	.56	<0.05
	56	--	.61	.62	.58	.61	--	.59	.59	.58	.58	<0.05
	112	--	.56	.56	.55	.52	--	.55	.53	.55	.53	<0.04
	156	--	.54	.54	.53	.54	--	.52	.50	.53	.53	<0.04
	216	--	.54	.54	.54	.51	--	.52	.54	.51	.52	<0.04
	0	<0.10	.46	.46	.46	.46	<0.10	.48	.49	.48	.48	<0.10
	14	--	.53	.53	.52	.52	--	.55	.56	.56	.57	<0.10
Trichlorofluoromethane	28	--	.54	.54	.53	.54	--	.59	.56	.56	.58	<0.10
	37	--	.48	.49	.48	.49	--	.50	.51	.52	.51	<0.10
	47	--	.50	.49	.49	.48	--	.52	.52	.52	.52	<0.10
	56	--	.52	.53	.53	.53	--	.54	.56	.54	.55	<0.10
	112	--	.45	.47	.46	.45	--	.49	.47	.48	.47	<0.09
	156	--	.39	.40	.40	.41	--	.42	.41	.42	.41	<0.09
	216	--	.35	.37	.37	.36	--	.38	.39	.37	.38	<0.09



**Table 4. Concentrations of volatile organic compounds (VOCs) in surface- and ground-water matrices determined for stability study—Continued**

[IUPAC, International Union of Pure and Applied Chemistry; holding time, the amount of time samples were held prior to laboratory analysis; µg/L, micrograms per liter; E, estimated; <, VOC not detected; --, sample not analyzed]

IUPAC compound name	Holding time (days)	Concentration in surface-water matrix (µg/L)					Concentration in ground-water matrix (µg/L)					Refrigerator blank (µg/L)		
		Unspiked sample	Spiked replicate sample number				Unspiked sample	Spiked replicate sample number						
			1	2	3	4		5	1	2	3		4	5
Trichloromethane	0	E0.02	.59	.59	.60	.59	.60	<0.05	0.57	0.58	0.57	0.58	0.58	<0.05
	14	--	.62	.62	.62	.62	.62	--	.60	.60	.59	.59	.60	<0.05
	28	--	.62	.63	.64	.64	.64	--	.61	.58	.61	.60	.60	<0.05
	37	--	.61	.61	.60	.62	.61	--	.58	.58	.57	.57	.57	<0.05
	47	--	.63	.65	.62	.64	.64	--	.60	.60	.60	.63	.60	<0.05
	56	--	.64	.65	.64	.64	.65	--	.60	.61	.60	.61	.61	<0.05
	112	--	.65	.65	.65	.65	.62	--	.61	.61	.60	.62	.60	<0.05
	156	--	.61	.62	.60	.60	.60	--	.58	.57	.58	.58	.58	<0.05
	216	--	.61	.63	.62	.60	.61	--	.58	.60	.58	.56	.58	<0.05
	0	<20	.52	.55	.55	.52	.56	<20	.58	.55	.59	.55	.53	<20
1,2,3-Trichloropropane	14	--	.56	.59	.59	.58	.62	--	.56	.57	.56	.56	.58	<20
	28	--	.52	.55	.50	.56	.54	--	.51	.52	.53	.51	.51	<20
	37	--	.57	.60	.58	.58	.59	--	.57	.58	.55	.60	.59	<20
	47	--	.61	.60	.60	.62	.61	--	.61	.59	.58	.60	.59	<20
	56	--	.68	.71	.66	.66	.71	--	.60	.62	.65	.67	.60	<20
	112	--	.64	.60	.58	.61	.56	--	.60	.56	.56	.59	.57	<0.07
	156	--	.51	.58	.54	.53	.57	--	.56	.52	.52	.52	.50	<0.07
	216	--	.56	.57	.54	.49	.57	--	.57	.61	.53	.53	.56	<0.07
	0	<0.05	.57	.56	.56	.56	.56	<0.05	.54	.55	.55	.55	.54	<0.05
	14	--	.54	.55	.53	.54	.55	--	.49	.51	.50	.48	.50	<0.05
1,2,4-Trimethylbenzene	28	--	.55	.55	.53	.54	.53	--	.48	.48	.48	.46	.48	<0.05
	37	--	.53	.52	.52	.53	.50	--	.47	.45	.38	.43	.46	<0.05
	47	--	.54	.56	.55	.55	.54	--	.46	.46	.47	.47	.48	<0.05
	56	--	.55	.54	.55	.56	.57	--	.44	.48	.41	.44	.48	<0.05
	112	--	.47	.49	.49	.48	.45	--	.42	.37	.36	.37	.40	<0.06
	156	--	.36	.45	.38	.17	.43	--	.30	.19	.28	.28	.32	<0.06
	216	--	.50	.55	.56	.55	.45	--	.44	.49	.44	.32	.40	<0.06

**Table 4. Concentrations of volatile organic compounds (VOCs) in surface- and ground-water matrices determined for stability study—Continued**

[IUPAC, International Union of Pure and Applied Chemistry; holding time, the amount of time samples were held prior to laboratory analysis; µg/L, micrograms per liter; E, estimated; <, VOC not detected; --, sample not analyzed]

IUPAC compound name	Holding time (days)	Concentration in surface-water matrix (µg/L)					Concentration in ground-water matrix (µg/L)					Refrigerator blank (µg/L)		
		Unspiked sample		Spiked replicate sample number			Unspiked sample		Spiked replicate sample number					
		1	2	3	4	5	1	2	3	4	5			
Bromobenzene	0	<0.05	0.55	0.55	0.55	0.54	0.56	<0.05	0.56	0.56	0.57	0.56	0.57	<0.05
	14	--	.56	.58	.57	.58	.57	--	.57	.56	.56	.57	.55	<.05
	28	--	.55	.56	.56	.56	.55	--	.56	.55	.56	.55	.57	<.05
	37	--	.56	.58	.56	.58	.58	--	.57	.55	.57	.57	.57	<.05
	47	--	.58	.59	.58	.59	.59	--	.59	.57	.58	.59	.59	<.05
	56	--	.61	.61	.60	.61	.63	--	.60	.60	.58	.62	.60	<.05
	112	--	.48	.49	.48	.48	.46	--	.48	.47	.47	.47	.47	<.04
	156	--	.49	.53	.52	.53	.53	--	.54	.51	.53	.52	.52	<.04
	216	--	.55	.54	.56	.55	.53	--	.55	.57	.52	.54	.55	<.04
	0	<.10	.56	.58	.58	.56	.57	<.10	.58	.58	.56	.58	.58	<.10
Bromochloromethane	14	--	.59	.58	.61	.58	.61	--	.56	.57	.59	.56	.60	<.10
	28	--	.57	.58	.58	.57	.58	--	.58	.57	.57	.58	.60	<.10
	37	--	.57	.58	.59	.60	.58	--	.58	.59	.56	.59	.58	<.10
	47	--	.59	.60	.60	.60	.61	--	.61	.60	.61	.63	.60	<.10
	56	--	.61	.62	.66	.62	.66	--	.63	.63	.62	.65	.63	<.10
	112	--	.55	.58	.57	.56	.55	--	.56	.55	.55	.56	.55	<.04
	156	--	.60	.59	.57	.59	.59	--	.60	.56	.58	.58	.56	<.04
	216	--	.55	.57	.58	.57	.59	--	.58	.60	.58	.54	.56	<.04
	0	<.5.0	5.9	6.0	6.0	6.1	6.2	<.5.0	5.8	6.2	6.2	6.2	6.0	<.5.0
	2-Butanone	14	--	6.0	6.0	6.3	6.4	6.5	--	5.8	6.1	5.9	5.8	6.0
28		--	5.3	5.3	5.4	5.5	5.2	--	5.0	5.1	5.2	4.9	5.2	<.5.0
37		--	6.0	6.3	6.6	6.6	6.4	--	5.9	6.1	6.2	6.0	6.1	<.5.0
47		--	5.8	6.0	6.1	6.5	6.1	--	5.8	5.8	5.8	6.0	5.9	<.5.0
56		--	6.4	6.6	6.6	6.4	6.9	--	6.2	6.6	6.3	6.4	6.2	<.5.0
112		--	3.4	4.9	4.7	4.1	3.6	--	6.8	6.8	6.8	6.9	6.8	<.1.6
156		--	E.69	<.1.6	<.1.6	<.1.6	<.1.6	--	5.9	5.8	5.7	5.6	5.6	<.1.6
216		--	<.1.6	<.1.6	<.1.6	<.1.6	<.1.6	--	5.2	5.6	5.6	5.5	5.7	<.1.6

**Table 4. Concentrations of volatile organic compounds (VOCs) in surface- and ground-water matrices determined for stability study—Continued**

[IUPAC, International Union of Pure and Applied Chemistry; holding time, the amount of time samples were held prior to laboratory analysis; µg/L, micrograms per liter; E, estimated; <, VOC not detected; --, sample not analyzed]

IUPAC compound name	Holding time (days)	Concentration in surface-water matrix (µg/L)					Concentration in ground-water matrix (µg/L)					Refrigerator blank (µg/L)		
		Unspiked sample		Spiked replicate sample number			Unspiked sample		Spiked replicate sample number					
		1	2	1	2	3	4	5	1	2	3		4	5
Carbon disulfide	0	<0.05	0.59	0.59	0.59	0.59	0.60	<0.05	0.59	0.59	0.59	0.60	0.58	<0.05
	14	--	.60	.61	.60	.59	.59	--	.60	.61	.61	.60	.60	<0.05
	28	--	.60	.58	.56	.57	.56	--	.59	.58	.59	.59	.60	<0.05
	37	--	.59	.60	.55	.60	.57	--	.59	.59	.57	.58	.59	<0.05
	47	--	.63	.64	.62	.62	.60	--	.61	.61	.61	.61	.61	<0.05
	56	--	.61	.59	.55	.60	.62	--	.59	.61	.58	.59	.59	<0.05
	112	--	.54	.58	.55	.47	.45	--	.56	.50	.51	.54	.52	E.01
156	--	.42	.45	.43	.44	.43	--	.44	.40	.42	.42	.42	E.01	
216	--	.46	.48	.47	.45	.45	--	.43	.44	.37	.42	.46	E.01	
1-Chloro-2-methylbenzene	0	<0.05	.54	.56	.55	.54	.57	<0.05	.56	.56	.56	.55	.56	<0.05
	14	--	.56	.53	.54	.54	.54	--	.55	.54	.55	.54	.55	<0.05
	28	--	.56	.55	.54	.54	.54	--	.55	.53	.55	.55	.56	<0.05
	37	--	.53	.53	.52	.54	.54	--	.52	.54	.51	.53	.52	<0.05
	47	--	.55	.56	.56	.56	.54	--	.55	.55	.54	.54	.54	<0.05
	56	--	.59	.58	.56	.58	.59	--	.58	.58	.56	.57	.57	<0.05
	112	--	.52	.54	.52	.52	.50	--	.52	.51	.52	.52	.52	<0.04
156	--	.48	.52	.52	.51	.51	--	.51	.49	.51	.50	.51	<0.04	
216	--	.51	.53	.53	.52	.52	--	.52	.55	.50	.51	.51	<0.04	
1-Chloro-4-methylbenzene	0	<0.05	.56	.56	.55	.56	.57	<0.05	.56	.56	.55	.57	.56	<0.05
	14	--	.53	.54	.55	.55	.55	--	.55	.54	.56	.55	.54	<0.05
	28	--	.54	.54	.55	.53	.53	--	.53	.53	.54	.53	.54	<0.05
	37	--	.51	.53	.52	.54	.53	--	.53	.54	.51	.53	.52	<0.05
	47	--	.54	.55	.56	.54	.54	--	.55	.55	.53	.55	.57	<0.05
	56	--	.56	.57	.55	.56	.58	--	.56	.57	.56	.55	.56	<0.05
	112	--	.48	.49	.50	.47	.45	--	.51	.51	.50	.51	.50	<0.06
156	--	.41	.45	.44	.39	.44	--	.48	.44	.47	.46	.46	<0.06	
216	--	.45	.46	.46	.44	.47	--	.53	.54	.49	.50	.50	<0.06	

Other analytes—Continued

**Table 4.** Concentrations of volatile organic compounds (VOCs) in surface- and ground-water matrices determined for stability study—Continued

[IUPAC, International Union of Pure and Applied Chemistry; holding time, the amount of time samples were held prior to laboratory analysis; µg/L, micrograms per liter; E, estimated; <, VOC not detected; --, sample not analyzed]

IUPAC compound name	Holding time (days)	Concentration in surface-water matrix (µg/L)					Concentration in ground-water matrix (µg/L)					Refrigerator blank (µg/L)		
		Unspiked sample	Spiked replicate sample number				Unspiked sample	Spiked replicate sample number						
			1	2	3	4		5	1	2	3		4	5
3-Chloro-1-propene	0	<0.10	1.1	1.0	1.0	1.1	1.1	1.0	1.1	1.1	1.1	1.1	1.0	<0.10
	14	--	1.0	1.0	1.0	1.0	--	1.0	1.0	1.0	1.0	1.0	1.0	<0.10
	28	--	.98	.98	1.0	1.0	.99	--	.97	.97	.98	.98	.98	<0.10
	37	--	.98	.97	.97	.99	.97	--	.96	.94	.95	.95	.97	<0.10
	47	--	.98	1.0	1.0	1.0	1.1	--	.97	.98	.99	1.0	1.0	<0.10
	56	--	1.0	1.0	1.0	1.0	1.0	--	.96	1.0	.96	.96	1.0	<0.10
	112	--	.90	.93	.93	.89	.86	--	.88	.84	.88	.87	.90	<0.20
Dibromomethane	156	--	.62	.64	.65	.65	.67	--	.63	.63	.71	.67	.64	<0.20
	216	--	.76	.75	.77	.78	.75	--	.70	.77	.76	.75	.77	<0.20
	0	<.10	.56	.55	.54	.56	.54	<.10	.57	.56	.56	.55	.56	<.10
	14	--	.59	.58	.58	.59	.60	--	.59	.57	.56	.57	.58	<.10
<i>trans</i> -1,4-Dichloro-2-butene	28	--	.56	.56	.56	.57	.56	--	.55	.57	.56	.56	.56	<.10
	37	--	.57	.57	.59	.60	.57	--	.58	.58	.58	.57	.59	<.10
	47	--	.60	.59	.60	.60	.59	--	.59	.60	.59	.60	.60	<.10
	56	--	.61	.62	.66	.63	.64	--	.60	.62	.62	.64	.61	<.10
	112	--	.60	.60	.59	.59	.57	--	.58	.57	.58	.57	.56	<.05
	156	--	.56	.59	.56	.57	.58	--	.57	.56	.58	.57	.58	<.05
	216	--	.55	.58	.59	.56	.57	--	.56	.58	.59	.56	.55	<.05
	0	<5.0	5.4	5.4	5.5	5.4	5.6	<5.0	5.7	5.8	5.6	5.7	5.6	<5.0
	14	--	4.9	5.0	5.1	5.1	5.3	--	4.9	4.9	4.9	4.8	5.0	<5.0
	28	--	3.8	3.9	4.0	4.1	4.1	--	3.8	3.7	3.9	3.8	3.8	<5.0
37	--	4.4	4.5	4.6	4.9	4.6	--	4.4	4.4	4.3	4.4	4.4	<5.0	
47	--	4.8	4.9	5.0	5.2	5.2	--	4.8	4.6	4.5	4.9	4.9	<5.0	
56	--	4.5	4.4	4.6	4.4	4.9	--	4.1	4.2	4.2	4.2	4.3	<5.0	
112	--	2.8	2.8	3.0	2.9	3.0	--	2.9	2.6	3.0	2.8	3.0	<.69	
156	--	1.6	1.6	1.5	1.5	1.6	--	1.9	1.7	1.8	1.8	1.7	<.69	
216	--	<.69	<.69	<.69	<.69	<.69	--	E1.4	E1.4	<.69	<.69	E1.2	<.69	

**Table 4. Concentrations of volatile organic compounds (VOCs) in surface- and ground-water matrices determined for stability study—Continued**

[IUPAC, International Union of Pure and Applied Chemistry; holding time, the amount of time samples were held prior to laboratory analysis; µg/L, micrograms per liter; E, estimated; <, VOC not detected; --, sample not analyzed]

IUPAC compound name	Holding time (days)	Concentration in surface-water matrix (µg/L)					Concentration in ground-water matrix (µg/L)					Refrigerator blank (µg/L)		
		Unspiked sample		Spiked replicate sample number			Unspiked sample		Spiked replicate sample number					
		1	2	1	2	3	4	5	1	2	3		4	5
1,3-Dichloropropane	0	<0.05	0.54	0.52	0.52	0.53	0.54	<0.05	0.54	0.53	0.53	0.55	0.54	<0.05
	14	--	.54	.55	.56	.56	.56	--	.53	.55	.55	.55	.56	<0.05
	28	--	.51	.53	.52	.53	.52	--	.52	.51	.52	.50	.52	<0.05
	37	--	.56	.56	.56	.56	.56	--	.55	.55	.54	.54	.55	<0.05
	47	--	.54	.56	.57	.57	.56	--	.58	.56	.55	.57	.57	<0.05
	56	--	.58	.60	.61	.57	.60	--	.59	.58	.58	.59	.57	<0.05
	112	--	.58	.58	.60	.57	.57	--	.59	.56	.57	.56	.58	<0.12
	156	--	.51	.54	.54	.54	.52	--	.54	.53	.53	.53	.54	<0.12
	216	--	.51	.51	.55	.52	.55	--	.54	.53	.53	.54	.53	<0.12
	0	<0.05	.52	.54	.53	.52	.52	<0.05	.54	.52	.54	.52	.52	<0.05
2,2-Dichloropropane	14	--	.46	.50	.49	.48	.48	--	.48	.47	.48	.46	.48	<0.05
	28	--	.44	.44	.44	.44	.45	--	.42	.39	.40	.42	.42	<0.05
	37	--	.34	.37	.37	.39	.39	--	.34	.34	.37	.35	.36	<0.05
	47	--	.34	.33	.33	.37	.39	--	.30	.31	.33	.33	.33	<0.05
	56	--	.32	.33	.33	.33	.36	--	.30	.30	.30	.32	.31	<0.05
	112	--	.17	.17	.17	.17	.17	--	.17	.17	.17	.18	.17	<0.08
	156	--	E.09	E.07	E.07	E.08	E.08	--	E.09	E.10	E.10	E.10	E.10	<0.08
	216	--	<.08	<.08	E.04	E.04	E.04	--	E.05	E.05	E.04	<.08	<.08	<0.08
	0	<0.05	.52	.52	.51	.51	.52	<0.05	.53	.52	.51	.52	.52	<0.05
	1,1-Dichloropropene	14	--	.57	.59	.58	.57	.58	--	.57	.59	.58	.56	.57
28		--	.58	.60	.57	.58	.58	--	.57	.58	.58	.57	.58	<0.05
37		--	.56	.56	.56	.57	.56	--	.55	.56	.52	.54	.54	<0.05
47		--	.57	.58	.57	.58	.56	--	.57	.55	.54	.56	.56	<0.05
56		--	.61	.60	.58	.60	.61	--	.57	.58	.55	.57	.58	<0.05
112		--	.59	.59	.60	.56	.54	--	.58	.53	.54	.56	.55	<0.03
156		--	.53	.54	.52	.54	.54	--	.49	.46	.50	.50	.49	<0.03
216		--	.52	.53	.53	.50	.53	--	.49	.49	.47	.45	.50	<0.03

**Table 4.** Concentrations of volatile organic compounds (VOCs) in surface- and ground-water matrices determined for stability study—Continued

[IUPAC, International Union of Pure and Applied Chemistry; holding time, the amount of time samples were held prior to laboratory analysis; µg/L, micrograms per liter; E, estimated; <, VOC not detected; --, sample not analyzed]

IUPAC compound name	Holding time (days)	Concentration in surface-water matrix (µg/L)					Concentration in ground-water matrix (µg/L)					Refrigerator blank (µg/L)			
		Unspiked sample		Spiked replicate sample number			Unspiked sample		Spiked replicate sample number						
		1	2	3	4	5	1	2	3	4	5				
(1,1-Dimethylethyl)benzene	0	<0.05	0.52	0.53	0.55	0.54	0.54	<0.05	0.53	0.53	0.53	0.54	0.53	<0.05	
	14	--	.53	.53	.53	.53	.52	--	.54	.54	.52	.53	.54	<.05	
	28	--	.53	.54	.52	.52	.52	--	.54	.54	.54	.54	.54	<.05	
	37	--	.52	.52	.51	.53	.52	--	.52	.52	.51	.52	.51	<.05	
	47	--	.53	.55	.53	.54	.54	--	.53	.53	.53	.53	.54	<.05	
	56	--	.55	.57	.55	.56	.57	--	.56	.56	.54	.55	.57	<.05	
	112	--	.52	.53	.54	.51	.49	--	.53	.51	.50	.51	.51	<.10	
	156	--	.43	.49	.45	.26	.48	--	.46	.38	.44	.44	.44	<.10	
	216	--	.53	.55	.57	.54	.47	--	.56	.59	.56	.53	.53	<.10	
	0	<5.0	5.6	5.6	5.5	5.7	5.7	5.7	<5.0	6.1	5.8	5.9	5.8	<5.0	
1,4-Epoxybutane	14	--	5.8	6.3	6.2	6.2	6.5	--	5.5	5.7	5.9	5.6	6.1	<5.0	
	28	--	5.0	5.5	5.7	5.8	5.6	--	5.0	5.3	5.4	5.2	5.3	<5.0	
	37	--	6.2	6.4	6.4	6.4	6.0	--	6.0	6.0	5.8	5.9	6.1	<5.0	
	47	--	6.1	6.6	6.0	6.3	6.5	--	6.2	5.8	5.9	6.1	6.5	<5.0	
	56	--	6.6	7.1	6.8	6.9	7.1	--	6.7	6.7	6.5	6.5	6.7	<5.0	
	112	--	7.1	7.2	7.4	7.0	6.9	--	6.5	6.8	6.7	6.7	7.0	<1.1	
	156	--	6.0	6.4	6.3	6.4	6.1	--	6.2	6.1	6.2	6.0	5.9	<1.1	
	216	--	5.4	5.5	5.9	5.5	5.5	--	5.2	5.7	5.4	5.4	5.5	<1.1	
	0	<0.05	.62	.62	.61	.62	.62	.62	<0.05	.62	.62	.63	.61	.61	<0.05
	1-Ethyl-2-methylbenzene	14	--	.62	.61	.60	.61	.61	--	.60	.61	.61	.59	.61	<0.05
28		--	.61	.60	.60	.60	.60	--	.60	.59	.61	.60	.59	<0.05	
37		--	.61	.61	.60	.62	.60	--	.61	.60	.57	.58	.60	<0.05	
47		--	.63	.63	.64	.64	.63	--	.62	.61	.61	.62	.62	<0.05	
56		--	.62	.63	.64	.63	.65	--	.62	.61	.61	.62	.61	<0.05	
112		--	.61	.62	.62	.60	.59	--	.62	.59	.58	.59	.60	<0.10	
156		--	.51	.57	.53	.33	.56	--	.53	.43	.51	.50	.54	<0.10	
216		--	.56	.59	.60	.60	.53	--	.57	.60	.56	.53	.55	<0.10	

**Table 4. Concentrations of volatile organic compounds (VOCs) in surface- and ground-water matrices determined for stability study—Continued**

[IUPAC, International Union of Pure and Applied Chemistry; holding time, the amount of time samples were held prior to laboratory analysis; µg/L, micrograms per liter; E, estimated; <, VOC not detected; --, sample not analyzed]

IUPAC compound name	Holding time (days)	Concentration in surface-water matrix (µg/L)					Concentration in ground-water matrix (µg/L)					Refrigerator blank (µg/L)			
		Unspiked sample		Spiked replicate sample number			Unspiked sample		Spiked replicate sample number						
		1	2	1	2	3	4	5	1	2	3		4	5	
Ethyl 2-methyl-2-propenoate	0	<1.0	2.8	2.7	2.8	2.8	2.8	<1.0	2.9	2.9	2.9	2.9	2.9	2.9	<1.0
	14	--	2.8	2.9	2.9	3.0	3.0	--	2.7	2.8	2.8	2.7	2.8	2.7	<1.0
	28	--	1.9	1.9	2.0	2.0	2.2	--	2.4	2.4	2.4	2.3	2.4	2.4	<1.0
	37	--	1.4	1.7	1.7	1.9	1.4	--	2.7	2.7	2.5	2.6	2.7	2.7	<1.0
	47	--	.69	.97	.89	.89	1.2	--	2.7	2.6	2.7	2.8	2.8	2.8	<1.0
	56	--	.49	.52	.67	.66	.61	--	2.8	2.9	2.7	2.9	2.9	2.9	<1.0
	112	--	<.28	<.28	<.28	<.28	<.28	--	2.9	2.8	2.7	2.8	2.8	2.8	<.28
	156	--	<.28	<.28	<.28	<.28	<.28	--	2.6	2.3	2.5	2.5	2.4	2.4	<.28
216	--	<.28	<.28	<.28	<.28	<.28	--	2.0	2.6	2.6	2.1	2.5	2.5	<.28	
2-Hexanone	0	<5.0	5.6	5.6	5.6	5.7	5.7	<5.0	5.8	6.0	5.8	5.9	5.8	5.8	<5.0
	14	--	5.6	5.9	6.0	6.1	6.4	--	5.6	5.7	5.8	5.8	6.0	6.0	<5.0
	28	--	4.3	4.4	4.5	4.6	4.7	--	4.8	4.8	5.0	4.8	4.7	4.7	<5.0
	37	--	4.0	4.7	4.8	5.2	4.2	--	5.6	5.9	5.8	5.8	5.9	5.9	<5.0
	47	--	2.6	3.4	3.3	3.3	3.7	--	6.1	5.8	5.7	6.0	6.1	6.1	<5.0
	56	--	2.2	2.4	2.9	2.7	2.6	--	5.6	6.1	6.2	6.2	6.0	6.0	<5.0
	112	--	<.75	E.19	<.75	E.18	<.75	--	6.6	6.4	6.5	6.4	6.4	6.4	<.75
	156	--	<.75	<.75	<.75	<.75	<.75	--	5.6	5.5	5.4	5.2	5.4	5.4	<.75
216	--	<.75	<.75	<.75	<.75	<.75	--	4.4	5.0	5.2	4.7	5.0	5.0	<.75	
Iodomethane	0	<.05	.53	.52	.52	.53	.55	<.05	.53	.53	.54	.54	.55	.55	<.05
	14	--	.50	.49	.49	.51	.48	--	.52	.52	.53	.52	.53	.53	<.05
	28	--	.44	.42	.43	.45	.44	--	.40	.41	.44	.44	.45	.45	<.05
	37	--	.48	.49	.47	.51	.52	--	.49	.51	.51	.51	.52	.52	<.05
	47	--	.48	.49	.50	.51	.50	--	.48	.52	.51	.52	.52	.52	<.05
	56	--	.44	.43	.38	.42	.43	--	.50	.50	.49	.48	.47	.47	<.05
	112	--	E.42	E.44	E.42	E.43	E.42	--	E.42	E.43	E.44	E.45	E.45	E.45	<.08
	156	--	E.53	E.54	E.53	E.63	E.62	--	E.58	E.69	E.63	E.60	E.59	E.59	<.08
216	--	E.45	E.44	E.47	E.44	E.46	--	E.43	E.47	E.48	E.47	E.47	E.47	<.08	

**Table 4. Concentrations of volatile organic compounds (VOCs) in surface- and ground-water matrices determined for stability study—Continued**

[IUPAC, International Union of Pure and Applied Chemistry; holding time, the amount of time samples were held prior to laboratory analysis; µg/L, micrograms per liter; E, estimated; <, VOC not detected; --, sample not analyzed]

IUPAC compound name	Holding time (days)	Concentration in surface-water matrix (µg/L)					Concentration in ground-water matrix (µg/L)					Refrigerator blank (µg/L)	
		Unspiked sample		Spiked replicate sample number			Unspiked sample		Spiked replicate sample number				
		1	2	3	4	5	1	2	3	4	5		
1-Isopropyl-4-methylbenzene	0	<0.05	0.55	0.55	0.55	0.54	0.54	<0.05	0.54	0.54	0.54	0.53	<0.05
	14	--	.51	.53	.50	.52	.51	--	.50	.51	.51	.50	<.05
	28	--	.47	.45	.45	.44	.46	--	.51	.52	.52	.52	<.05
	37	--	.33	.38	.35	.39	.32	--	.47	.46	.45	.46	<.05
	47	--	.25	.31	.28	.27	.30	--	.49	.49	.50	.49	<.05
	56	--	.21	.21	.23	.23	.22	--	.49	.50	.48	.50	<.05
	112	--	E.05	E.06	E.07	E.06	E.05	--	.46	.43	.43	.44	<.11
Methyl 2-methyl-2-propenoate	156	--	<.11	E.02	<.11	<.11	E.02	--	.31	.20	.29	.36	<.11
	216	--	<.11	<.11	<.11	<.11	<.11	--	.52	.60	.51	.46	<.11
	0	<1.0	2.9	2.9	2.9	3.0	2.9	<1.0	3.0	3.1	3.0	3.0	<1.0
	14	--	3.0	3.1	3.2	3.2	3.2	--	2.8	2.8	2.9	2.8	<1.0
	28	--	2.9	3.0	3.0	3.1	3.0	--	2.5	2.5	2.5	2.3	<1.0
	37	--	3.6	3.6	3.8	3.8	3.7	--	2.8	2.7	2.6	2.8	<1.0
	47	--	3.6	3.7	3.7	3.8	3.7	--	2.8	2.7	2.8	2.9	<1.0
4-Methyl-2-pentanone	56	--	3.4	3.5	3.7	3.6	4.0	--	2.7	2.9	2.6	2.8	<1.0
	112	--	.86	1.4	1.3	1.0	.94	--	2.8	2.8	2.7	2.7	<.35
	156	--	<.35	<.35	.39	.65	.49	--	2.7	2.4	2.5	2.5	<.35
	216	--	<.35	<.35	<.35	<.35	<.35	--	2.7	2.7	2.6	2.2	<.35
	0	<5.0	5.7	5.7	5.8	5.7	6.0	<5.0	5.8	6.0	5.9	5.9	<5.0
	14	--	5.9	6.0	6.2	6.2	6.3	--	5.7	5.7	5.7	5.8	<5.0
	28	--	5.0	5.2	5.2	5.2	5.3	--	5.1	5.0	5.2	5.0	<5.0
Other analytes—Continued	37	--	5.5	5.8	6.1	6.2	5.7	--	5.9	5.9	5.8	5.9	<5.0
	47	--	4.8	5.4	5.4	5.4	5.5	--	6.0	5.8	5.8	6.0	<5.0
	56	--	4.8	5.4	5.4	5.3	5.4	--	6.0	6.2	6.2	6.3	<5.0
	112	--	1.4	2.2	2.3	2.0	2.0	--	6.2	6.3	6.3	6.3	<.37
	156	--	E.47	E.61	E.90	1.1	E.96	--	5.7	5.6	5.3	5.3	<.37
	216	--	<.37	<.37	<.37	<.37	<.37	--	5.0	5.2	5.3	5.2	<.37



**Table 4. Concentrations of volatile organic compounds (VOCs) in surface- and ground-water matrices determined for stability study—Continued**

[IUPAC, International Union of Pure and Applied Chemistry; holding time, the amount of time samples were held prior to laboratory analysis; µg/L, micrograms per liter; E, estimated; <, VOC not detected; --, sample not analyzed]

IUPAC compound name	Holding time (days)	Concentration in surface-water matrix (µg/L)					Concentration in ground-water matrix (µg/L)					Refrigerator blank (µg/L)		
		Unspiked sample		Spiked replicate sample number			Unspiked sample		Spiked replicate sample number					
		1	2	3	4	5	1	2	3	4	5			
2-Methyl-2-propenenitrile	0	<2.0	2.8	2.8	2.7	2.8	<2.0	2.8	2.9	2.8	2.8	2.8	2.8	<2.0
	14	--	2.8	2.8	2.9	2.9	--	2.7	2.7	2.8	2.8	2.8	2.8	<2.0
	28	--	2.5	2.6	2.6	2.6	--	2.6	2.4	2.5	2.5	2.5	2.4	<2.0
	37	--	2.9	2.9	3.0	3.0	--	2.8	2.8	2.8	2.8	2.8	2.9	<2.0
	47	--	2.9	3.0	2.8	3.1	3.0	--	2.8	2.9	2.8	2.9	3.0	<2.0
	56	--	3.1	3.0	3.1	2.9	3.2	--	2.8	2.9	2.8	3.0	2.8	<2.0
	112	--	3.2	3.3	3.2	3.1	3.0	--	3.0	2.9	2.9	3.0	3.0	<.57
	156	--	2.8	2.9	2.8	2.9	2.8	--	2.8	2.6	2.7	2.7	2.7	<.57
	216	--	2.7	2.8	3.0	2.9	2.9	--	2.8	2.9	3.0	2.7	2.8	<.57
	0	<2.0	2.6	2.6	2.6	2.6	2.7	<2.0	2.7	2.7	2.7	2.8	2.7	<2.0
Methyl-2-propenoate	14	--	2.5	2.7	2.7	2.7	--	2.6	2.6	2.6	2.6	2.6	2.7	<2.0
	28	--	1.6	1.6	1.7	1.7	--	2.2	2.2	2.3	2.2	2.2	2.2	<2.0
	37	--	1.2	1.4	1.4	1.7	1.2	--	2.6	2.6	2.6	2.6	2.6	<2.0
	47	--	.52	.73	.73	.66	.99	--	2.7	2.7	2.7	2.8	2.7	<2.0
	56	--	.34	.36	.50	.45	.46	--	2.6	2.8	2.7	2.7	2.7	<2.0
	112	--	<.61	<.61	<.61	<.61	<.61	--	2.8	2.9	2.8	2.8	2.9	<.61
	156	--	<.61	<.61	<.61	<.61	<.61	--	2.7	2.6	2.6	2.6	2.6	<.61
	216	--	<.61	<.61	<.61	<.61	<.61	--	2.1	2.5	2.6	2.2	2.5	<.61
	0	<.05	.57	.57	.57	.58	.58	<.05	.56	.56	.56	.57	.57	<.05
	14	--	.54	.55	.54	.55	.55	--	.53	.55	.54	.54	.54	<.05
(1-Methylpropyl)benzene	28	--	.56	.56	.54	.54	.54	--	.55	.53	.55	.54	.55	<.05
	37	--	.53	.53	.52	.54	.52	--	.51	.51	.50	.51	.51	<.05
	47	--	.55	.55	.55	.55	.53	--	.53	.53	.54	.54	.53	<.05
	56	--	.57	.56	.55	.57	.57	--	.55	.55	.55	.55	.55	<.05
	112	--	.51	.52	.52	.50	.48	--	.52	.50	.49	.50	.50	<.05
	156	--	.41	.48	.42	.18	.47	--	.41	.30	.39	.39	.44	<.05
	216	--	.54	.59	.60	.59	.47	--	.54	.60	.53	.52	.51	<.05

**Table 4.** Concentrations of volatile organic compounds (VOCs) in surface- and ground-water matrices determined for stability study—Continued

[IUPAC, International Union of Pure and Applied Chemistry; holding time, the amount of time samples were held prior to laboratory analysis; µg/L, micrograms per liter; E, estimated; <, VOC not detected; --, sample not analyzed]

IUPAC compound name	Holding time (days)	Concentration in surface-water matrix (µg/L)					Concentration in ground-water matrix (µg/L)					Refrigerator blank (µg/L)		
		Unspiked sample	Spiked replicate sample number				Unspiked sample	Spiked replicate sample number						
			1	2	3	4		5	1	2	3		4	5
1,1'-Oxybisethane	0	<0.10	1.1	1.1	1.1	1.1	1.1	<0.10	1.1	1.1	1.1	1.1	1.1	<0.10
	14	--	1.1	1.2	1.2	1.2	1.2	--	1.1	1.1	1.1	1.1	1.2	<10
	28	--	1.0	1.1	1.0	1.1	1.1	--	1.0	1.0	1.0	1.0	1.0	<10
	37	--	1.1	1.1	1.2	1.2	1.1	--	1.1	1.1	1.1	1.1	1.1	<10
	47	--	1.1	1.1	1.1	1.2	1.1	--	1.2	1.1	1.1	1.2	1.2	<10
	56	--	1.3	1.3	1.3	1.3	1.3	--	1.2	1.2	1.2	1.3	1.2	<10
	112	--	E1.5	E1.5	E1.5	E1.5	E1.4	--	E1.5	E1.4	E1.4	E1.4	E1.5	<17
	156	--	1.0	1.1	1.0	1.1	1.0	--	1.1	1.1	1.0	1.0	1.0	<17
	216	--	1.0	1.0	1.1	1.0	1.0	--	1.0	.96	1.0	1.0	1.0	<17
	0	<5.0	7.0	7.0	7.1	7.2	7.2	<5.0	6.2	6.5	6.2	6.4	6.4	<5.0
14	--	7.1	7.4	7.4	7.3	7.5	--	5.7	5.8	6.1	5.9	6.0	<5.0	
28	--	6.7	7.1	7.1	7.2	6.9	--	5.6	5.8	5.9	5.6	5.8	<5.0	
37	--	7.3	7.8	7.7	8.1	7.8	--	6.0	6.3	6.4	6.2	6.2	<5.0	
47	--	7.2	7.7	7.8	7.9	7.4	--	6.1	6.2	5.7	6.3	6.2	E.60	
56	--	8.1	9.0	8.8	8.1	8.7	--	6.2	6.5	6.8	7.0	6.3	<5.0	
112	--	9.9	10.4	10.1	9.7	9.3	--	8.1	8.3	8.0	7.8	8.2	<4.9	
156	--	E8.5	E9.4	E9.0	E9.0	E9.0	--	E8.2	E8.1	E8.1	E7.7	E7.9	<4.9	
216	--	6.0	6.2	6.1	6.3	<4.9	--	5.7	6.0	6.4	6.2	6.2	<4.9	
1,1,1,2-Tetrachloroethane	0	<0.05	.54	.54	.56	.53	.54	<0.05	.54	.54	.54	.56	.54	<0.05
	14	--	.55	.54	.55	.54	.55	--	.54	.55	.54	.54	.54	<0.05
	28	--	.55	.53	.54	.55	.54	--	.54	.54	.54	.53	.53	<0.05
	37	--	.54	.55	.55	.55	.55	--	.54	.54	.54	.53	.53	<0.05
	47	--	.57	.57	.55	.57	.56	--	.56	.58	.56	.56	.57	<0.05
	56	--	.58	.59	.60	.58	.59	--	.56	.58	.57	.58	.57	<0.05
	112	--	.51	.51	.52	.51	.51	--	.51	.51	.49	.51	.50	<0.04
	156	--	.49	.52	.52	.54	.53	--	.54	.53	.53	.52	.51	<0.04
	216	--	.54	.54	.55	.53	.52	--	.54	.57	.55	.54	.52	<0.04

**Table 4. Concentrations of volatile organic compounds (VOCs) in surface- and ground-water matrices determined for stability study—Continued**

[IUPAC, International Union of Pure and Applied Chemistry; holding time, the amount of time samples were held prior to laboratory analysis; µg/L, micrograms per liter; E, estimated; <, VOC not detected; --, sample not analyzed]

IUPAC compound name	Holding time (days)	Concentration in surface-water matrix (µg/L)					Concentration in ground-water matrix (µg/L)					Refrigerator blank (µg/L)			
		Unspiked sample	Spiked replicate sample number				Unspiked sample	Spiked replicate sample number							
			1	2	3	4		5	1	2	3		4	5	
<b>Other analytes—Continued</b>															
1,1,2,2-Tetrachloroethane	0	<0.10	0.57	0.57	0.57	0.56	0.59	<0.10	0.59	0.59	0.57	0.59	0.58	0.58	<0.10
	14	--	.57	.58	.60	.60	.62	--	.58	.56	.56	.58	.58	.59	<0.10
	28	--	.52	.53	.54	.55	.52	--	.53	.51	.51	.50	.50	.52	<0.10
	37	--	.56	.59	.62	.63	.59	--	.58	.58	.57	.58	.58	.59	<0.10
	47	--	.60	.62	.63	.63	.60	--	.62	.59	.60	.63	.63	.63	<0.10
	56	--	.61	.64	.65	.61	.64	--	.58	.62	.61	.63	.63	.61	<0.10
	112	--	.59	.57	.58	.58	.55	--	.55	.54	.54	.55	.54	.55	<0.13
	156	--	.49	.54	.53	.54	.54	--	.53	.52	.53	.52	.52	.52	<0.13
216	--	.56	.56	.57	.55	.55	--	.54	.58	.55	.55	.55	.55	<0.13	
1,2,3,4-Tetramethylbenzene	0	<0.05	.54	.55	.54	.55	.50	<0.05	.48	.56	.55	.54	.54	.52	<0.05
	14	--	.57	.57	.56	.60	.60	--	.48	.48	.47	.44	.44	.49	<0.05
	28	--	.57	.61	.60	.56	.59	--	.48	.48	.47	.45	.45	.47	<0.05
	37	--	.54	.56	.56	.55	.51	--	.49	.43	.34	.39	.39	.46	<0.05
	47	--	.65	.64	.62	.64	.65	--	.50	.48	.51	.52	.52	.54	<0.05
	56	--	.60	.55	.57	.57	.58	--	.42	.45	.35	.42	.42	.44	<0.05
	112	--	.53	.57	.58	.54	.52	--	.42	.38	.35	.37	.37	.39	<0.23
	156	--	E.24	E.40	E.30	E.26	E.38	--	E.19	E.13	E.19	E.15	E.22	E.22	<0.23
216	--	.44	.51	.51	.51	.45	--	.32	.38	.34	E.19	E.19	.29	<0.23	
1,2,3,5-Tetramethylbenzene	0	<0.05	.53	.54	.54	.54	.50	<0.05	.50	.55	.53	.53	.53	.50	<0.05
	14	--	.53	.54	.54	.55	.58	--	.45	.46	.46	.41	.45	.45	<0.05
	28	--	.55	.58	.58	.54	.56	--	.44	.45	.44	.43	.46	.46	<0.05
	37	--	.50	.50	.52	.51	.46	--	.42	.37	.28	.35	.41	.41	<0.05
	47	--	.57	.57	.54	.57	.56	--	.42	.40	.42	.43	.43	.43	<0.05
	56	--	.55	.50	.53	.54	.55	--	.36	.41	.30	.36	.40	.40	<0.05
	112	--	.53	.56	.56	.55	.52	--	.39	.33	.32	.34	.36	.36	<0.24
	156	--	E.26	E.41	E.30	E.20	E.38	--	E.18	E.10	E.17	E.14	E.19	E.19	<0.24
216	--	.45	.52	.54	.53	.41	--	.32	.38	.32	E.17	.27	.27	<0.24	

**Table 4.** Concentrations of volatile organic compounds (VOCs) in surface- and ground-water matrices determined for stability study—Continued

[IUPAC, International Union of Pure and Applied Chemistry; holding time, the amount of time samples were held prior to laboratory analysis; µg/L, micrograms per liter; E, estimated; <, VOC not detected; --, sample not analyzed]

IUPAC compound name	Holding time (days)	Concentration in surface-water matrix (µg/L)					Concentration in ground-water matrix (µg/L)					Refrigerator blank (µg/L)		
		Unspiked sample		Spiked replicate sample number			Unspiked sample		Spiked replicate sample number					
		1	2	3	4	5	1	2	3	4	5			
1,2,3-Trimethylbenzene	0	<0.05	0.56	0.56	0.55	0.55	<0.05	0.54	0.56	0.56	0.57	0.56	<0.05	
	14	--	.55	.55	.55	.56	--	.53	.54	.52	.50	.53	<.05	
	28	--	.54	.56	.55	.54	--	.52	.52	.53	.52	.52	<.05	
	37	--	.55	.55	.56	.54	--	.53	.51	.47	.50	.53	<.05	
	47	--	.58	.59	.58	.58	--	.55	.53	.54	.54	.56	<.05	
	56	--	.58	.56	.58	.57	--	.51	.54	.50	.52	.54	<.05	
	112	--	.54	.55	.56	.54	--	.51	.49	.47	.48	.50	<.12	
	156	--	.38	.48	.40	.18	.46	.36	.24	.34	.32	.40	<.12	
	216	--	.52	.58	.59	.60	.47	.53	.57	.53	.44	.47	<.12	
	1,3,5-Trimethylbenzene	0	<0.05	.52	.53	.52	.53	<0.05	.53	.52	.52	.53	.52	<0.05
		14	--	.51	.52	.49	.50	--	.49	.50	.50	.48	.50	<0.05
		28	--	.51	.51	.50	.49	.50	.49	.48	.49	.48	.49	<0.05
37		--	.49	.50	.48	.50	.48	.48	.46	.42	.46	.47	<0.05	
47		--	.50	.52	.51	.51	.51	.47	.48	.48	.48	.48	<0.05	
56		--	.53	.51	.53	.53	.55	.48	.50	.46	.47	.50	<0.05	
112		--	.47	.48	.50	.48	.46	.45	.42	.42	.42	.43	<0.04	
156		--	.41	.47	.43	.29	.46	.40	.30	.38	.37	.40	<0.04	
216		--	.50	.52	.53	.52	.46	.46	.50	.44	.39	.44	<0.04	
Other analytes—Continued														



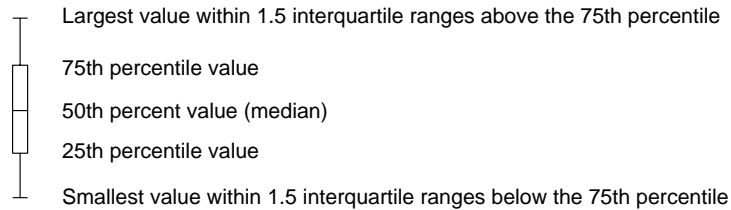
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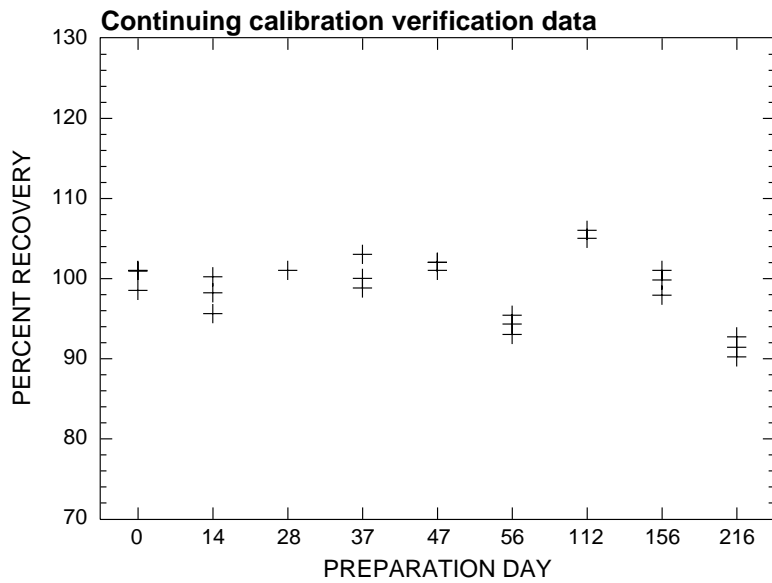
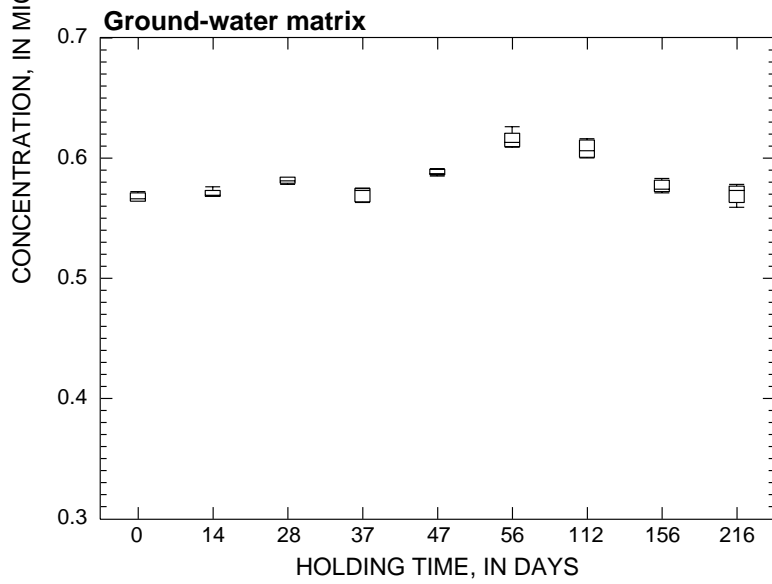
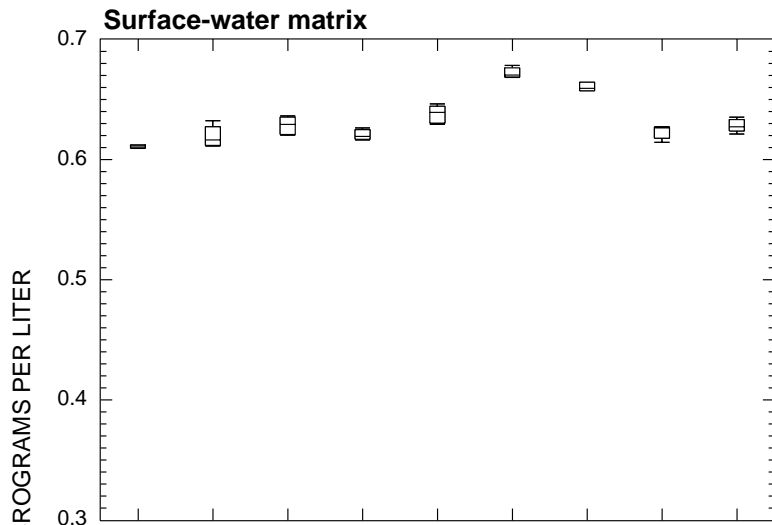
## Section B - Plots of concentration data for volatile organic compounds in surface- and ground-water matrices and continuing calibration verification data

Note: Graphical plots of concentration data consists of five replicate samples of each water matrix and three replicate samples for continuing calibration verification standards analyzed on days 0, 14, 28, 37, 47, 56, 112, 156, 216.

