



# REFERENCE MATERIALS AND PROFICIENCY TESTING



European Edition

**R.T. Corporation Ltd**

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## NATURAL-MATRIX CRMs

A certified reference material is defined as a reference material, characterized by a metrologically valid procedure for one or more specified properties, and accompanied by a certificate that states the values of the specified property, its associated uncertainty and a statement of metrological traceability.

RTC is unique: we are the only know company producing “Real-World” CRMs and have become the world leader in the production and certification of soil and sediment Certified Reference Materials. All CRMs are produced and certified in full compliance with ISO Guides 34 and 35. All RTC CRMs are either natural matrix materials or natural matrices in which selected analytes have been fortified to give the resultant CRM an analyte profile that meets the needs of the market.

In certification of RTC CRMs, data developed from multilaboratory analysis is supported by in-house data and a robust statistical program is used. Most CRMs are method specific, and the certificates show a confidence interval, uncertainty, and a prediction value, expanded uncertainty, in addition to the mean value and standard deviation from the mean.

Certified Reference Material development started at RTC more than 16 years ago. We collected soils and solid wastes from contaminated sites around the United States to produce real-world CRMs for the USEPA. Since then our product range has grown and now includes a wide range of natural-matrix CRMs

We continue to work closely with regulatory agencies in the USA, Asia and Europe to develop new samples for proficiency testing schemes and CRMs to meet the needs of analytical laboratories around the world.

### USING RTC CRMs

Our product range has been developed to provide a compatible range of CRMs, QCs and Laboratory Proficiency Testing Programs (LPTP or PT) to meet all the needs of an environmental laboratory. Full details of the PT samples begin on page 59 and the QC program begins on page 85.

### KEY FACTORS TO CONSIDER WHEN CHOOSING A CRM:

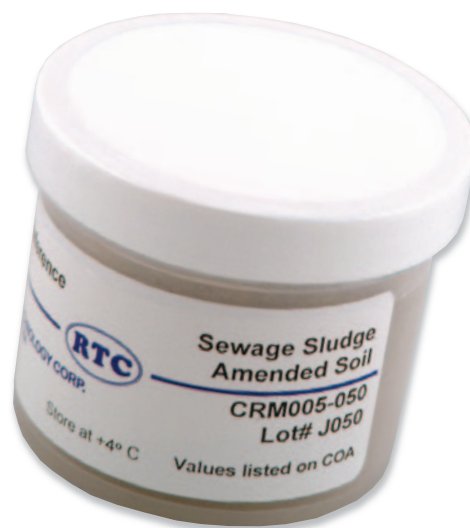
- A CRM should have as many analytes as possible with certified values that fall into the normal range of the method.
- The matrix description should be as close as possible to that of the test samples – all RTC CRMs have a clear matrix description.
- Especially for inorganic analysis, the digestion method used for the sample should be similar to that for the CRM.

#### Contents

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 Clean Soil - Nonpolluted Blank Soils  
 Trace Metals - Sludge  
 Trace Metals - Miscellaneous Media  
 Metals - Speciation  
 TCLP Metals - Soil  
 TCLP Organics - Soil  
 Total Petroleum Hydrocarbons - Soil  
 Diesel/BTEX/Gasoline - Soil  
 VOCs (High Level) - Soil  
 VOCs (Low Level) - Soil  
 Base Neutral Acids (BNAs) - Soil  
 Base Neutral Acids (BNAs) - Soil  
 Organic Compounds - Sediment/Sludge  
 Explosive Residue - Soil  
 Chlordane/Toxaphene - Soil  
 Pesticides - Soil  
 Organophosphorus Pesticides - Soil  
 Herbicides - Soil  
 Polychlorinated Biphenyls (PCBs)  
 Constant Value - Water

These CRMs were produced and certified from naturally contaminated matrices and have not been fortified or modified in any way. Analytical data for Certification was obtained using USEPA SW846, 3rd edition methods 3050 (hot block) and 3051 (microwave) using nitric acid extraction. Analysis was carried out according to USEPA methods 6010 (ICP-EOS), 6020 (ICP-MS) and 7000 (AES).

The samples are intended for use in analytical systems using these and related methods. Note that nitric acid extraction is not as rigorous as aqua regia, and these samples may not be suitable for method validation where an aqua regia extraction is used.



## SOIL - SEWAGE SLUDGE AMENDED

CRM005-050

From a sewage sludge agricultural land farming application located in the Western United States. This CRM has been analyzed by 27 laboratories in a round-robin.

- 50 grams
- pH 7.59

## SEDIMENT 1

CRM008-050

From the copper electroplating process of a circuit-board manufacturer in the Midwestern United States. This CRM has been analyzed by 20 laboratories in a round-robin.

- 50 grams
- pH 5.19

## SEDIMENT 2

CRM015-050

From a stream located in the Western United States. This CRM has been analyzed by 20 laboratories in a round-robin.

- Certified for 27 analytes plus Cyanide
- 50 grams
- pH 7.53

## SEDIMENT 3

CRM016-050

From a stream located in the Western United States. This CRM has been analyzed by 20 laboratories in a round-robin.

- 50 grams
- pH 7.85

## DRY SANDY LOAM 2

CRM020-050

From a USEPA Superfund Site located in the Western United States. This CRM has been analyzed by 269 laboratories in a round-robin.

- 50 grams
- pH 2.96

## DRY SANDY LOAM 3

CRM021-100

From a contaminated waste site in the Midwestern United States. This CRM has been analyzed by 20 laboratories.

- 100 grams
- pH 9.76

## DRY LOAM 5

CRM022-030

From a contaminated waste site in the Western United States. This CRM has been analyzed by 20 laboratories in a round-robin.

- Certified for 27 analytes plus Cyanide
- 30 grams
- pH 7.79

## SANDY LOAM 7

CRM023-050

From a moderately contaminated site located in the Western United States. This CRM has been analyzed by 20 laboratories in a round-robin.

- 50 grams
- pH 7.40

## LOAMY SAND 1

CRM024-050

From a site located in the Western United States. This CRM has been analyzed by 23 laboratories in a round-robin.

- 50 grams
- pH 7.39

	CRM005-050	CRM008-050	CRM015-050	CRM016-050	CRM020-050	CRM021-100	CRM022-030	CRM023-050	CRM024-050
Aluminium, Al	15300	23900	9200	8920	1760	2730	10100	8470	8680
Antimony, Sb		(2.55)	(<3)	(<1)	8.38	4960	(<0.2)		(1.17)
Arsenic, As	6.91	14.1	6.60	7.76	400	24.8	5.40	380	3.42
Barium, Ba	853	53.6	83.0	79.3	24.8	586	109	75.5	79.6
Beryllium, Be	0.610	1.07	0.470	0.490			0.500	0.430	0.430
Boron, B		(26.5)	(8