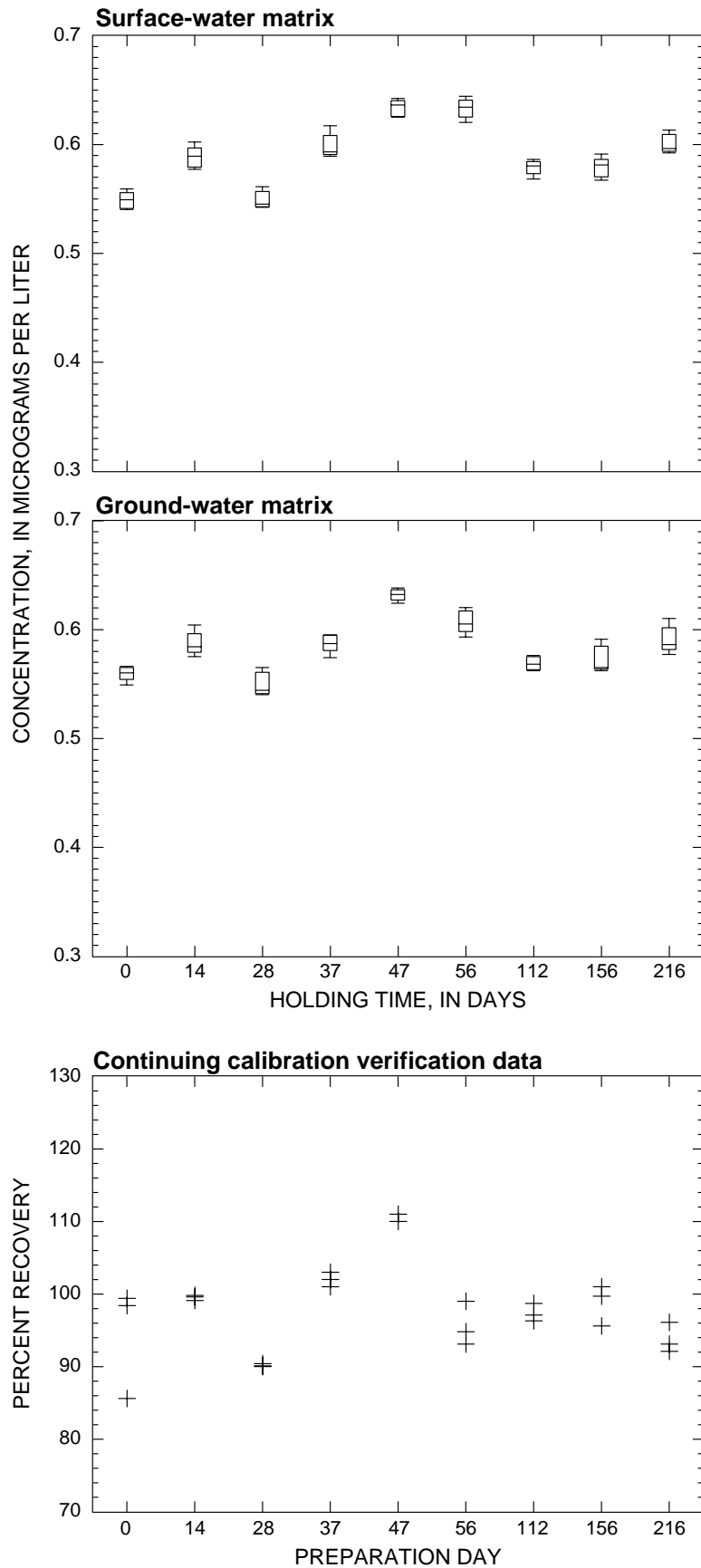
### EXPLANATION



# Benzene

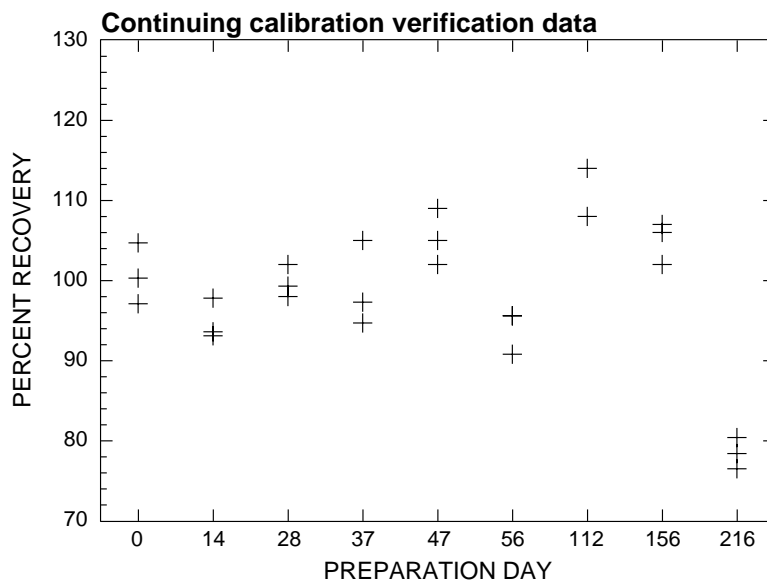
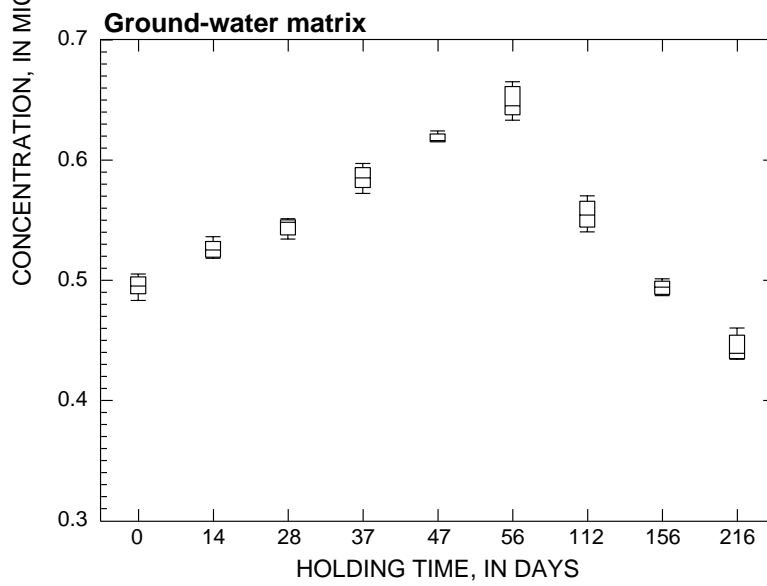
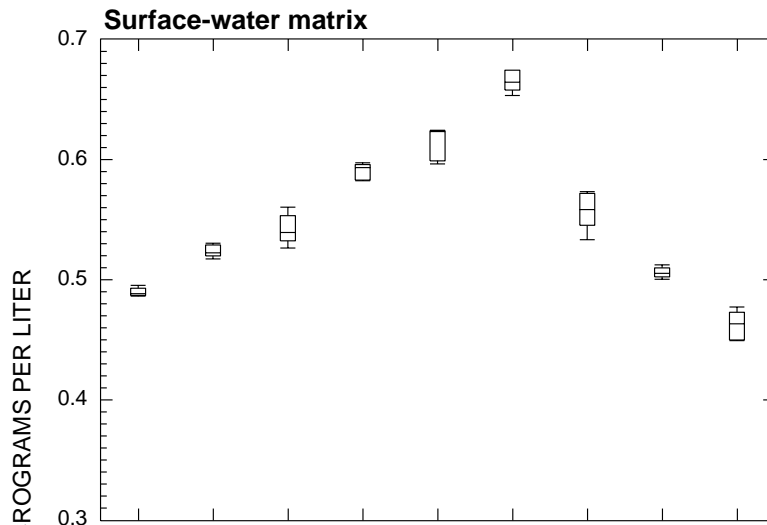


# Bromodichloromethane

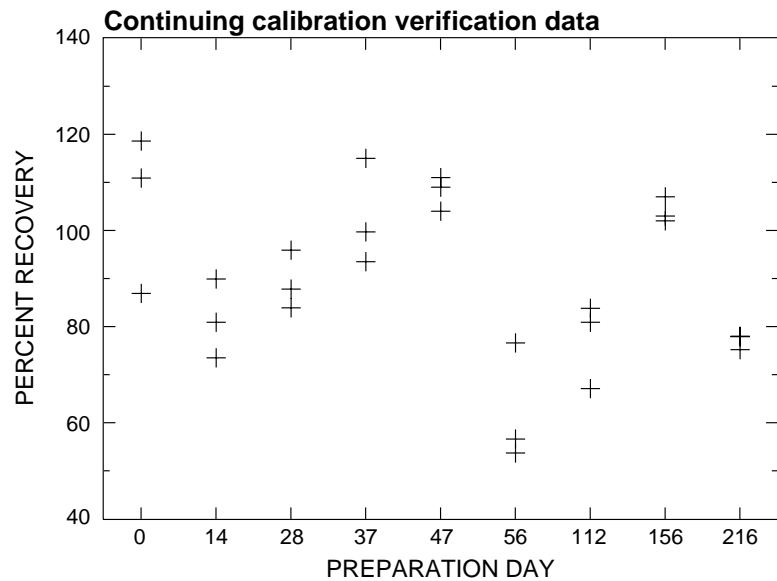
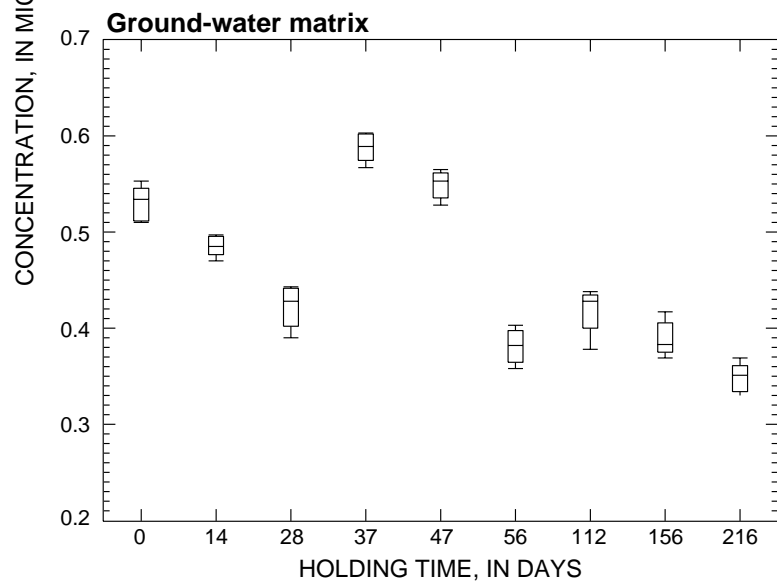
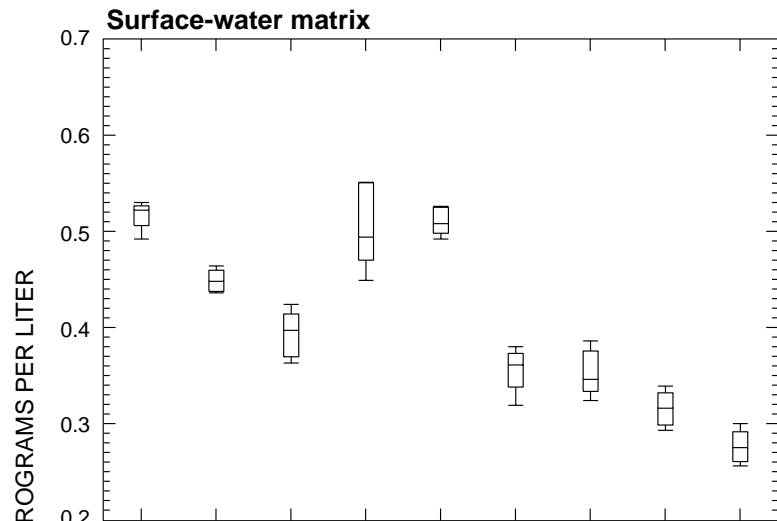




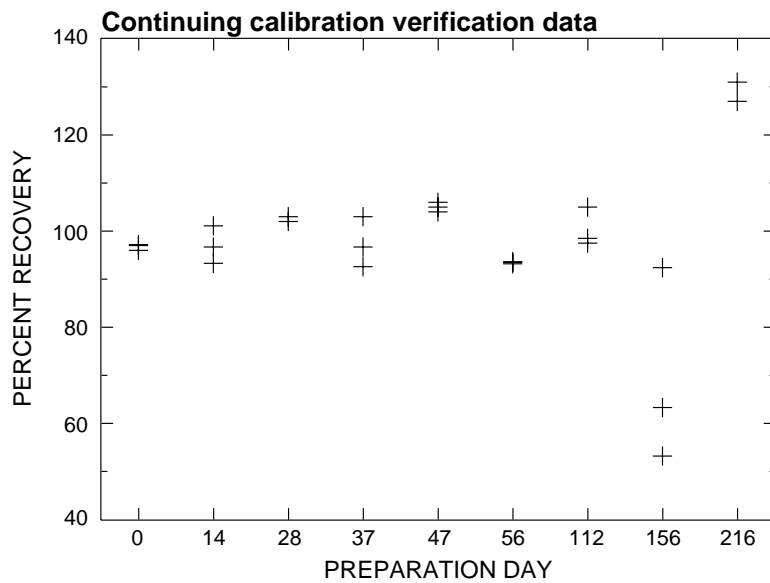
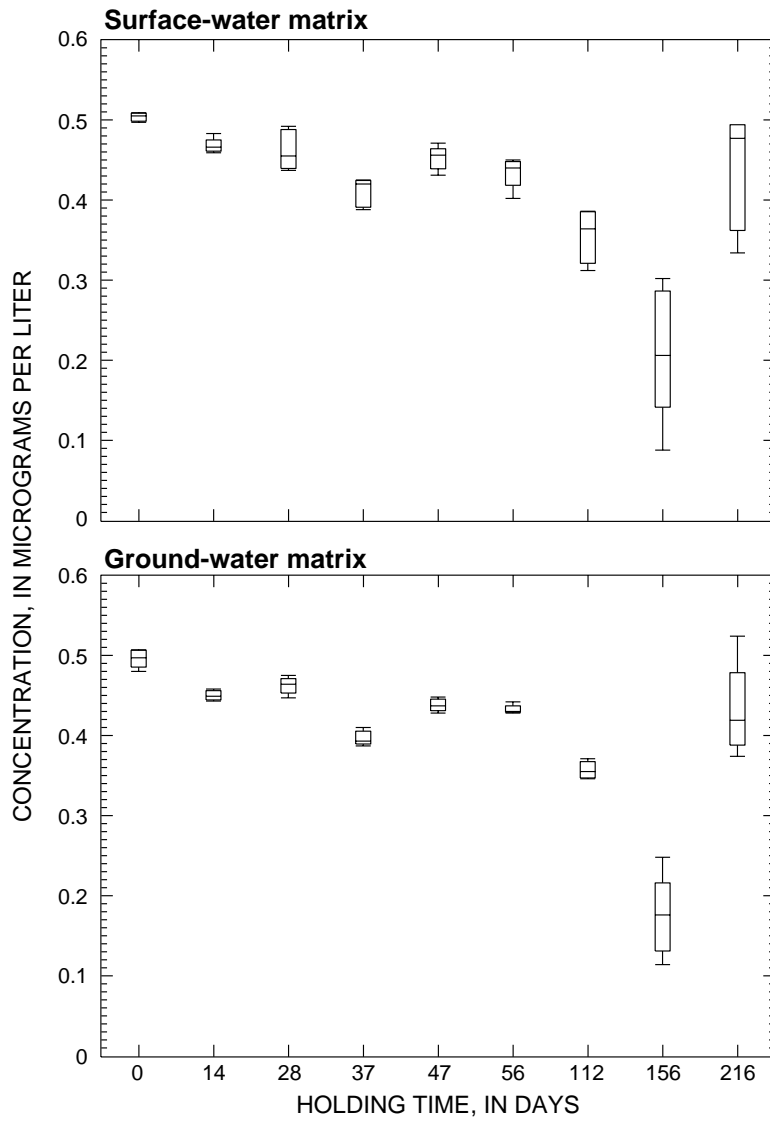
# Bromoethene



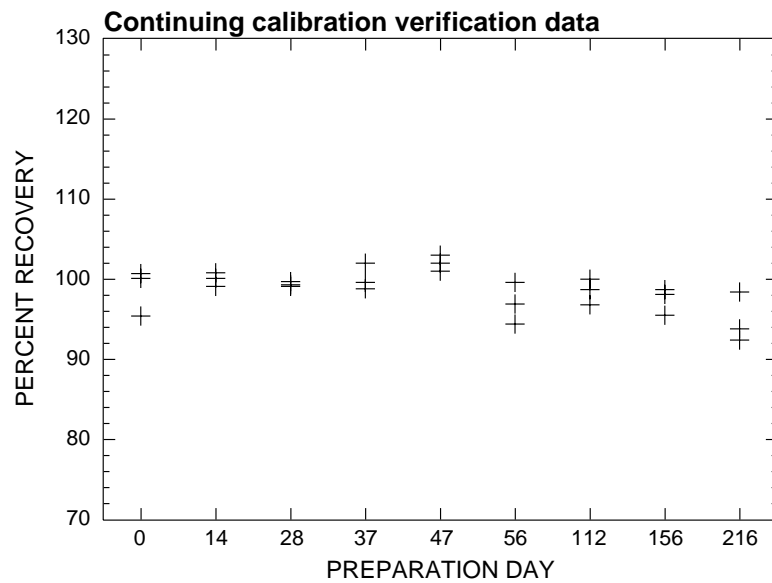
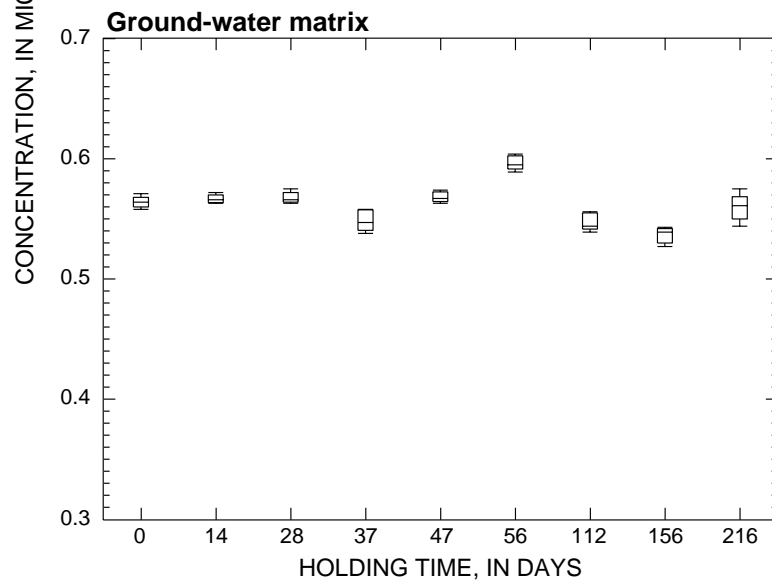
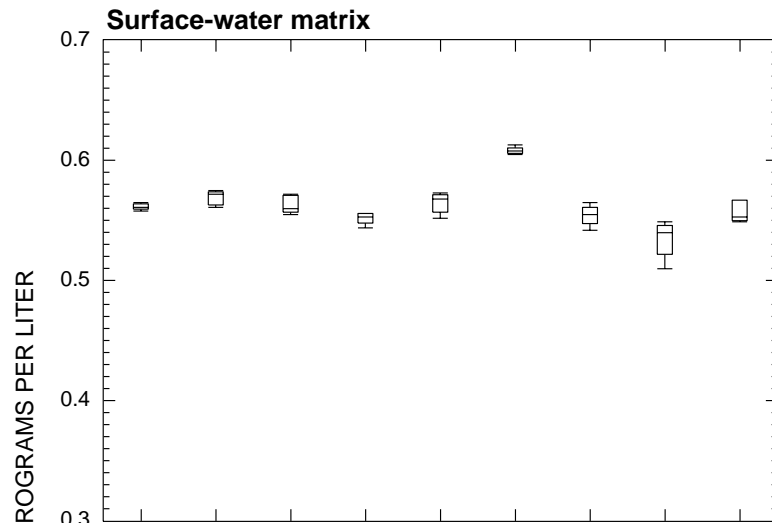
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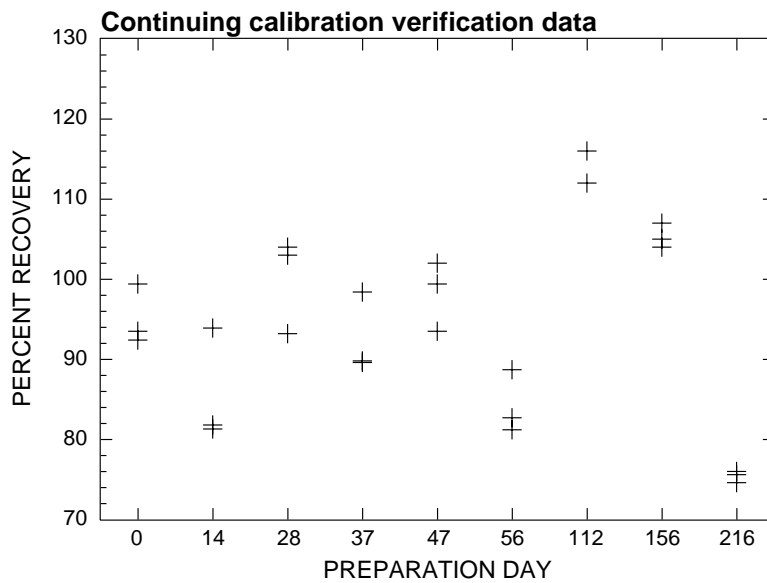
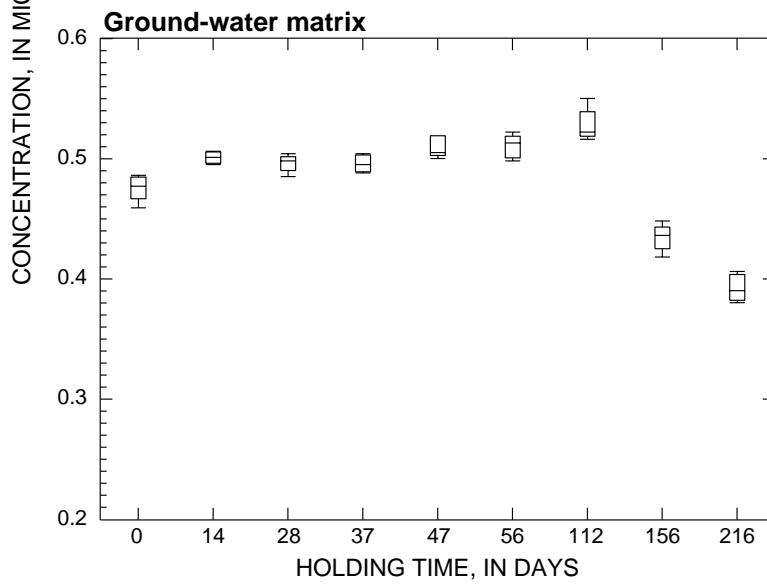
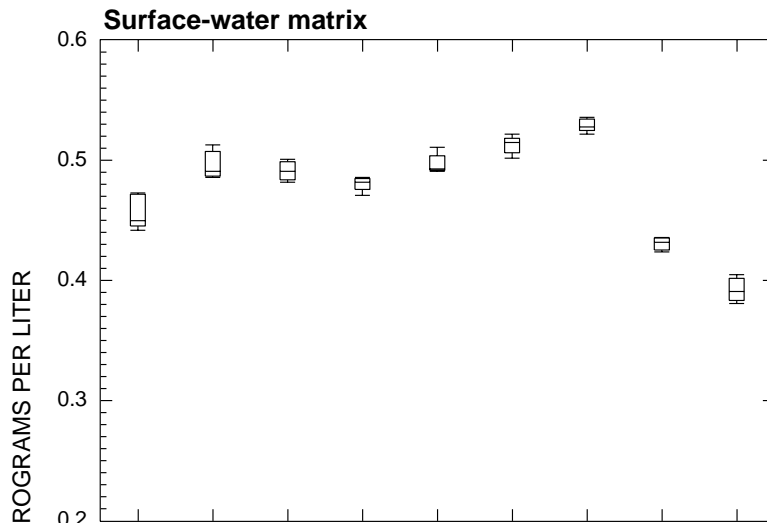
# n-Butylbenzene



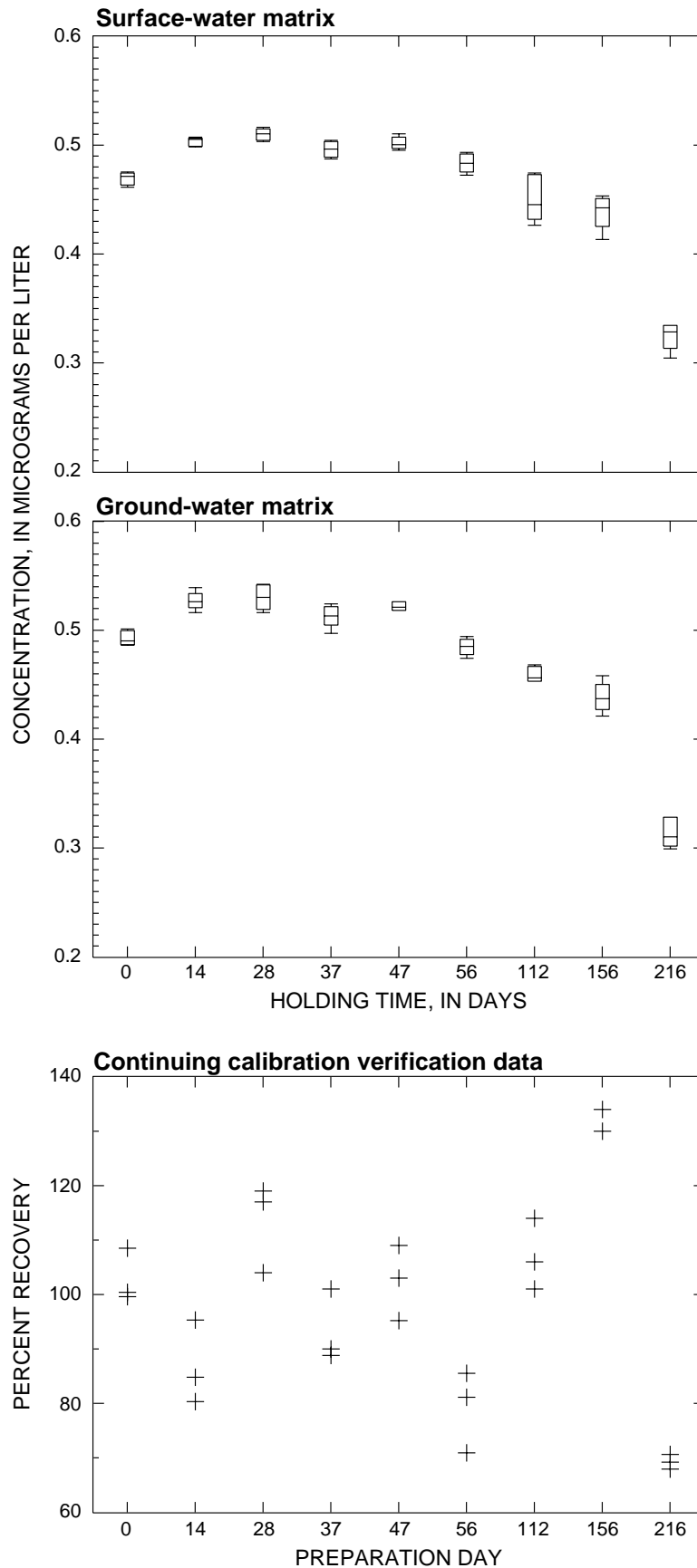
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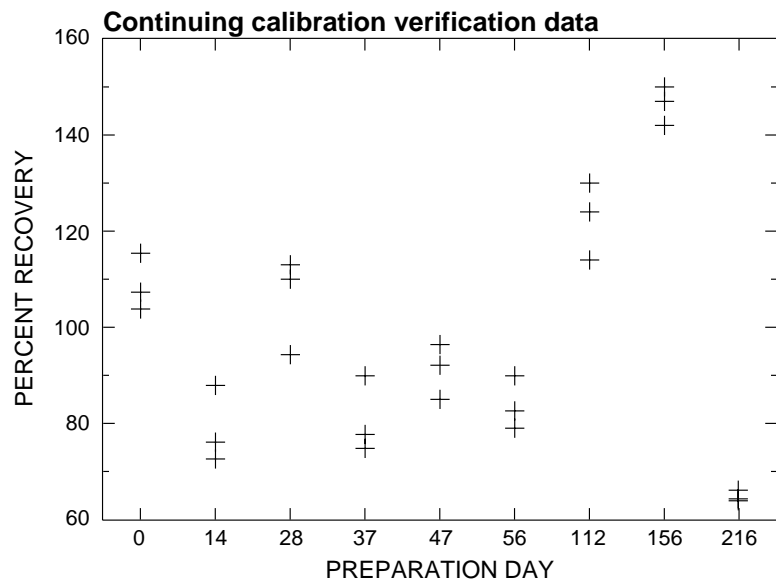
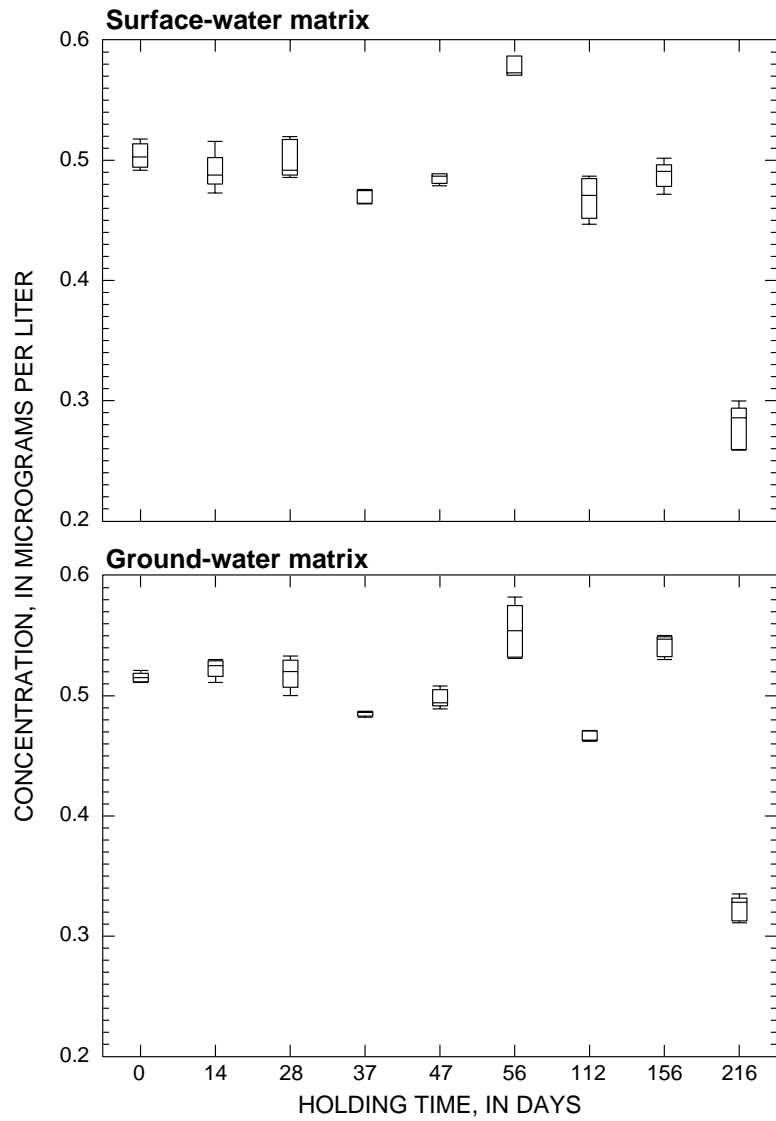
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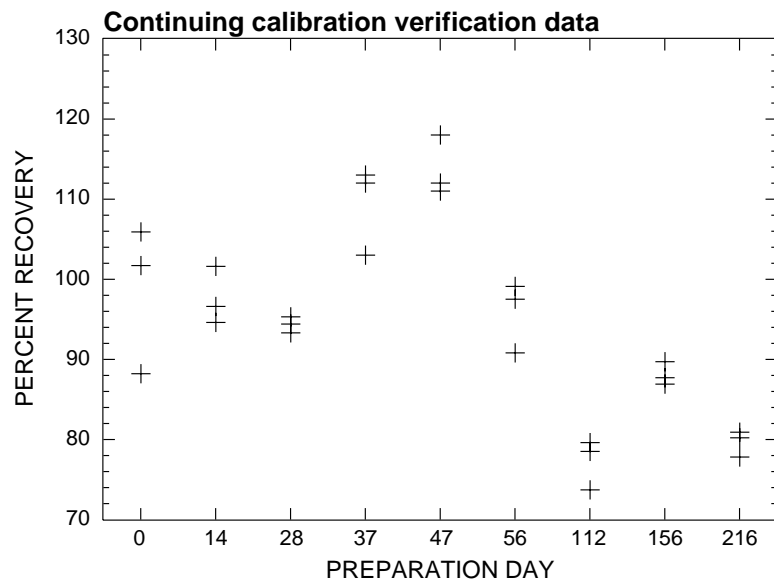
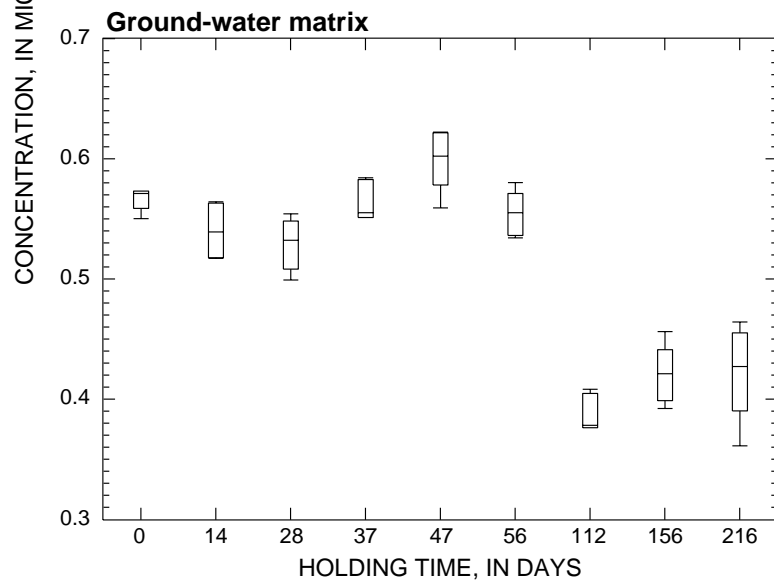
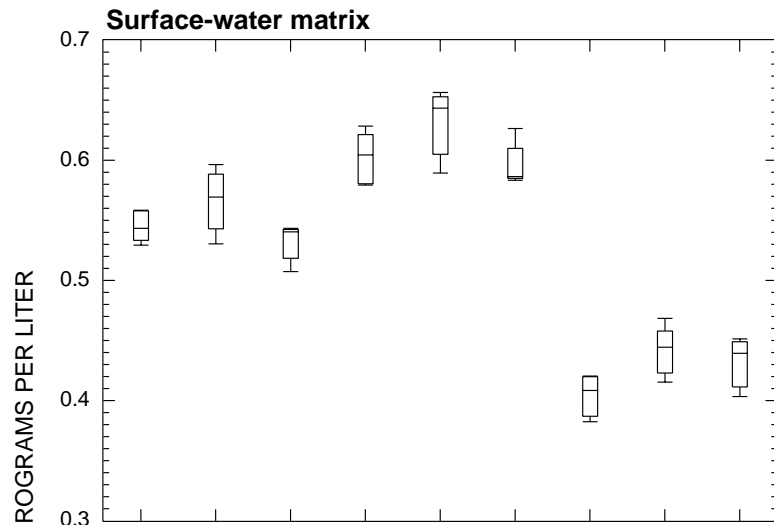
# Chloroethene



# Chloromethane

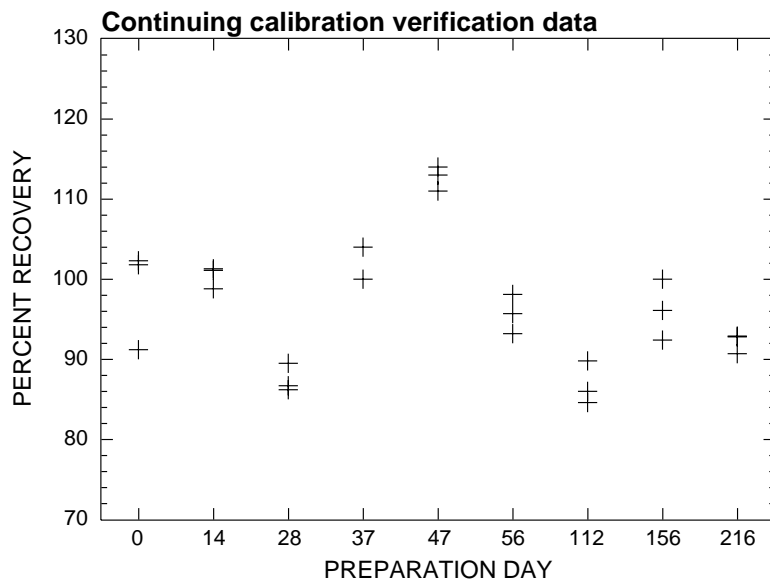
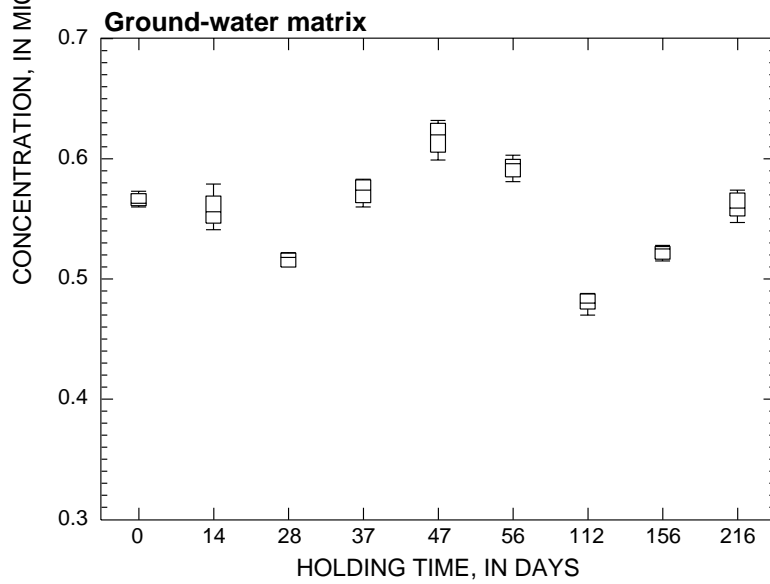
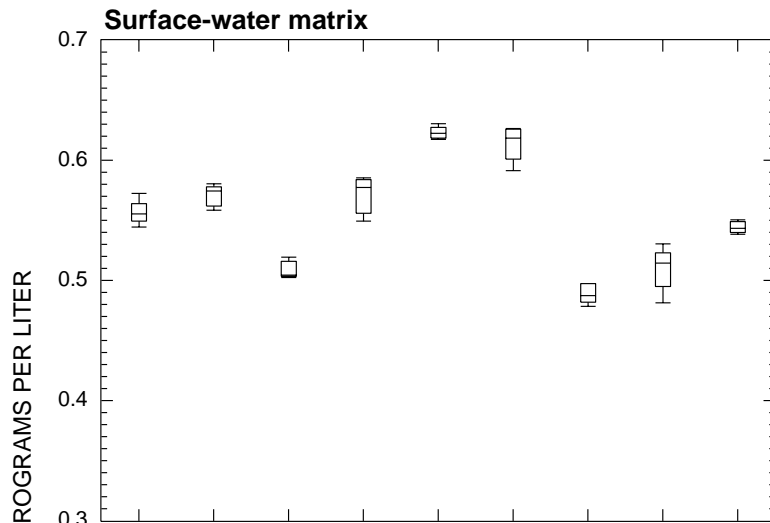


# 1,2-Dibromo-3-chloropropane

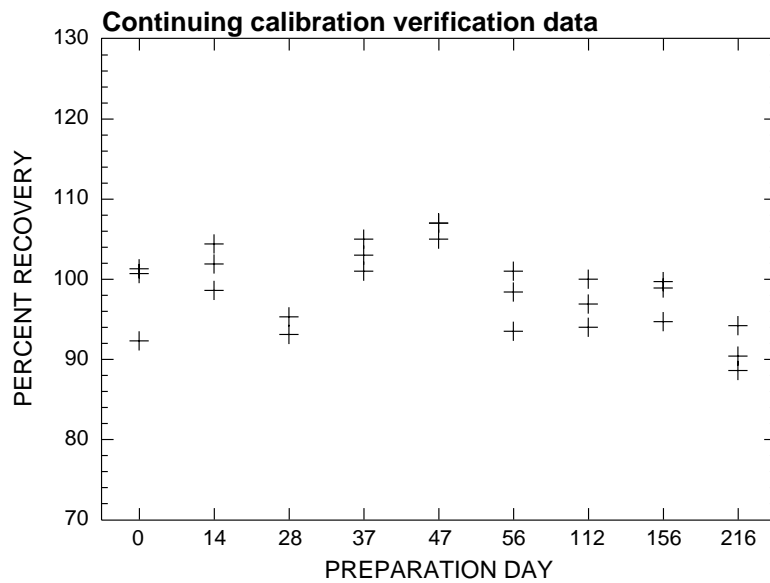
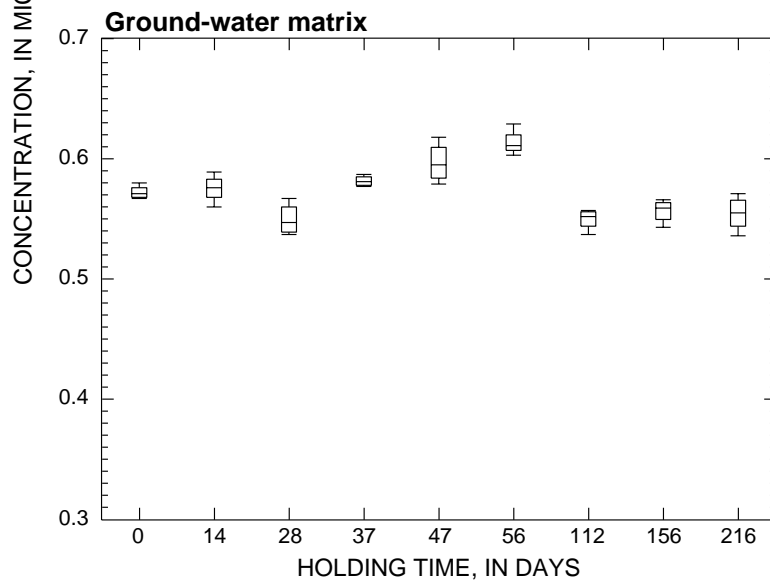
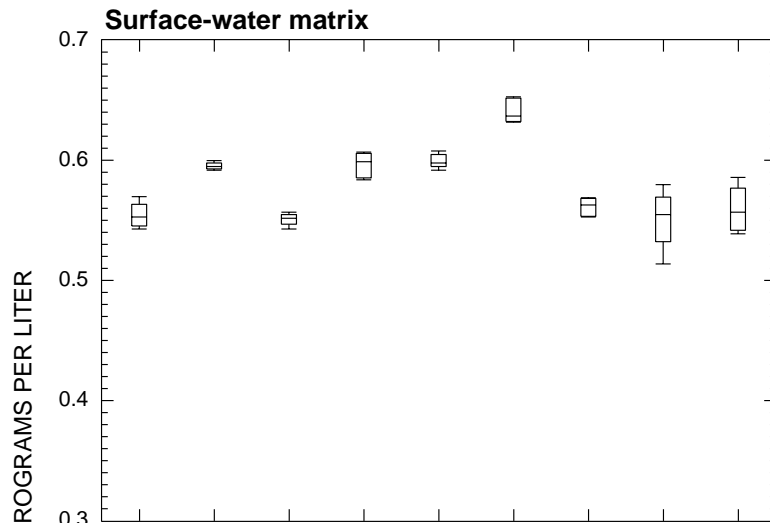




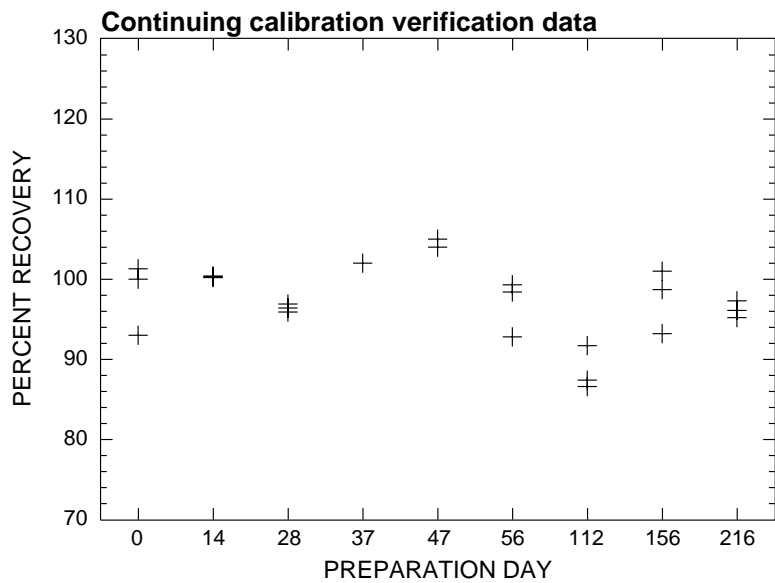
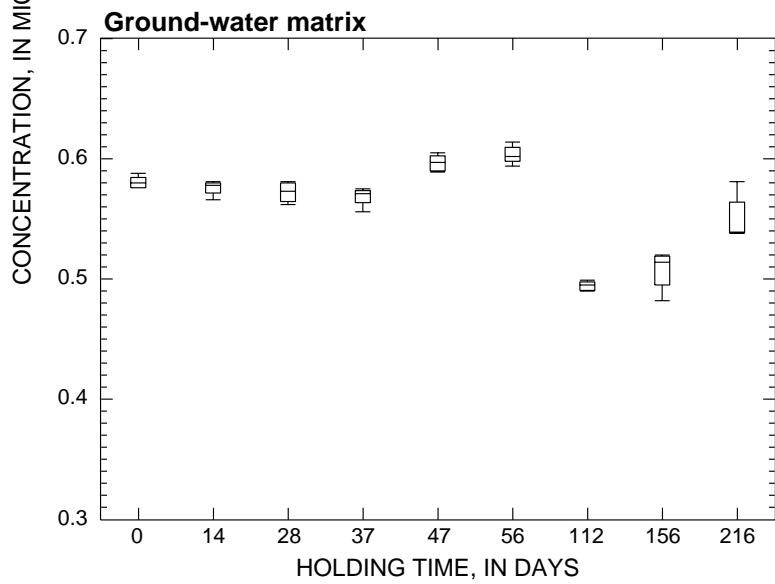
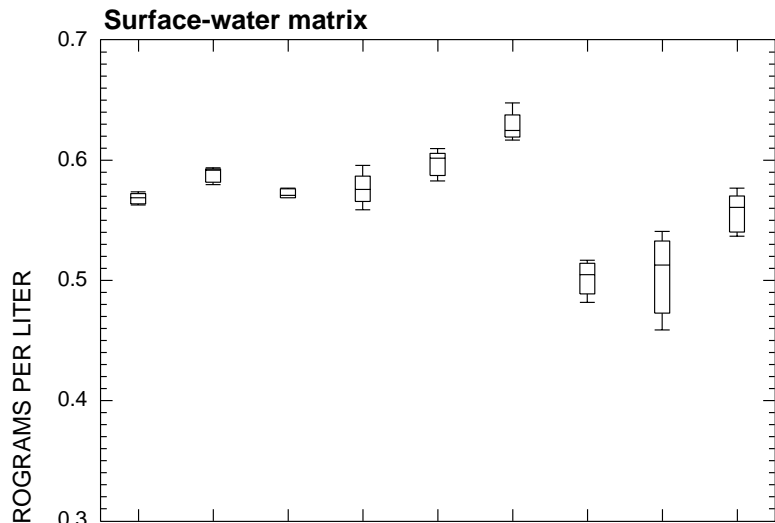
# Dibromochloromethane



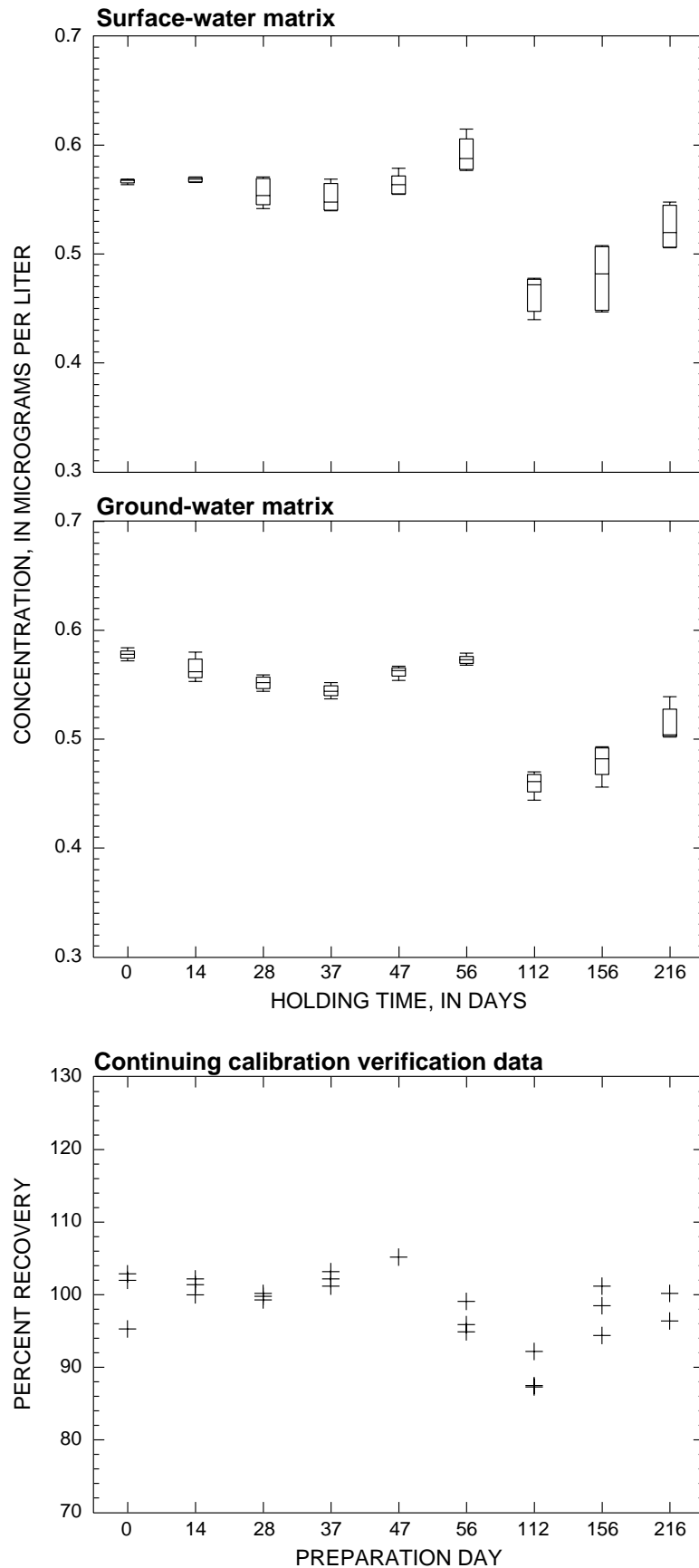
# 1,2-Dibromoethane



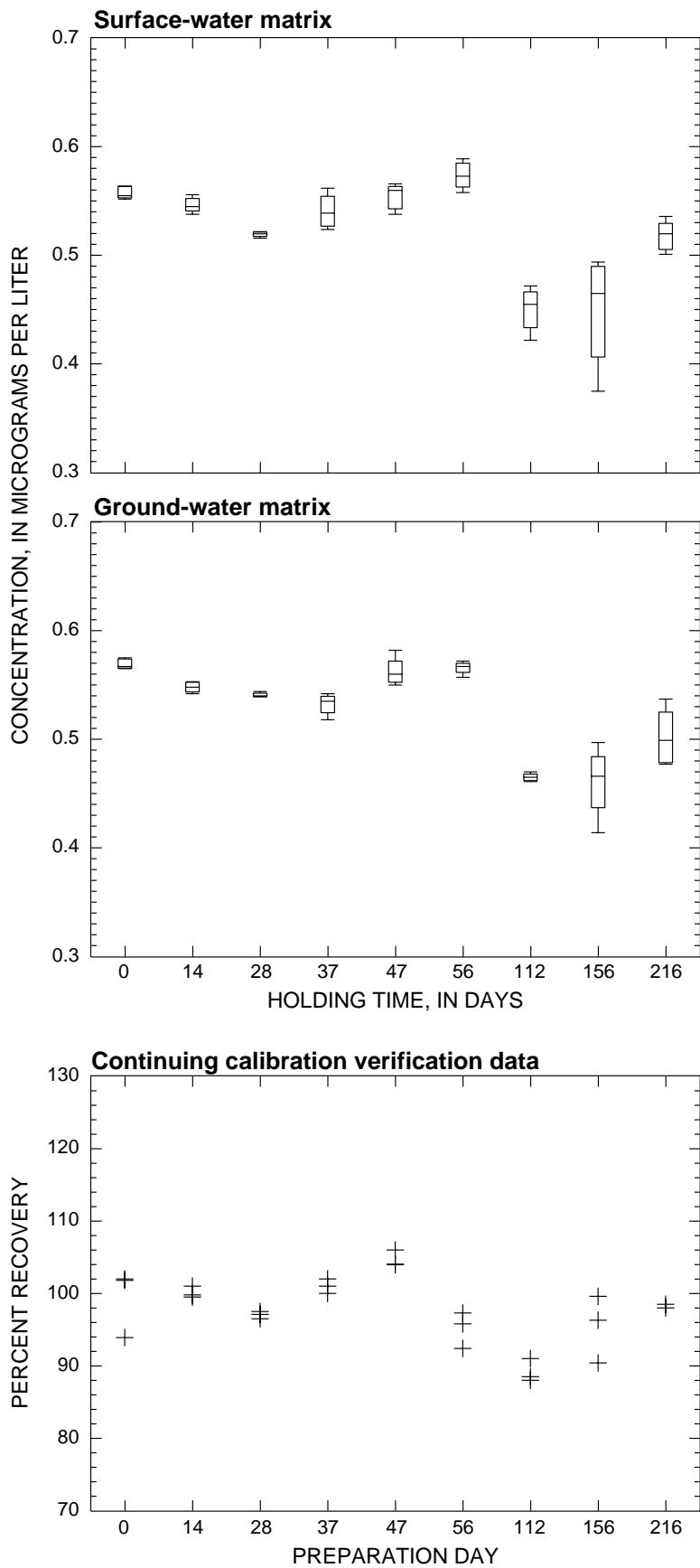
# 1,2-Dichlorobenzene



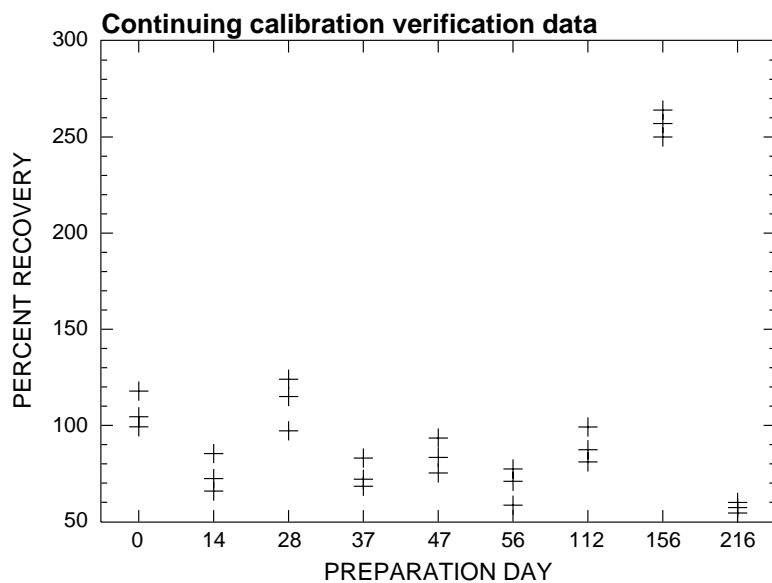
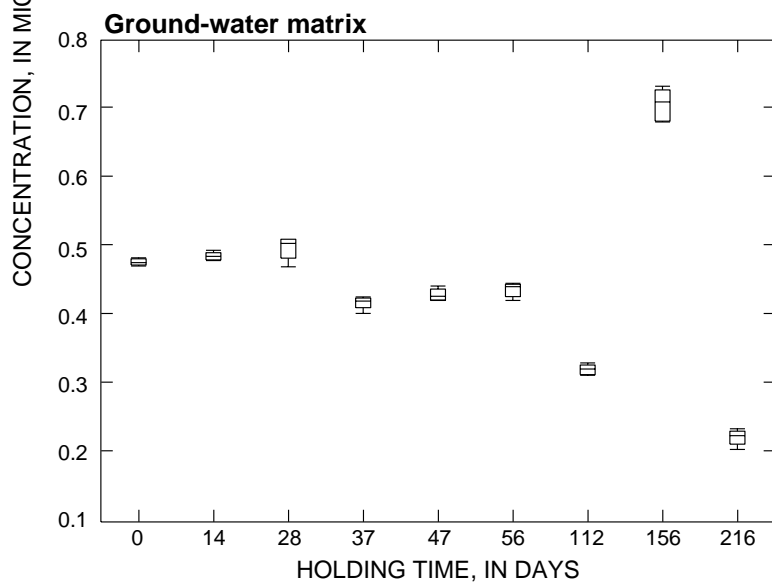
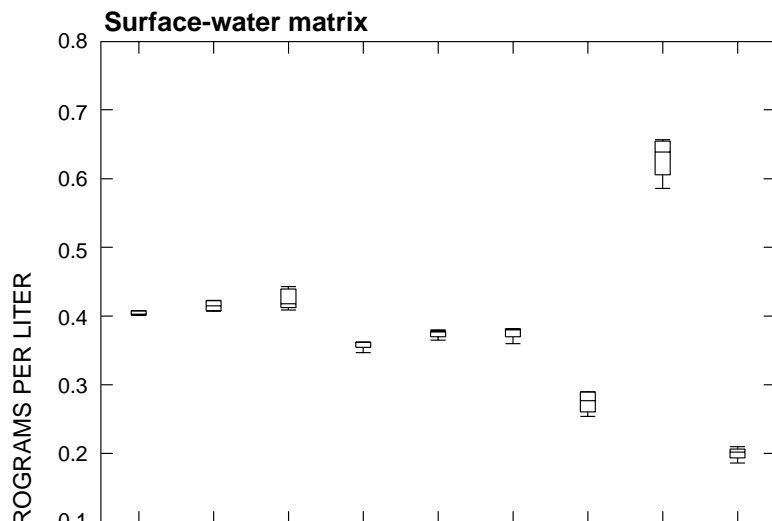
# 1,3-Dichlorobenzene



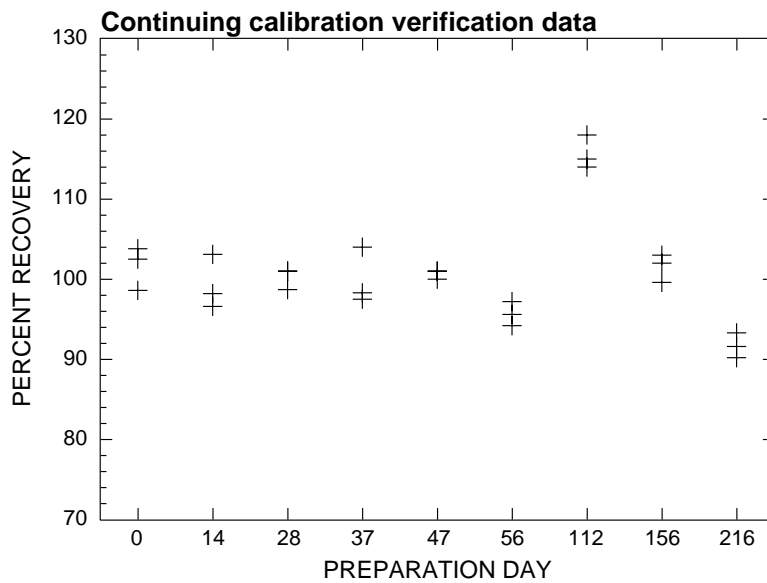
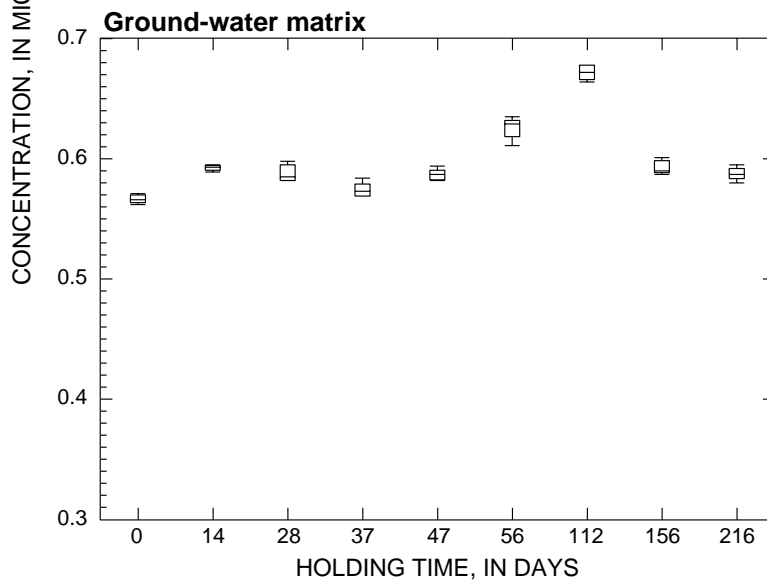
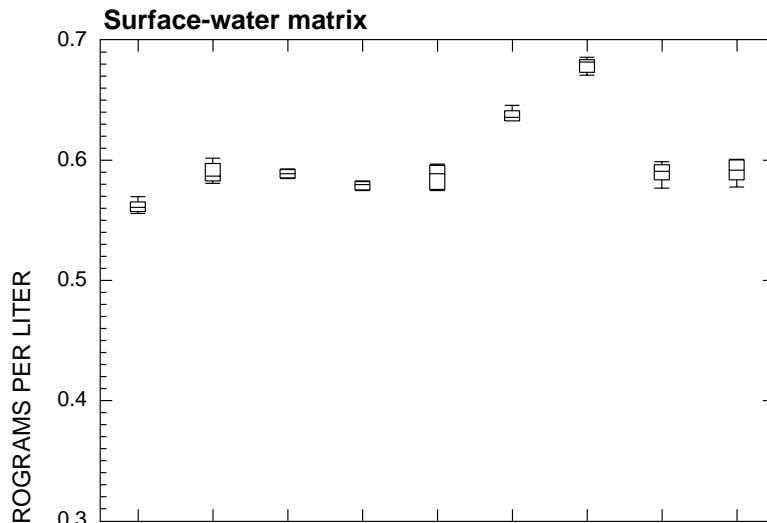
# 1,4-Dichlorobenzene



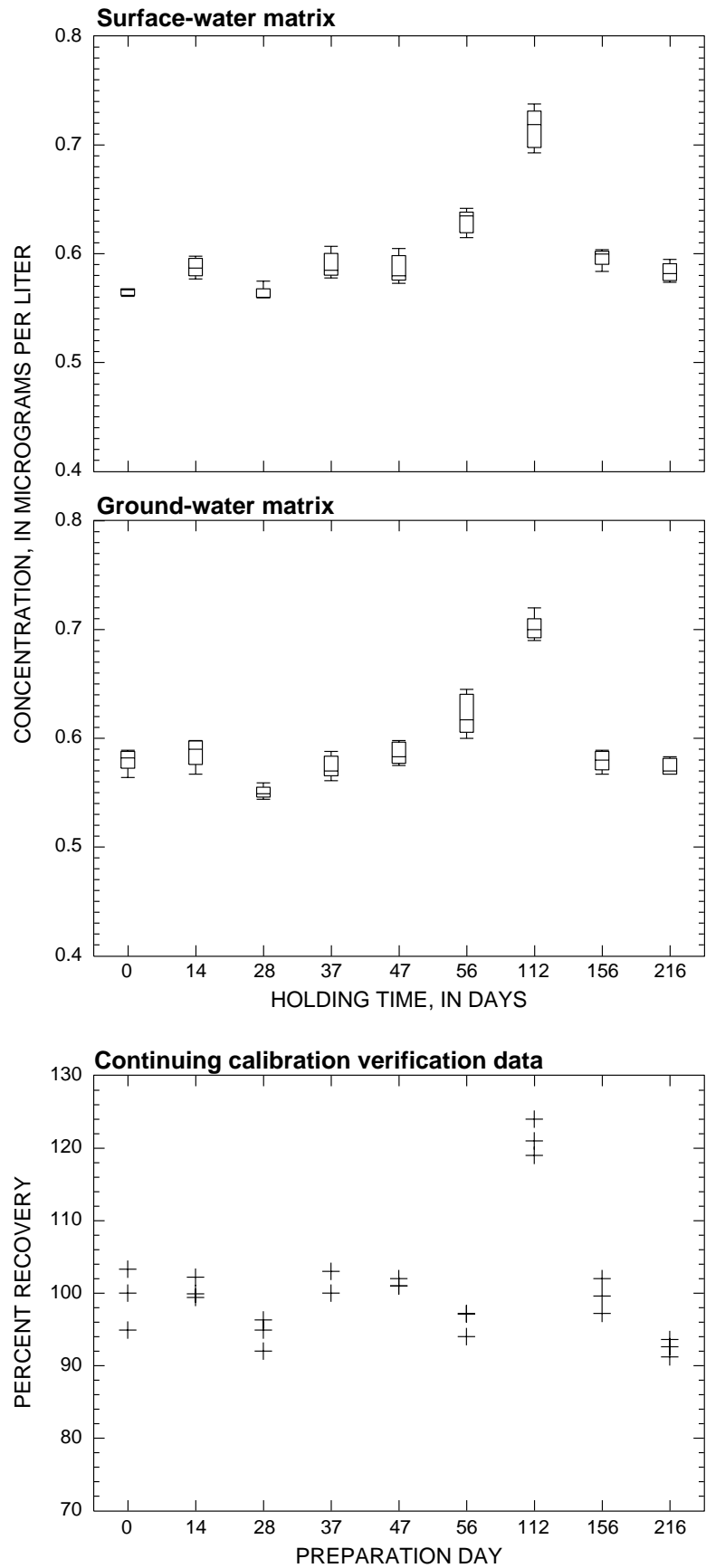
# Dichlorodifluoromethane



# 1,1-Dichloroethane

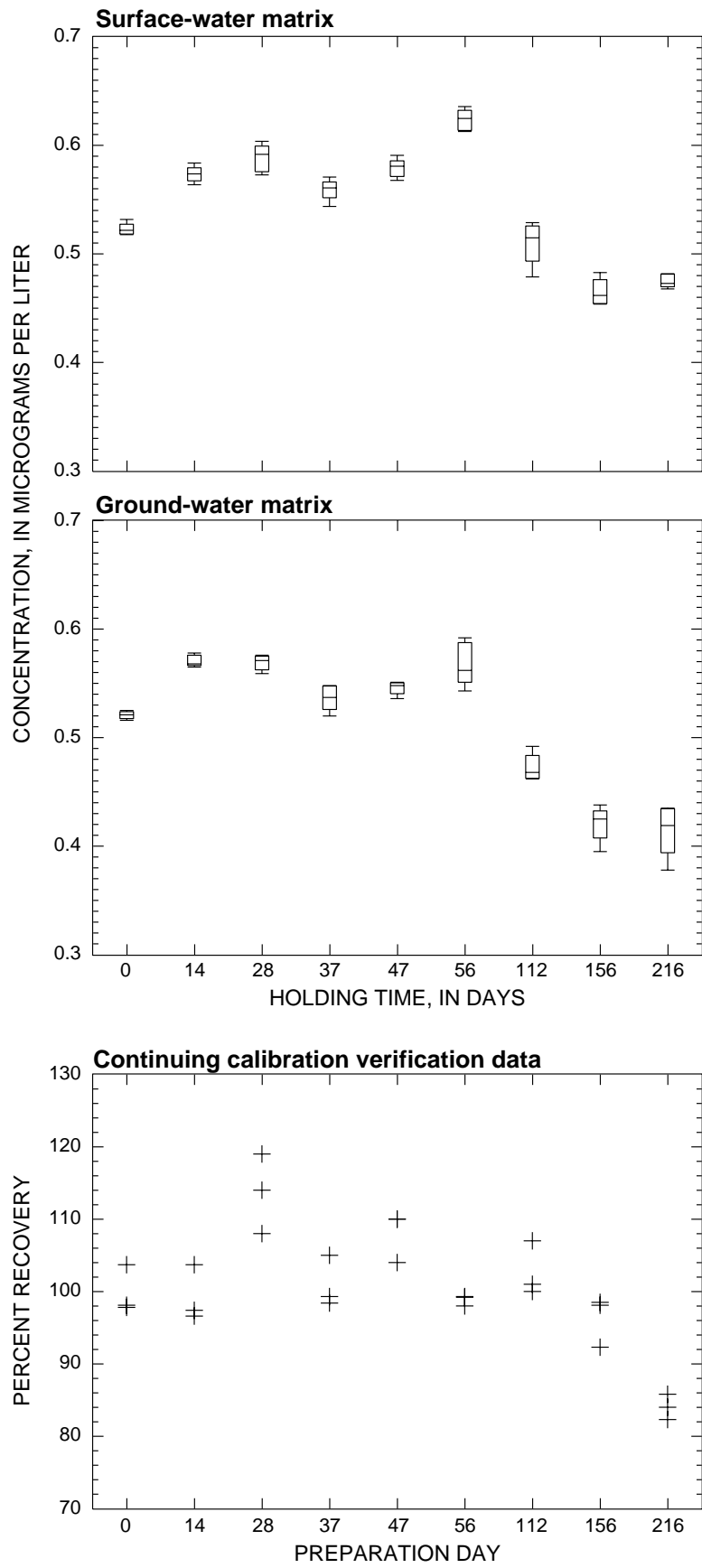


# 1,2-Dichloroethane

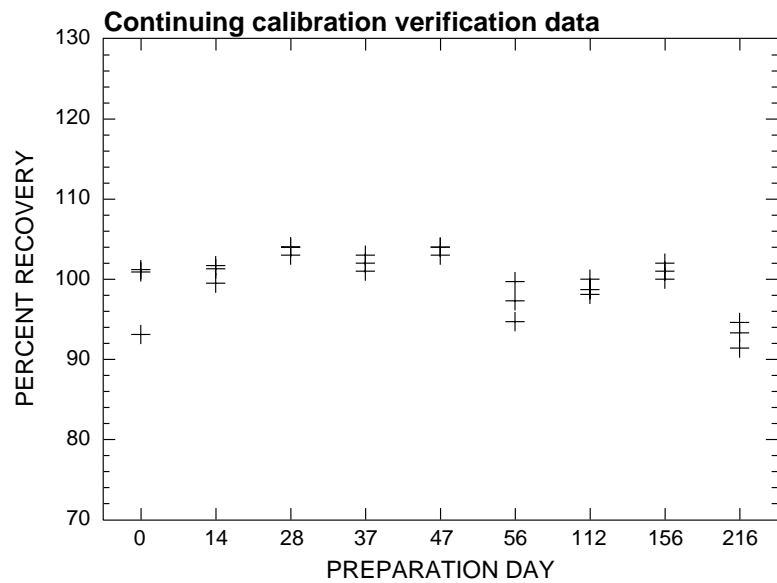
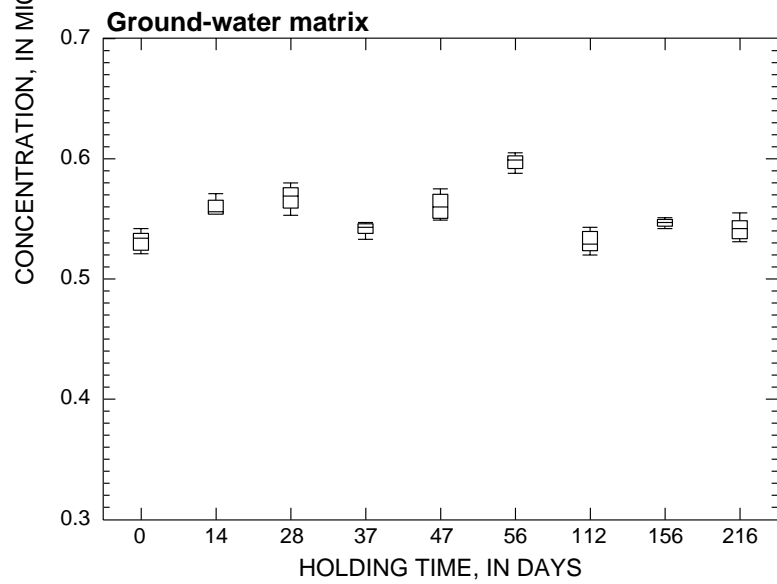
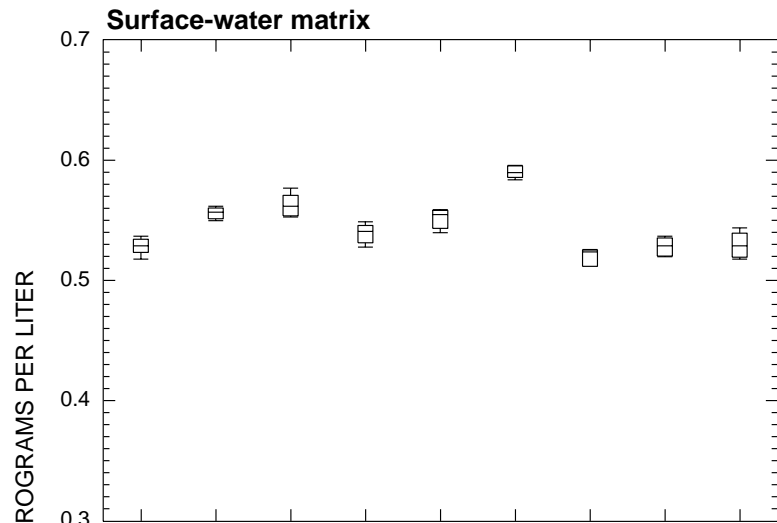




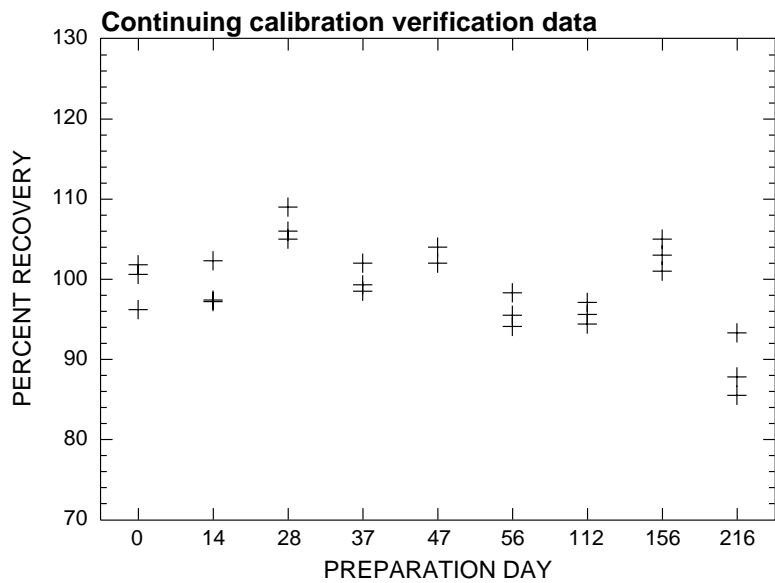
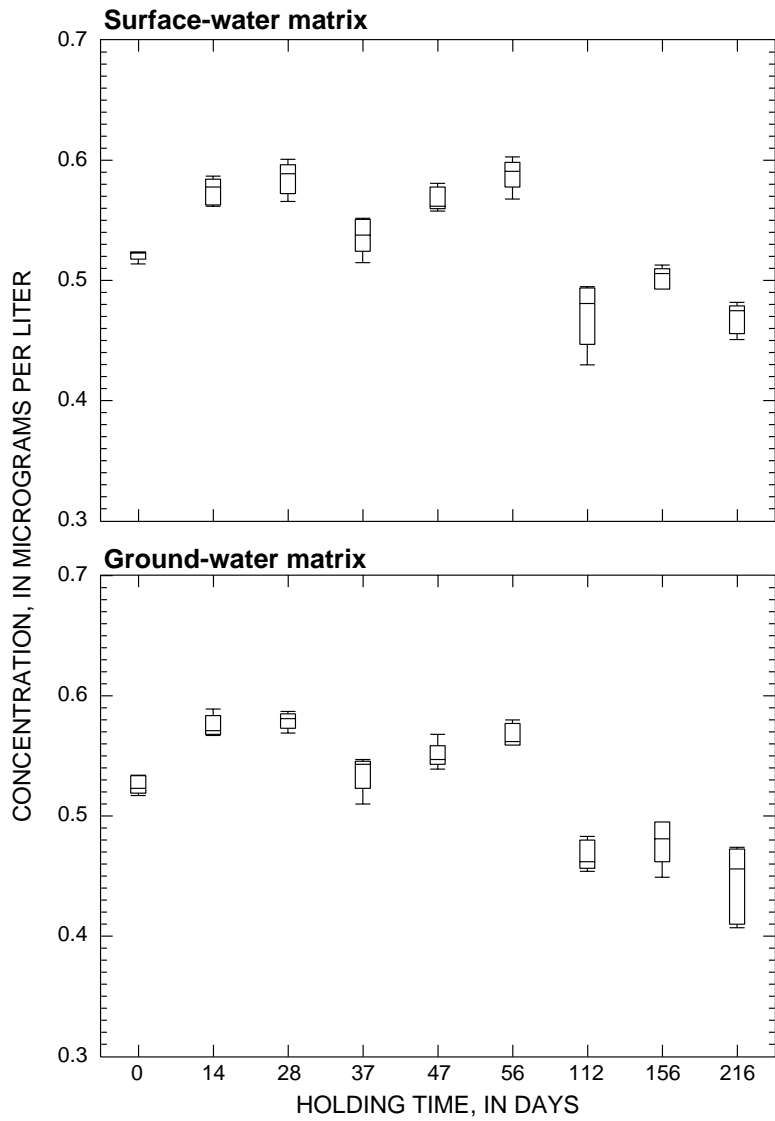
# 1,1-Dichloroethene



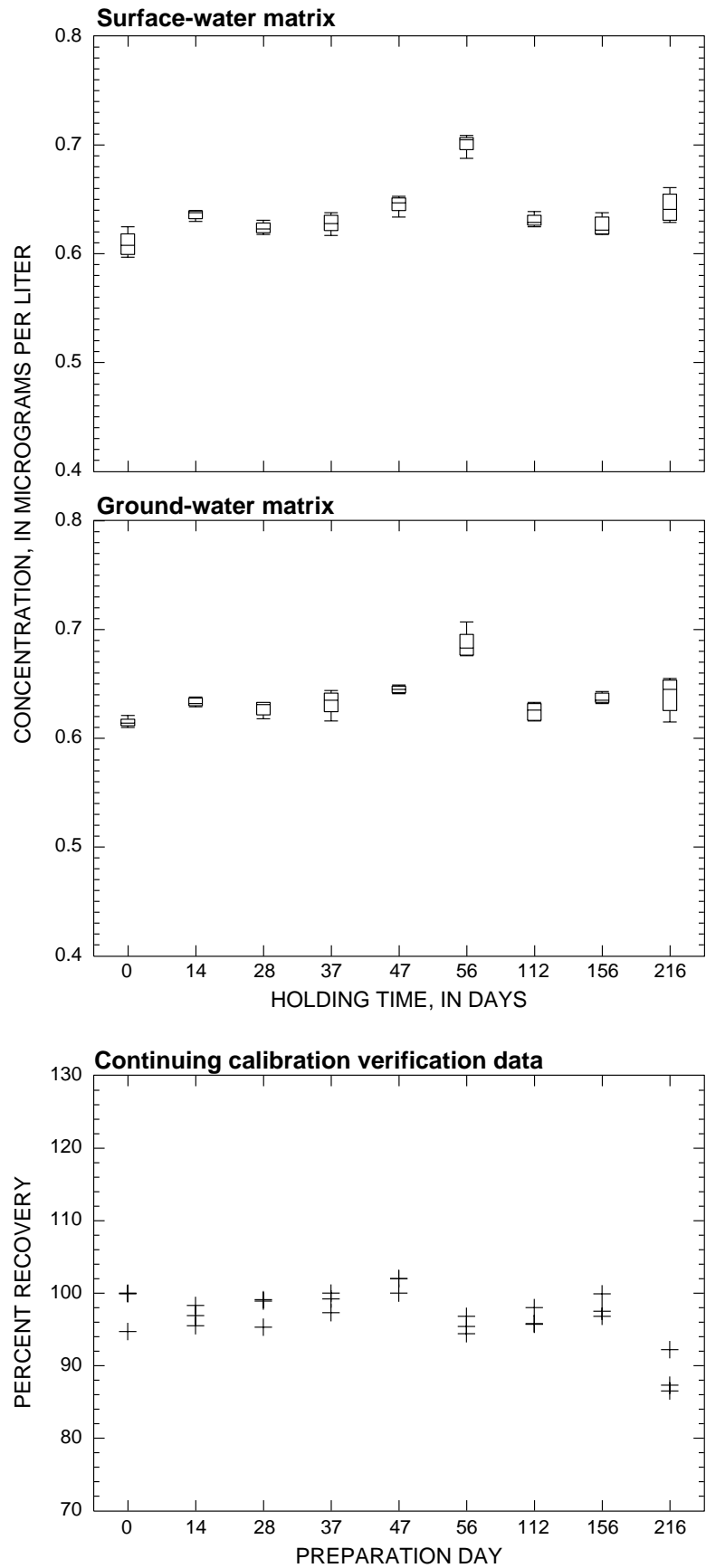
# cis-1,2-Dichloroethene



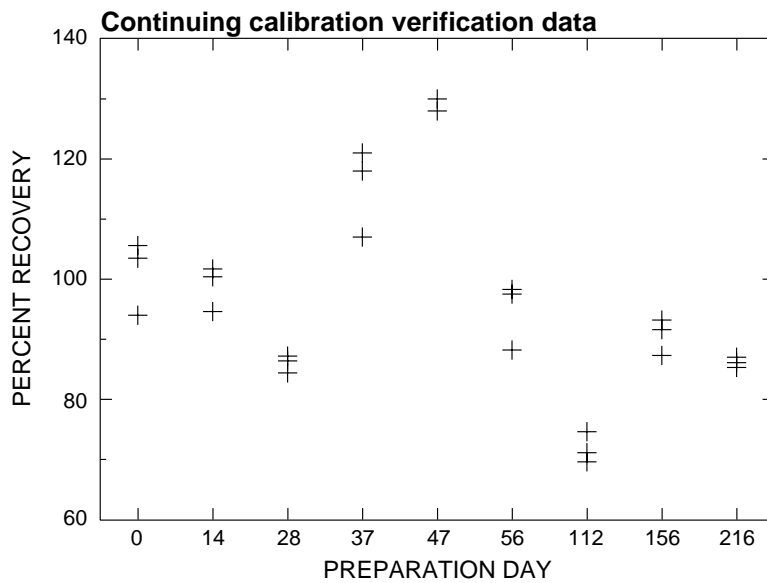
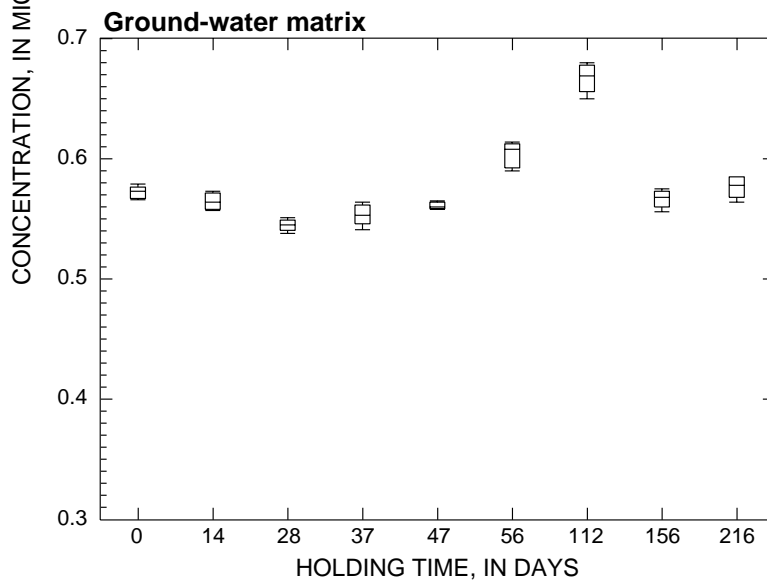
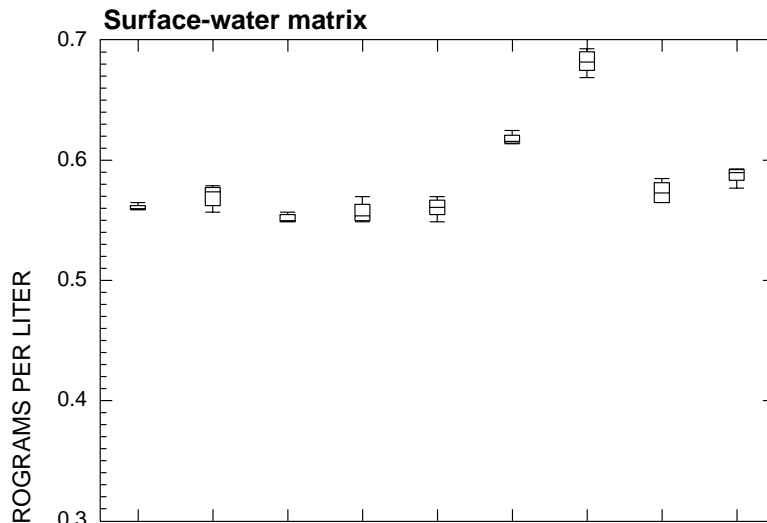
# trans-1,2-Dichloroethene



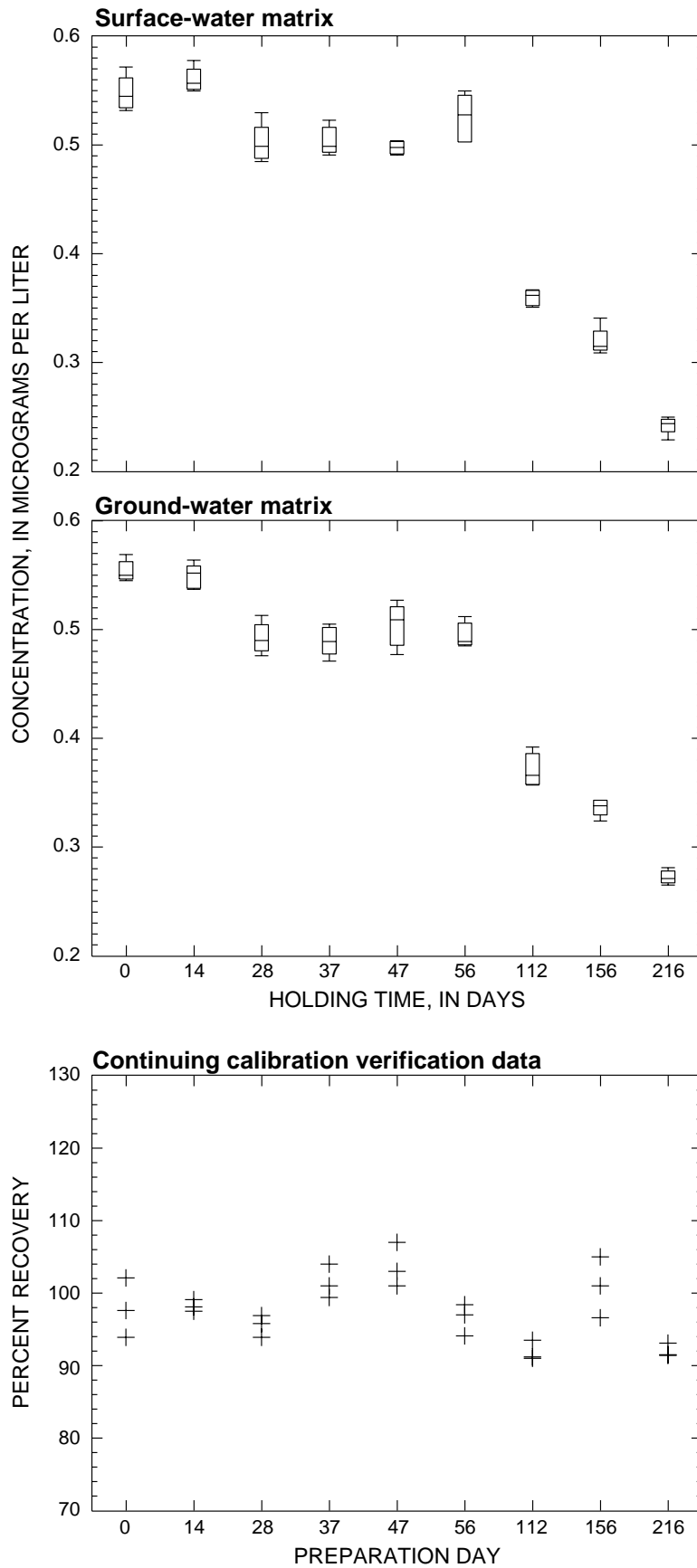
# Dichloromethane



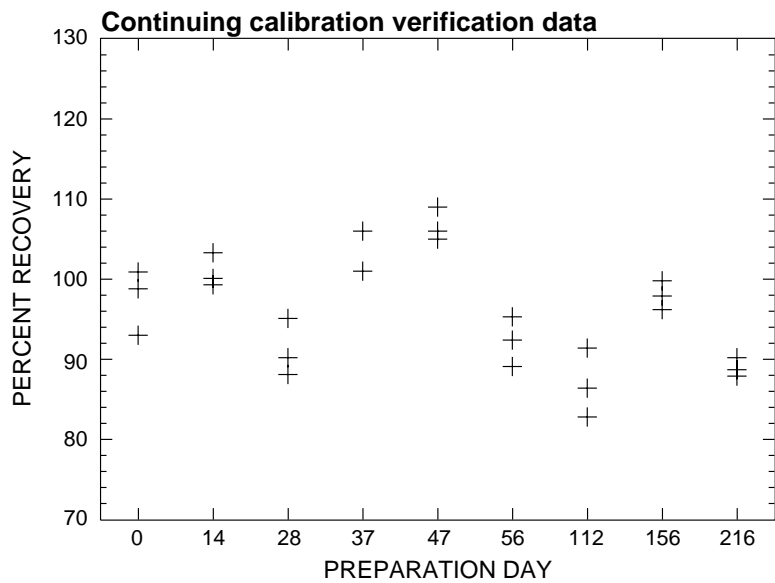
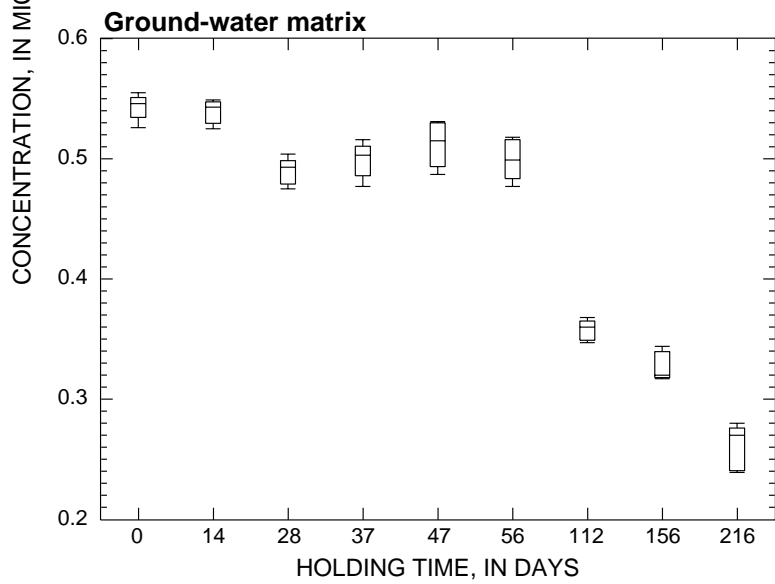
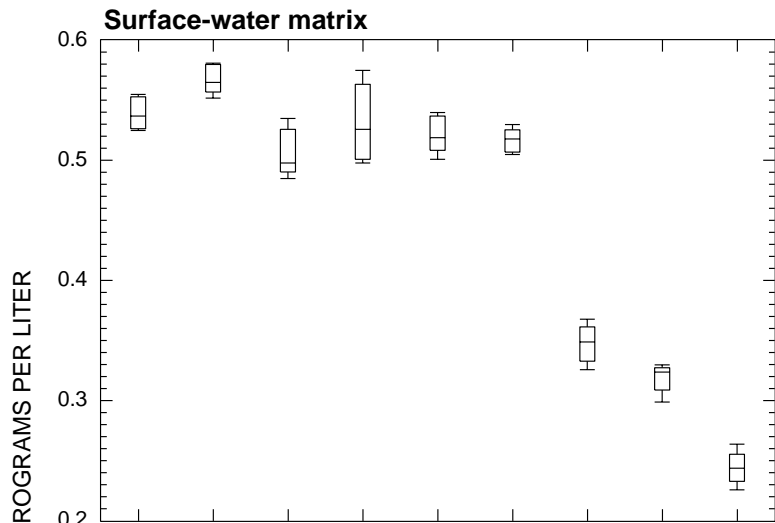
# 1,2-Dichloropropane



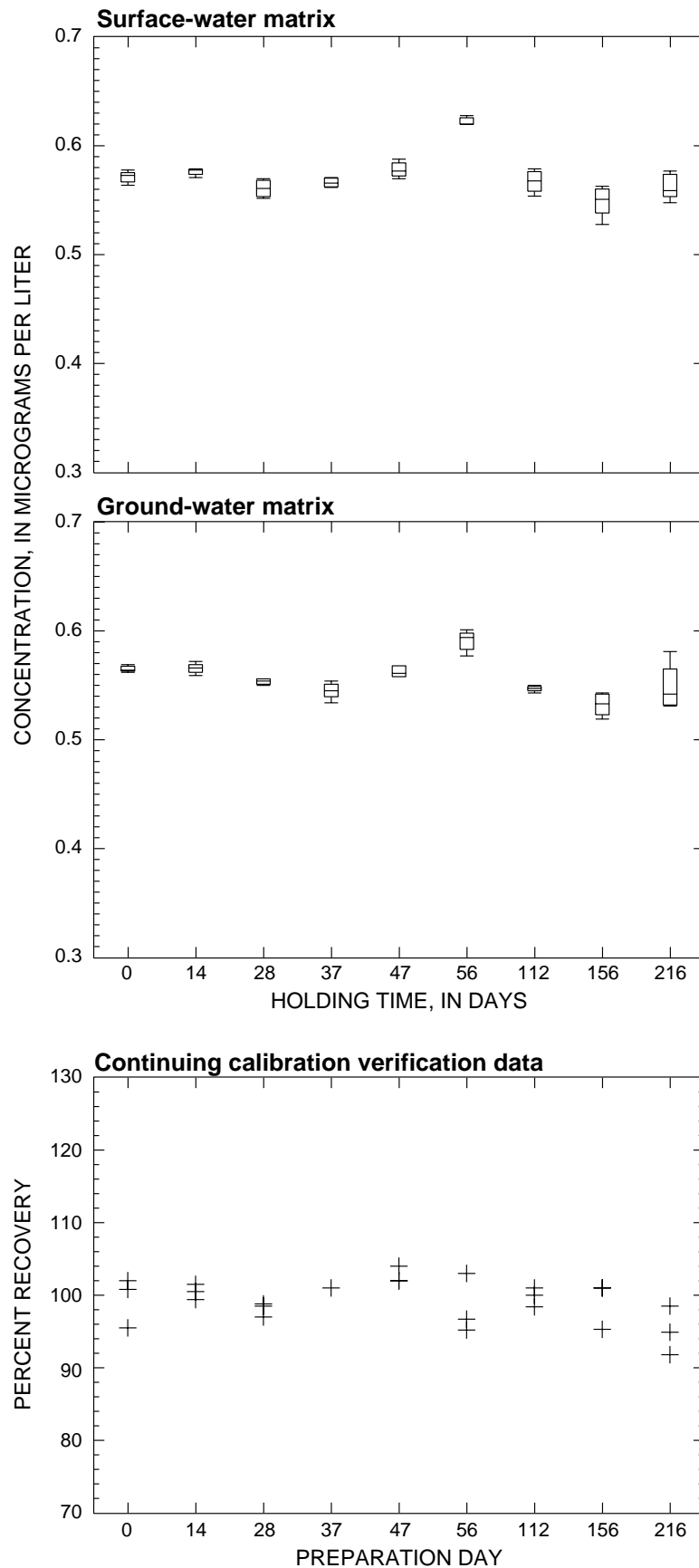
# cis-1,3-Dichloropropene



# trans-1,3-Dichloropropene

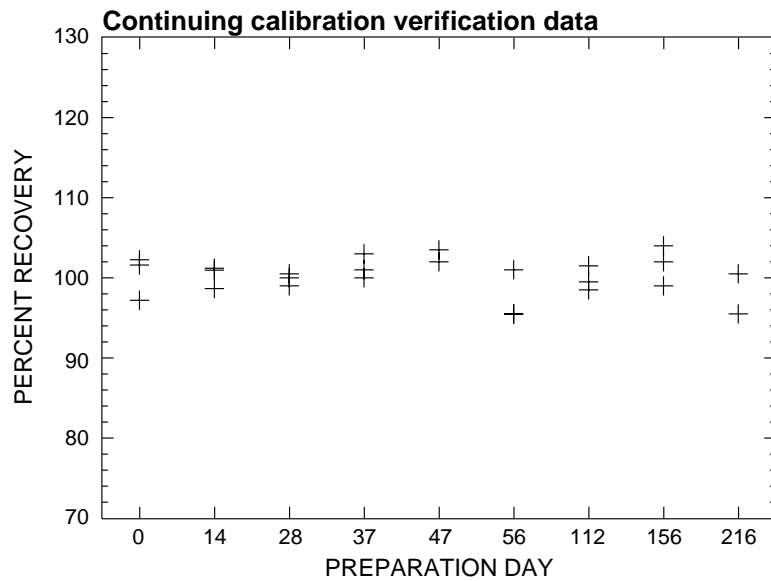
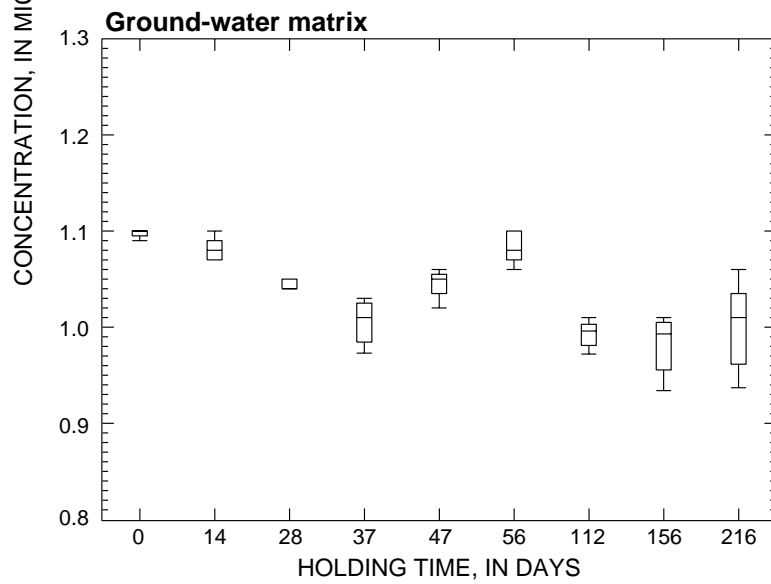
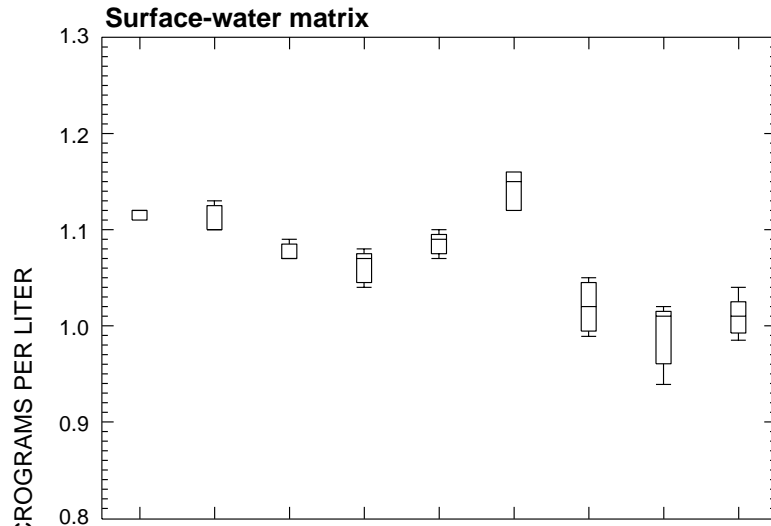


# 1,2-Dimethylbenzene

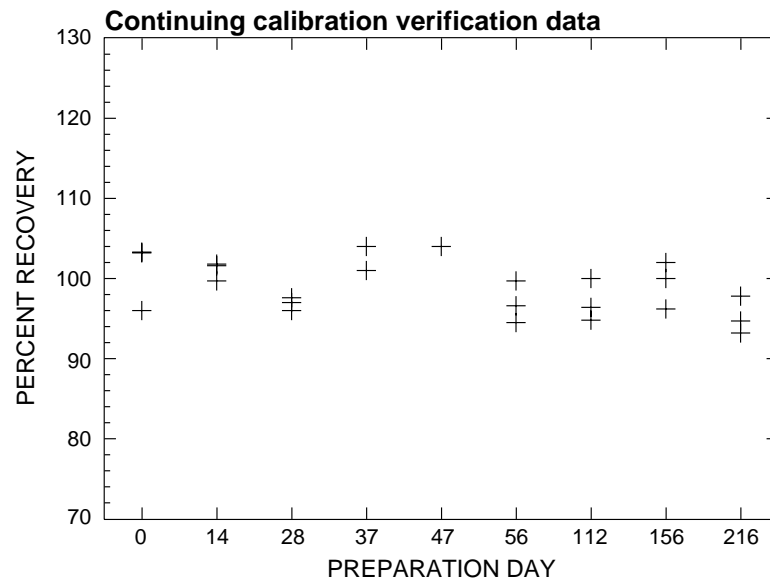
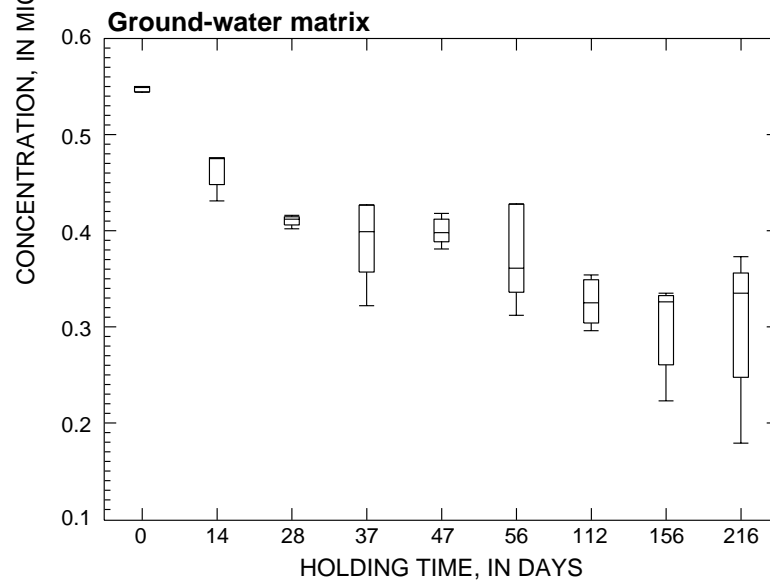
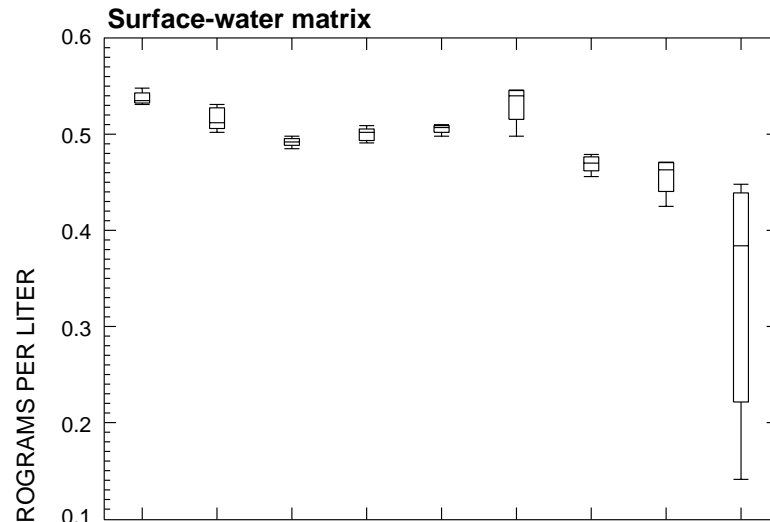




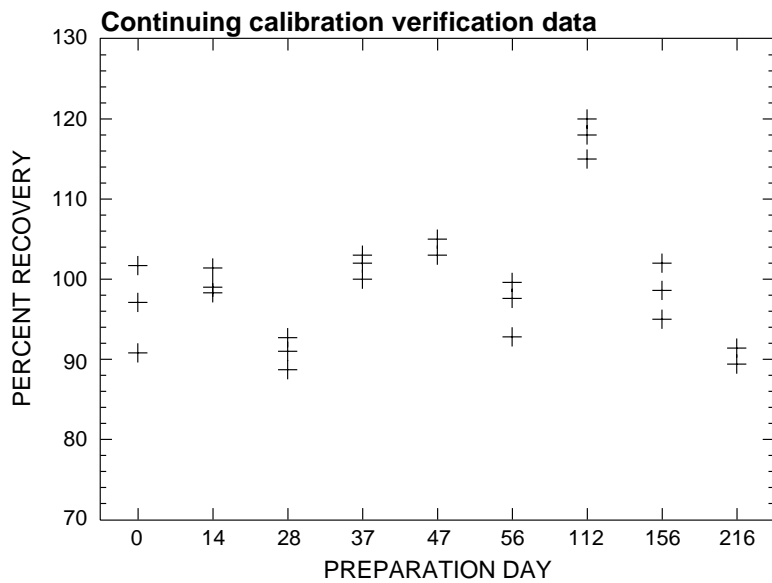
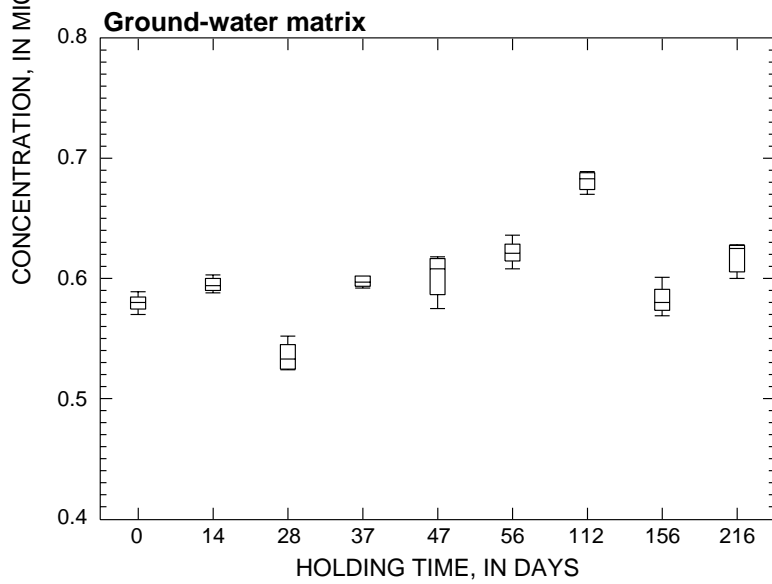
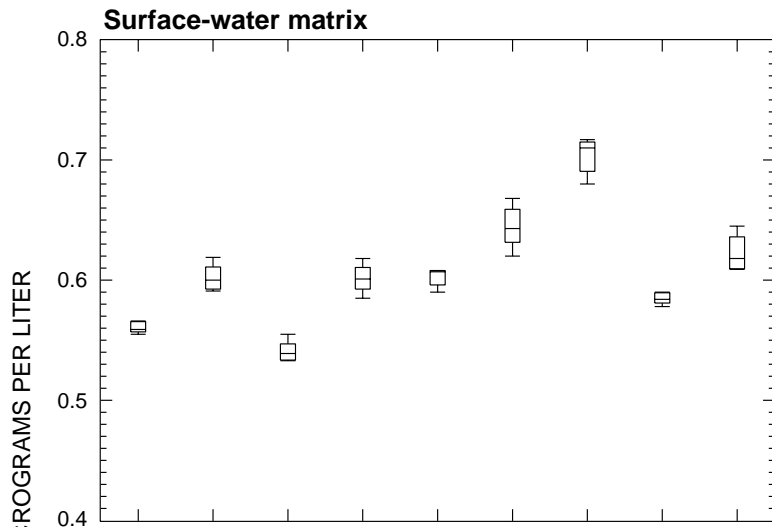
# 1,3- and 1,4-Dimethylbenzene



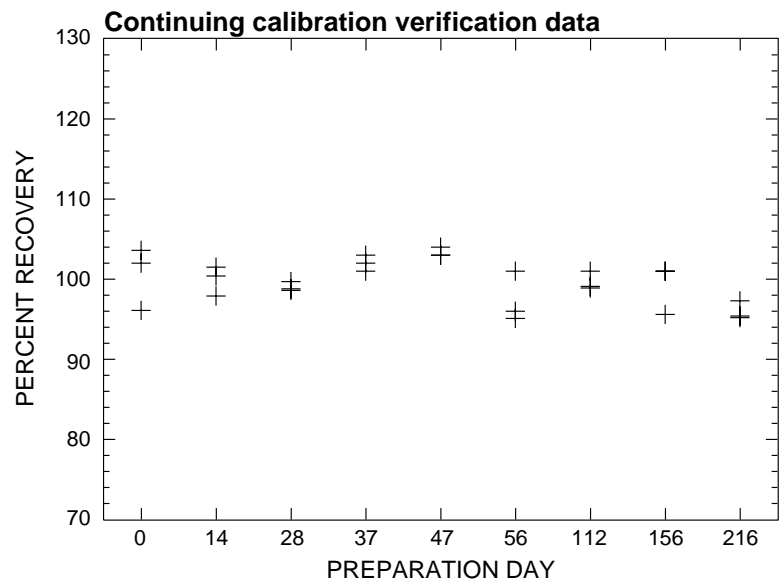
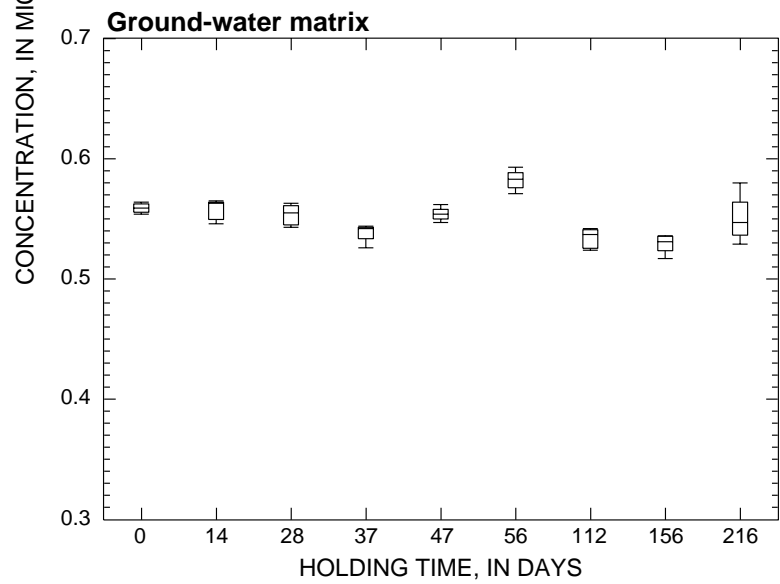
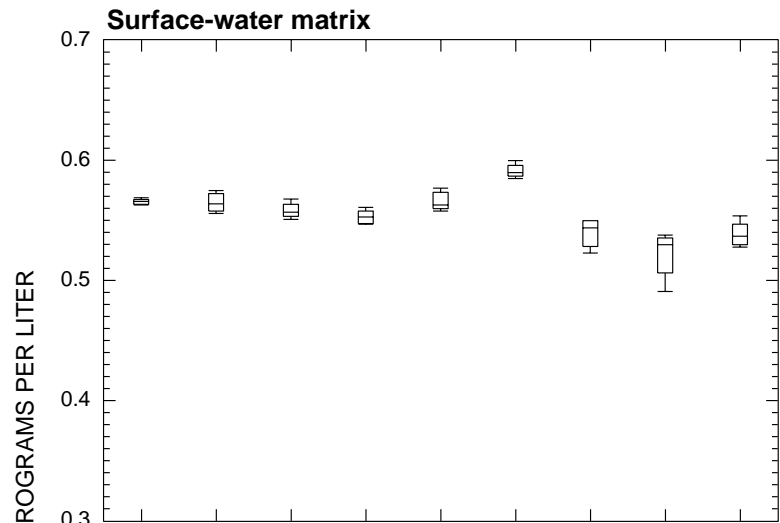
# Ethylbenzene



# 2-Ethoxy-2-methylpropane

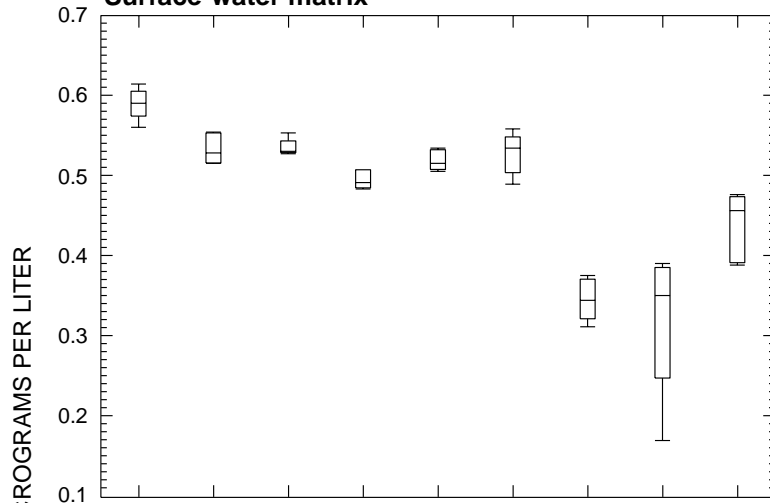


# Ethylbenzene

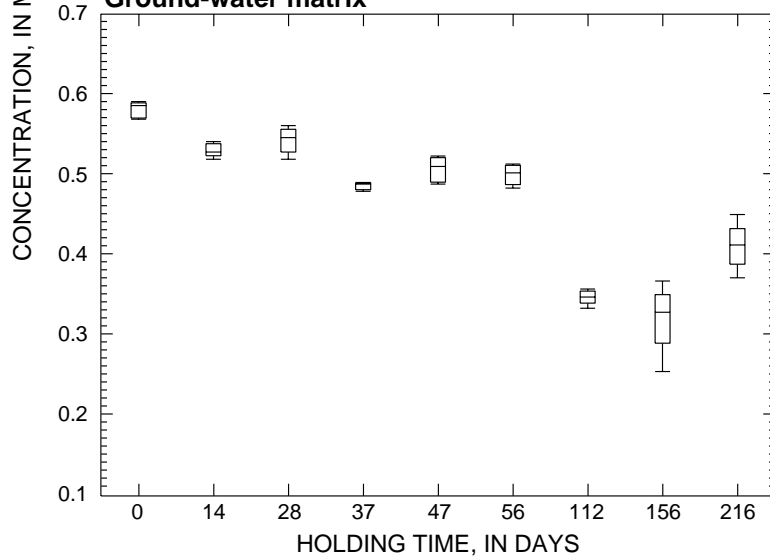


# 1,1,2,3,4,4-Hexachloro-1,3-butadiene

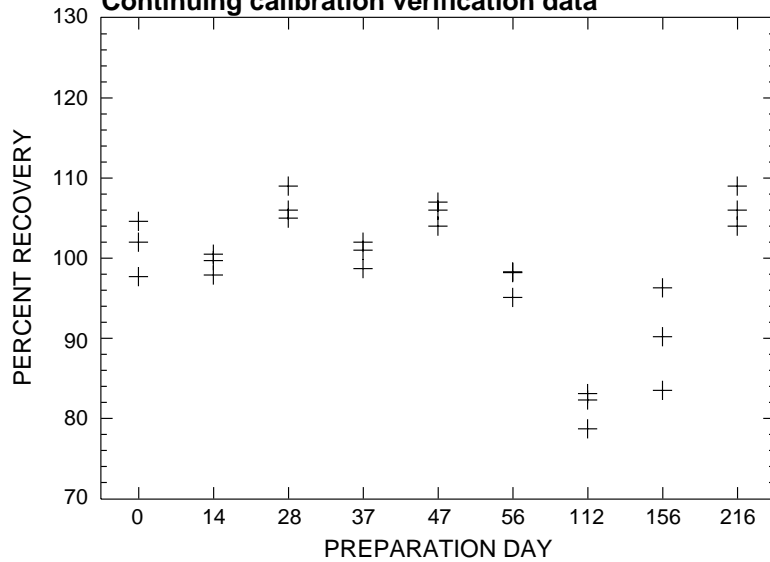
## Surface-water matrix



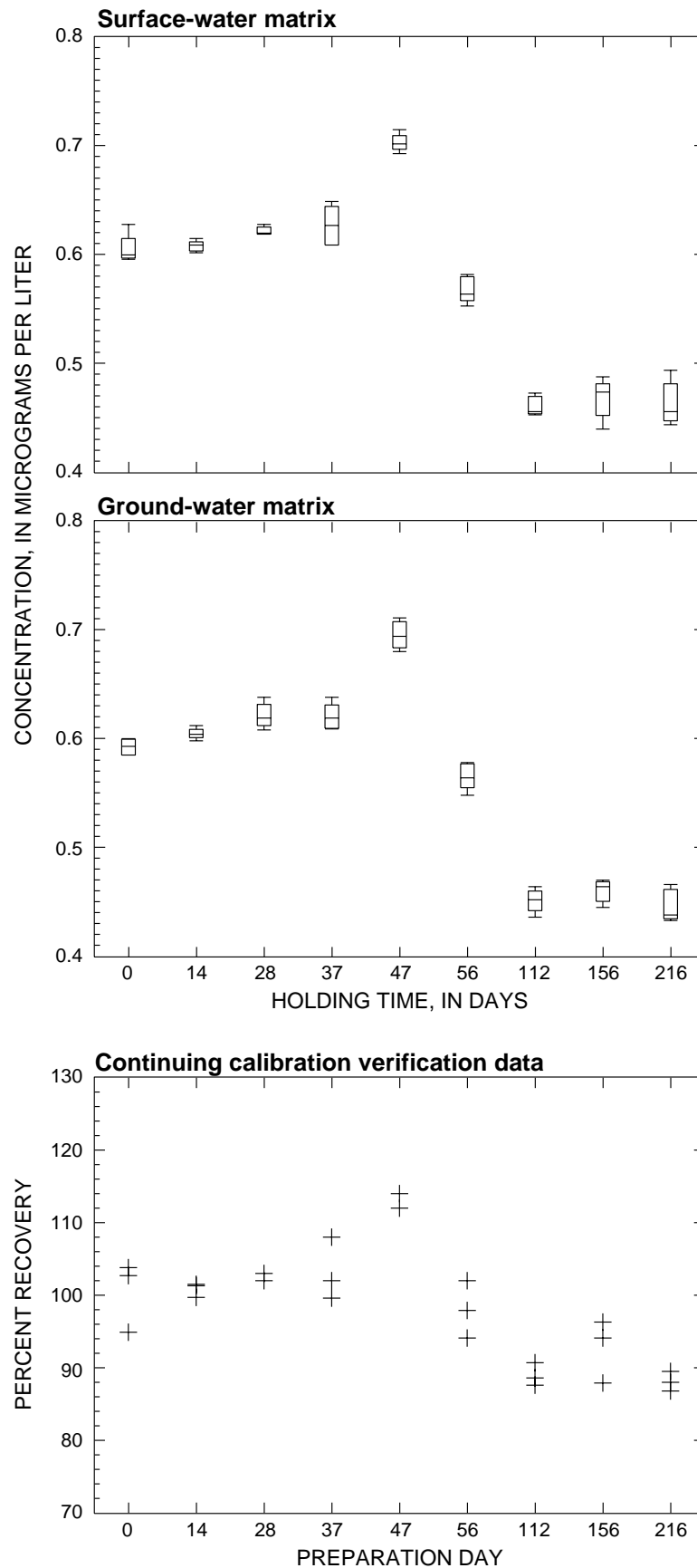
## Ground-water matrix



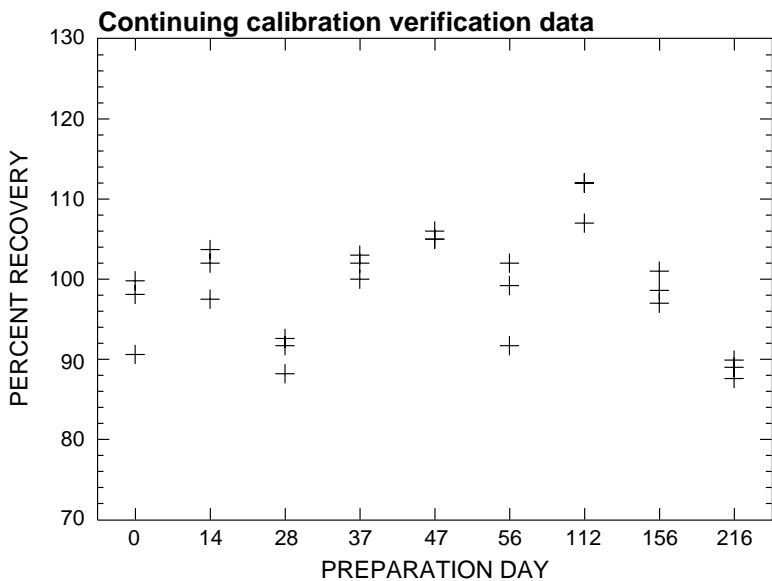
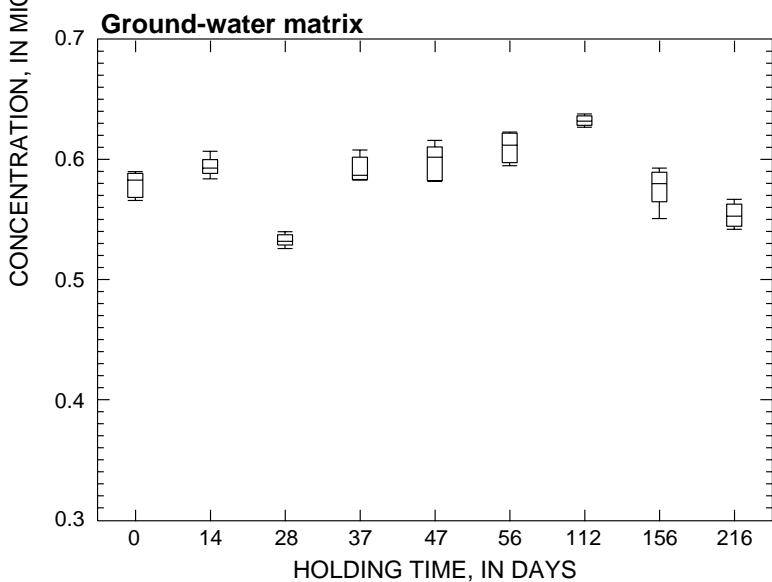
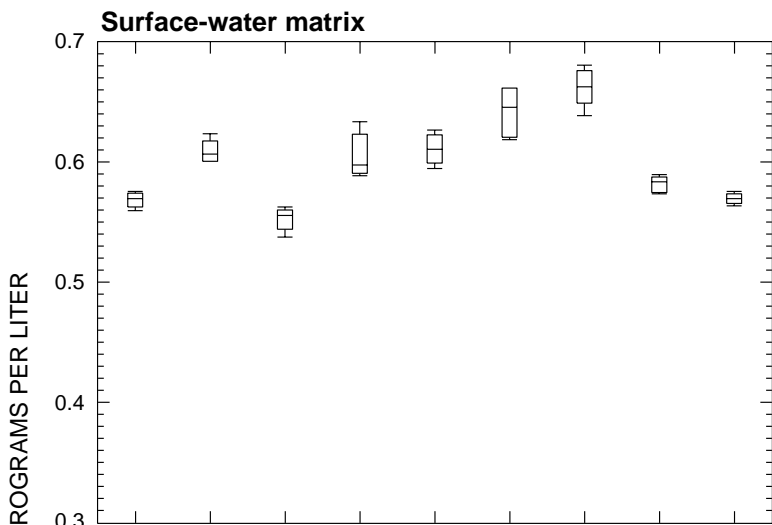
## Continuing calibration verification data



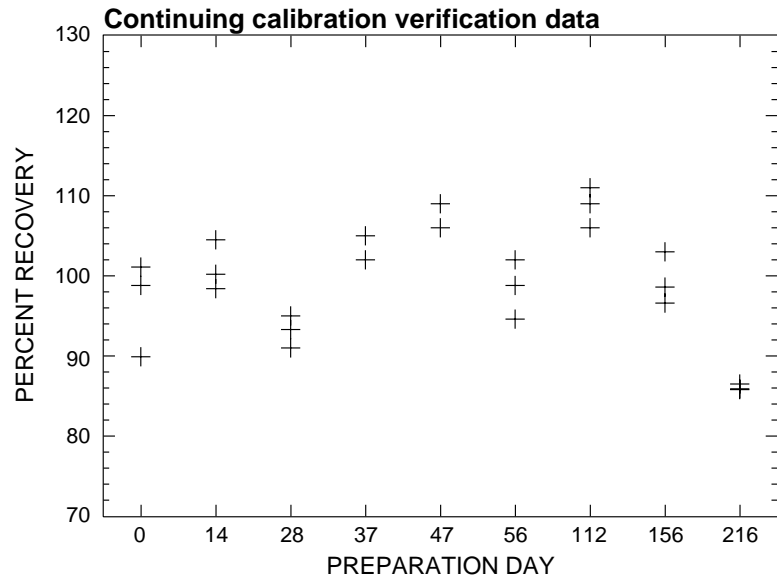
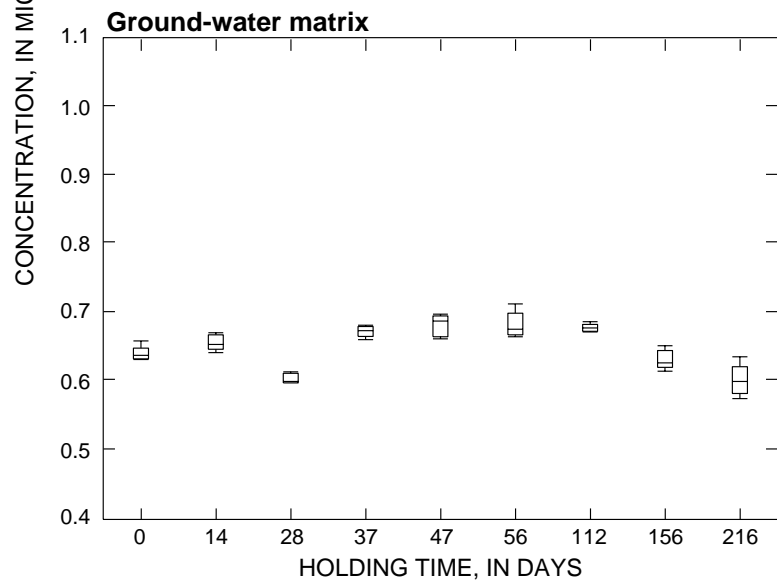
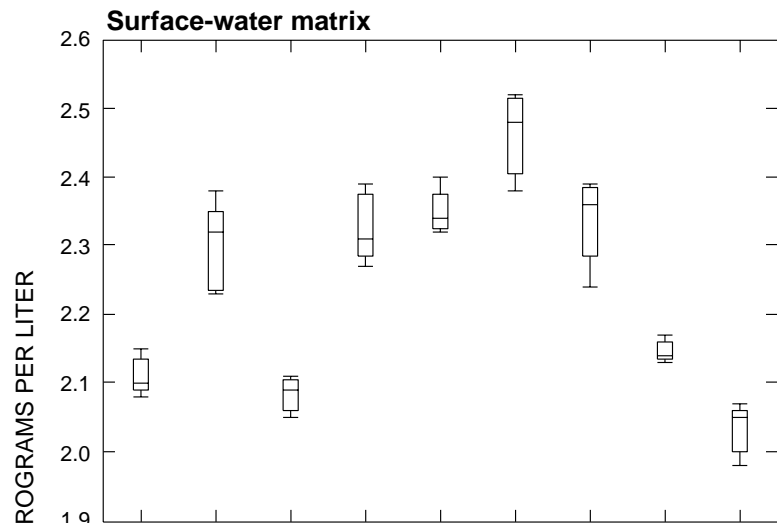
# 1,1,1,2,2,2-Hexachloroethane



# 2-Methoxy-2-methylbutane

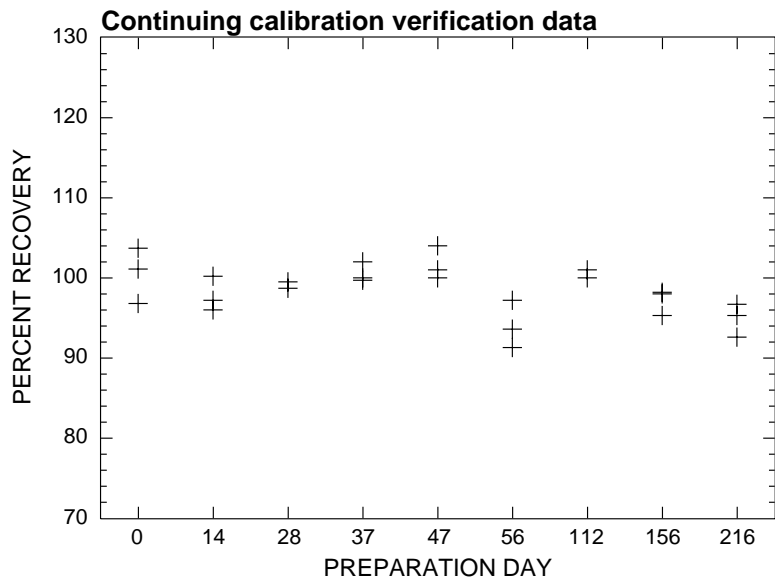
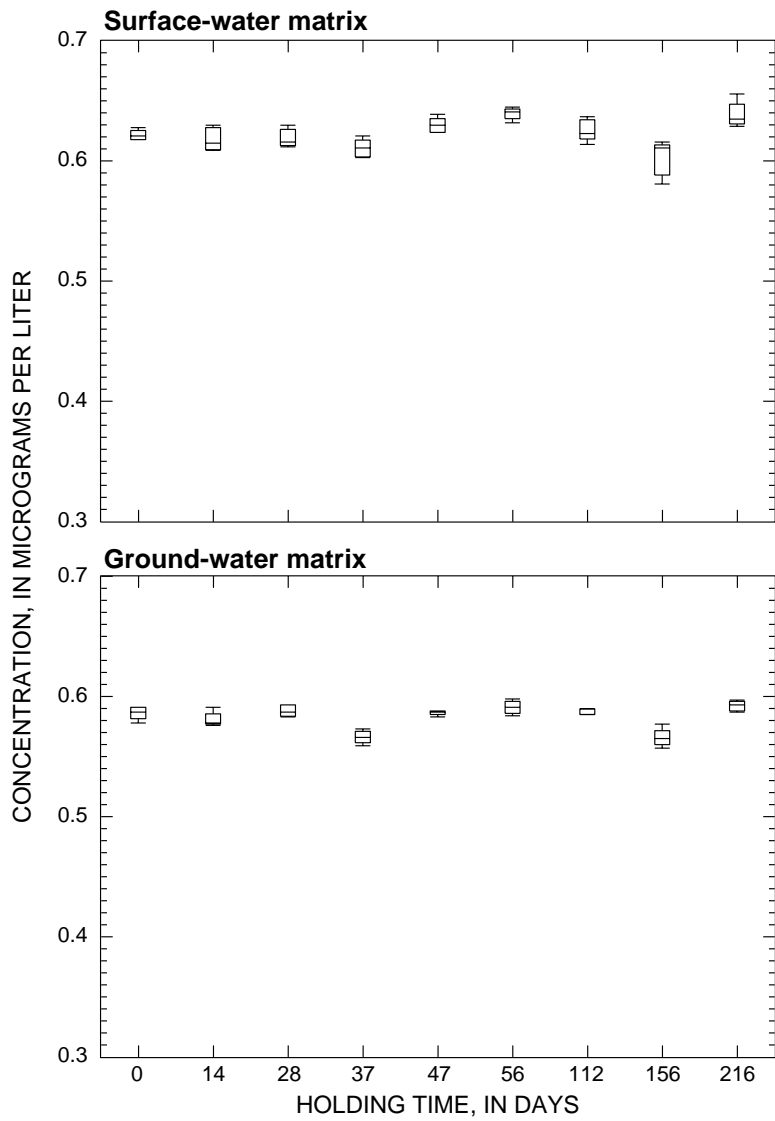


# 2-Methoxy-2-methylpropane

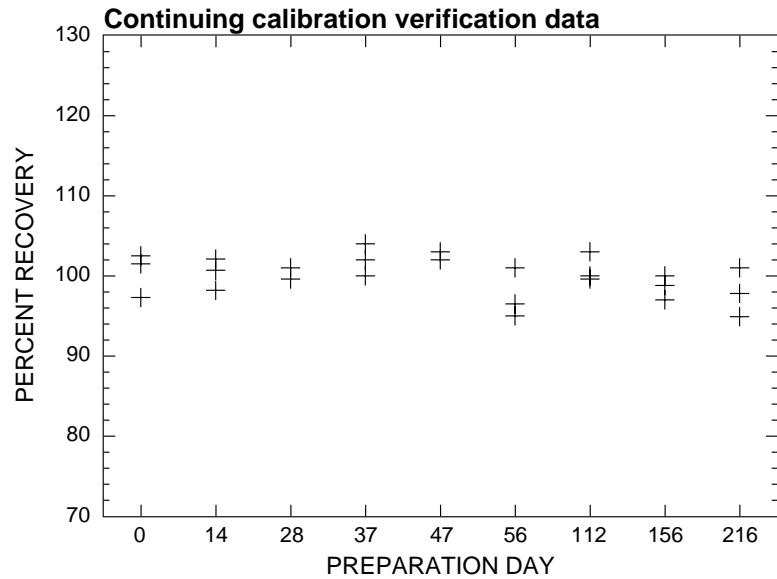
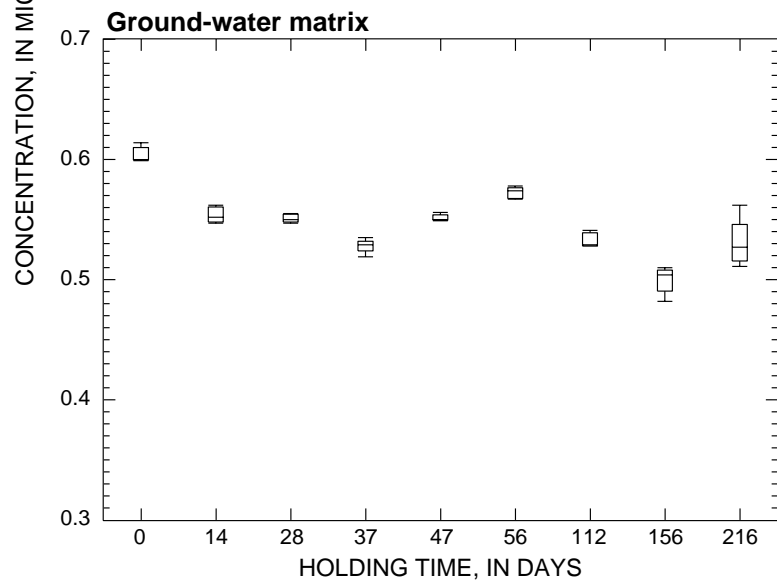
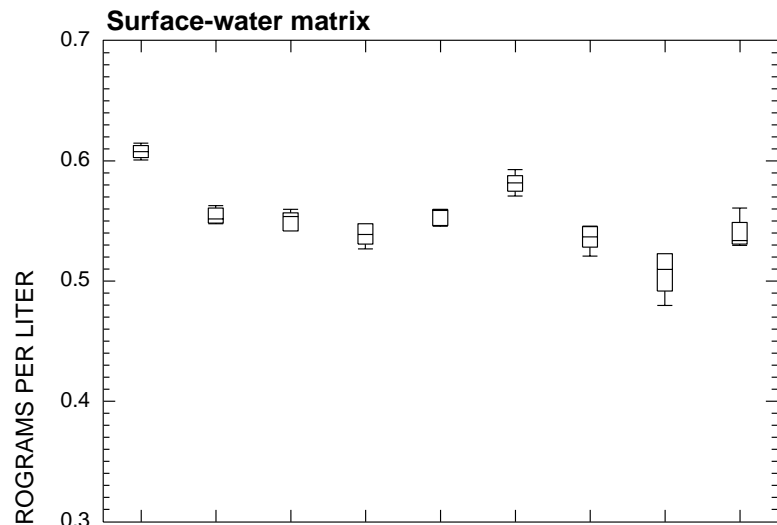




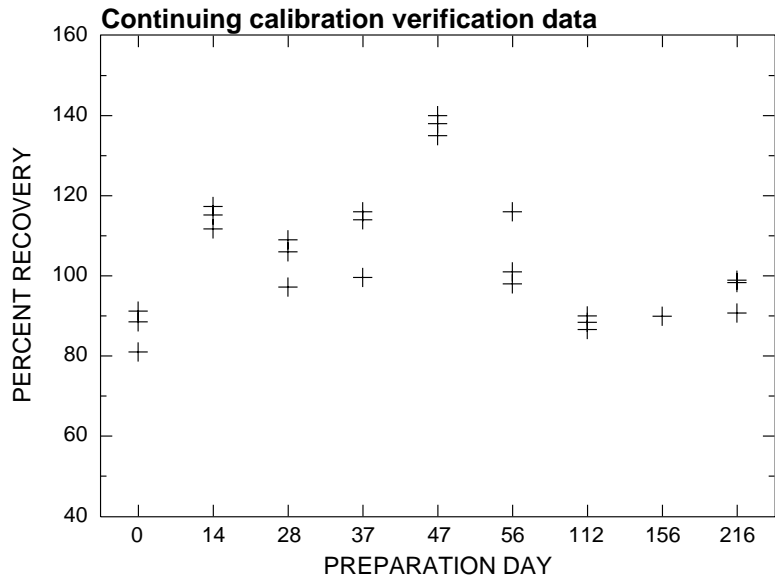
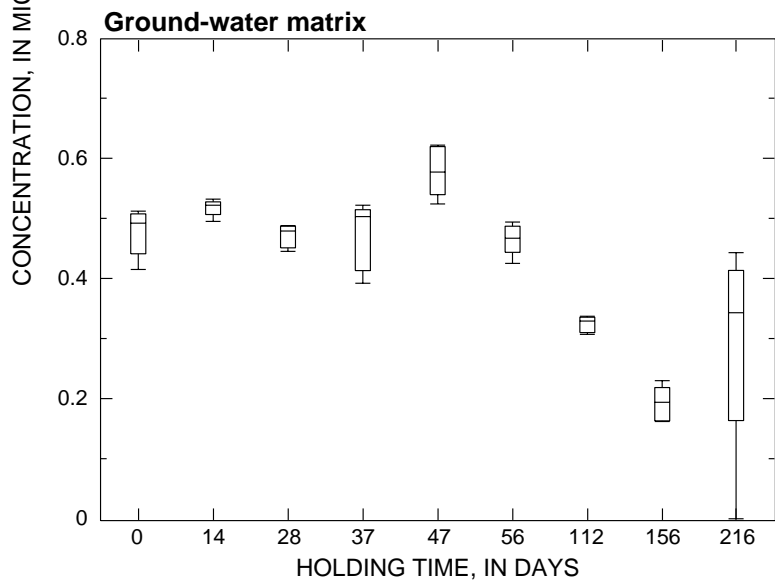
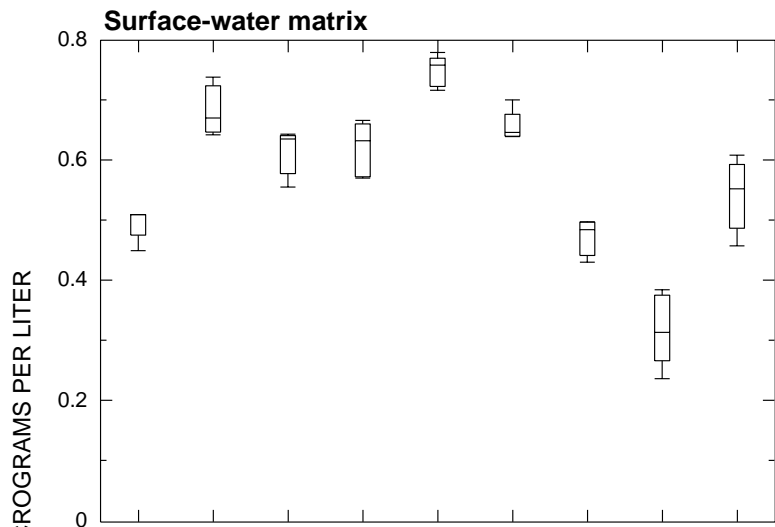
# Methylbenzene



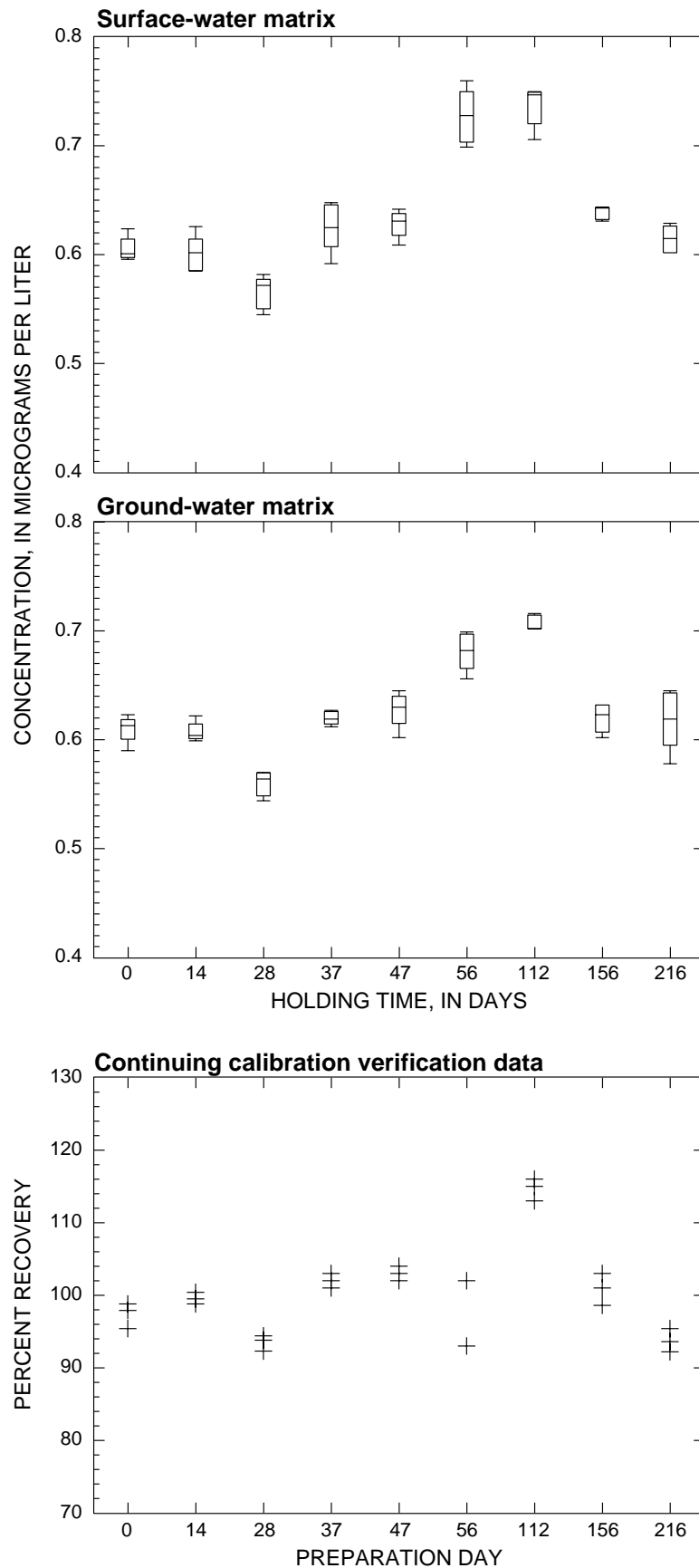
# (1-Methylethyl)benzene



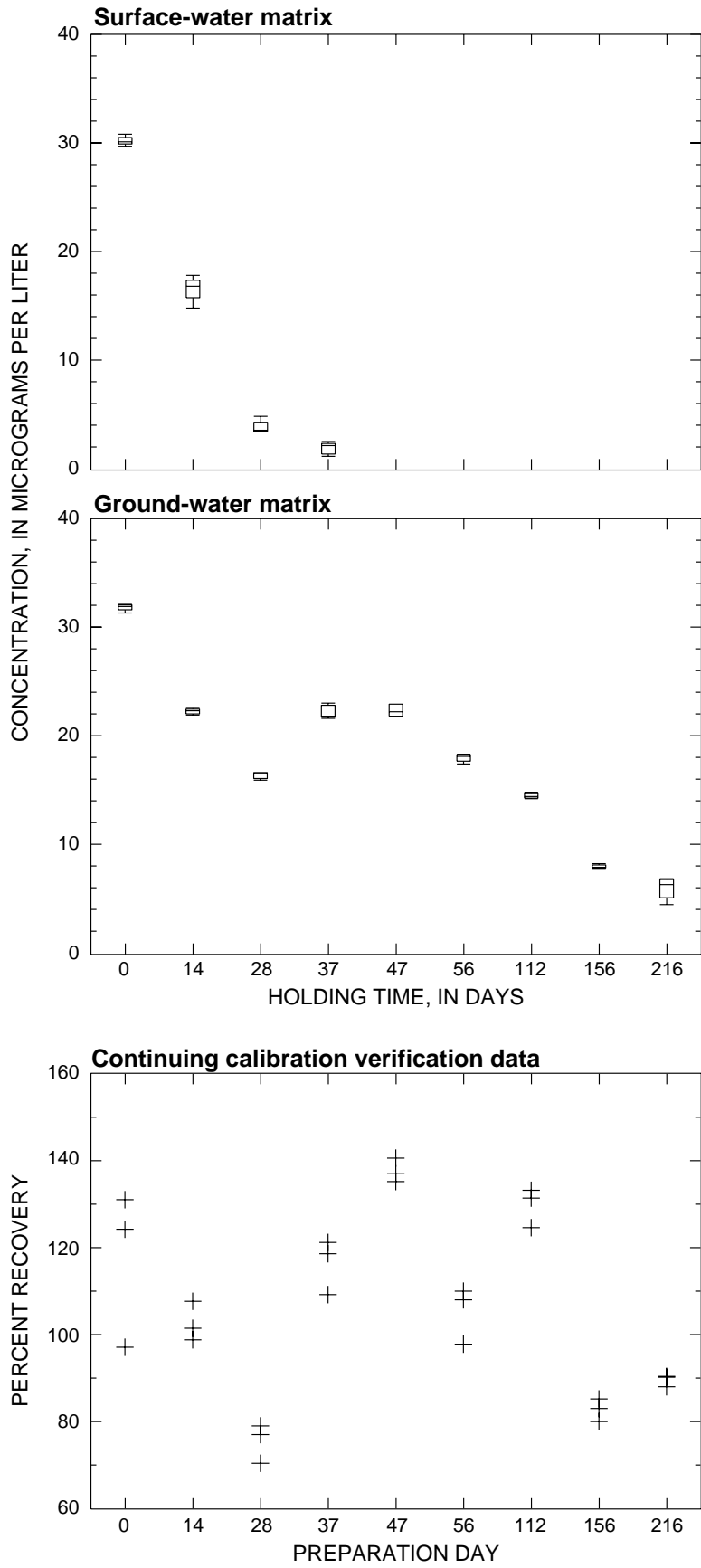
# Naphthalene



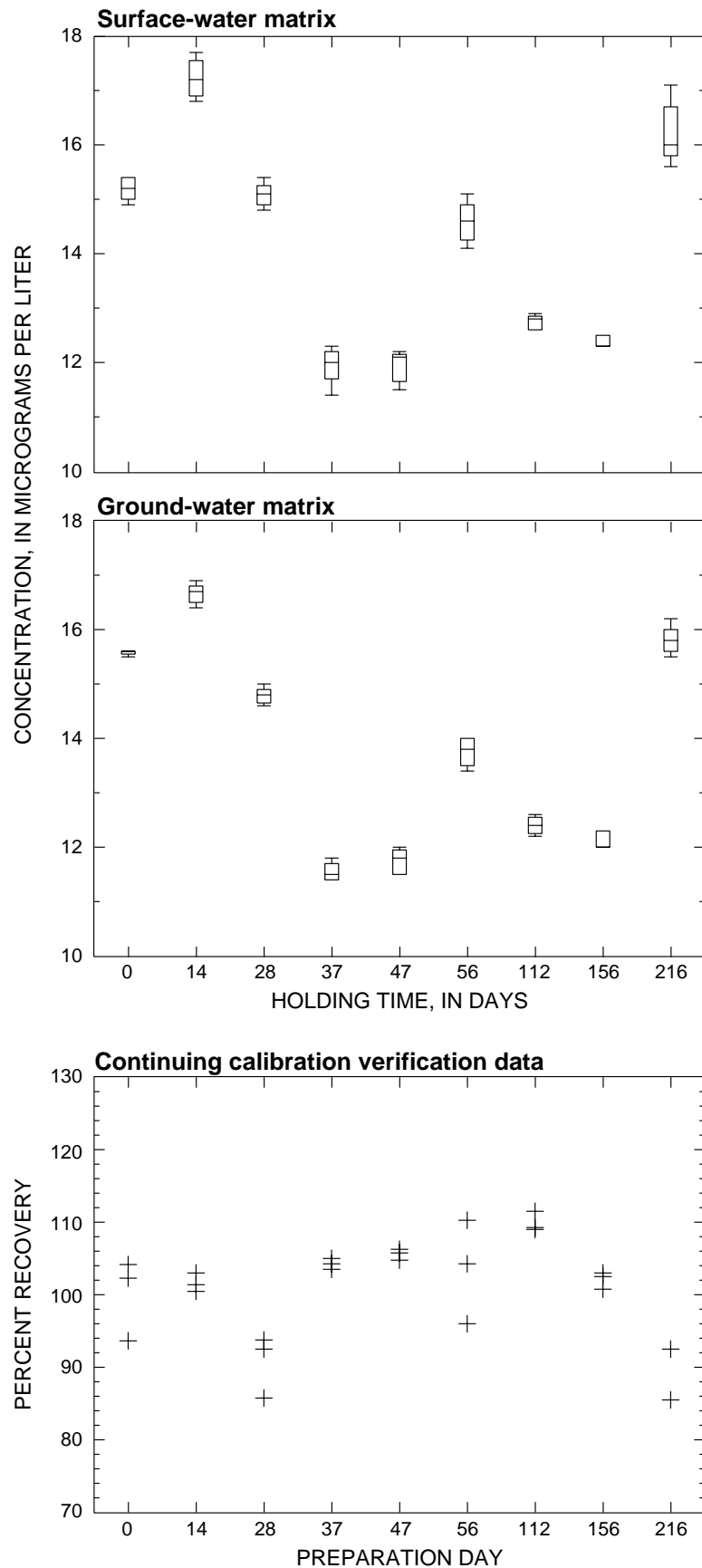
# 2,2'-Oxybis[propane]



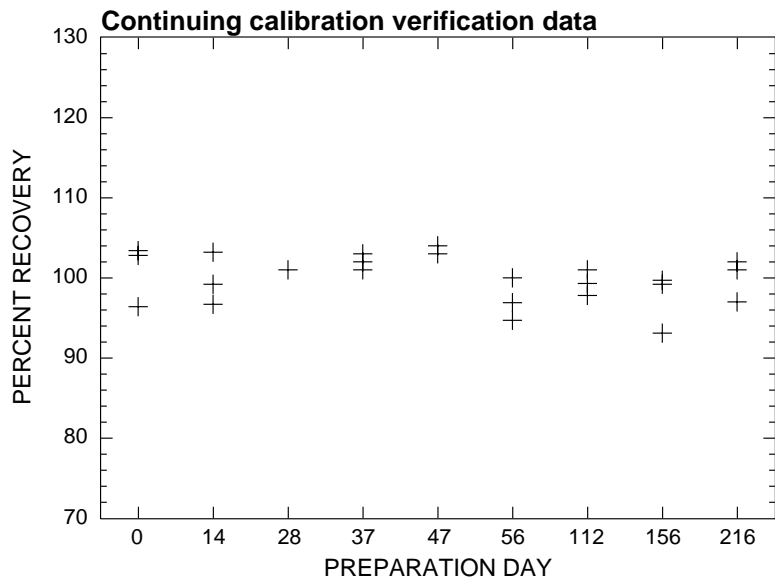
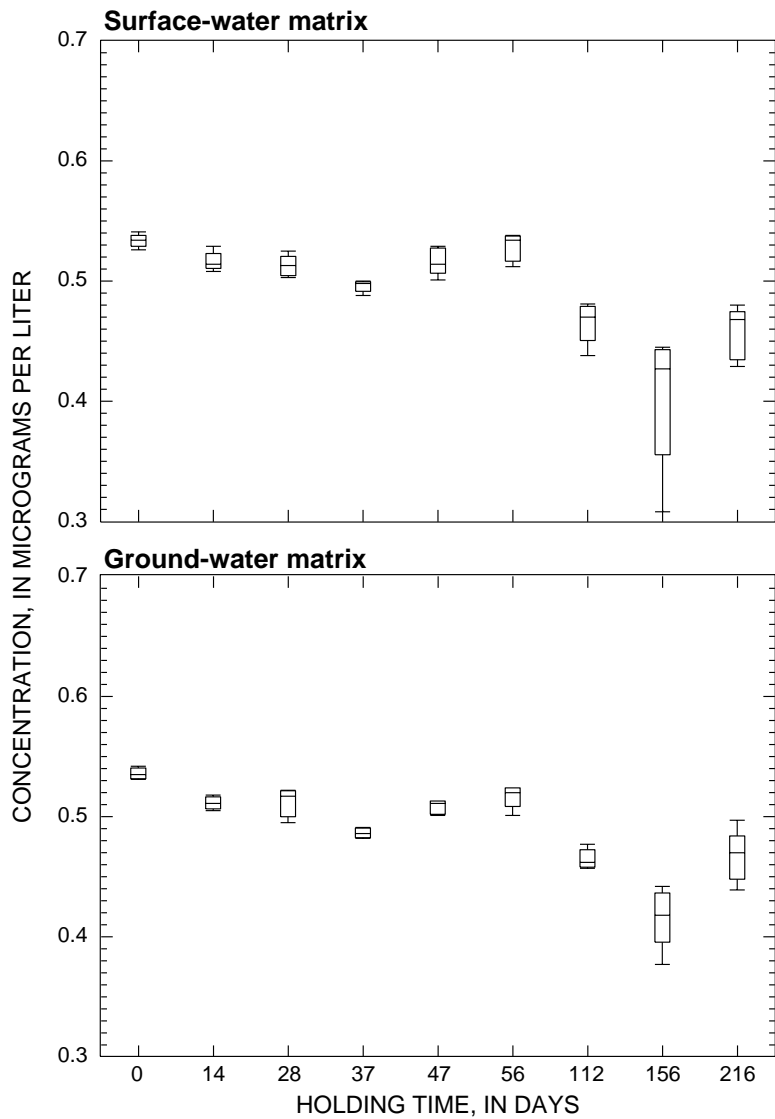
# 2-Propenal



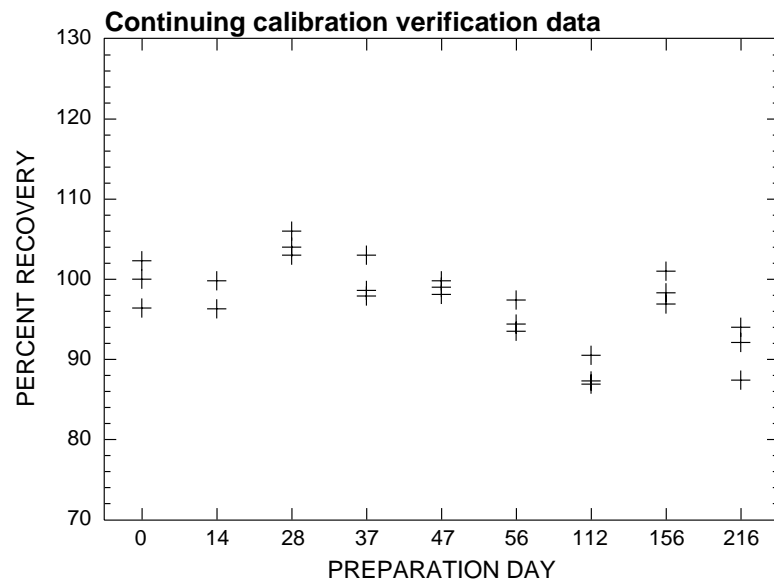
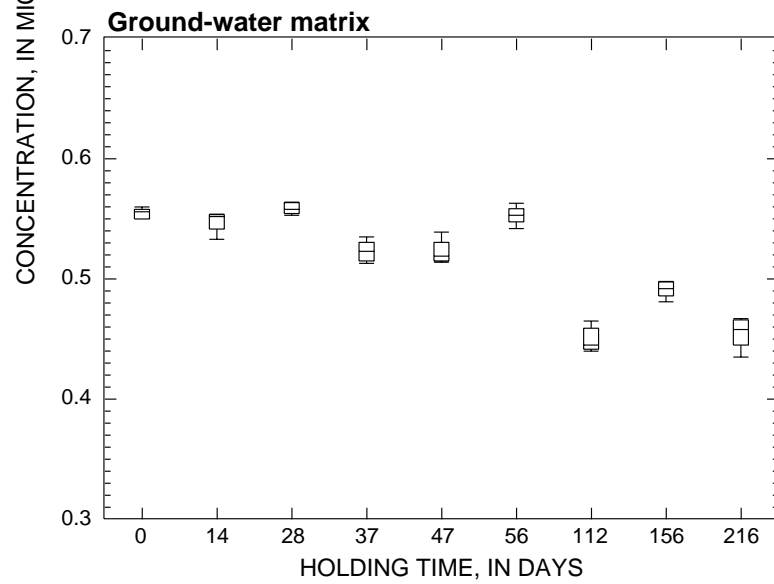
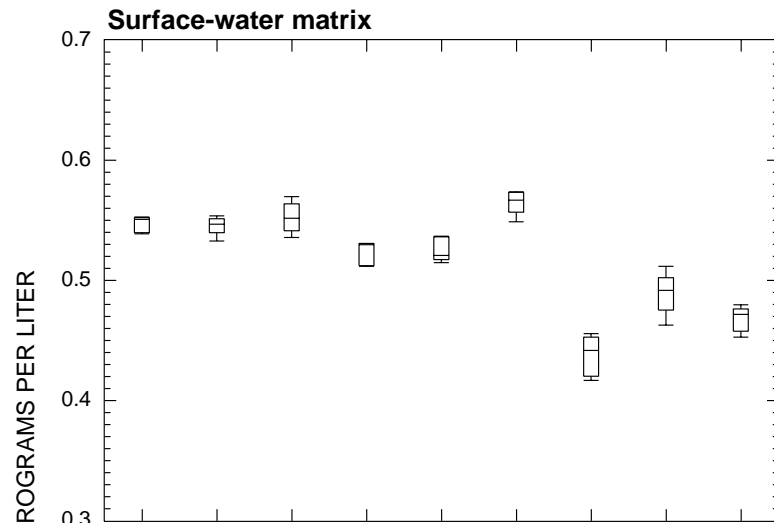
# 2-Propenenitrile



# n-Propylbenzene

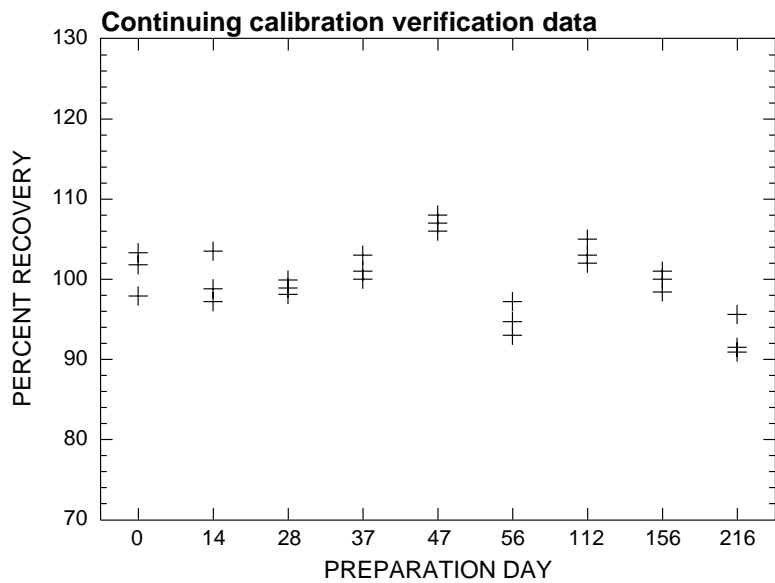
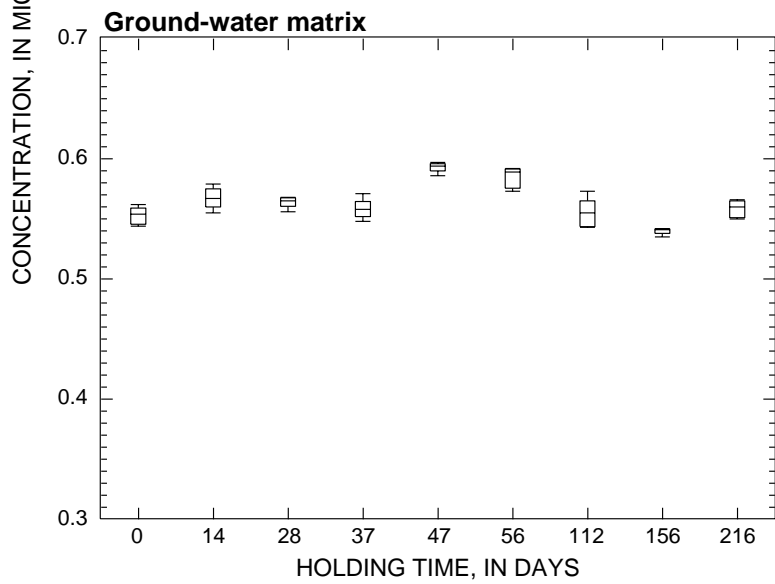
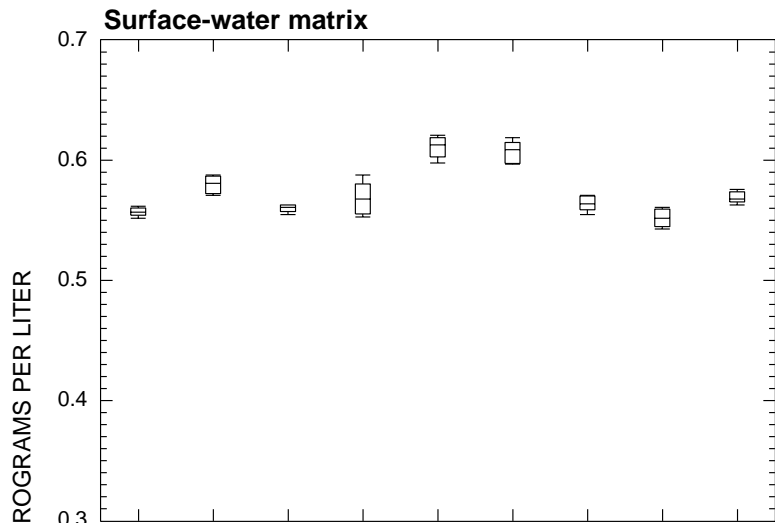


# Tetrachloroethene

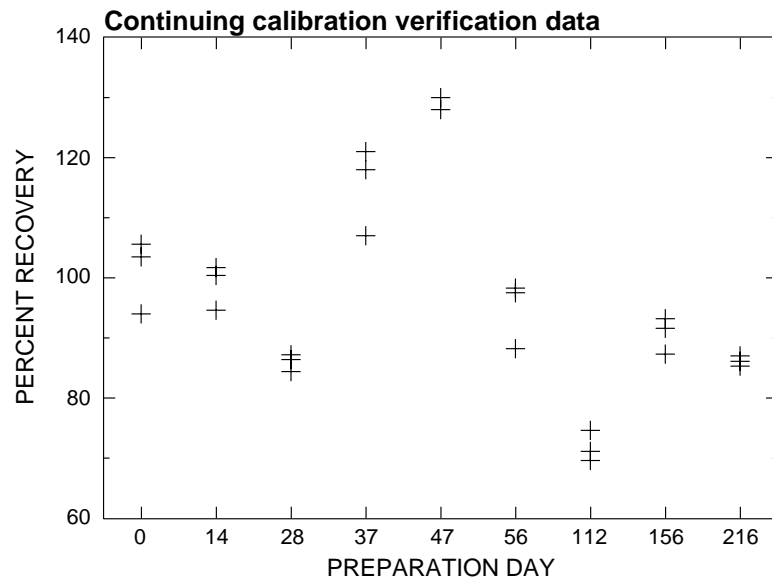
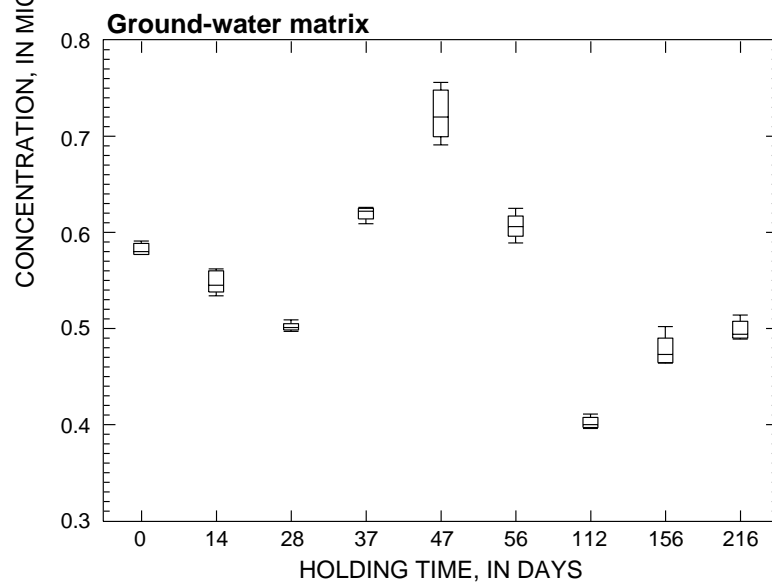
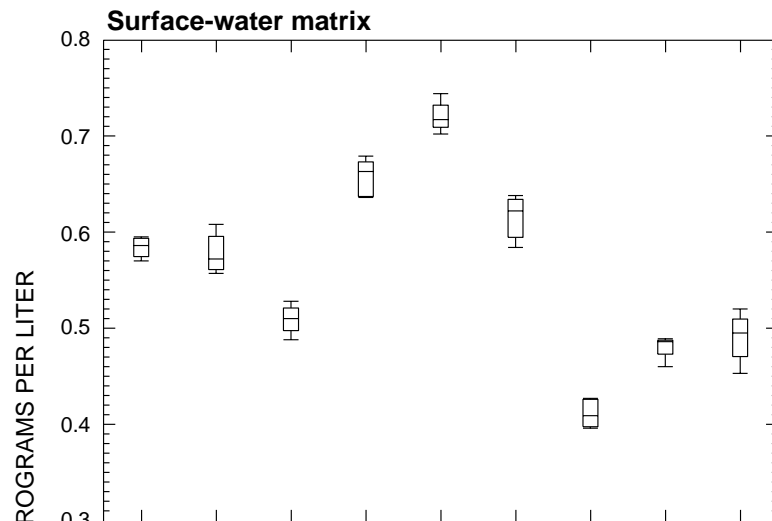




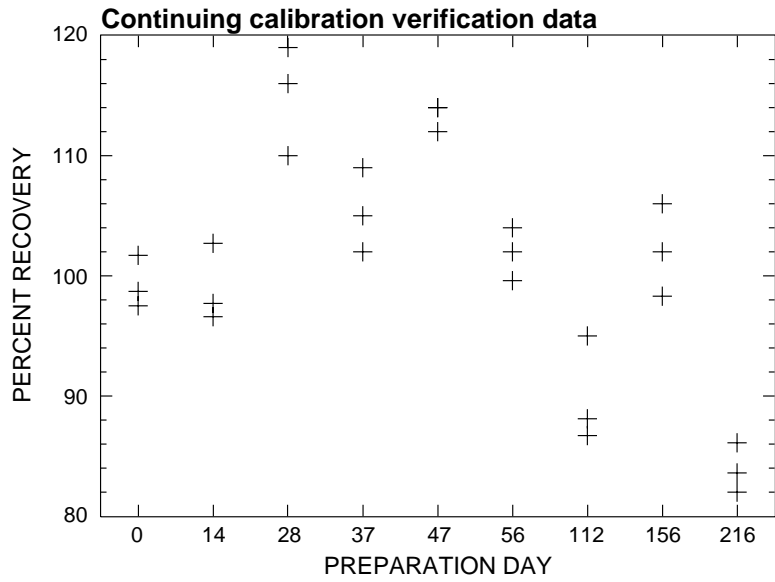
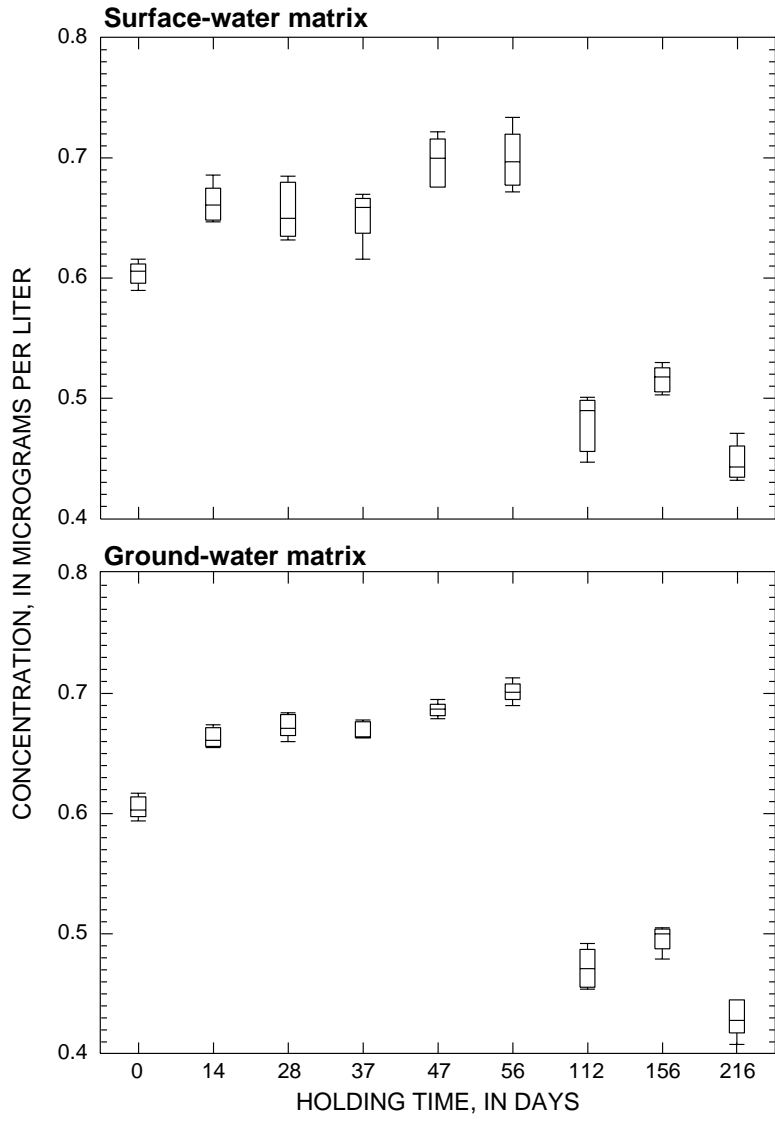
# Tetrachloromethane



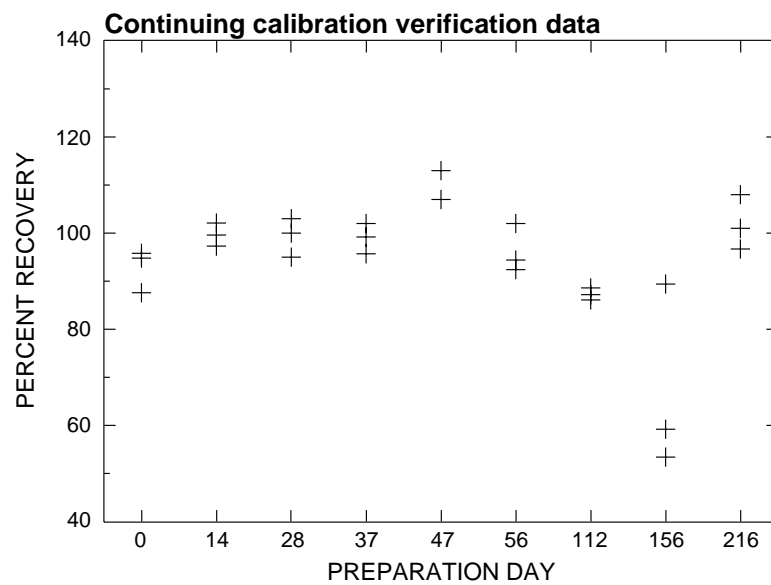
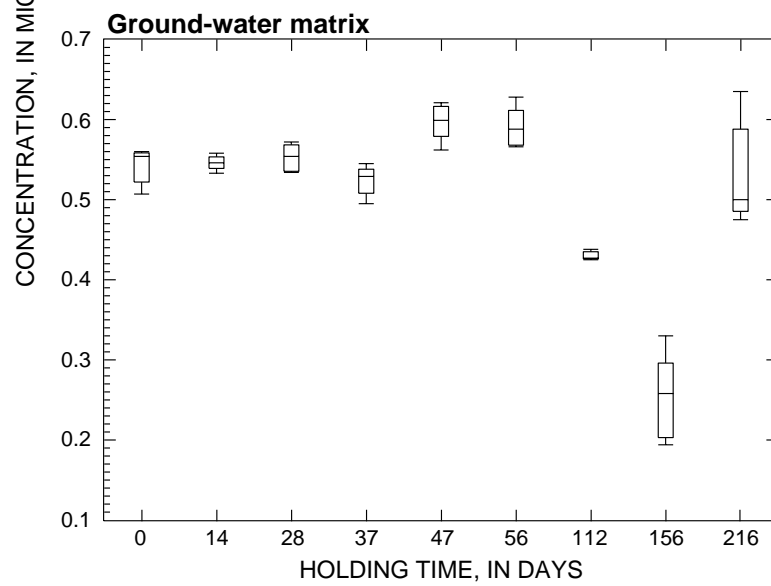
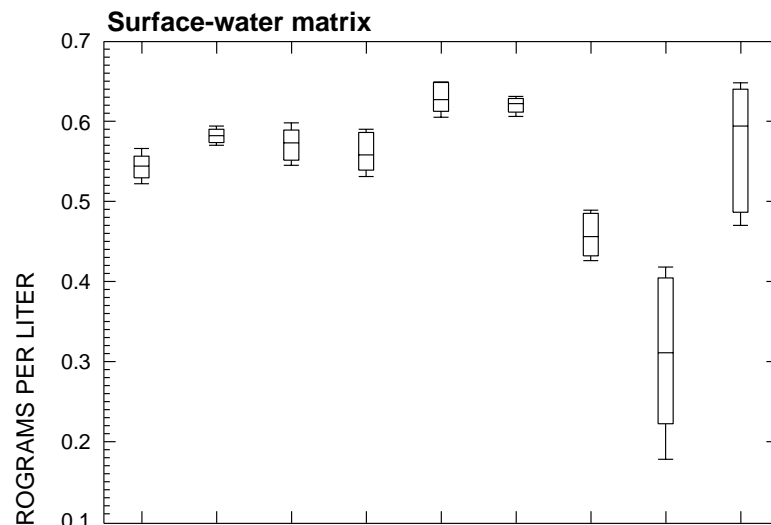
# Tribromomethane



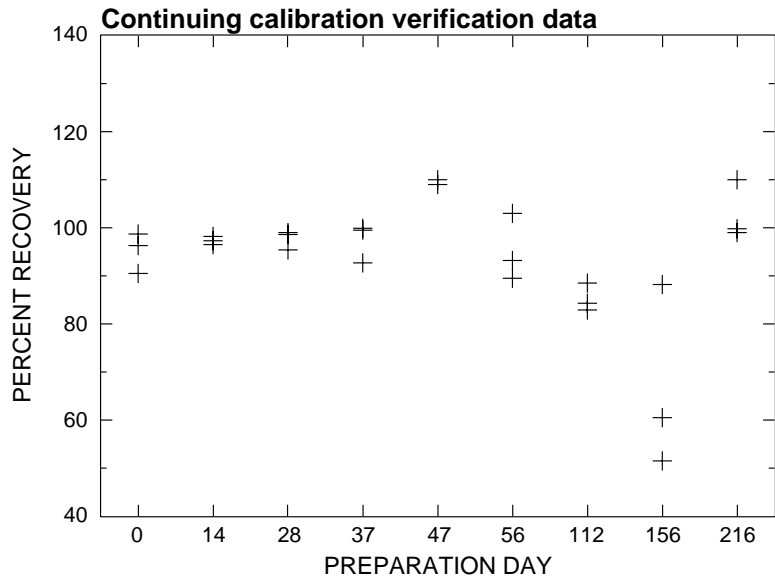
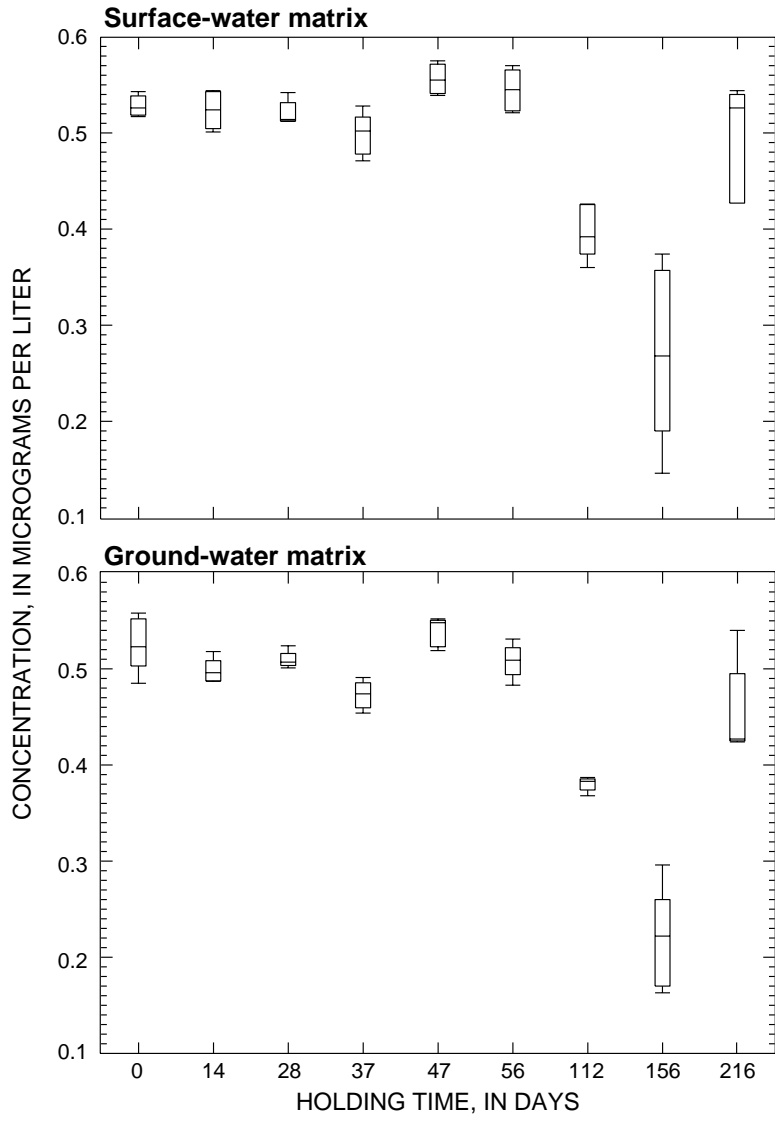
# 1,1,2-Trichloro-1,2,2-trifluoroethane



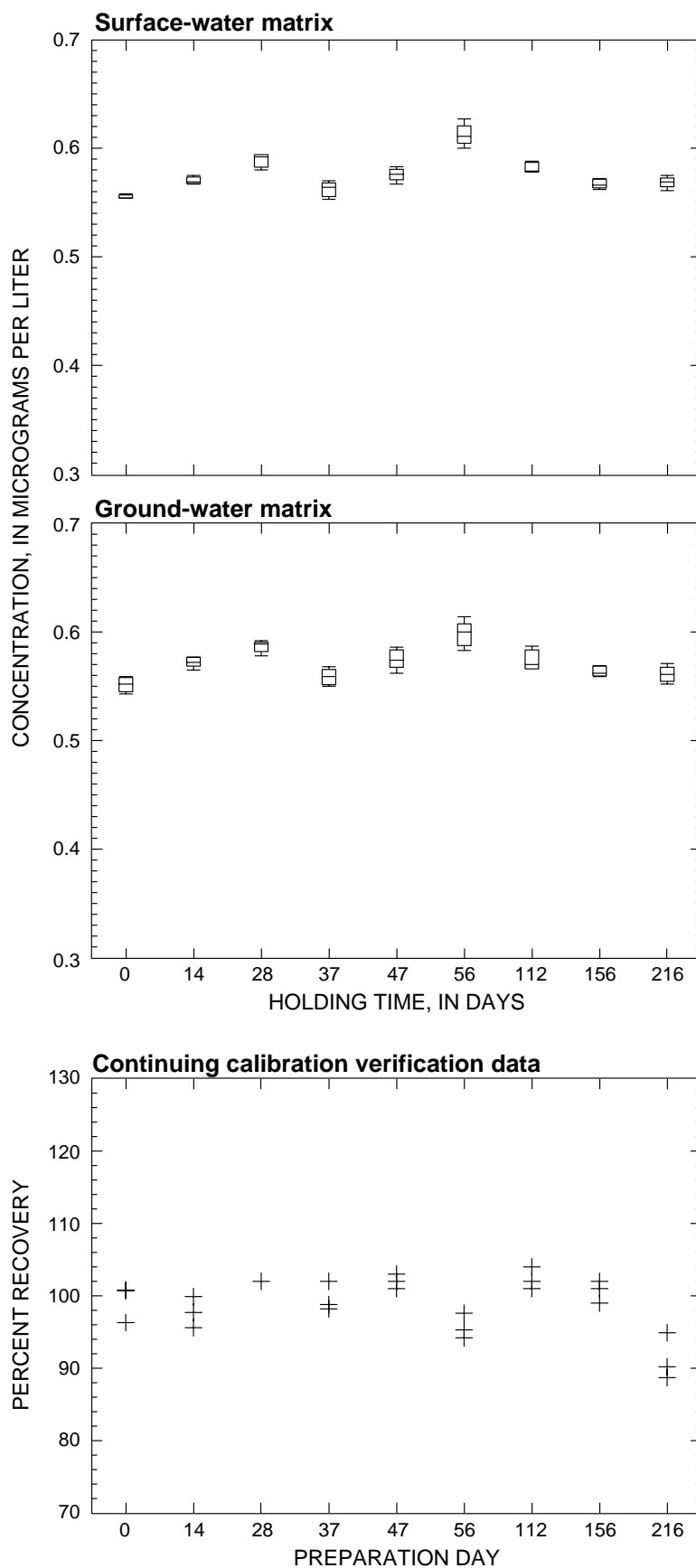
# 1,2,3-Trichlorobenzene



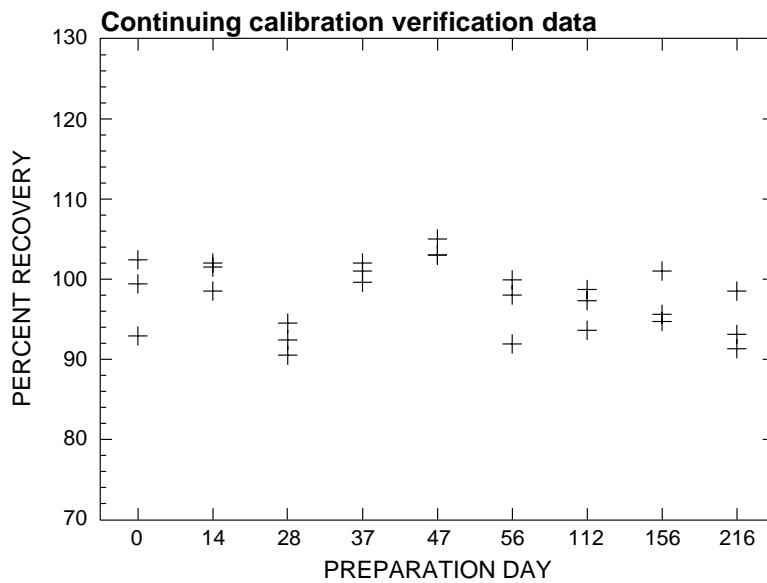
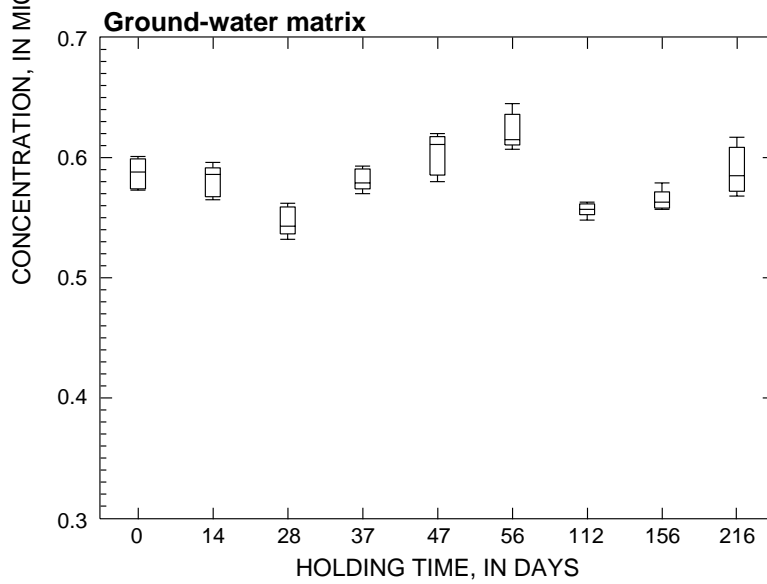
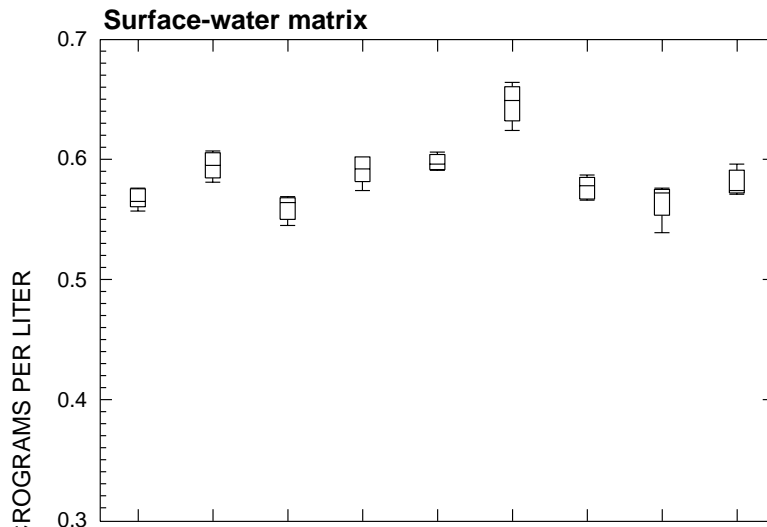
# 1,2,4-Trichlorobenzene



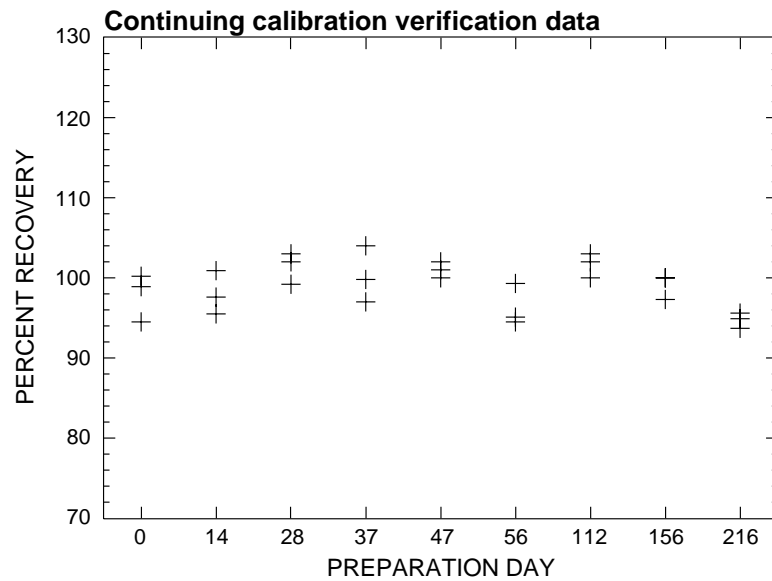
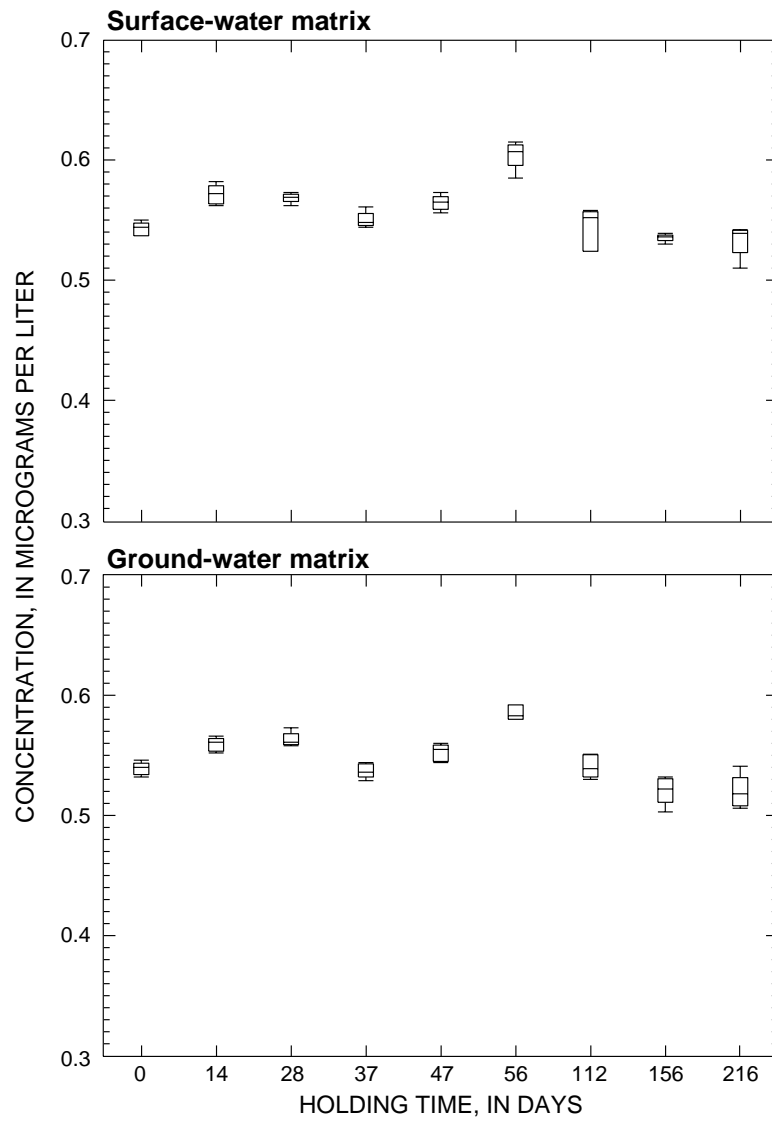
# 1,1,1-Trichloroethane



# 1,1,2-Trichloroethane

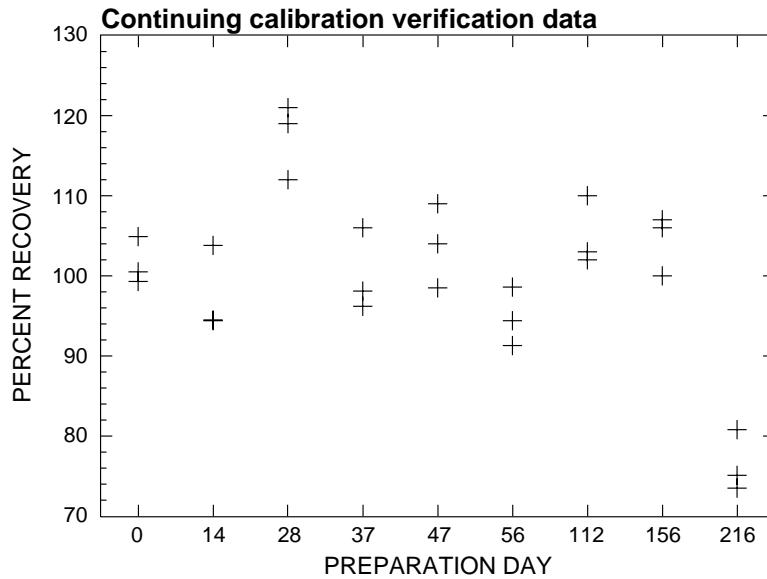
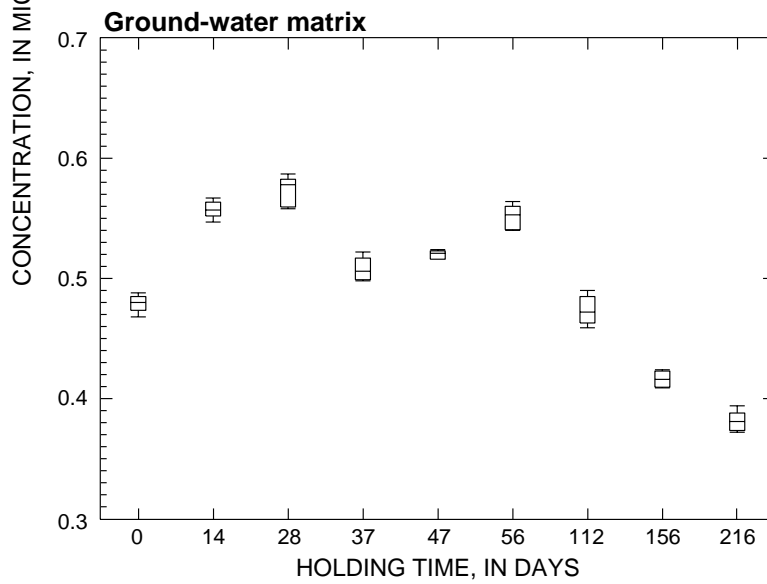
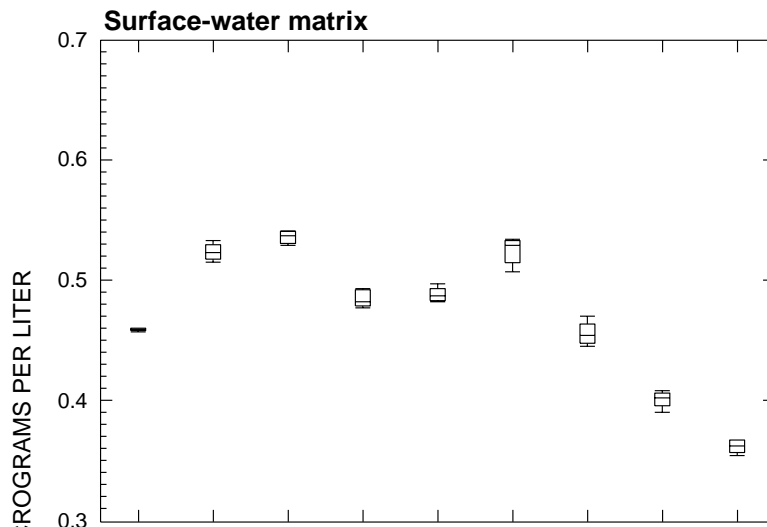


# Trichloroethene

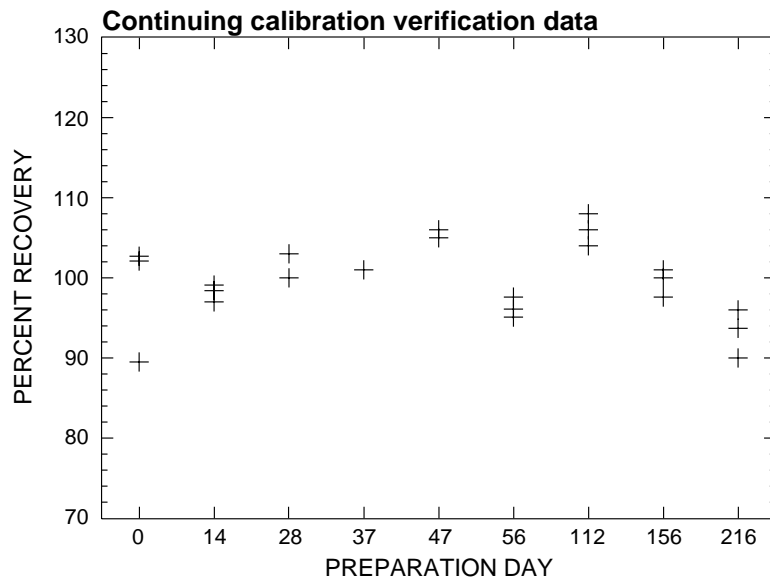
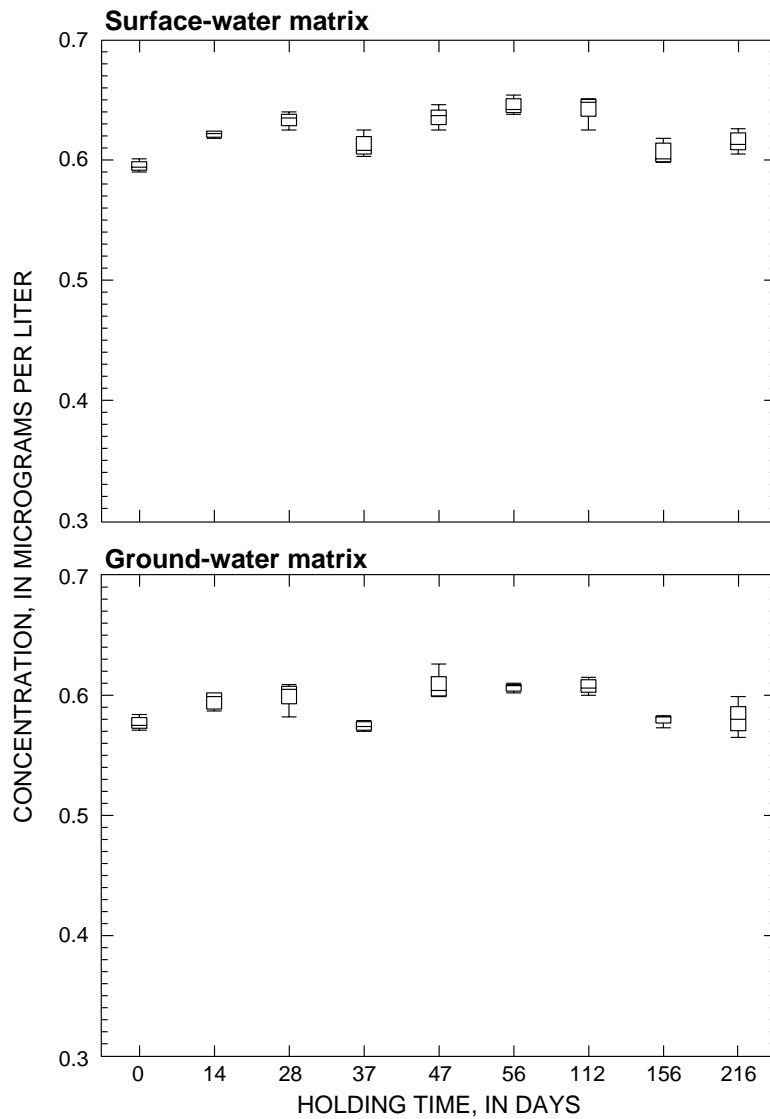




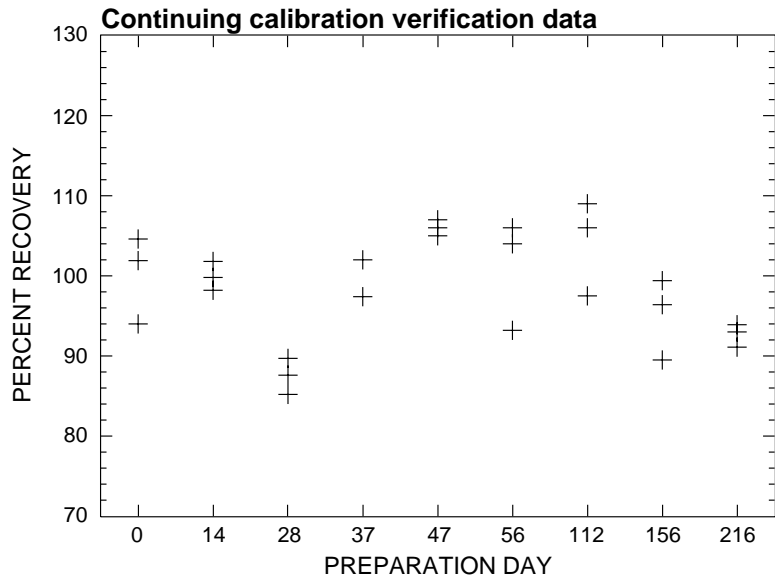
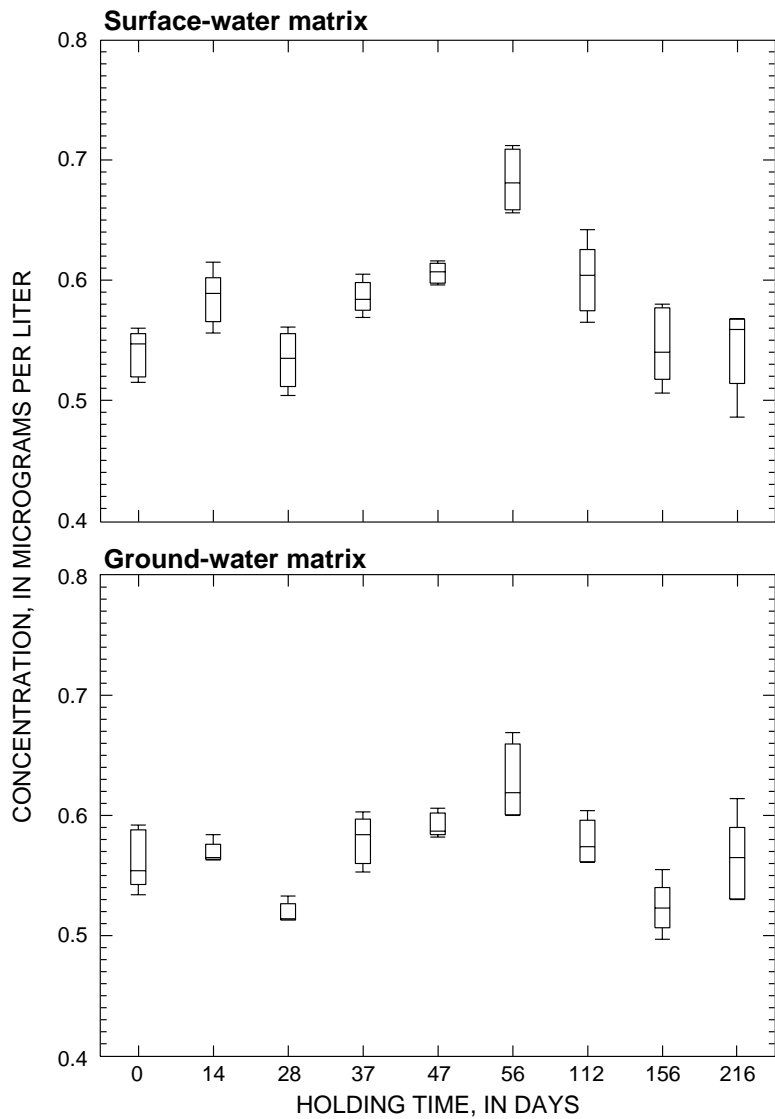
# Trichlorofluoromethane



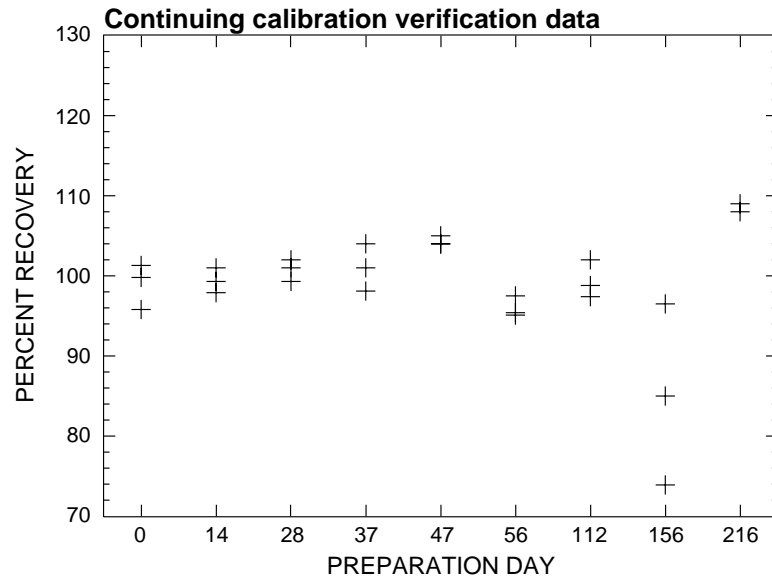
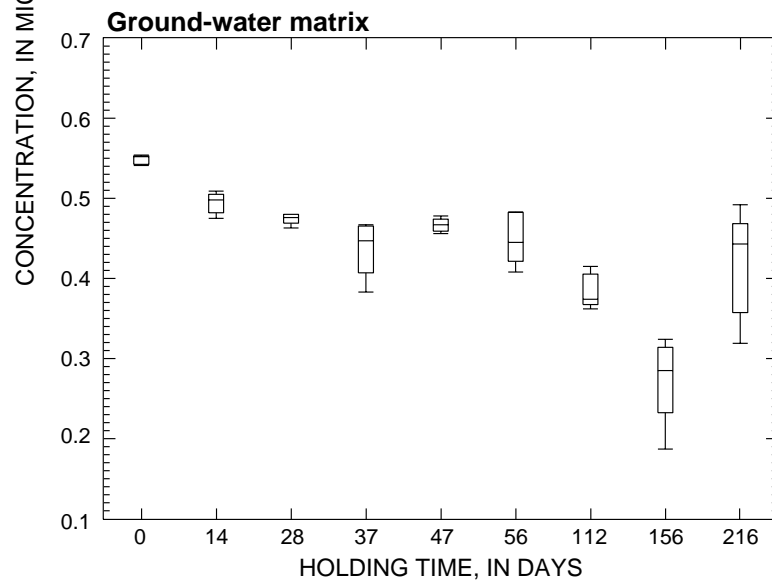
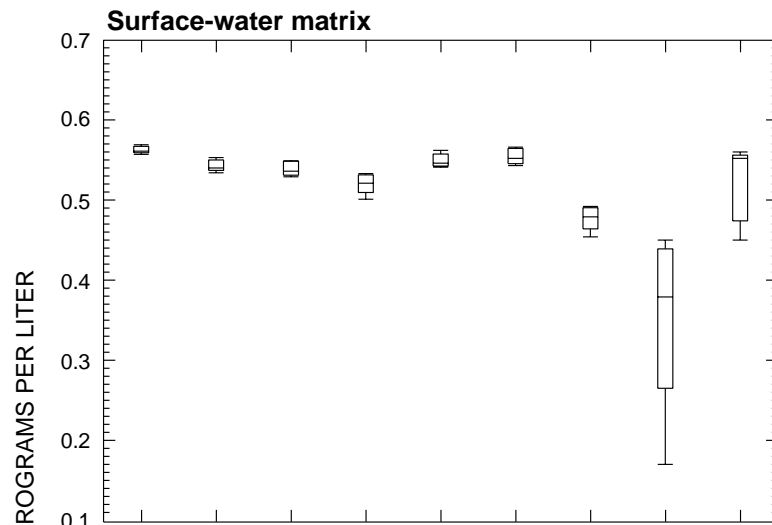
# Trichloromethane



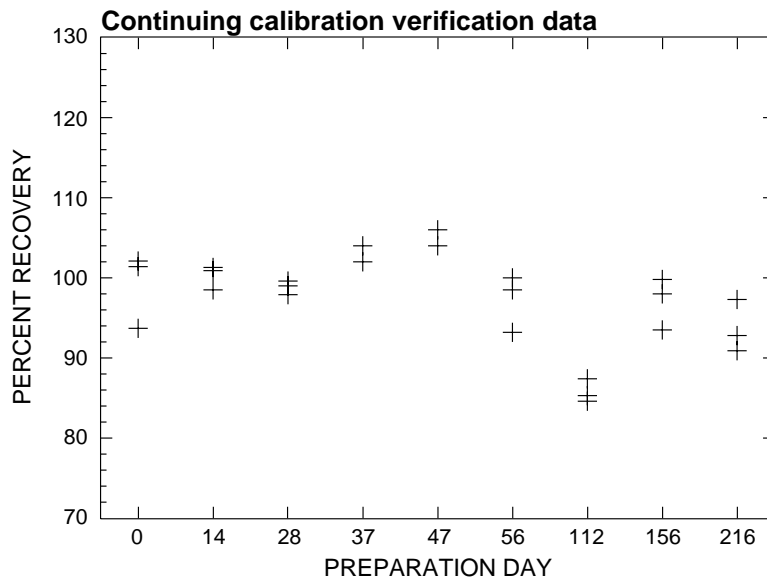
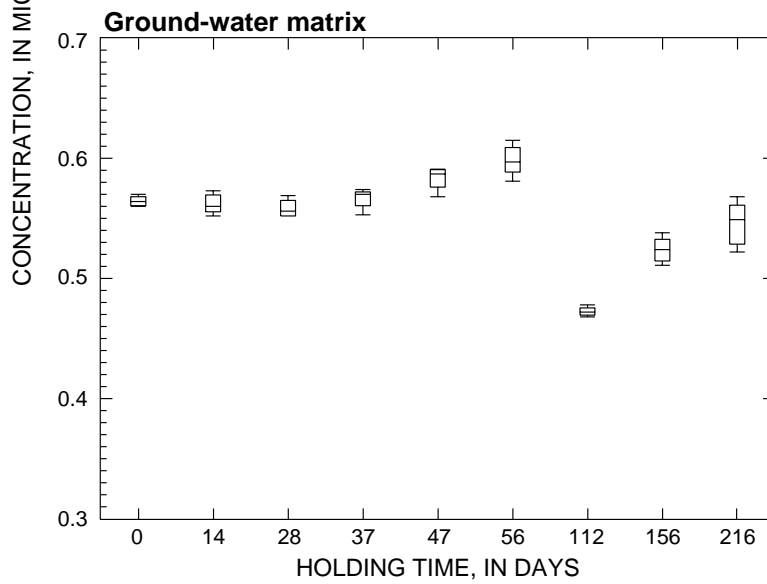
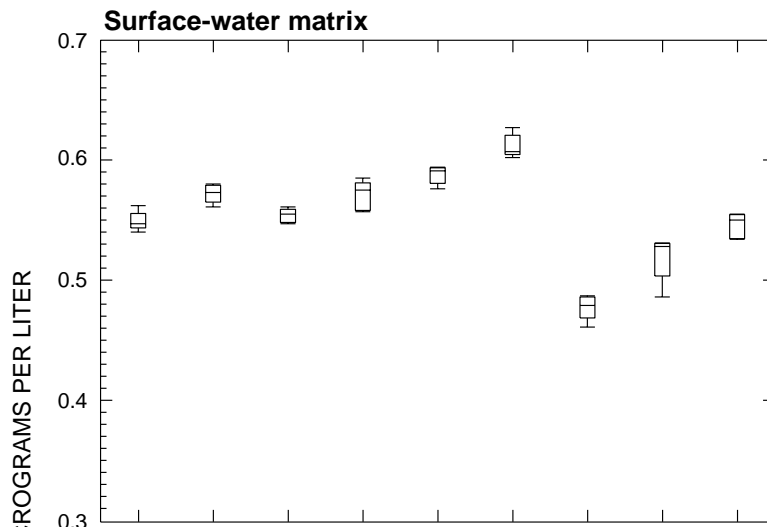
# 1,2,3-Trichloropropane



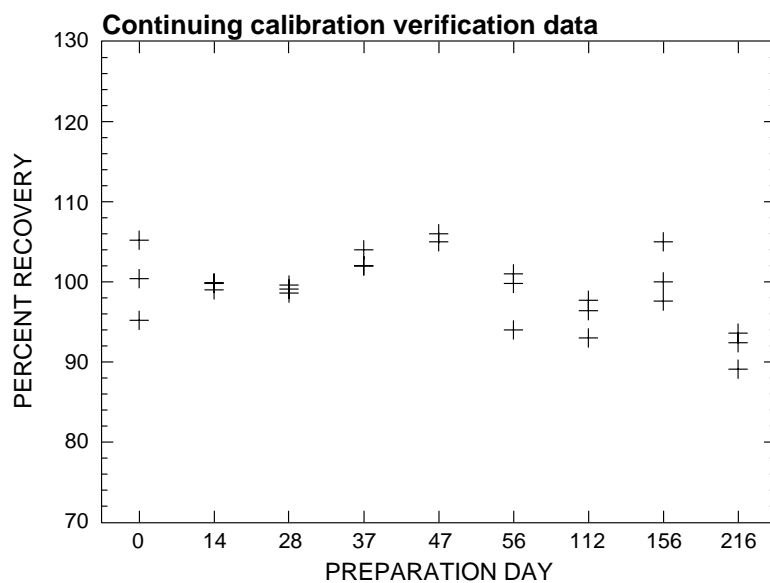
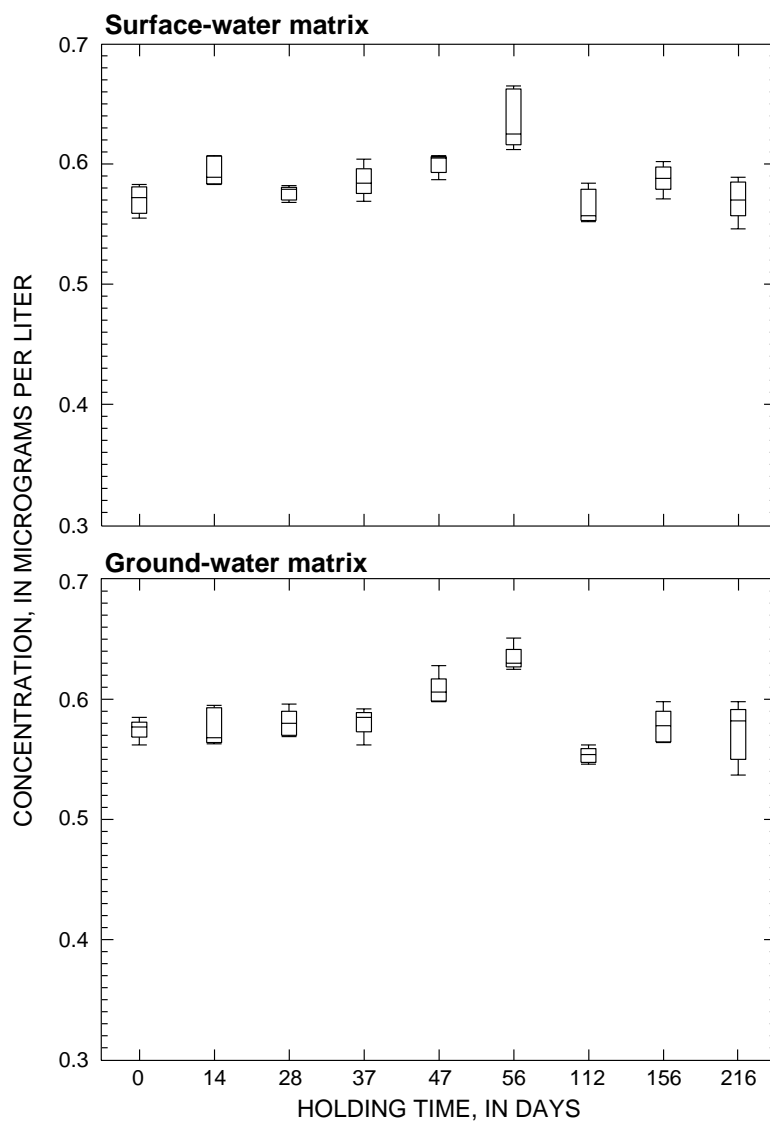
# 1,2,4-Trimethylbenzene



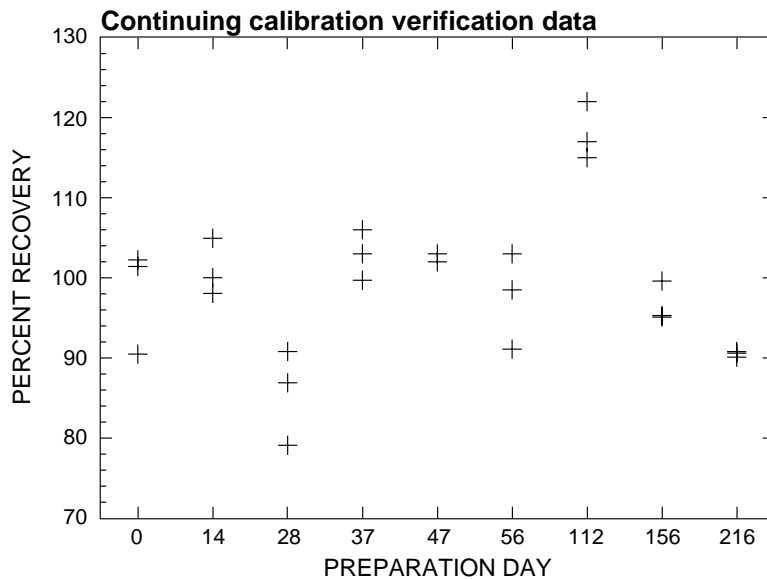
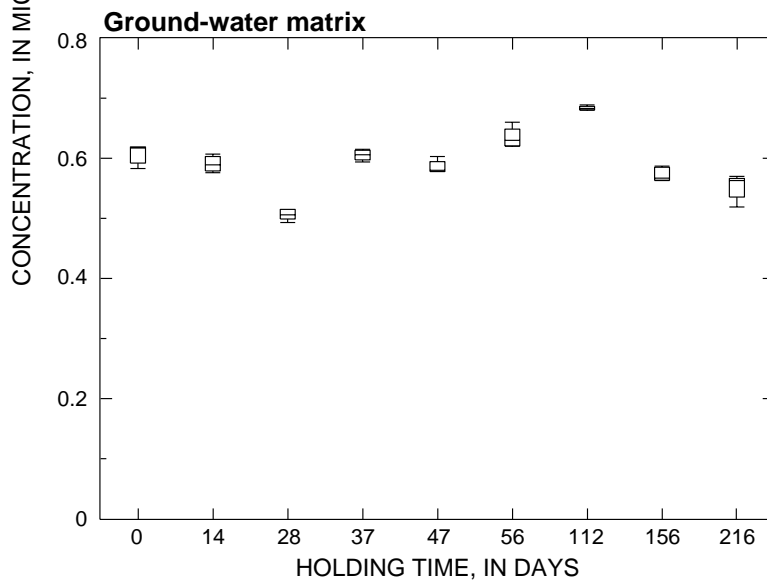
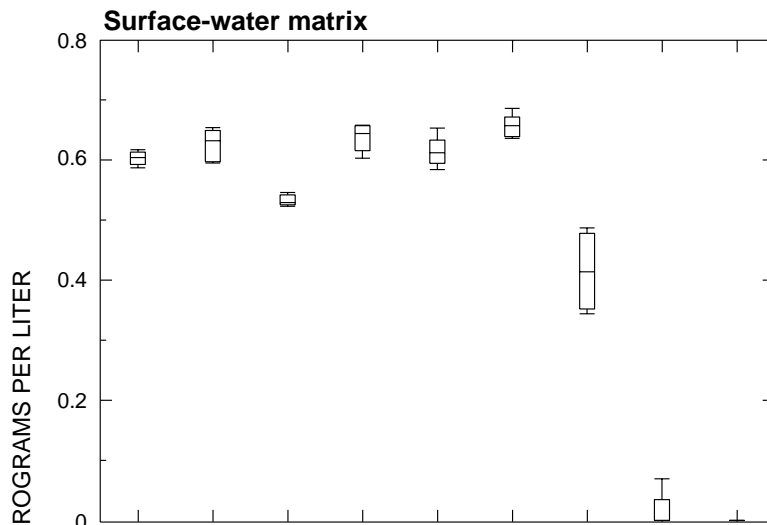
# Bromobenzene



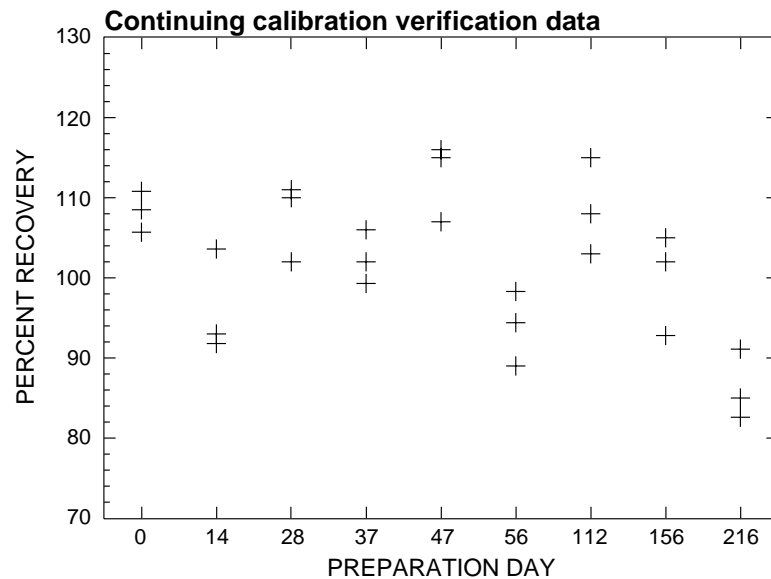
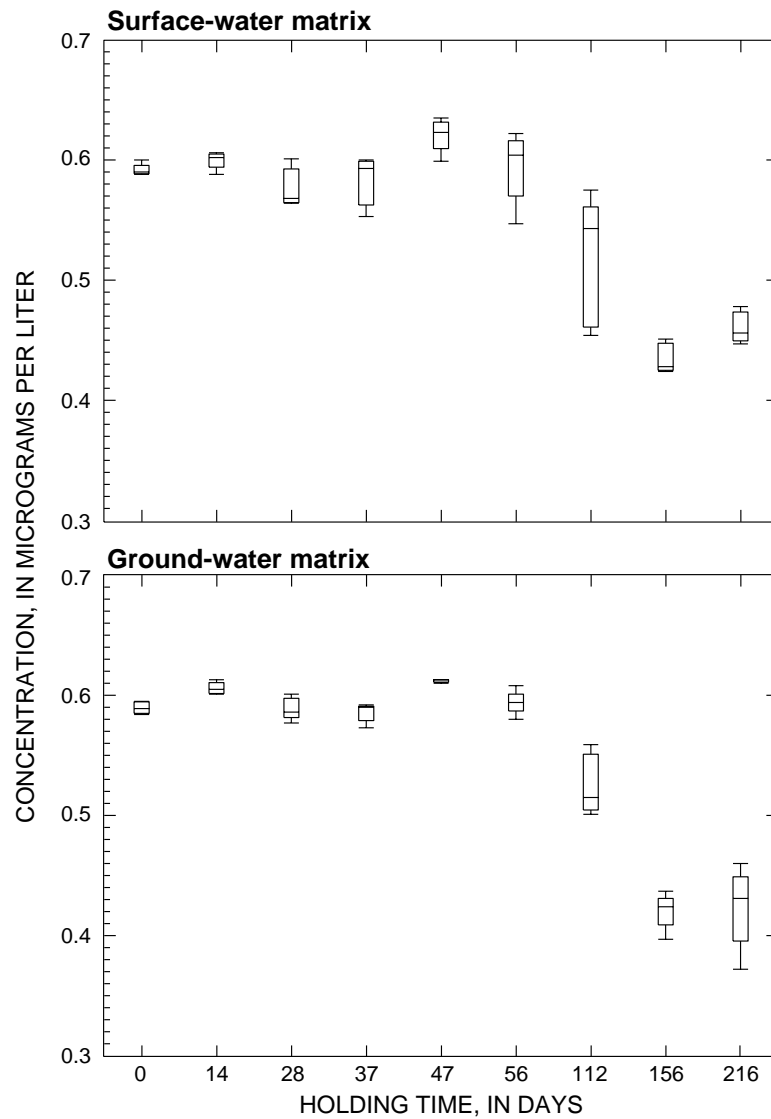
# Bromochloromethane



# 2-Butanone

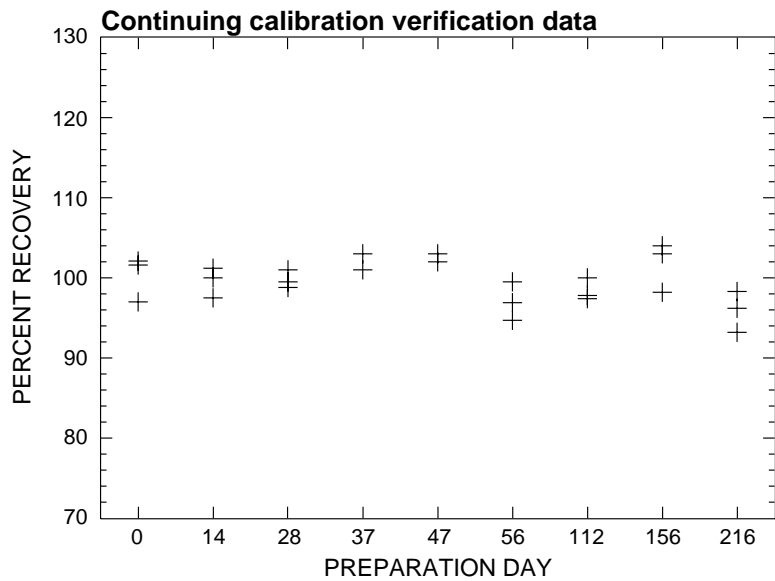
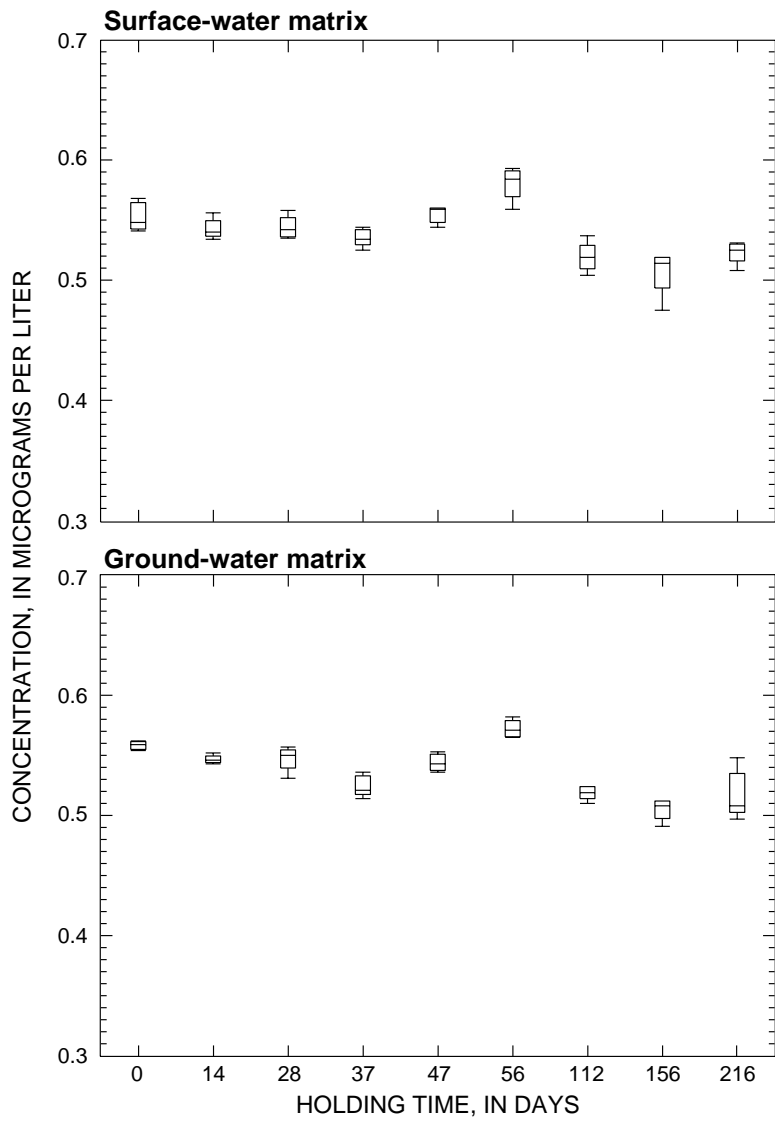


# Carbon disulfide

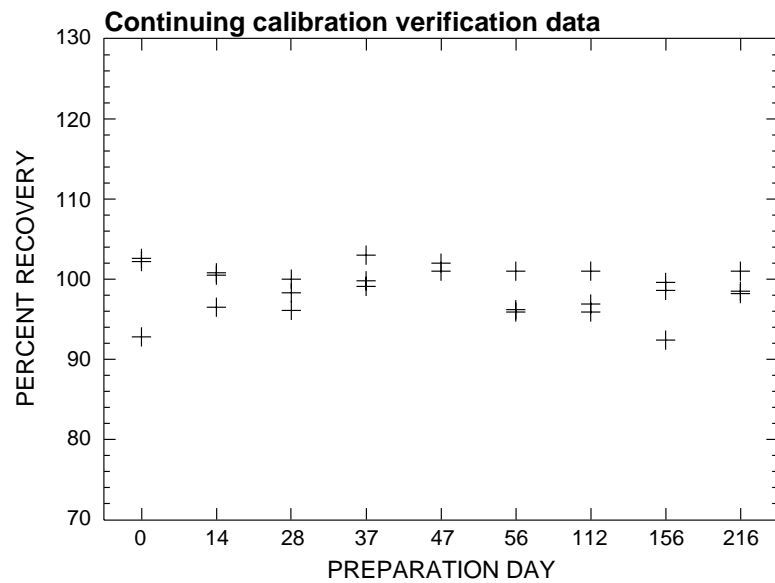
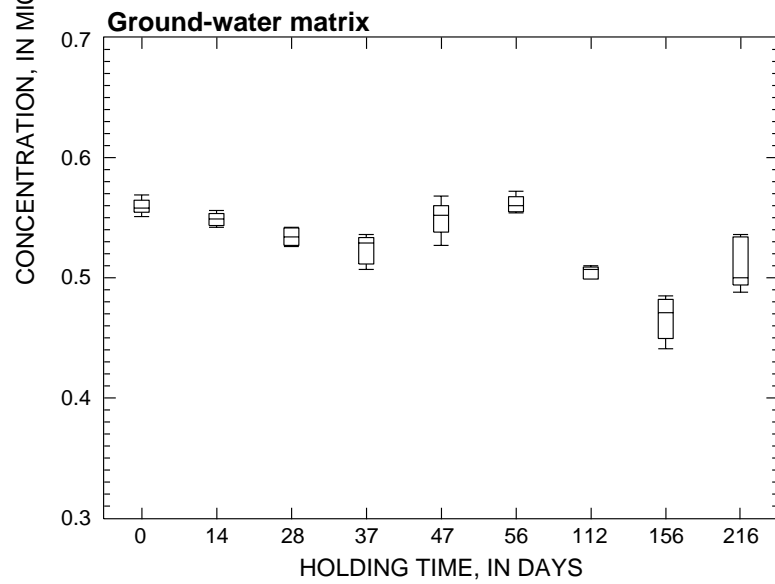
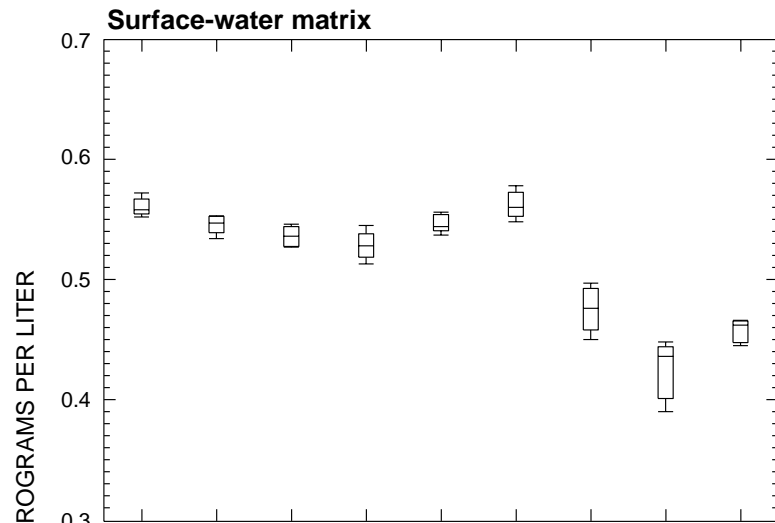




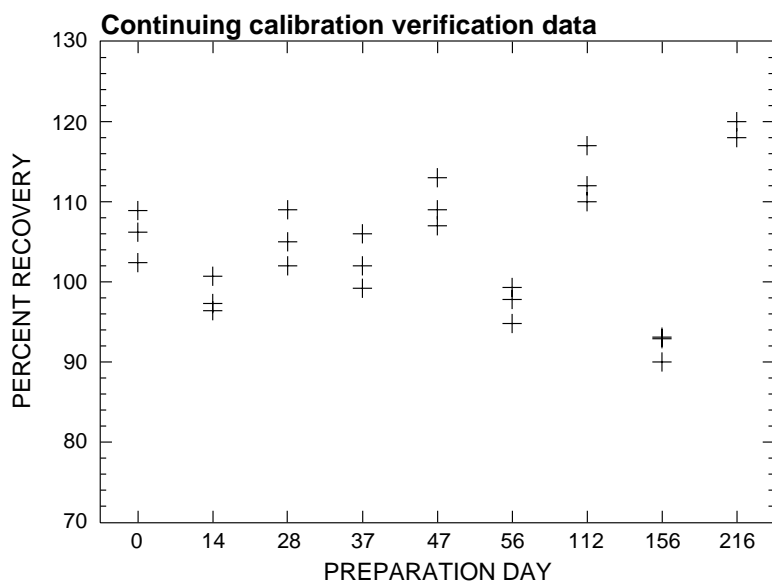
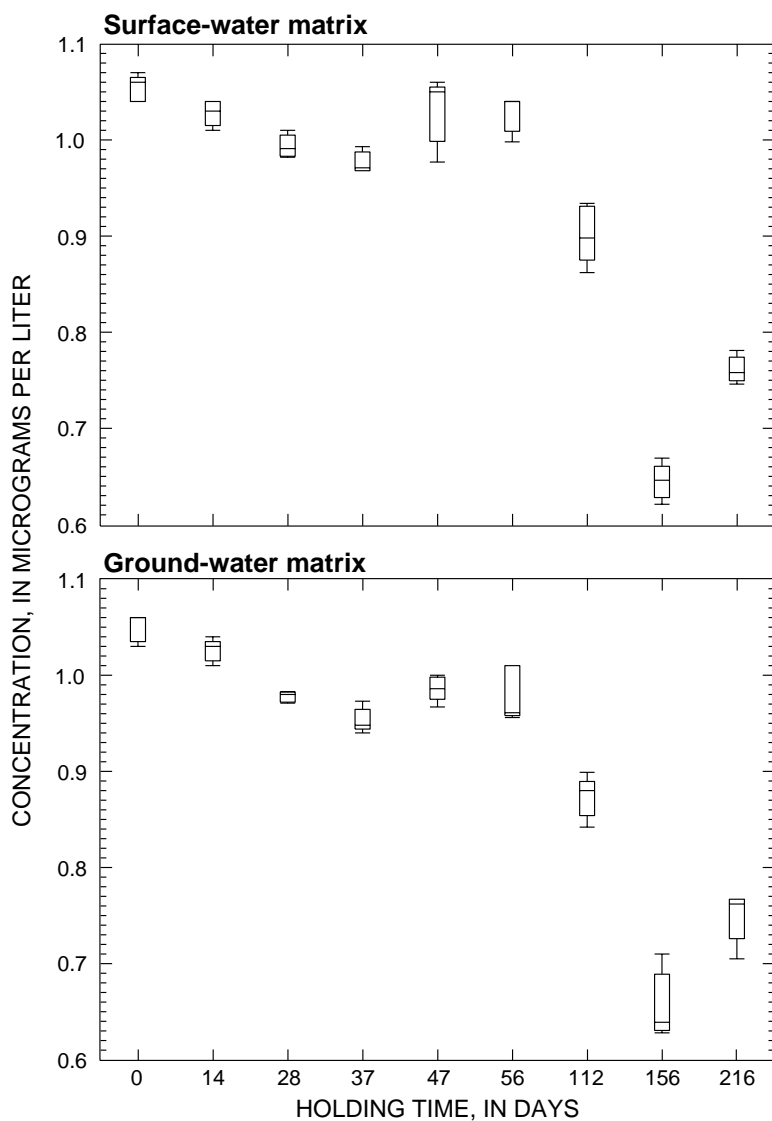
# 1-Chloro-2-methylbenzene



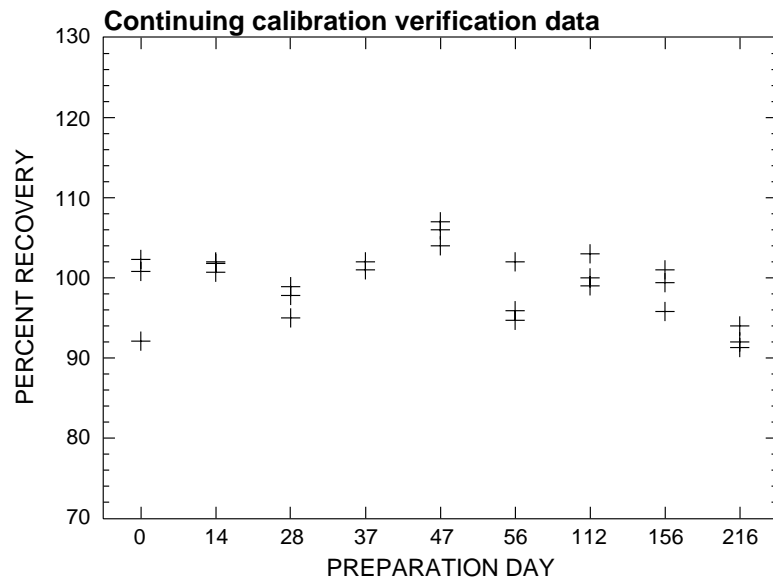
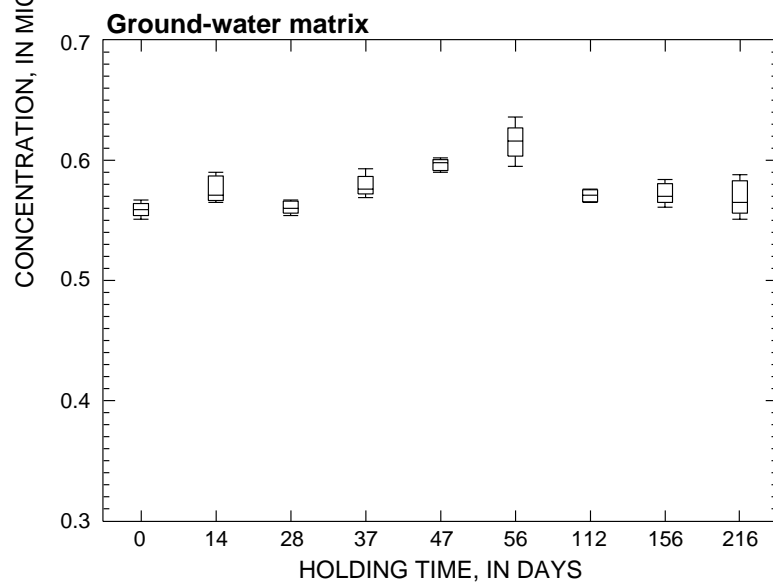
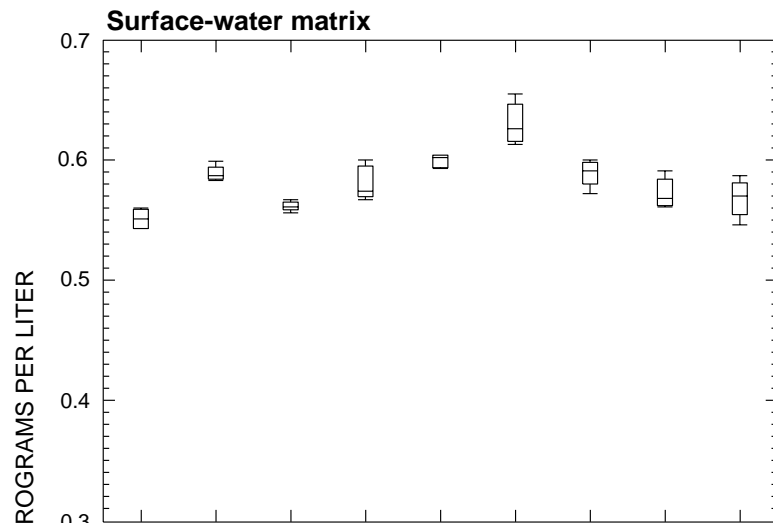
# 1-Chloro-4-methylbenzene



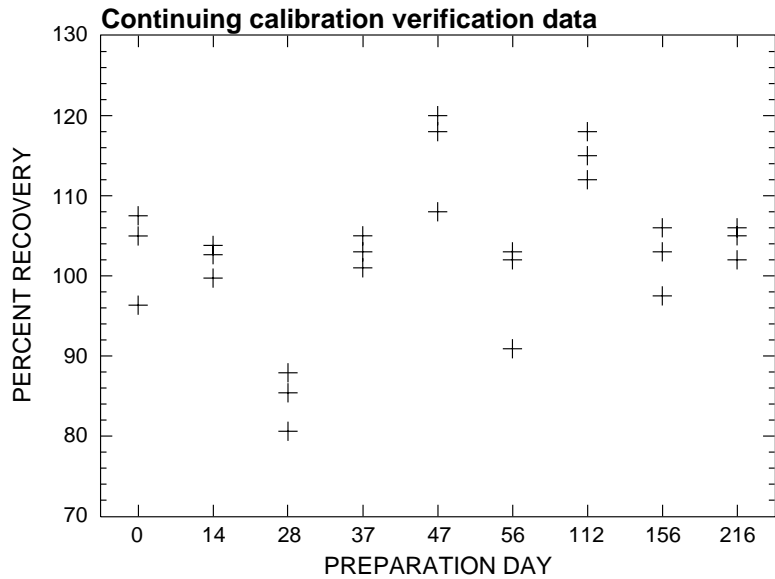
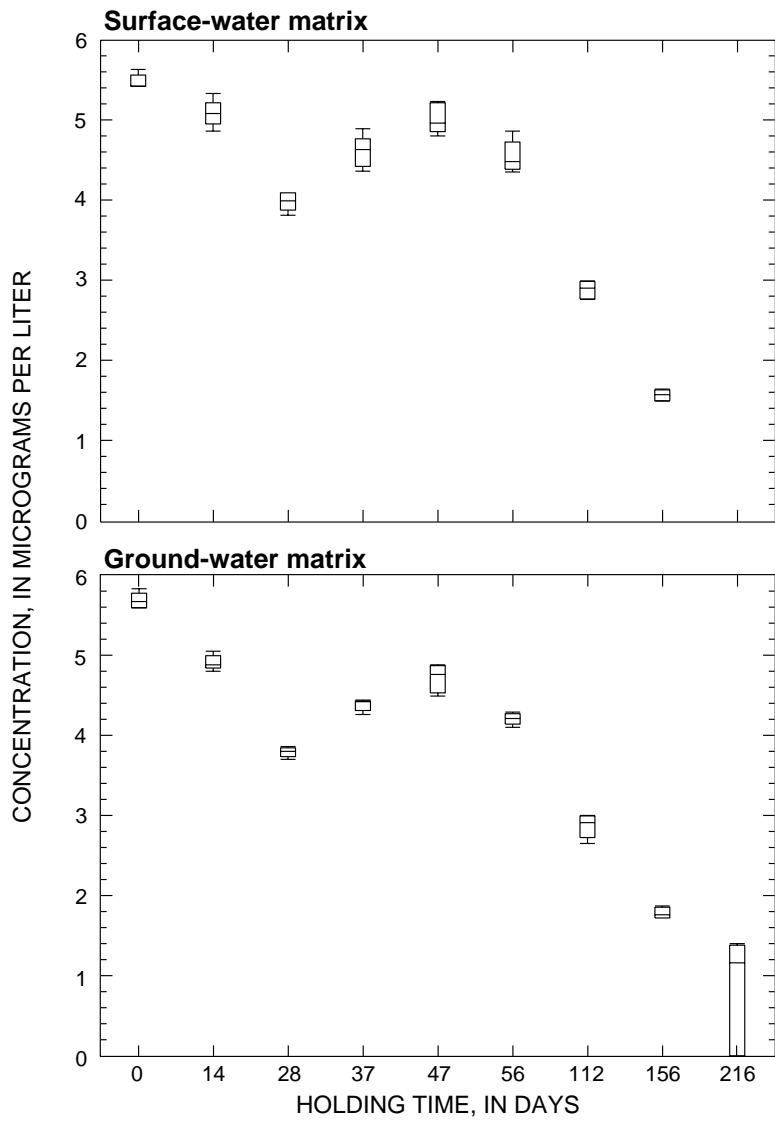
# 3-Chloro-1-propene



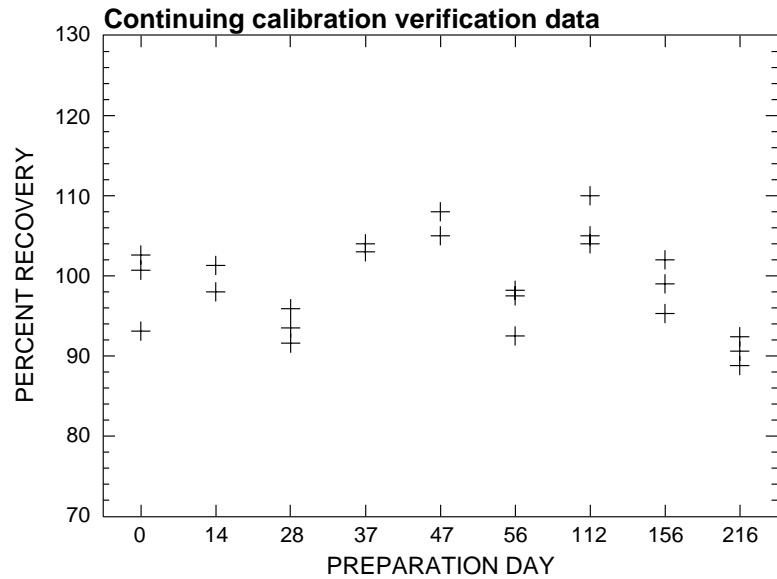
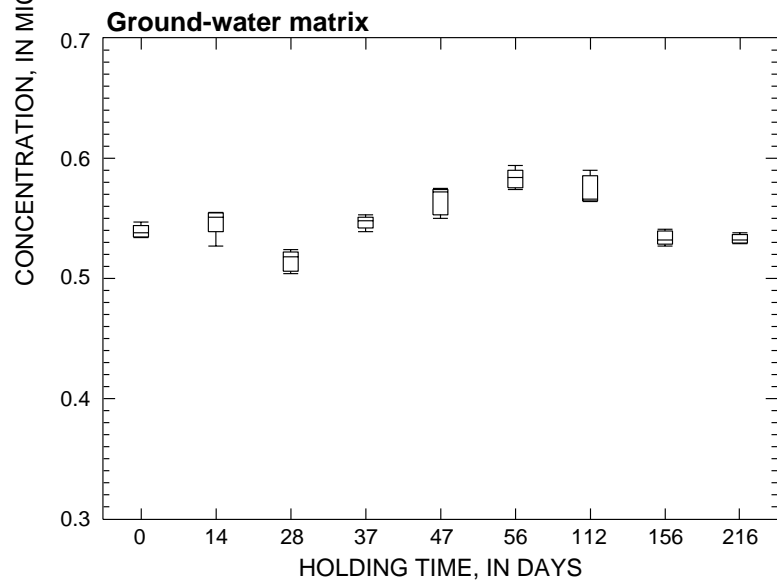
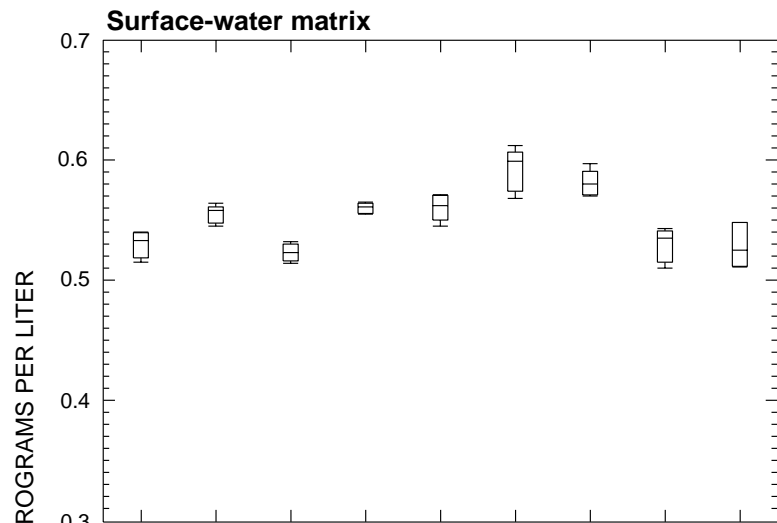
# Dibromomethane



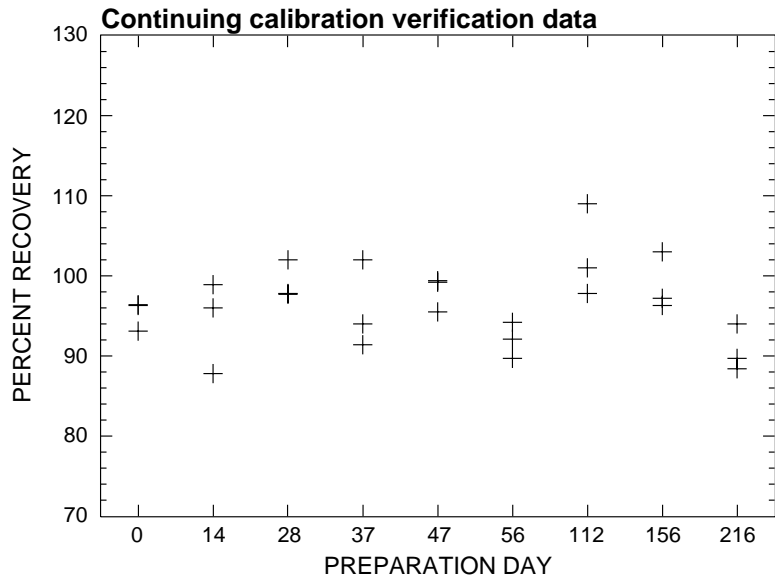
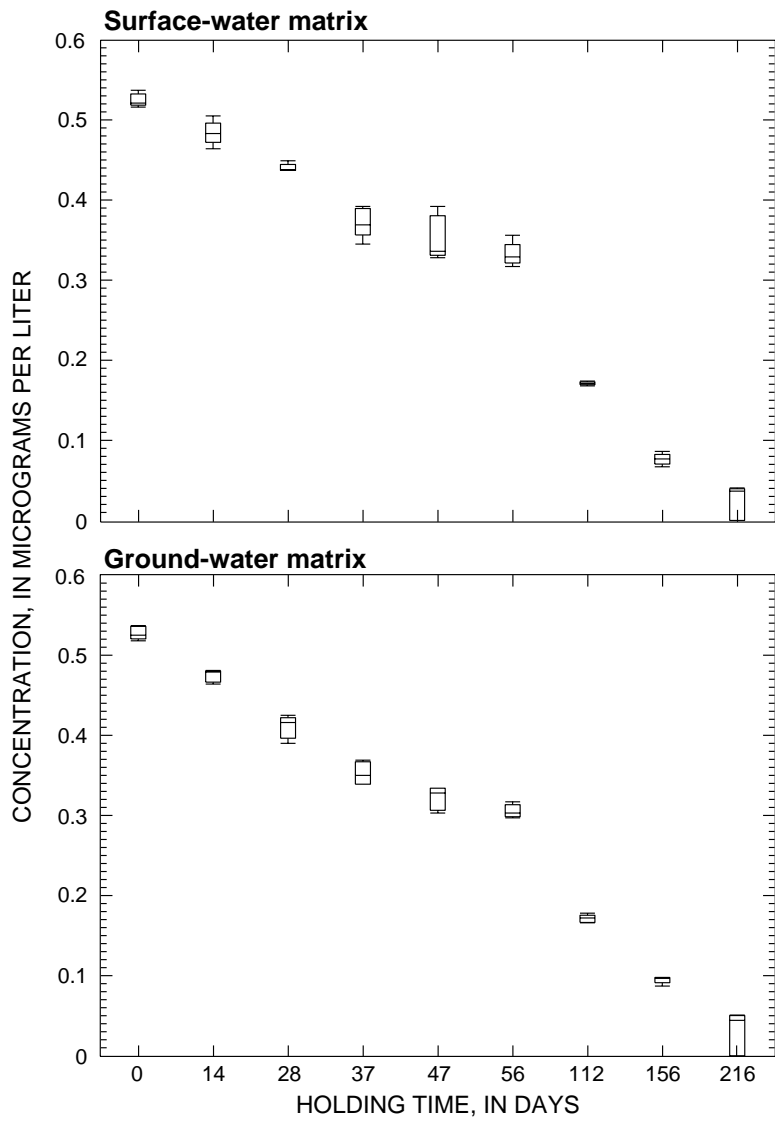
# trans-1,4-Dichloro-2-butene



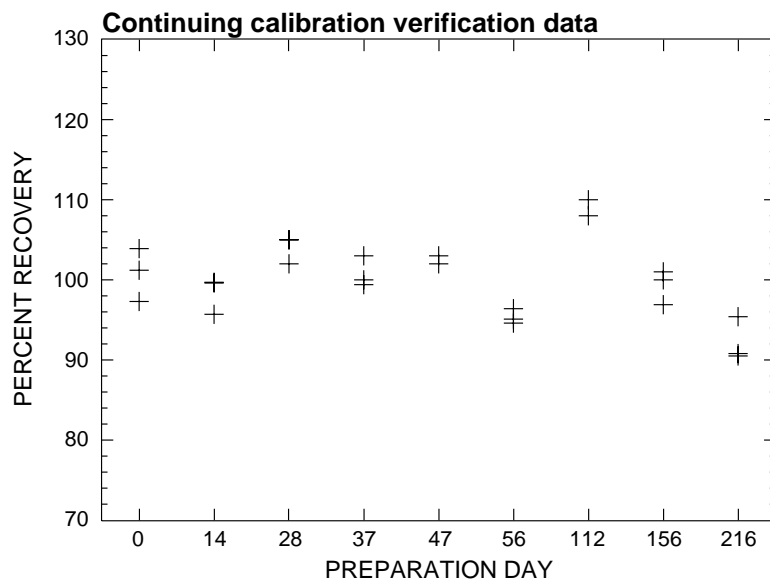
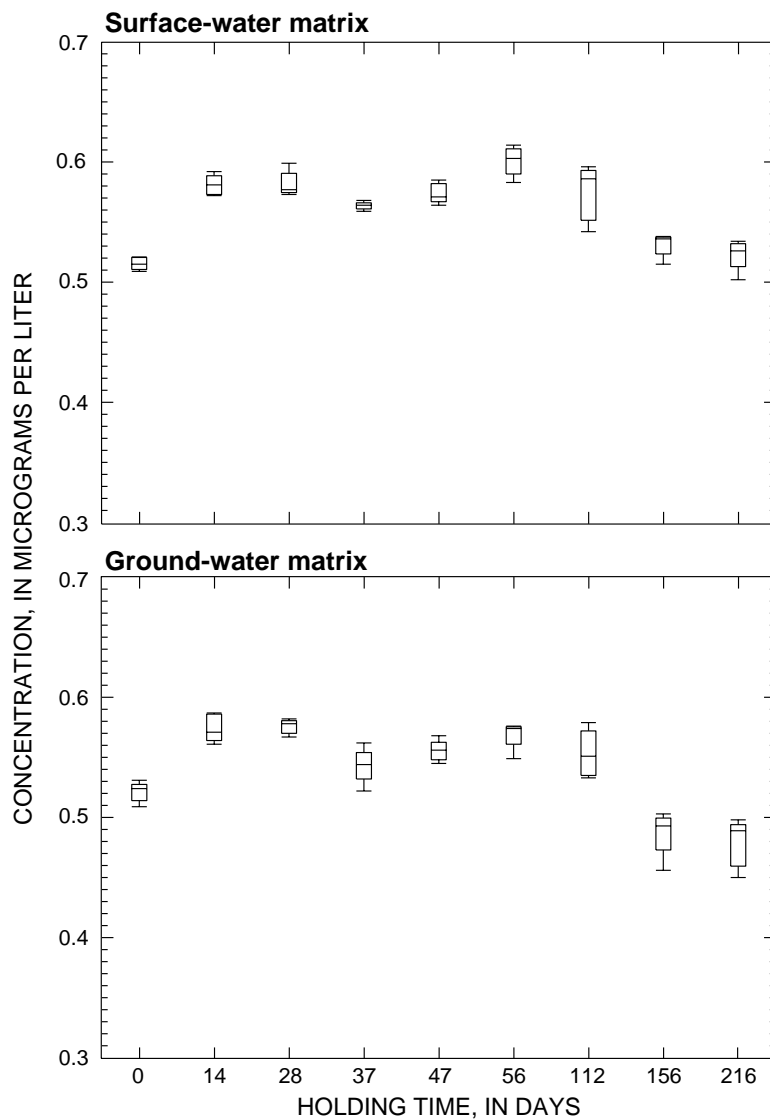
# 1,3-Dichloropropane



# 2,2-Dichloropropane

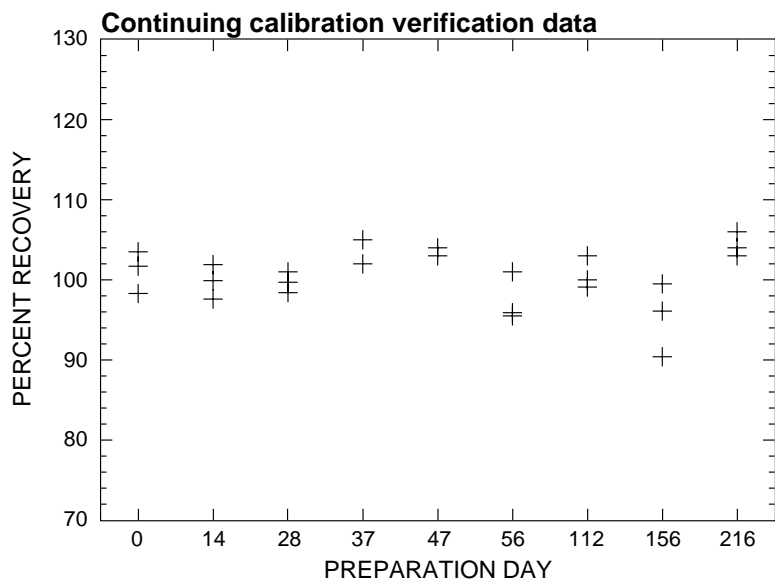
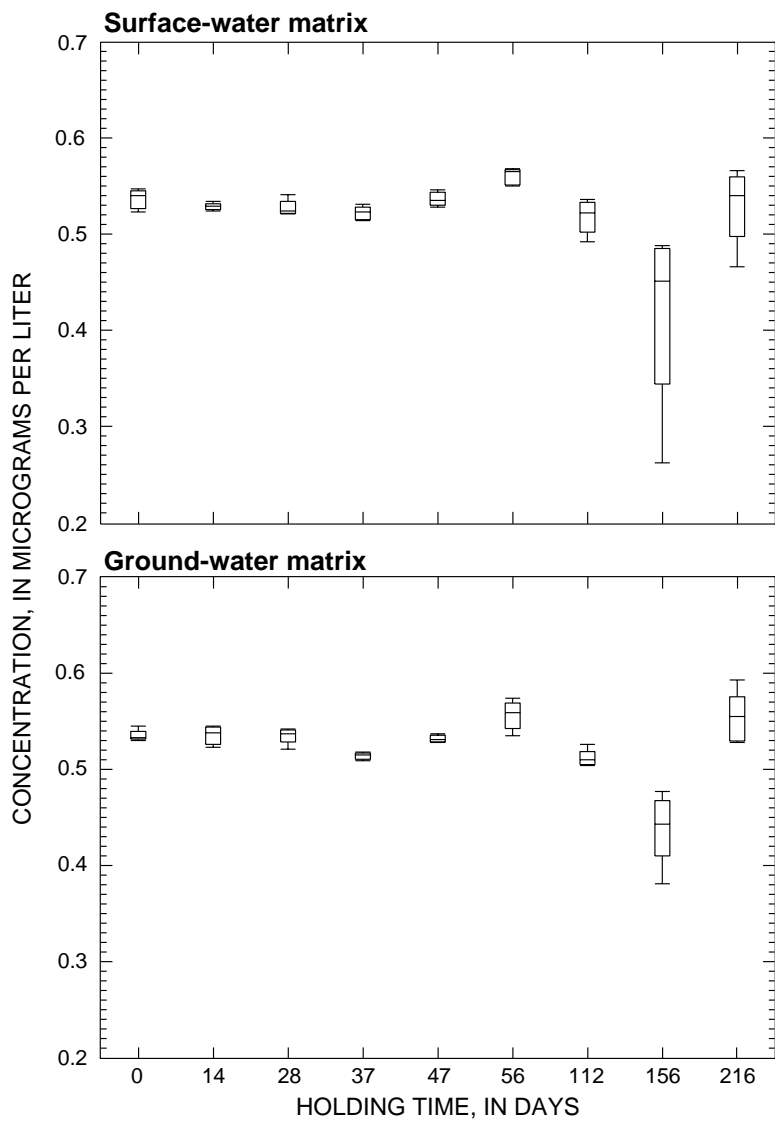


# 1,1-Dichloropropene

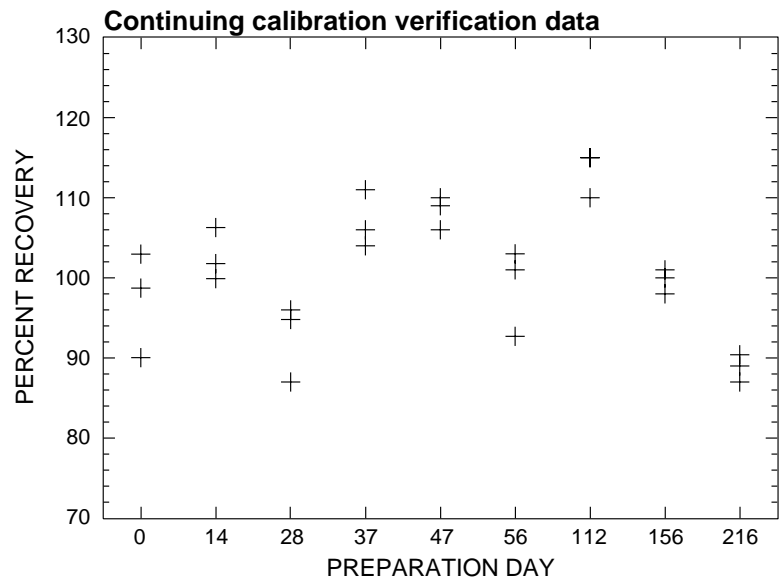
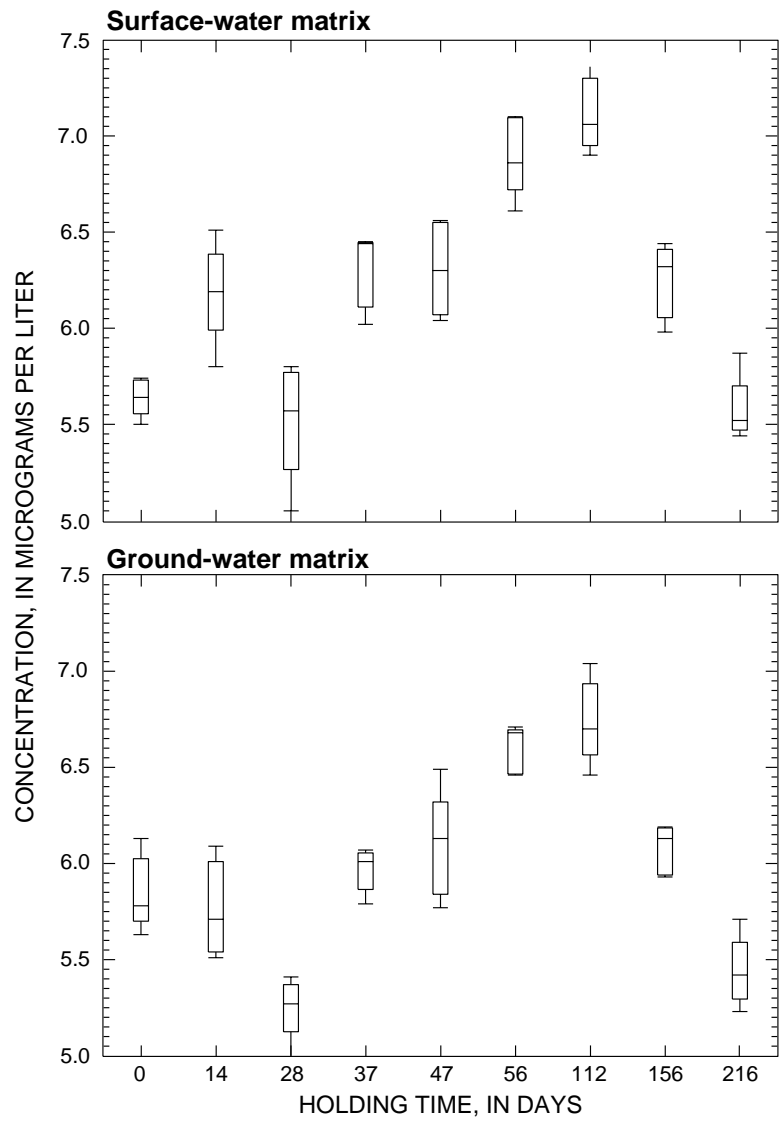




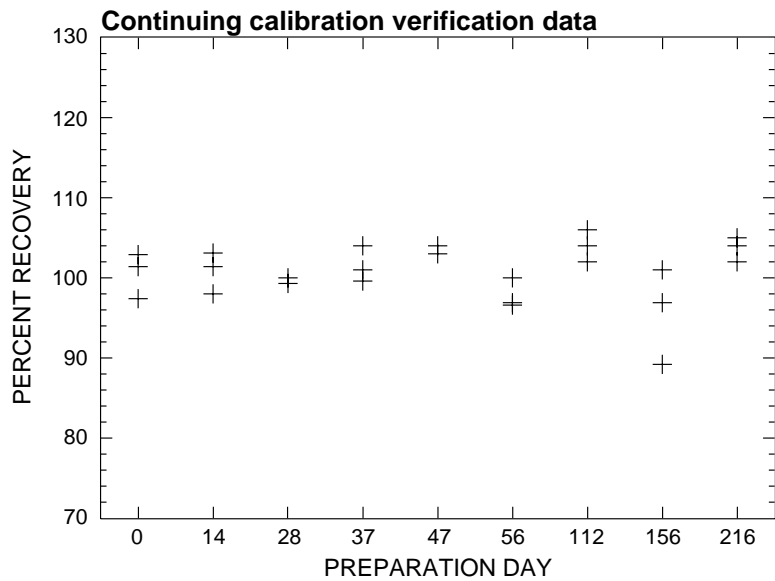
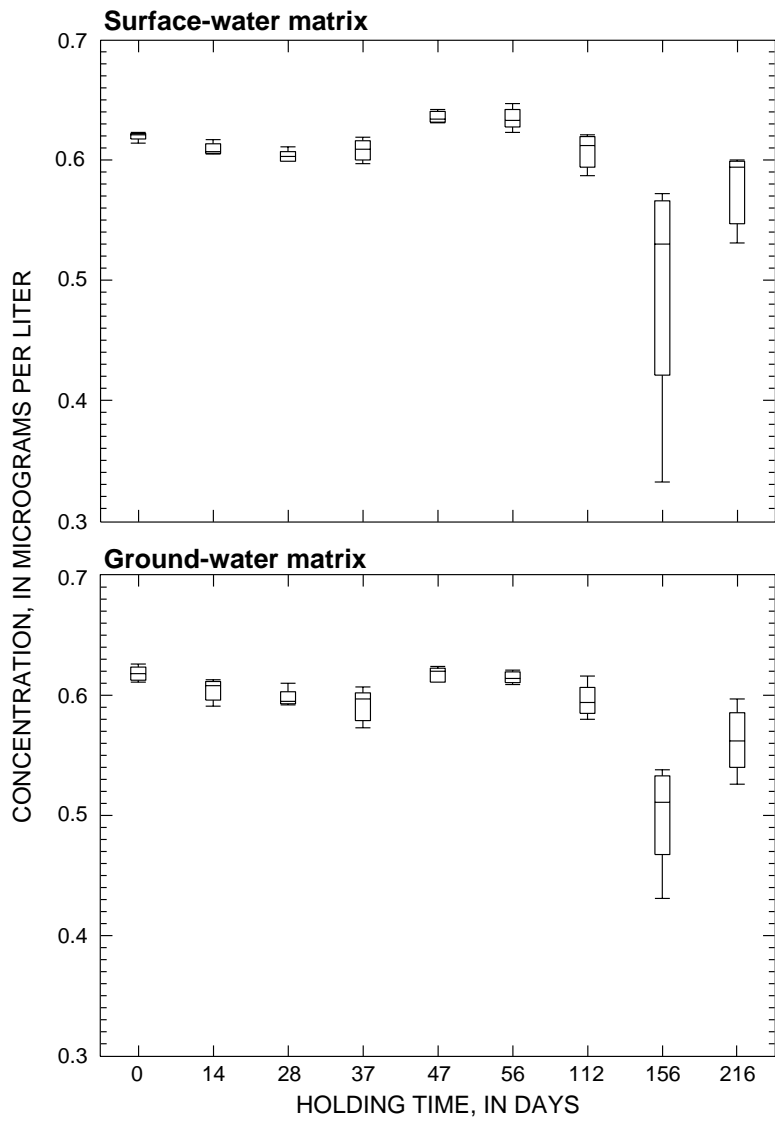
# (1,1-Dimethylethyl)benzene



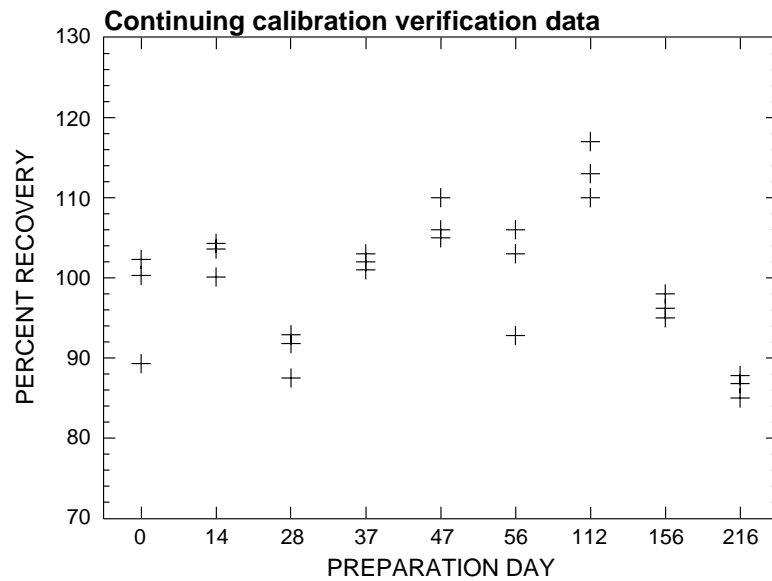
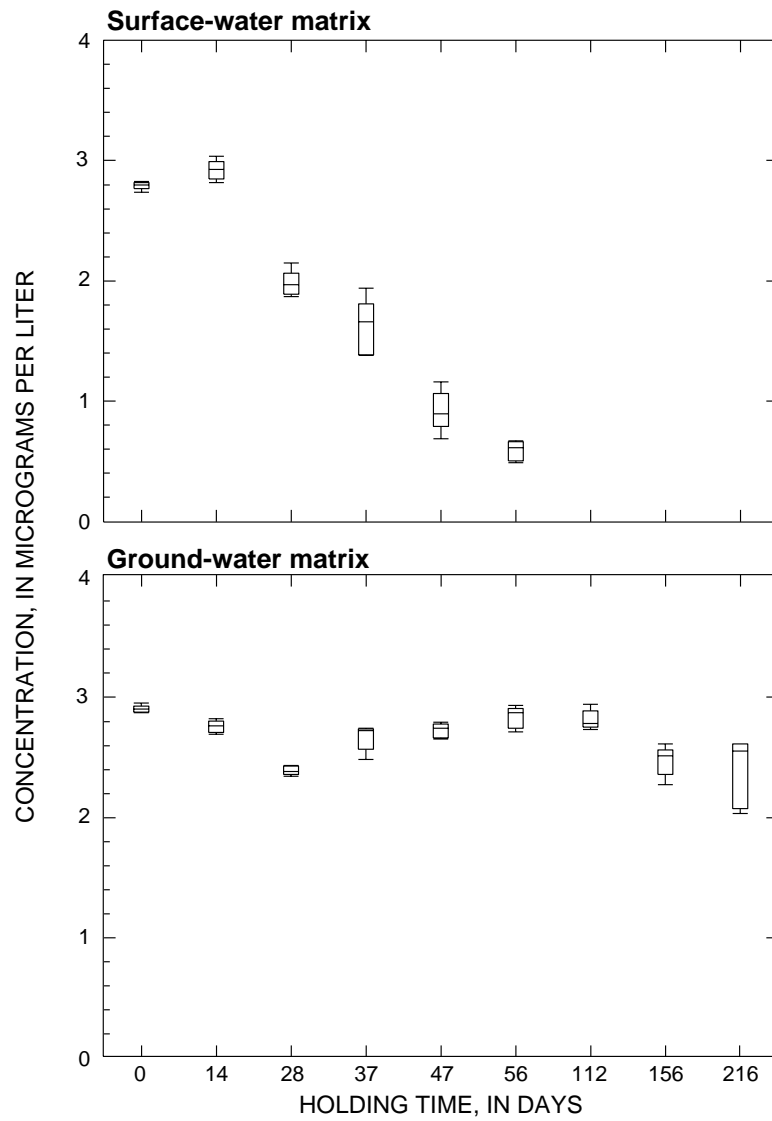
# 1,4-Epoxybutane



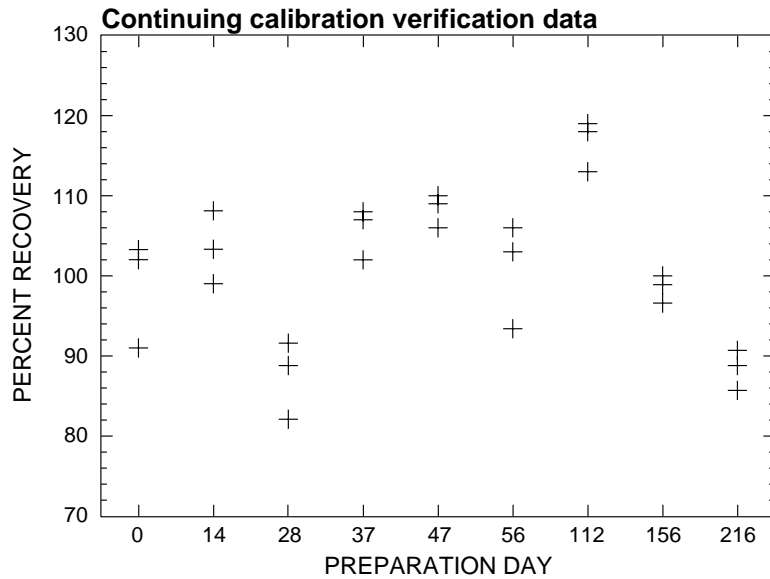
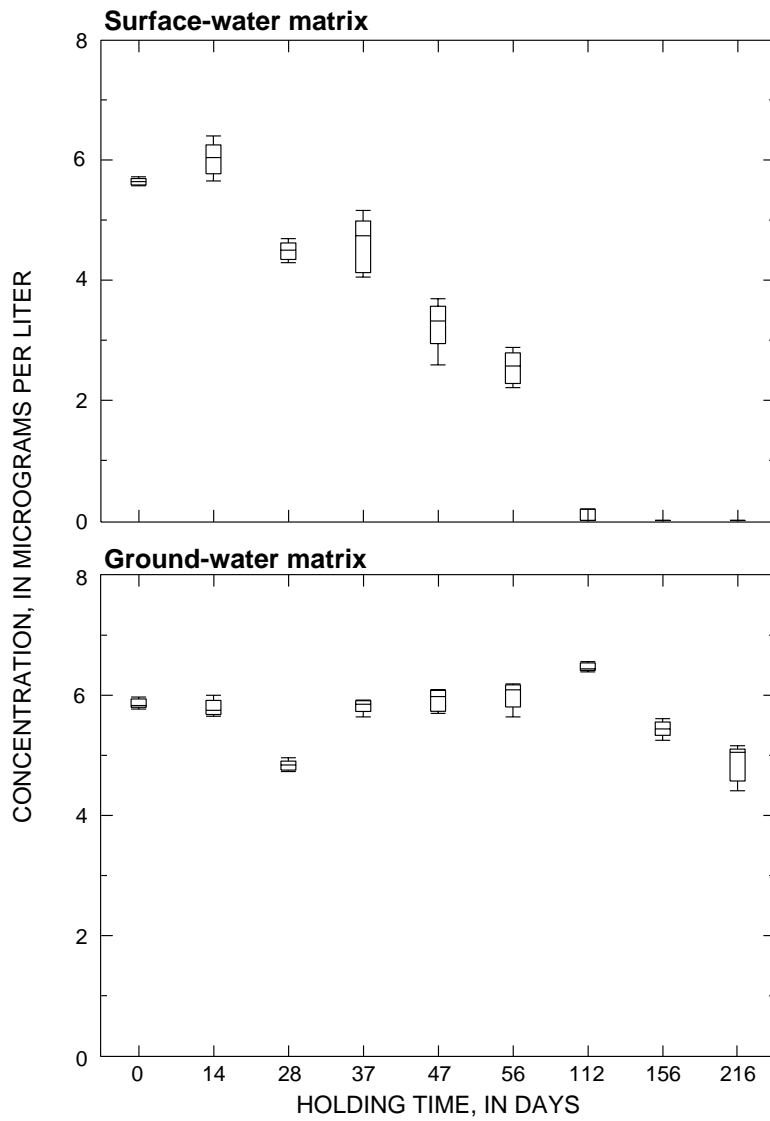
# 1-Ethyl-2-methylbenzene



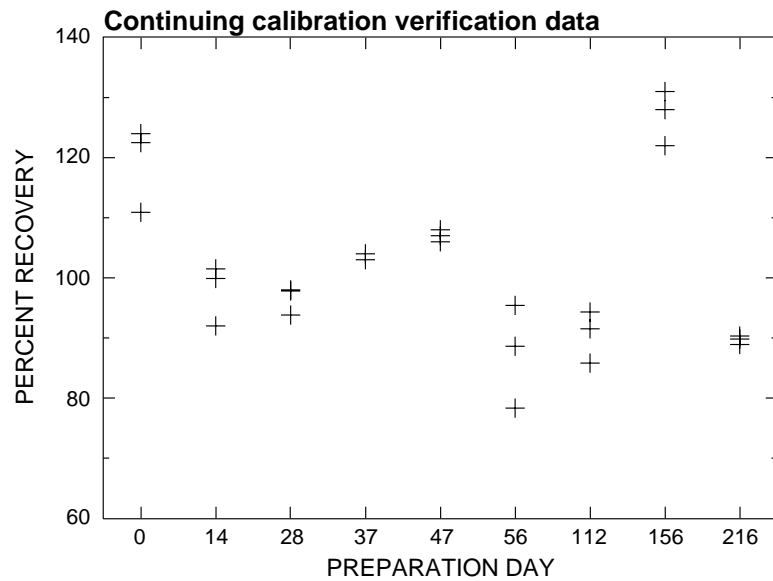
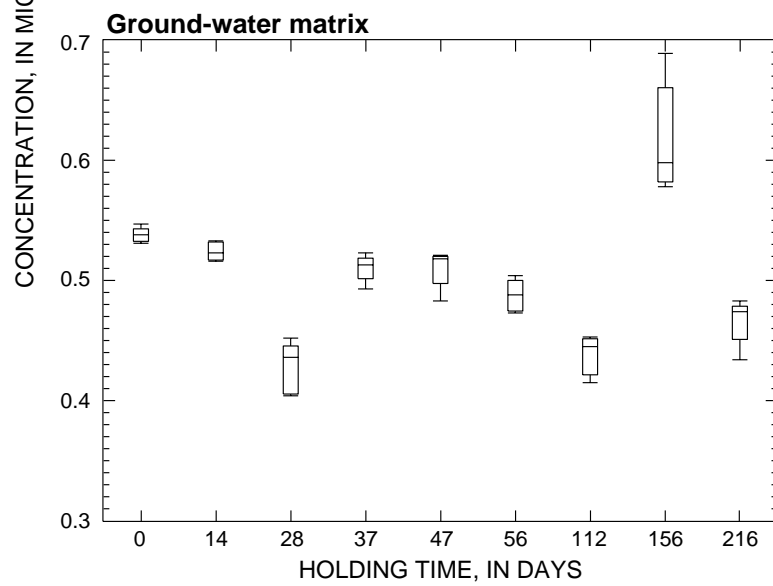
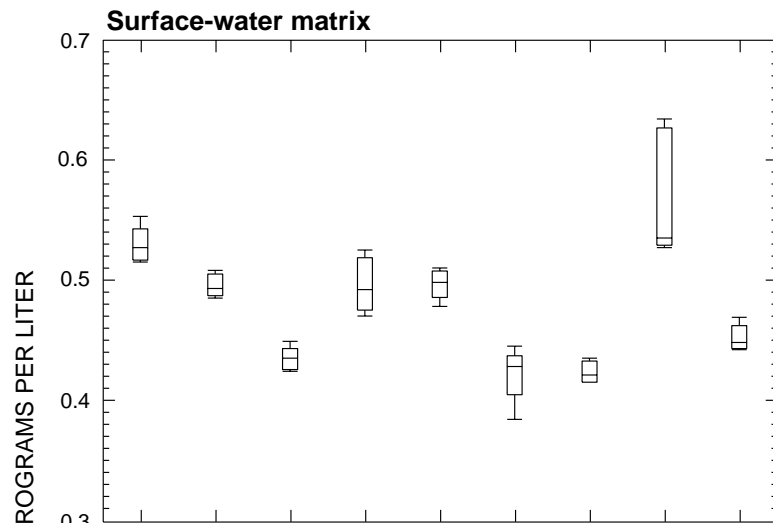
# Ethyl 2-methyl-2-propenoate



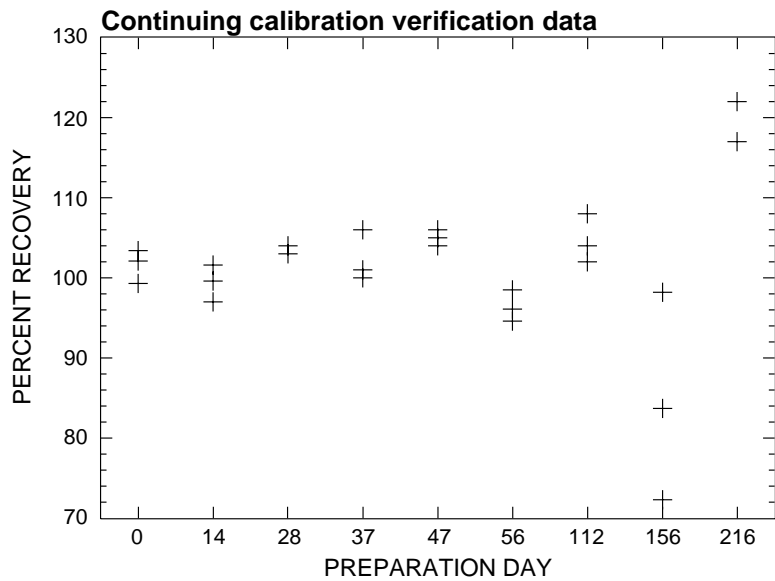
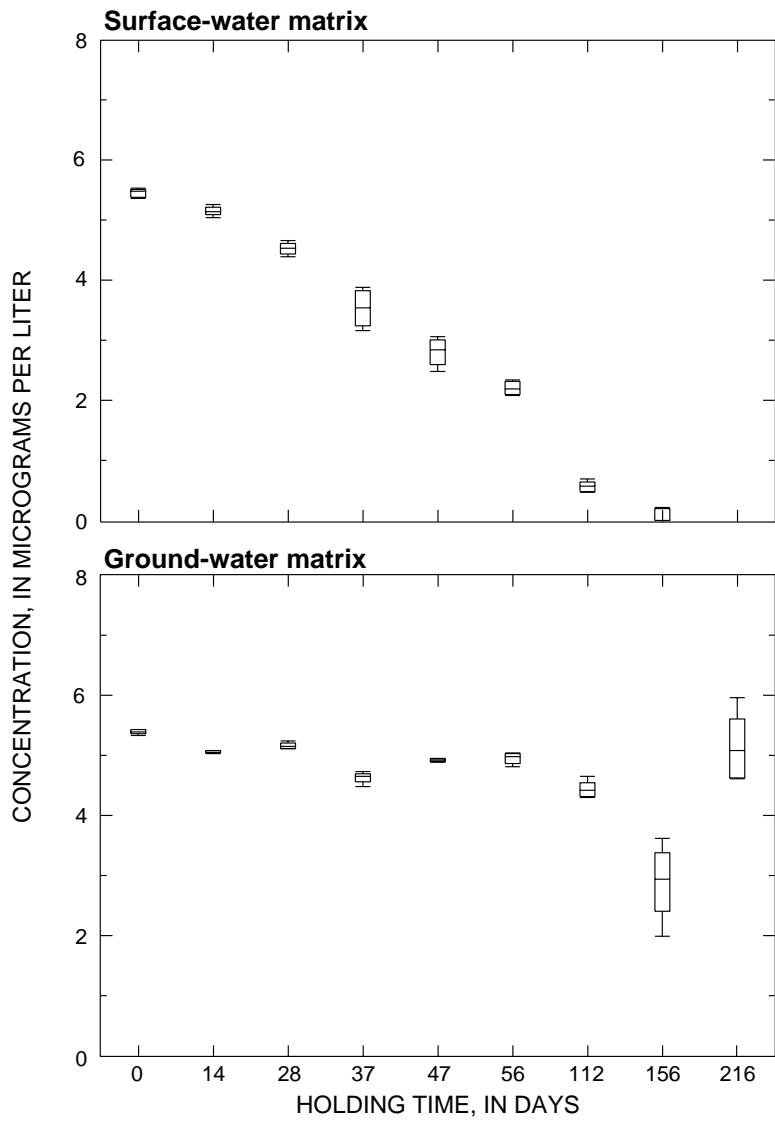
# 2-Hexanone



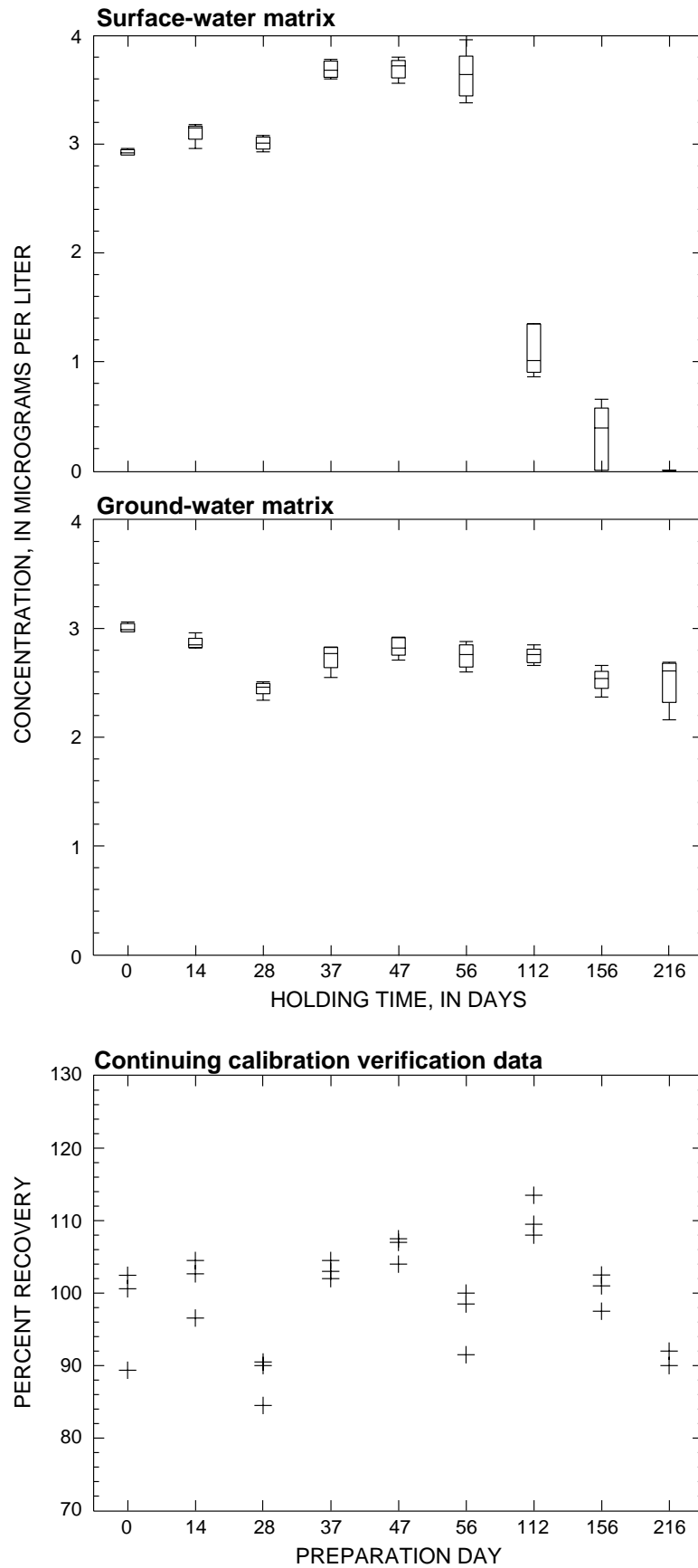
# Iodomethane



# 1-Isopropyl-4-methylbenzene

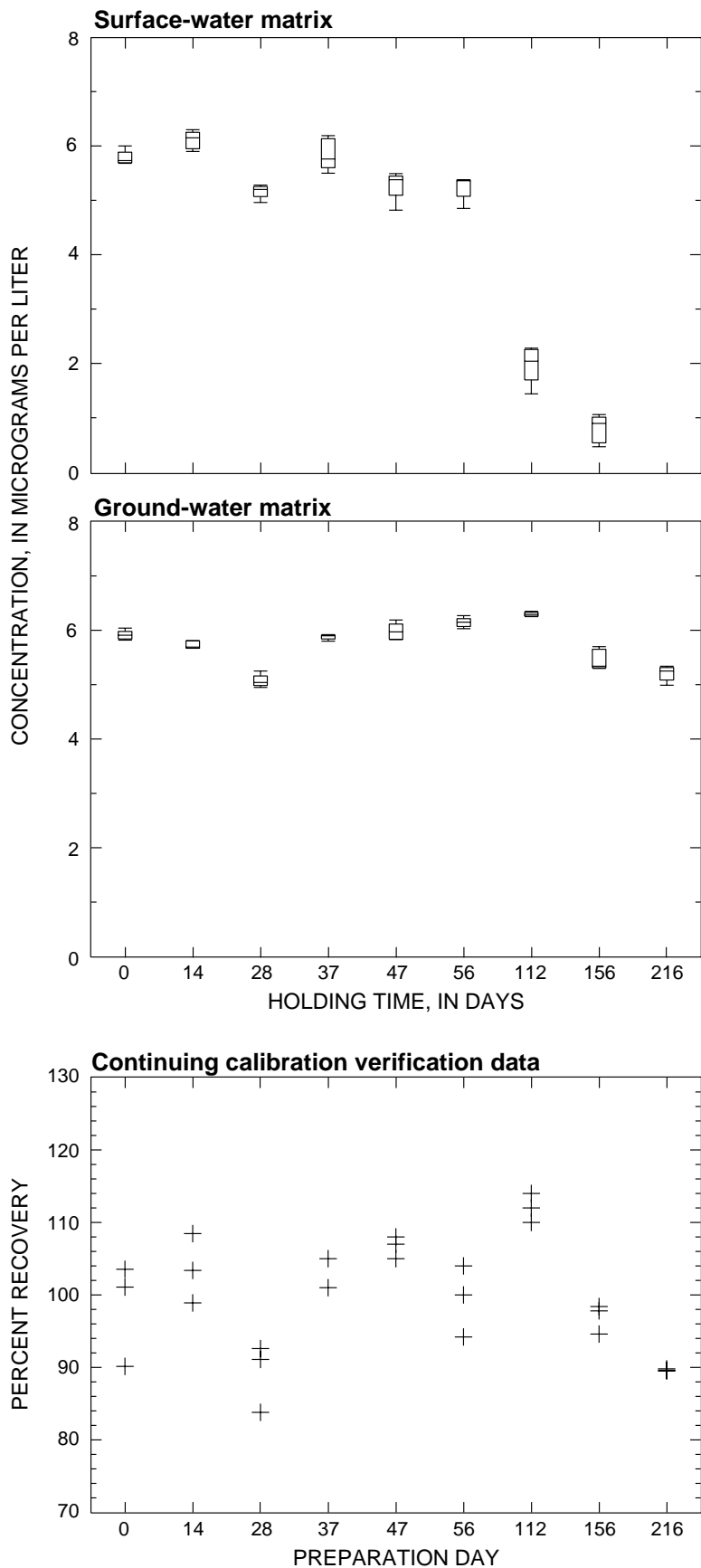


# Methyl 2-methyl-2-propenoate

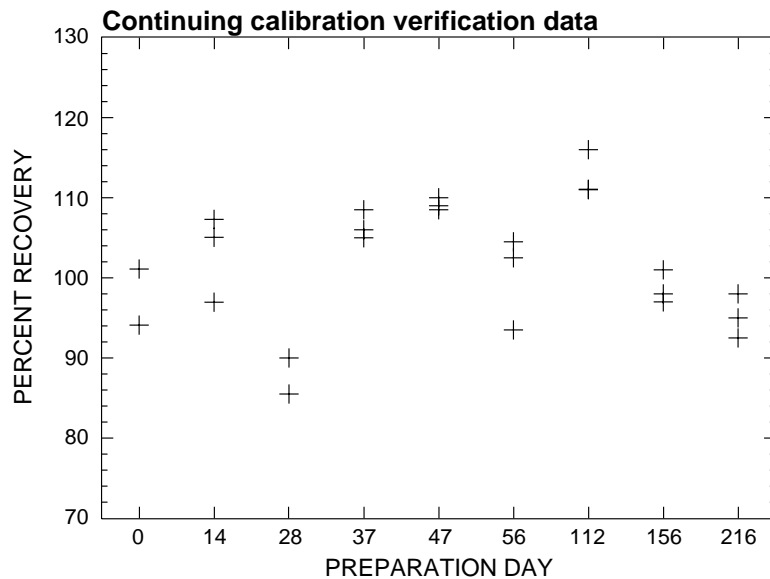
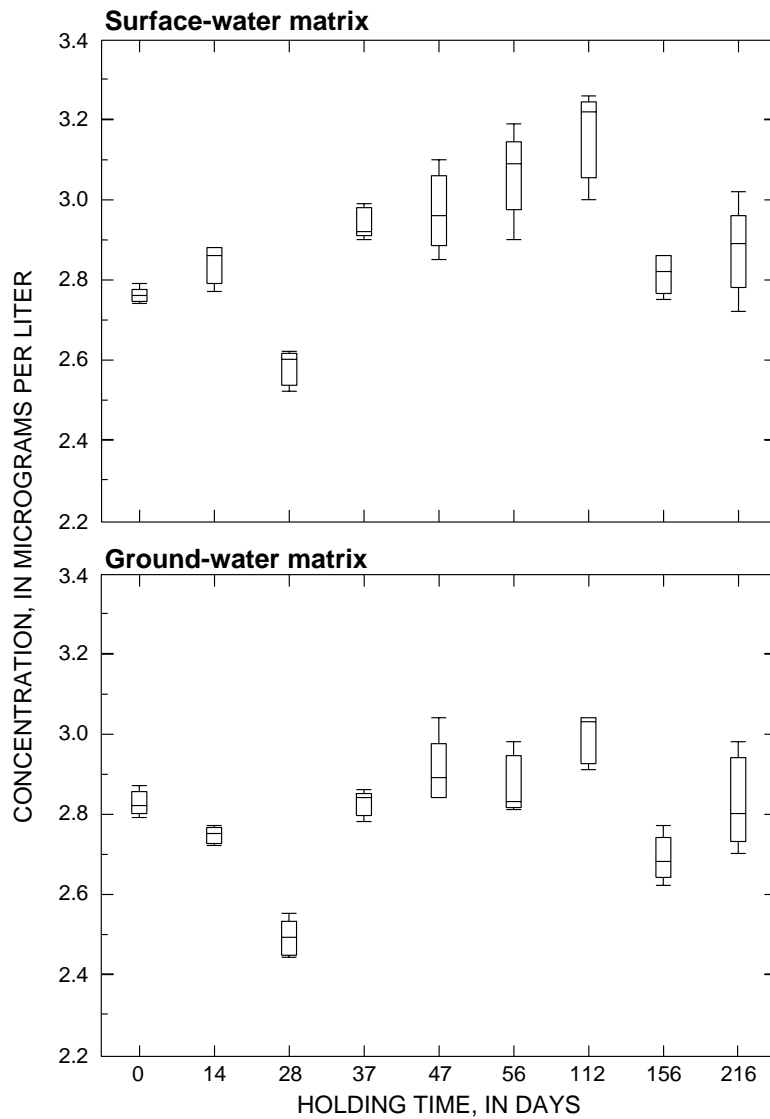




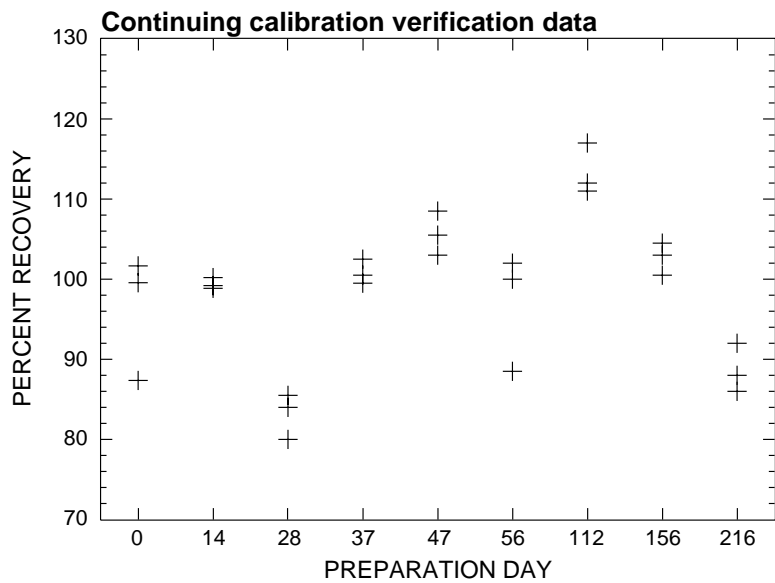
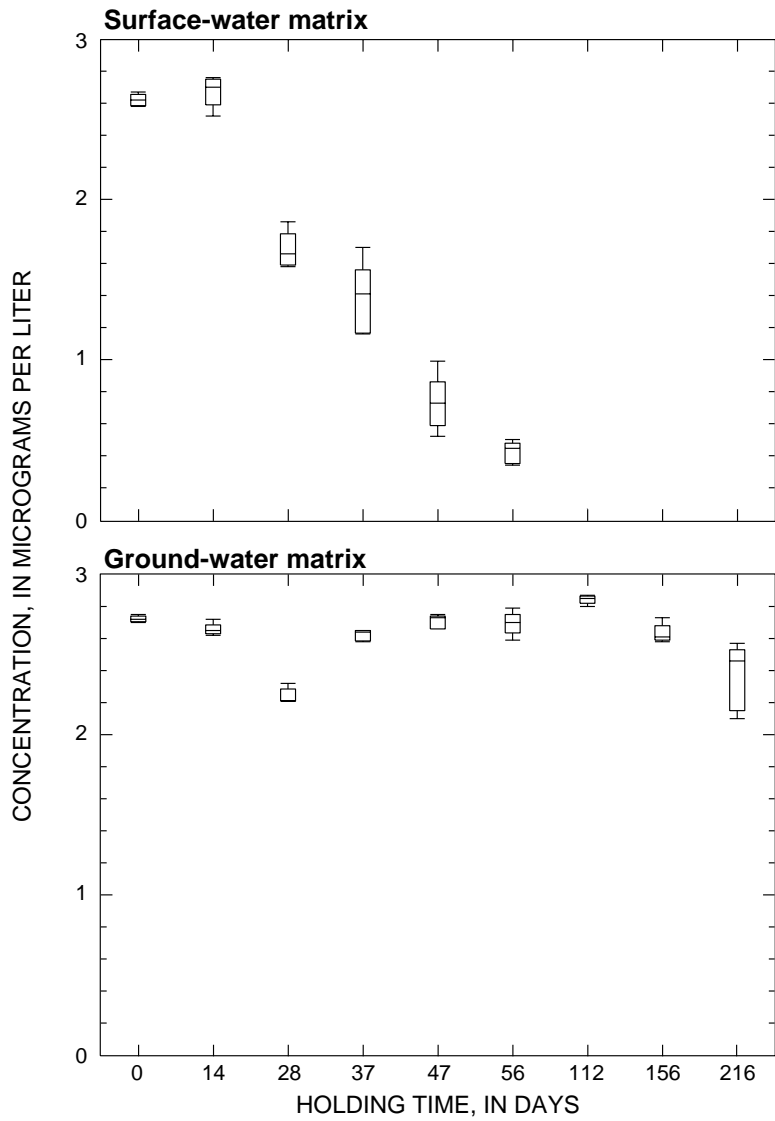
# 4-Methyl-2-pentanone



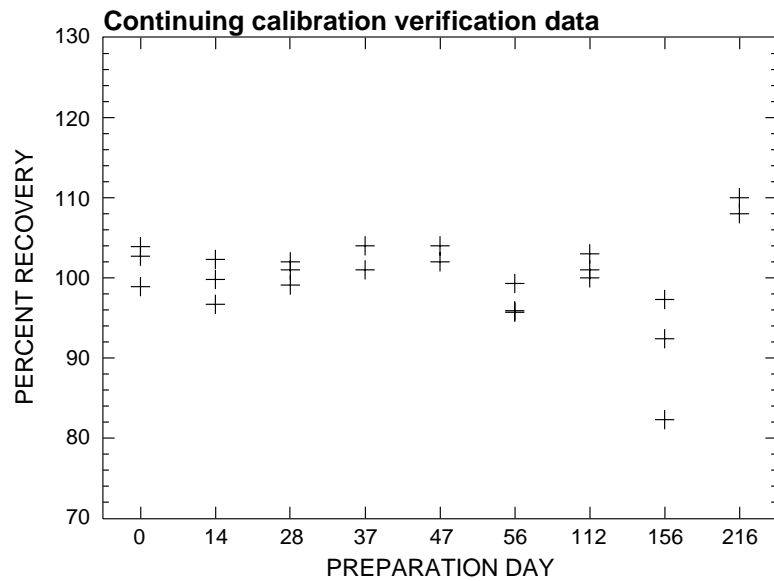
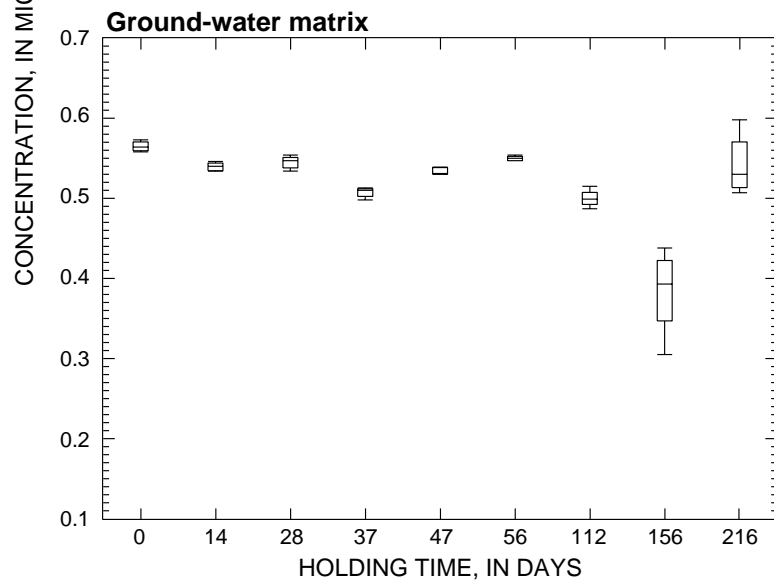
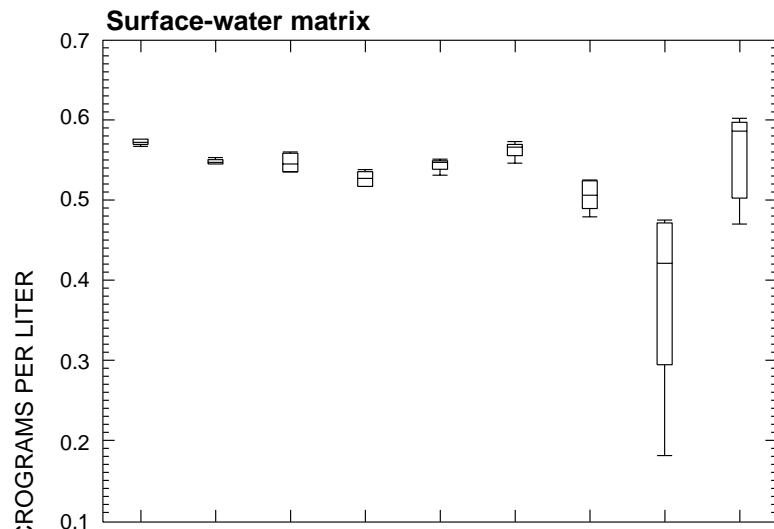
# 2-Methyl-2-propenenitrile



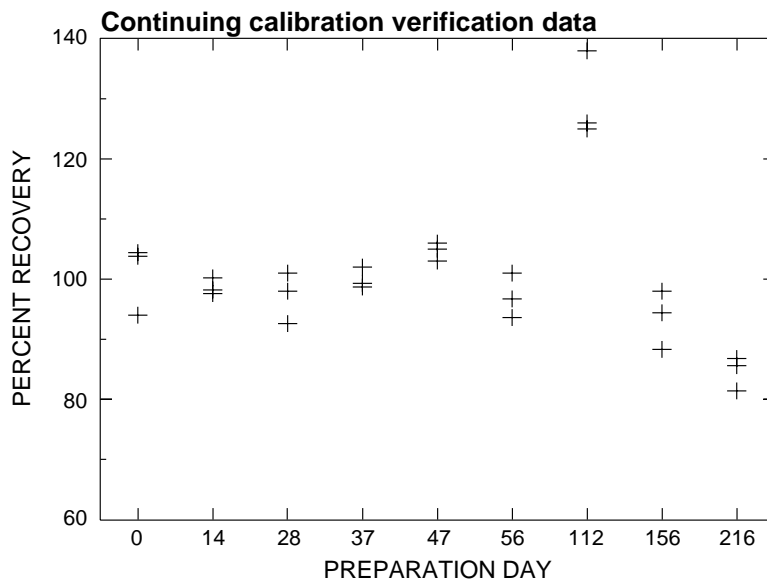
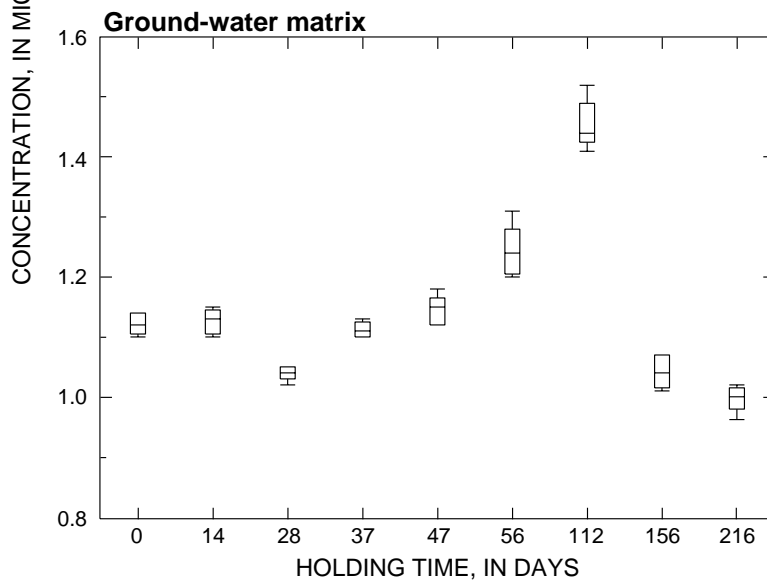
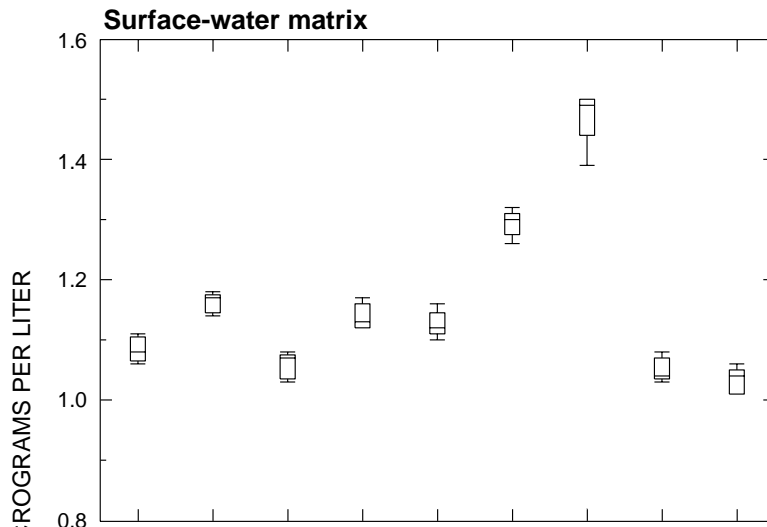
# Methyl-2-propenoate



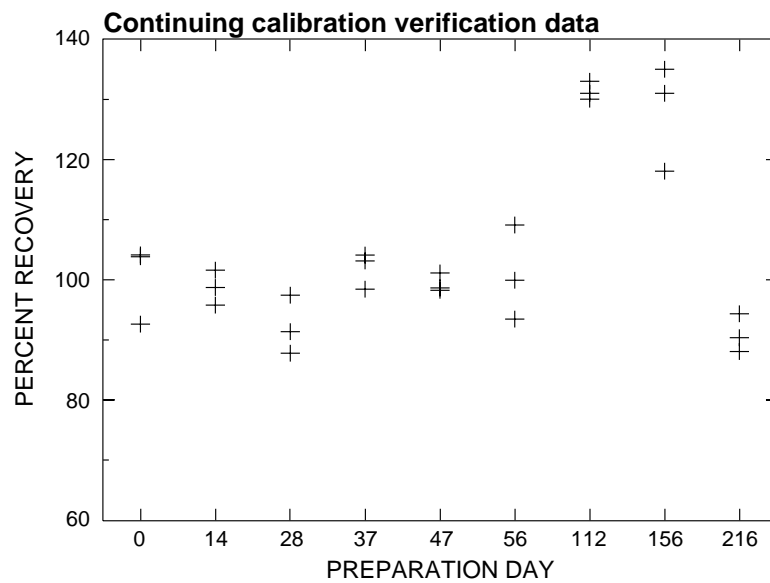
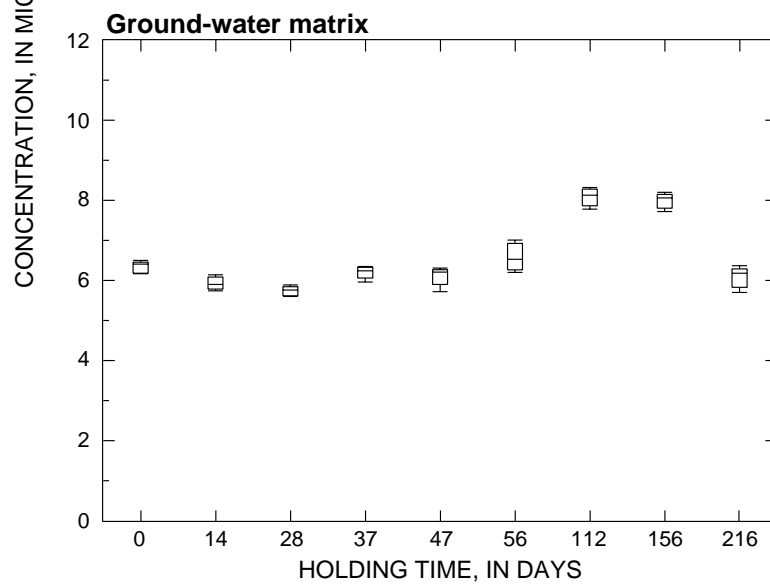
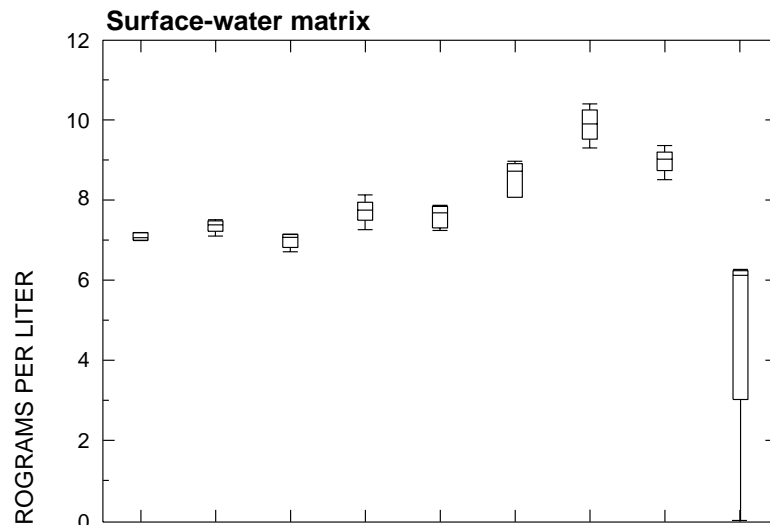
# (1-Methylpropyl)benzene



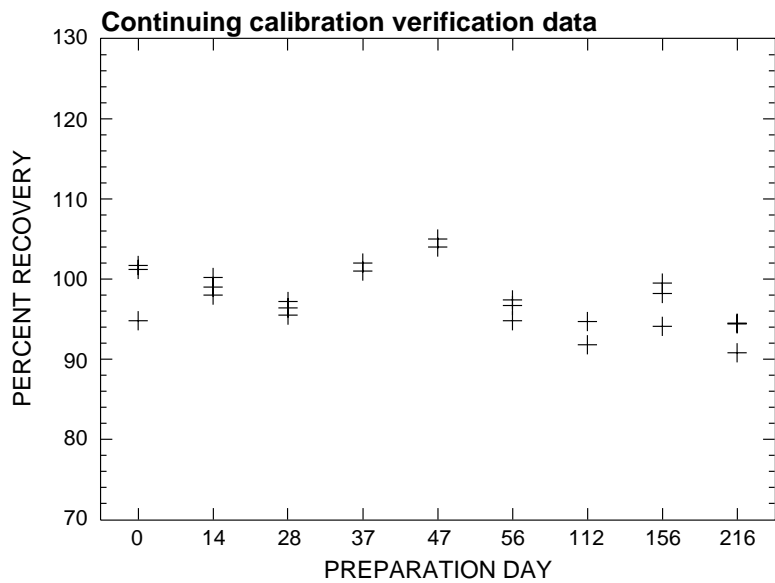
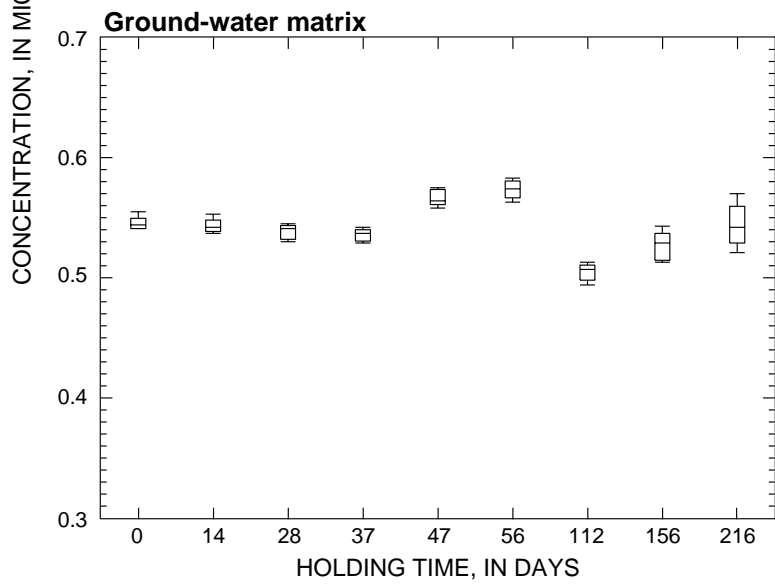
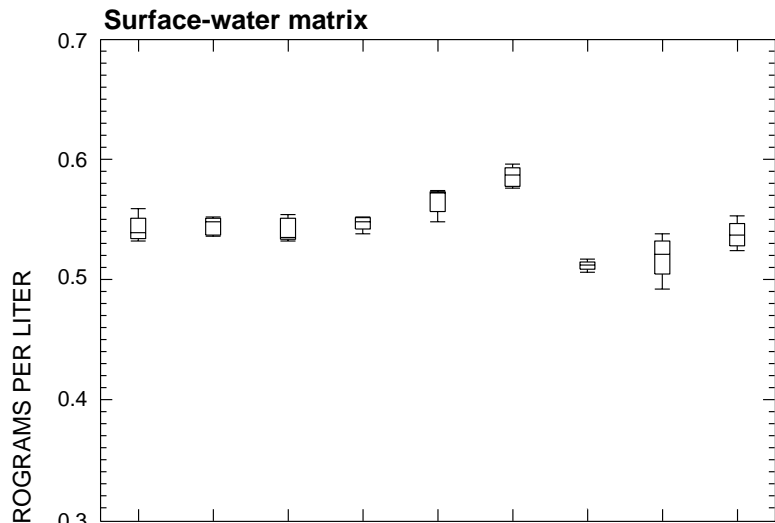
# 1,1'-Oxybisethane



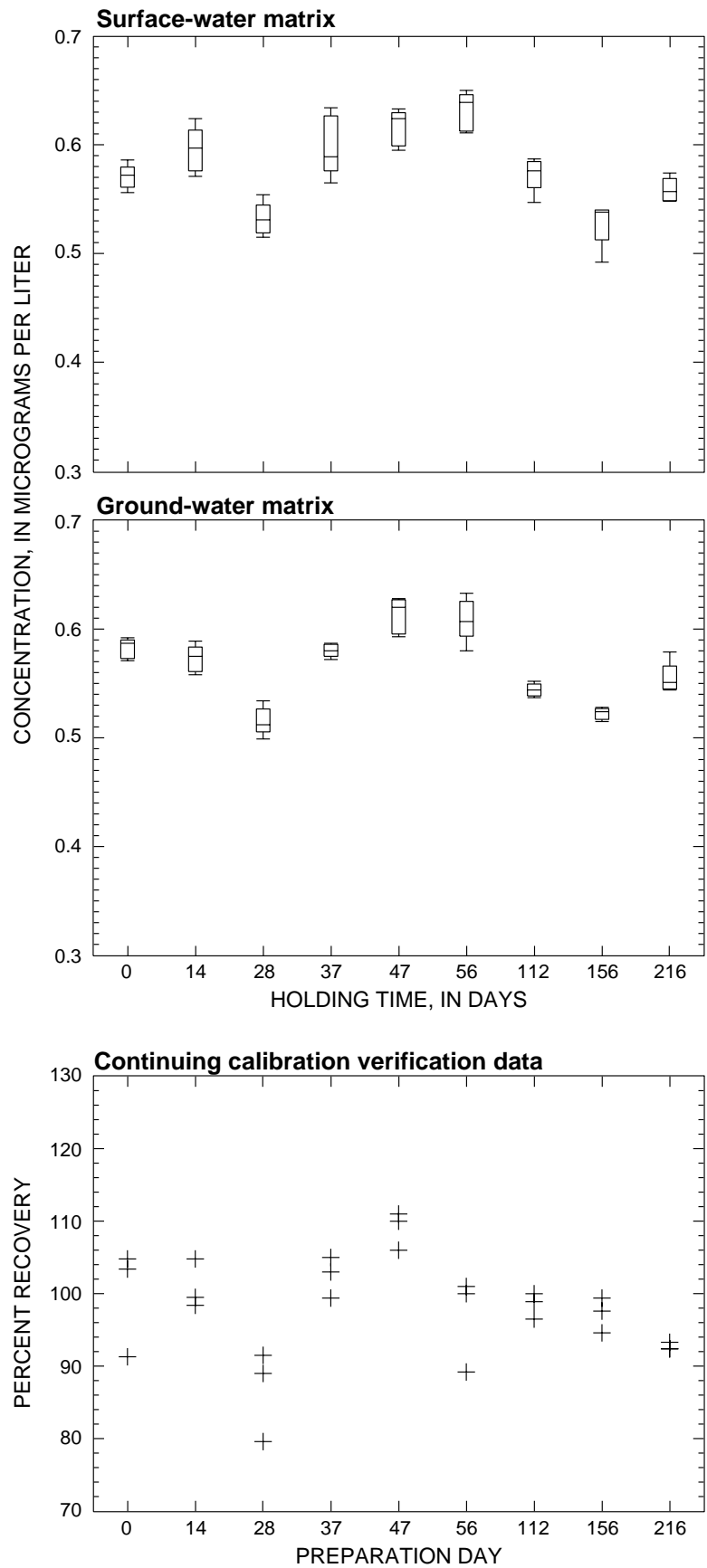
# 2-Propanone



# 1,1,1,2-Tetrachloroethane

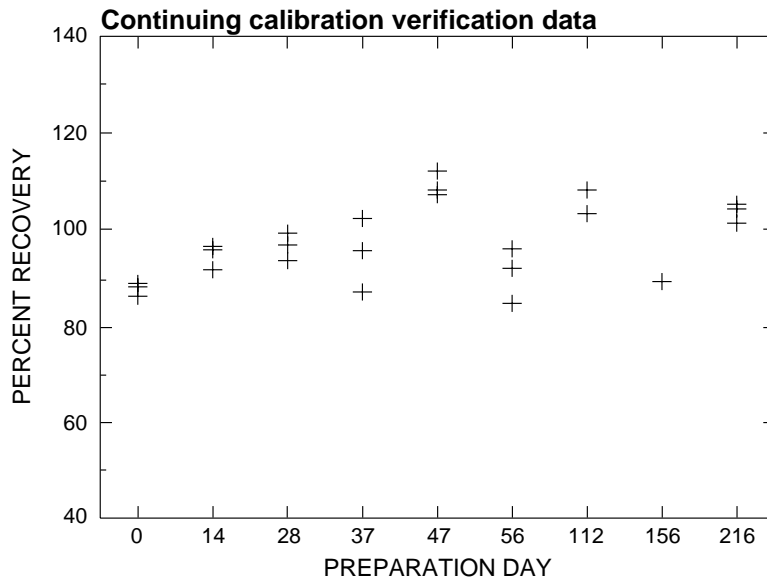
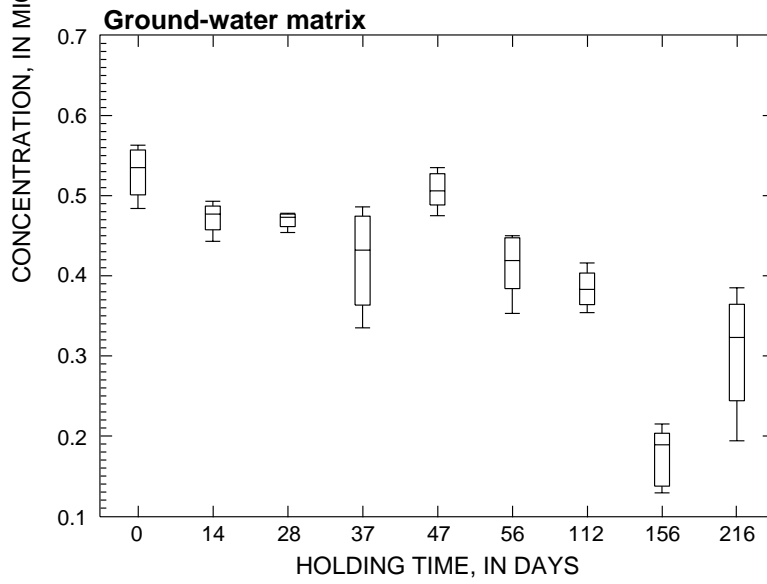
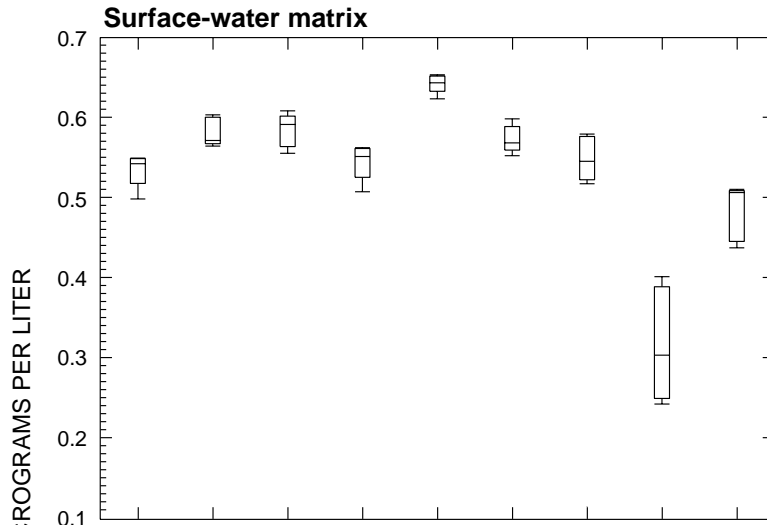


# 1,1,2,2-Tetrachloroethane

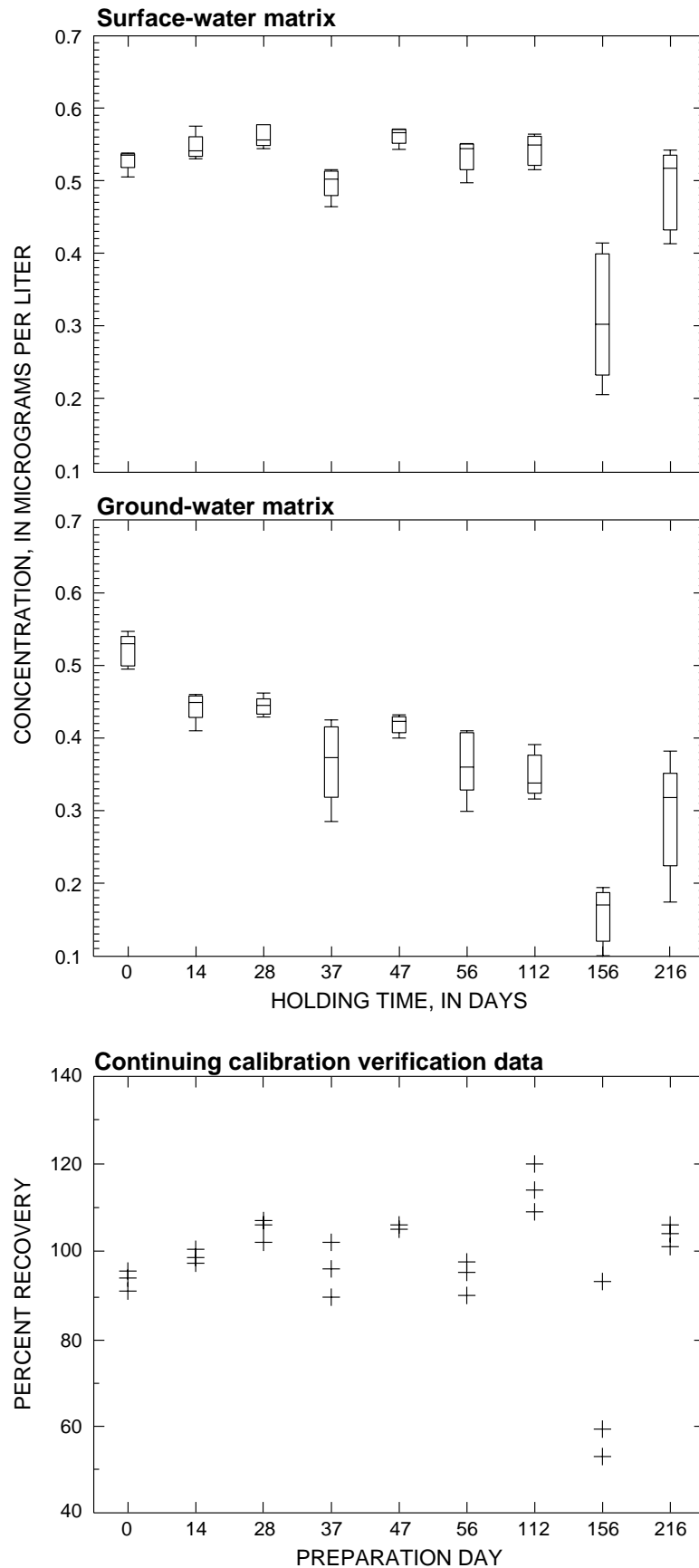




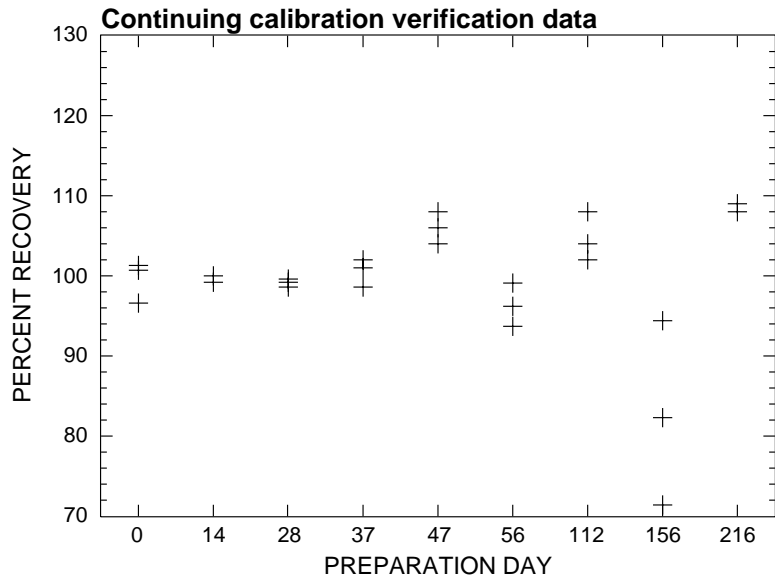
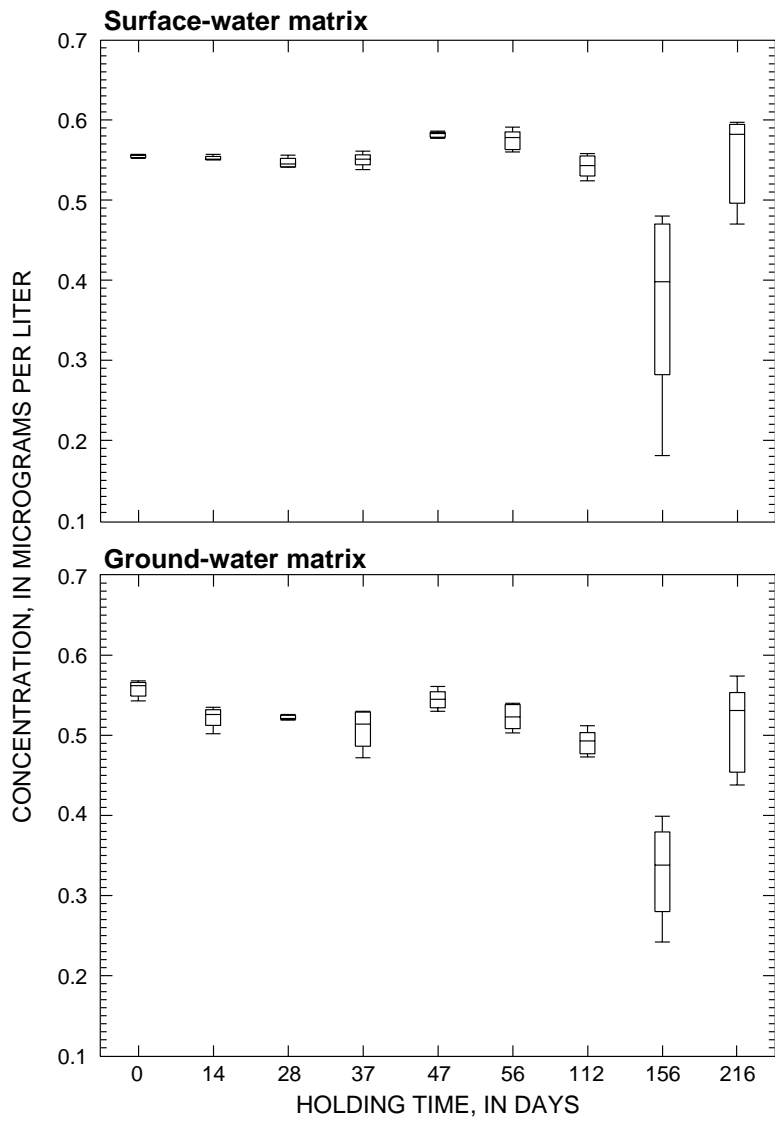
# 1,2,3,4-Tetramethylbenzene



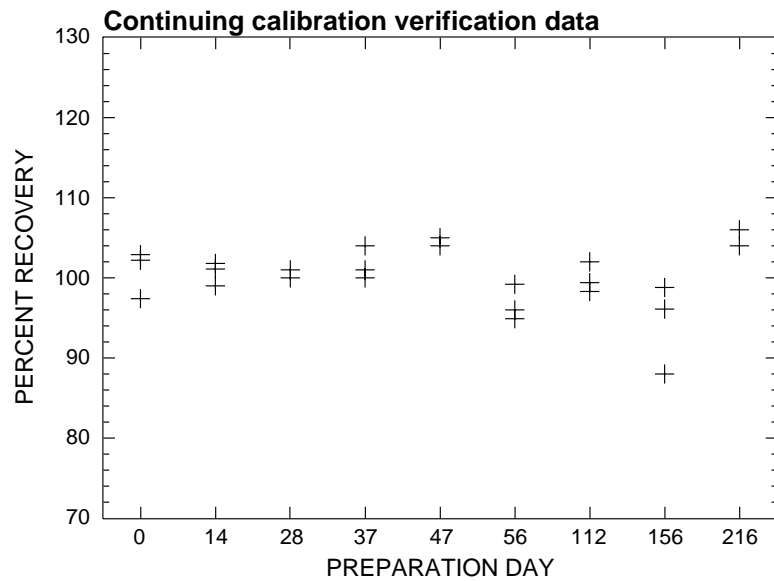
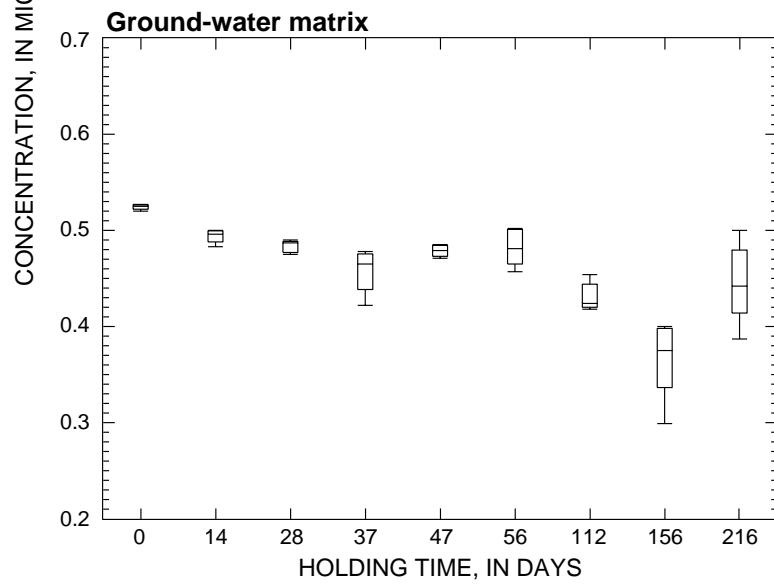
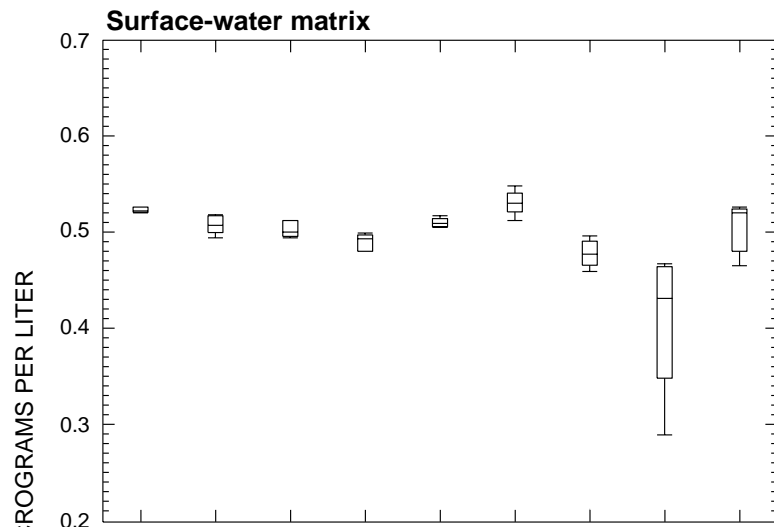
# 1,2,3,5-Tetramethylbenzene



# 1,2,3-Trimethylbenzene



# 1,3,5-Trimethylbenzene



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Section C - Analytical Results for Continuing  
Calibration Verification Standards

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**Table 5.** Percent-recovery data for continuing calibration verification standards (CCVS) for day 0 through day 216

[IUPAC, International Union of Pure and Applied Chemistry]

IUPAC compound name	Preparation day	Replicate CCVS, in percentage of recovery		
		1	2	3
<b>Target analytes</b>				
Benzene	0	101	101	98.5
	14	100	98.2	95.6
	28	101	101	101
	37	103	100	98.8
	47	102	101	102
	56	93.0	95.4	94.3
	112	105	105	106
	156	101	97.9	99.8
	216	92.7	91.4	90.2
Bromodichloromethane	0	99.4	98.4	85.6
	14	99.1	99.8	99.6
	28	90.0	90.1	90.4
	37	102	101	103
	47	110	110	111
	56	93.1	99.0	94.8
	112	98.7	97.1	96.3
	156	101	95.6	99.7
	216	96.1	93.1	92.1
Bromoethene	0	100	105	97.1
	14	97.8	93.6	93.1
	28	102	99.3	98.0
	37	105	94.7	97.3
	47	109	102	105
	56	95.6	90.8	95.6
	112	114	108	108
	156	107	102	106
	216	80.4	76.5	78.4
Bromomethane	0	111	119	86.9
	14	89.9	80.9	73.5
	28	95.9	83.9	87.8
	37	115	93.5	99.7
	47	111	104	109
	56	76.6	56.6	53.7
	112	80.9	83.8	67.1
	156	102	103	107
	216	77.9	78.0	75.2

**Table 5.** Percent-recovery data for continuing calibration verification standards (CCVS) for day 0 through day 216—Continued

[IUPAC, International Union of Pure and Applied Chemistry]

IUPAC compound name	Preparation day	Replicate CCVS, in percentage of recovery		
		1	2	3
<b>Target analytes—Continued</b>				
<i>n</i> -Butylbenzene	0	97.0	97.2	96.0
	14	101	96.7	93.3
	28	103	102	102
	37	103	92.6	96.7
	47	106	104	105
	56	93.6	93.5	93.2
	112	105	98.5	97.5
	156	63.3	53.2	92.4
	216	127	131	131
Chlorobenzene	0	100	101	95.4
	14	101	100	99.1
	28	99.3	99.7	99.1
	37	102	99.6	98.8
	47	101	102	103
	56	94.4	99.6	96.9
	112	100	96.8	98.7
	156	98.7	95.5	98.1
	216	98.4	93.8	92.4
Chloroethane	0	93.5	99.4	92.4
	14	93.9	81.8	81.3
	28	104	93.2	103
	37	98.4	89.6	89.8
	47	102	93.5	99.4
	56	88.7	81.2	82.7
	112	116	112	112
	156	107	104	105
	216	75.6	76.0	74.6
Chloroethene	0	99.6	108	100
	14	95.3	80.3	84.8
	28	119	104	117
	37	101	88.8	90.0
	47	109	95.2	103
	56	85.5	70.9	81.1
	112	114	106	101
	156	130	130	134
	216	67.9	69.2	70.6

**Table 5.** Percent-recovery data for continuing calibration verification standards (CCVS) for day 0 through day 216—Continued

[IUPAC, International Union of Pure and Applied Chemistry]

IUPAC compound name	Preparation day	Replicate CCVS, in percentage of recovery		
		1	2	3
<b>Target analytes—Continued</b>				
Chloromethane	0	104	115	107
	14	87.9	72.6	76.1
	28	113	94.3	110
	37	89.9	74.8	77.7
	47	96.4	85.0	92.1
	56	82.6	79.0	89.9
	112	130	114	124
	156	142	147	150
	216	63.9	64.3	66.1
1,2-Dibromo-3-chloropropane	0	102	106	88.2
	14	96.6	94.6	102
	28	93.3	95.3	94.4
	37	103	112	113
	47	118	111	112
	56	90.8	99.1	97.5
	112	79.6	73.7	78.5
	156	86.9	87.7	89.7
	216	80.2	80.9	77.8
Dibromochloromethane	0	102	102	91.2
	14	98.8	101	101
	28	86.7	89.5	86.2
	37	100	104	104
	47	111	113	114
	56	93.2	98.1	95.7
	112	89.8	86.0	84.6
	156	100	92.4	96.1
	216	92.8	92.9	90.7
1,2-Dibromoethane	0	101	101	92.3
	14	98.6	102	104
	28	93.1	95.3	95.3
	37	101	103	105
	47	107	105	107
	56	93.5	101	98.4
	112	100	94.0	96.9
	156	99.7	94.7	98.9
	216	94.2	90.4	88.6



**Table 5.** Percent-recovery data for continuing calibration verification standards (CCVS) for day 0 through day 216—Continued

[IUPAC, International Union of Pure and Applied Chemistry]

IUPAC compound name	Preparation day	Replicate CCVS, in percentage of recovery		
		1	2	3
<b>Target analytes—Continued</b>				
1,2-Dichlorobenzene	0	100	101	93.0
	14	100	100	100
	28	96.4	96.9	95.9
	37	102	102	102
	47	105	105	104
	56	92.8	98.4	99.3
	112	91.7	86.6	87.4
	156	101	93.2	98.7
	216	97.3	96.1	95.2
1,3-Dichlorobenzene	0	103	102	95.1
	14	99.8	102	101
	28	100	99.1	99.6
	37	103	102	101
	47	105	105	105
	56	94.7	98.9	95.7
	112	92.0	87.1	87.3
	156	101	94.2	98.3
	216	100	96.2	96.2
1,4-Dichlorobenzene	0	102	102	93.9
	14	99.8	101	99.5
	28	97.5	97.1	96.5
	37	101	100	102
	47	104	106	104
	56	92.4	97.3	95.8
	112	91.0	88.0	88.5
	156	99.6	90.4	96.3
	216	98.0	98.5	98.5
Dichlorodifluoromethane	0	99.2	118	104
	14	85.3	65.8	72.3
	28	124	97.1	115
	37	83.0	68.3	72.0
	47	93.4	75.2	83.3
	56	77.3	58.5	70.9
	112	99.1	87.3	81.0
	156	257	250	264
	216	59.9	54.4	57.2

**Table 5.** Percent-recovery data for continuing calibration verification standards (CCVS) for day 0 through day 216—Continued

[IUPAC, International Union of Pure and Applied Chemistry]

IUPAC compound name	Preparation day	Replicate CCVS, in percentage of recovery		
		1	2	3
<b>Target analytes—Continued</b>				
1,1-Dichloroethane	0	102	104	98.6
	14	103	98.2	96.6
	28	101	98.7	101
	37	104	98.3	97.5
	47	101	100	101
	56	95.6	97.2	94.2
	112	118	114	115
	156	103	99.6	102
	216	93.3	91.6	90.2
1,2-Dichloroethane	0	100	103	94.9
	14	102	99.9	99.4
	28	92.0	94.9	96.3
	37	103	100	100
	47	101	102	101
	56	94.0	97.1	97.2
	112	124	119	121
	156	102	97.2	99.6
	216	93.6	92.6	91.2
1,1-Dichloroethene	0	98.1	104	97.8
	14	104	97.4	96.6
	28	119	108	114
	37	105	98.4	99.3
	47	110	104	110
	56	98.0	99.2	99.3
	112	107	100	101
	156	98.1	92.3	98.5
	216	84.0	82.3	85.8
<i>cis</i> -1,2-Dichloroethene	0	101	101	93.1
	14	102	101	99.5
	28	104	103	104
	37	103	102	101
	47	104	103	104
	56	94.7	99.7	97.3
	112	100	98.1	98.7
	156	102	100	101
	216	94.6	93.3	91.4

**Table 5.** Percent-recovery data for continuing calibration verification standards (CCVS) for day 0 through day 216—Continued

[IUPAC, International Union of Pure and Applied Chemistry]

IUPAC compound name	Preparation day	Replicate CCVS, in percentage of recovery		
		1	2	3
<b>Target analytes—Continued</b>				
<i>trans</i> -1,2-Dichloroethene	0	101	102	96.2
	14	102	97.2	97.4
	28	109	105	106
	37	102	99.3	98.5
	47	104	104	102
	56	95.5	98.3	94.1
	112	97.1	94.4	95.6
	156	105	101	103
	216	93.3	87.8	85.5
Dichloromethane	0	100	99.9	94.7
	14	98.3	95.5	96.9
	28	98.9	95.3	99.1
	37	100	99.2	97.3
	47	102	100	102
	56	94.4	96.8	95.4
	112	98.0	95.8	95.7
	156	99.9	96.8	97.5
1,2-Dichloropropane	0	103	103	97.1
	14	98.6	98.8	96.6
	28	94.3	94.2	97.6
	37	103	97.8	98.6
	47	100	100	101
	56	96.0	96.9	96.4
	112	118	115	118
	156	101	96.8	100
<i>cis</i> -1,3-Dichloropropene	0	97.6	102	93.9
	14	97.5	99.1	98.1
	28	96.9	95.8	93.9
	37	99.4	101	104
	47	107	103	101
	56	94.1	98.4	97.0
	112	93.5	91.0	91.2
	156	101	96.6	105
216	91.5	91.4	93.1	

**Table 5.** Percent-recovery data for continuing calibration verification standards (CCVS) for day 0 through day 216—Continued

[IUPAC, International Union of Pure and Applied Chemistry]

IUPAC compound name	Preparation day	Replicate CCVS, in percentage of recovery		
		1	2	3
<b>Target analytes—Continued</b>				
<i>trans</i> -1,3-Dichloropropene	0	101	98.8	93.0
	14	99.3	103	100
	28	90.2	95.1	88.1
	37	101	101	106
	47	105	106	109
	56	89.1	95.3	92.4
	112	91.4	82.8	86.4
	156	99.8	96.2	97.9
	216	90.2	87.9	88.7
1,2-Dimethylbenzene	0	102	101	95.5
	14	100	102	99.4
	28	98.8	98.5	97.0
	37	101	101	101
	47	102	104	102
	56	95.2	103	96.7
	112	101	98.4	100
	156	101	95.3	101
	216	98.5	94.9	91.8
1,3-Dimethylbenzene and 1,4-Dimethylbenzene	0	102	102	97.2
	14	101	101	98.6
	28	100	100	99.0
	37	103	101	100
	47	102	104	104
	56	95.5	101	95.5
	112	102	98.5	99.5
	156	104	99.0	102
	216	100	95.5	95.5
Ethenylbenzene	0	103	103	96.0
	14	102	102	99.7
	28	96.0	97.6	97.0
	37	104	101	101
	47	104	104	104
	56	94.5	99.7	96.6
	112	100	94.8	96.4
	156	102	96.2	100
	216	97.8	94.7	93.2

**Table 5.** Percent-recovery data for continuing calibration verification standards (CCVS) for day 0 through day 216—Continued

[IUPAC, International Union of Pure and Applied Chemistry]

IUPAC compound name	Preparation day	Replicate CCVS, in percentage of recovery		
		1	2	3
<b>Target analytes—Continued</b>				
2-Ethoxy-2-methylpropane	0	97.1	102	90.8
	14	99.0	98.3	101
	28	88.7	91.0	92.7
	37	100	102	103
	47	105	105	103
	56	92.8	97.6	99.6
	112	120	115	118
	156	102	95.0	98.6
	216	91.4	89.4	89.4
Ethylbenzene	0	104	102	96.1
	14	102	100	97.9
	28	99.7	98.8	98.6
	37	103	102	101
	47	103	104	103
	56	95.1	101	96.0
	112	101	99.1	98.9
	156	101	95.6	101
	216	97.3	95.4	95.2
1,1,2,3,4,4-Hexachloro-1,3-butadiene	0	102	105	97.7
	14	99.7	100	97.9
	28	109	105	106
	37	102	101	98.7
	47	106	104	107
	56	95.1	98.2	98.3
	112	83.1	82.3	78.7
	156	90.2	83.5	96.3
	216	104	106	109
1,1,1,2,2,2-Hexachloroethane	0	104	103	94.9
	14	101	102	99.7
	28	103	102	102
	37	99.6	108	102
	47	112	114	114
	56	94.1	102	97.9
	112	90.7	87.6	88.6
	156	96.3	87.9	94.1
	216	88.0	86.8	89.5

**Table 5.** Percent-recovery data for continuing calibration verification standards (CCVS) for day 0 through day 216—Continued

[IUPAC, International Union of Pure and Applied Chemistry]

IUPAC compound name	Preparation day	Replicate CCVS, in percentage of recovery		
		1	2	3
<b>Target analytes—Continued</b>				
2-Methoxy-2-methylbutane	0	98.1	99.8	90.6
	14	97.5	102	104
	28	88.2	91.7	92.6
	37	100	103	102
	47	105	106	105
	56	91.7	99.2	102
	112	112	107	112
	156	101	97.0	98.6
	216	89.0	89.9	87.6
2-Methoxy-2-methylpropane	0	98.8	101	89.9
	14	98.4	100	104
	28	91.0	93.3	95.0
	37	102	102	105
	47	106	106	109
	56	94.6	98.8	102
	112	111	106	109
	156	103	96.6	98.6
	216	86.5	85.9	85.8
Methylbenzene	0	104	101	96.8
	14	100	97.2	96.0
	28	98.7	99.5	99.5
	37	102	100	99.7
	47	101	100	104
	56	91.3	97.2	93.6
	112	101	100	100
	156	98.2	95.3	98.0
	216	96.7	95.3	92.6
(1-Methylethyl)benzene	0	102	102	97.3
	14	102	101	98.2
	28	101	99.6	99.6
	37	104	102	100
	47	102	103	103
	56	96.5	101	95.0
	112	103	99.6	100
	156	100	97.0	98.8
	216	101	97.8	94.9

**Table 5.** Percent-recovery data for continuing calibration verification standards (CCVS) for day 0 through day 216—Continued

[IUPAC, International Union of Pure and Applied Chemistry]

IUPAC compound name	Preparation day	Replicate CCVS, in percentage of recovery		
		1	2	3
<b>Target analytes—Continued</b>				
Naphthalene	0	88.5	91.2	81.0
	14	112	115	117
	28	97.2	106	109
	37	116	99.6	114
	47	140	135	138
	56	101	98.0	116
	112	88.4	86.6	90.0
	156	50.1	45.3	89.9
	216	90.7	98.3	98.9
2,2'-Oxybis[propane]	0	97.9	98.8	95.4
	14	100	99.5	98.8
	28	92.3	93.8	94.4
	37	103	101	102
	47	103	102	104
	56	93.0	102	102
	112	116	115	113
	156	103	98.6	101
	216	92.2	95.4	93.6
2-Propenal	0	124	131	97.1
	14	98.8	101	108
	28	70.4	77.0	79.0
	37	109	119	121
	47	135	137	141
	56	97.8	108	110
	112	133	131	125
	156	85.2	83.0	80.0
	216	88.0	90.4	90.2
2-Propenenitrile	0	102	104	93.6
	14	100	101	103
	28	85.8	92.5	93.8
	37	104	105	104
	47	105	106	106
	56	96.0	110	104
	112	109	112	109
	156	101	102	103
	216	85.5	92.5	92.5

**Table 5.** Percent-recovery data for continuing calibration verification standards (CCVS) for day 0 through day 216—Continued

[IUPAC, International Union of Pure and Applied Chemistry]

IUPAC compound name	Preparation day	Replicate CCVS, in percentage of recovery		
		1	2	3
<b>Target analytes—Continued</b>				
<i>n</i> -Propylbenzene	0	103	103	96.4
	14	103	99.2	96.7
	28	101	101	101
	37	103	102	101
	47	104	103	103
	56	96.9	100	94.7
	112	101	97.8	99.3
	156	99.2	93.1	99.7
	216	102	97.0	101
Tetrachloroethene	0	102	100	96.4
	14	99.8	99.8	96.3
	28	106	104	103
	37	103	98.6	97.9
	47	99.8	99.0	98.1
	56	94.4	97.4	93.5
	112	90.5	86.9	87.3
	156	101	96.9	98.3
	216	94.0	92.1	87.4
Tetrachloromethane	0	102	103	97.9
	14	104	98.8	97.2
	28	99.9	98.9	98.1
	37	103	100	101
	47	107	108	106
	56	94.7	97.2	93.0
	112	105	102	103
	156	101	98.4	100
	216	95.6	90.9	91.5
Tribromomethane	0	104	106	94.0
	14	94.6	100	102
	28	84.4	86.4	87.2
	37	107	121	118
	47	128	130	130
	56	88.2	98.3	97.5
	112	74.6	71.1	69.6
	156	93.2	87.3	91.6
	216	87.0	86.1	85.3



**Table 5.** Percent-recovery data for continuing calibration verification standards (CCVS) for day 0 through day 216—Continued

[IUPAC, International Union of Pure and Applied Chemistry]

IUPAC compound name	Preparation day	Replicate CCVS, in percentage of recovery		
		1	2	3
<b>Target analytes—Continued</b>				
1,1,2-Trichloro-1,2,2-trifluoroethane	0	98.7	102	97.5
	14	103	96.6	97.7
	28	119	110	116
	37	109	105	102
	47	114	112	114
	56	99.6	102	104
	112	95.0	88.1	86.7
	156	106	98.3	102
	216	86.1	83.6	82.0
1,2,3-Trichlorobenzene	0	94.8	95.8	87.6
	14	97.3	99.6	102
	28	95.0	100	103
	37	99.2	95.7	102
	47	107	113	113
	56	92.4	94.4	102
	112	88.6	86.1	87.2
	156	59.2	53.4	89.4
	216	96.7	101	108
1,2,4-Trichlorobenzene	0	96.3	98.7	90.5
	14	96.5	97.3	98.2
	28	95.4	98.6	99.0
	37	99.9	92.7	99.5
	47	109	109	110
	56	89.5	93.2	103
	112	88.5	82.9	84.3
	156	60.5	51.5	88.2
	216	99.8	99.0	110
1,1,1-Trichloroethane	0	101	101	96.3
	14	99.9	97.7	95.6
	28	102	102	102
	37	102	98.2	98.8
	47	103	101	102
	56	95.3	97.6	94.2
	112	104	101	102
	156	102	99.0	101
	216	94.9	90.2	88.7

**Table 5.** Percent-recovery data for continuing calibration verification standards (CCVS) for day 0 through day 216—Continued

[IUPAC, International Union of Pure and Applied Chemistry]

IUPAC compound name	Preparation day	Replicate CCVS, in percentage of recovery		
		1	2	3
<b>Target analytes—Continued</b>				
1,1,2-Trichloroethane	0	99.4	102	92.9
	14	98.5	102	102
	28	90.5	94.5	92.4
	37	99.6	101	102
	47	103	105	103
	56	91.9	99.9	98.0
	112	98.7	93.6	97.3
	156	101	94.7	95.6
	216	98.5	91.3	93.1
Trichloroethene	0	98.9	100	94.5
	14	101	97.6	95.5
	28	103	99.2	102
	37	104	99.8	97.0
	47	100	101	102
	56	95.1	99.3	94.5
	112	103	100	102
	156	100	97.3	100
	216	95.6	93.7	94.9
Trichlorofluoromethane	0	99.3	105	100
	14	104	94.4	94.5
	28	121	112	119
	37	106	96.2	98.1
	47	109	98.5	104
	56	98.6	91.3	94.4
	112	110	103	102
	156	106	100	107
	216	80.8	75.1	73.5
Trichloromethane	0	103	102	89.5
	14	99.1	98.4	97.0
	28	100	100	103
	37	101	101	101
	47	105	105	106
	56	95.1	97.6	96.1
	112	108	104	106
	156	101	97.6	100
	216	96.0	93.7	90.0

**Table 5.** Percent-recovery data for continuing calibration verification standards (CCVS) for day 0 through day 216—Continued

[IUPAC, International Union of Pure and Applied Chemistry]

IUPAC compound name	Preparation day	Replicate CCVS, in percentage of recovery		
		1	2	3
<b>Target analytes—Continued</b>				
1,2,3-Trichloropropane	0	102	105	94.0
	14	98.2	99.8	102
	28	85.2	87.6	89.7
	37	97.4	102	102
	47	105	107	106
	56	93.2	106	104
	112	109	97.5	106
	156	99.4	89.5	96.4
	216	93.0	91.1	93.9
1,2,4-Trimethylbenzene	0	99.8	101	95.8
	14	101	99.3	97.9
	28	102	101	99.3
	37	104	98.1	101
	47	104	105	104
	56	95.1	97.5	95.4
	112	102	97.4	98.8
	156	85.0	73.9	96.5
	216	109	108	108
<b>Other analytes</b>				
Bromobenzene	0	102	101	93.7
	14	98.5	101	101
	28	99.0	99.6	97.9
	37	102	102	104
	47	104	106	106
	56	93.2	100	98.5
	112	87.4	85.3	84.6
	156	99.8	93.5	98.0
	216	97.3	92.8	90.9
Bromochloromethane	0	100	105	95.2
	14	99.8	99.9	99.0
	28	99.1	98.6	99.6
	37	102	104	102
	47	105	105	106
	56	94.0	101	99.8
	112	97.7	93.0	96.4
	156	105	97.6	100
	216	93.6	92.4	89.1

**Table 5.** Percent-recovery data for continuing calibration verification standards (CCVS) for day 0 through day 216—Continued

[IUPAC, International Union of Pure and Applied Chemistry]

IUPAC compound name	Preparation day	Replicate CCVS, in percentage of recovery		
		1	2	3
<b>Other analytes—Continued</b>				
2-Butanone	0	101	102	90.5
	14	98.1	100	105
	28	79.1	86.9	90.8
	37	99.7	106	103
	47	103	103	102
	56	91.1	98.5	103
	112	122	115	117
	156	99.6	95.1	95.3
	216	90.6	90.8	90.1
Carbon disulfide	0	108	111	106
	14	104	91.8	93.0
	28	110	102	111
	37	106	102	99.3
	47	116	107	115
	56	98.3	89.0	94.4
	112	115	103	108
	156	105	92.8	102
	216	85.0	82.6	91.1
1-Chloro-2-methylbenzene	0	102	102	97.0
	14	101	100	97.5
	28	101	98.8	99.5
	37	103	101	101
	47	102	102	103
	56	94.7	99.5	96.9
	112	100	97.4	97.8
	156	103	98.2	104
	216	98.3	96.2	93.2
1-Chloro-4-methylbenzene	0	102	103	92.8
	14	100	101	96.5
	28	100	98.3	96.1
	37	103	99.1	99.8
	47	101	102	102
	56	96.2	101	95.9
	112	101	95.9	96.9
	156	98.6	92.4	99.6
	216	101	98.2	98.5

**Table 5.** Percent-recovery data for continuing calibration verification standards (CCVS) for day 0 through day 216—Continued

[IUPAC, International Union of Pure and Applied Chemistry]

IUPAC compound name	Preparation day	Replicate CCVS, in percentage of recovery		
		1	2	3
<b>Other analytes—Continued</b>				
3-Chloro-1-propene	0	106	109	102
	14	101	97.3	96.4
	28	105	102	109
	37	106	102	99.2
	47	109	107	113
	56	99.3	97.8	94.8
	112	117	110	112
	156	92.9	90.0	93.1
	216	118	118	120
Dibromomethane	0	101	102	92.1
	14	101	102	102
	28	95.0	97.8	98.9
	37	101	102	102
	47	104	106	107
	56	94.7	102	95.9
	112	103	99.0	100
	156	101	95.8	99.4
	216	94.0	92.0	91.3
<i>trans</i> -1,4-Dichloro-2-butene	0	105	107	96.3
	14	99.7	103	104
	28	80.6	85.4	87.9
	37	101	105	103
	47	108	118	120
	56	90.9	103	102
	112	118	112	115
	156	106	97.5	103
	216	102	105	106
1,3-Dichloropropane	0	101	103	93.1
	14	98.0	101	101
	28	91.6	93.5	95.9
	37	103	103	104
	47	105	105	108
	56	92.5	98.2	97.5
	112	110	104	105
	156	102	95.3	99.0
	216	92.4	90.6	88.8

**Table 5.** Percent-recovery data for continuing calibration verification standards (CCVS) for day 0 through day 216—Continued

[IUPAC, International Union of Pure and Applied Chemistry]

IUPAC compound name	Preparation day	Replicate CCVS, in percentage of recovery		
		1	2	3
<b>Other analytes—Continued</b>				
2,2-Dichloropropane	0	93.1	96.4	96.3
	14	98.9	96.0	87.8
	28	102	97.8	97.7
	37	102	91.4	94.0
	47	99.2	95.5	99.4
	56	94.2	92.1	89.7
	112	109	102	97.8
	156	103	96.3	97.2
	216	94.0	88.4	89.7
1,1-Dichloropropene	0	101	104	97.3
	14	99.6	99.7	95.7
	28	105	102	105
	37	103	100	99.4
	47	102	103	103
	56	95.1	96.4	94.6
	112	110	108	108
	156	101	96.9	100
	216	95.4	90.8	90.5
(1,1-Dimethylethyl)benzene	0	104	102	98.3
	14	102	99.9	97.6
	28	101	99.7	98.4
	37	105	102	102
	47	104	103	103
	56	95.5	101	95.9
	112	103	99.1	100
	156	96.1	90.4	99.5
	216	106	104	103
1,4-Epoxybutane	0	98.8	103	90.0
	14	102	99.9	106
	28	87.0	94.8	96.0
	37	104	106	111
	47	106	110	109
	56	92.7	101	103
	112	115	110	115
	156	100	98.0	101
	216	90.4	87.0	89.0

**Table 5.** Percent-recovery data for continuing calibration verification standards (CCVS) for day 0 through day 216—Continued

[IUPAC, International Union of Pure and Applied Chemistry]

IUPAC compound name	Preparation day	Replicate CCVS, in percentage of recovery		
		1	2	3
<b>Other analytes—Continued</b>				
1-Ethyl-2-methylbenzene	0	103	101	97.4
	14	103	101	98.0
	28	100	100	99.3
	37	104	99.6	101
	47	103	104	104
	56	96.9	100	96.6
	112	106	102	104
	156	96.9	89.2	101
	216	105	104	102
Ethyl 2-methyl-2-propenoate	0	100	102	89.3
	14	100	104	104
	28	87.5	91.8	92.9
	37	101	102	103
	47	105	110	106
	56	92.8	103	106
	112	113	110	117
	156	98.0	95.0	96.2
	216	87.8	86.8	85.0
2-Hexanone	0	102	103	91.0
	14	99.0	103	108
	28	82.1	88.8	91.6
	37	102	108	107
	47	106	109	110
	56	93.4	103	106
	112	119	113	118
	156	100	96.6	98.9
	216	85.7	88.8	90.7
Iodomethane	0	122	124	111
	14	102	99.9	92.0
	28	97.8	93.8	98.0
	37	103	104	104
	47	107	106	108
	56	95.4	88.6	78.3
	112	85.8	94.3	91.5
	156	131	122	128
	216	89.8	90.3	88.9

**Table 5.** Percent-recovery data for continuing calibration verification standards (CCVS) for day 0 through day 216—Continued

[IUPAC, International Union of Pure and Applied Chemistry]

IUPAC compound name	Preparation day	Replicate CCVS, in percentage of recovery		
		1	2	3
<b>Other analytes—Continued</b>				
1-Isopropyl-4-methylbenzene	0	103	102	99.3
	14	102	99.6	97.0
	28	104	103	103
	37	106	101	100
	47	104	106	105
	56	96.1	98.5	94.6
	112	108	104	102
	156	83.7	72.3	98.2
	216	117	122	122
Methyl 2-methyl-2-propenoate	0	101	102	89.4
	14	96.6	103	104
	28	84.5	90.5	90.0
	37	102	103	104
	47	104	107	108
	56	91.5	98.5	100
	112	114	110	108
	156	102	97.5	101
	216	90.0	92.0	92.0
4-Methyl-2-pentanone	0	101	104	90.1
	14	98.9	103	108
	28	83.8	91.1	92.6
	37	101	105	105
	47	105	107	108
	56	94.2	100	104
	112	112	110	114
	156	97.8	94.6	98.4
	216	89.8	89.5	89.6
2-Methyl-2-propenenitrile	0	101	101	94.1
	14	97.0	105	107
	28	85.5	90.0	90.0
	37	105	106	108
	47	110	109	108
	56	93.5	102	104
	112	116	110	111
	156	101	98.0	97.0
	216	92.5	98.0	95.0



**Table 5.** Percent-recovery data for continuing calibration verification standards (CCVS) for day 0 through day 216—Continued

[IUPAC, International Union of Pure and Applied Chemistry]

IUPAC compound name	Preparation day	Replicate CCVS, in percentage of recovery		
		1	2	3
<b>Other analytes—Continued</b>				
Methyl-2-propenoate	0	99.6	102	87.4
	14	99.2	98.8	100
	28	80.0	84.0	85.5
	37	100	99.5	102
	47	106	103	108
	56	88.5	100	102
	112	117	111	112
	156	104	103	100
	216	88.0	92.0	86.0
(1-Methylpropyl)benzene	0	104	103	98.9
	14	102	99.8	96.7
	28	102	99.1	101
	37	104	101	101
	47	102	104	104
	56	95.9	99.3	95.7
	112	103	100	101
	156	92.4	82.3	97.3
	216	108	110	110
1,1'-Oxybisethane	0	104	104	94.0
	14	97.6	98.2	100
	28	92.6	98.0	101
	37	102	99.3	98.7
	47	106	105	103
	56	93.6	96.7	101
	112	138	125	126
	156	98.0	88.3	94.4
	216	81.4	85.6	86.8
2-Propanone	0	104	104	92.5
	14	95.6	98.6	101
	28	87.6	91.2	97.3
	37	98.3	103	104
	47	98.5	98.1	101
	56	93.3	99.8	109
	112	131	130	133
	156	135	118	131
	216	87.9	90.2	94.2

**Table 5.** Percent-recovery data for continuing calibration verification standards (CCVS) for day 0 through day 216—Continued

[IUPAC, International Union of Pure and Applied Chemistry]

IUPAC compound name	Preparation day	Replicate CCVS, in percentage of recovery		
		1	2	3
<b>Other analytes—Continued</b>				
1,1,1,2-Tetrachloroethane	0	102	101	94.8
	14	99.0	100	98.0
	28	97.2	96.4	95.5
	37	102	101	101
	47	105	104	104
	56	94.8	97.4	96.7
	112	94.7	91.8	91.8
	156	98.2	94.1	99.5
	216	94.5	94.4	90.8
1,1,2,2-Tetrachloroethane	0	103	105	91.3
	14	98.4	99.5	105
	28	79.6	91.5	89.0
	37	99.4	103	105
	47	106	111	110
	56	89.2	101	100
	112	100	96.5	98.9
	156	99.4	94.6	97.6
	216	92.4	93.3	92.4
1,2,3,4-Tetramethylbenzene	0	88.6	89.3	86.6
	14	96.4	92.2	97.1
	28	94.1	99.9	97.4
	37	103	87.5	96.2
	47	113	109	108
	56	92.5	85.1	96.6
	112	109	104	104
	156	49.2	47.4	89.7
	216	105	102	106
1,2,3,5-Tetramethylbenzene	0	95.4	93.8	90.8
	14	100	97.2	98.5
	28	102	106	107
	37	102	89.4	95.9
	47	106	106	105
	56	95.1	89.8	97.5
	112	120	109	114
	156	59.1	52.8	93.0
	216	104	101	106

**Table 5.** Percent-recovery data for continuing calibration verification standards (CCVS) for day 0 through day 216—Continued

[IUPAC, International Union of Pure and Applied Chemistry]

IUPAC compound name	Preparation day	Replicate CCVS, in percentage of recovery		
		1	2	3
<b>Other analytes—Continued</b>				
1,2,3-Trimethylbenzene	0	101	101	96.6
	14	100	99.2	99.2
	28	98.6	99.2	99.6
	37	102	98.6	101
	47	104	108	106
	56	93.7	99.1	96.2
	112	108	102	104
	156	82.3	71.4	94.4
	216	109	109	108
1,3,5-Trimethylbenzene	0	103	102	97.4
	14	101	102	99.0
	28	100	101	101
	37	104	100	101
	47	105	105	104
	56	96.0	99.2	94.9
	112	102	98.3	99.4
	156	96.1	88.0	98.8
	216	106	104	104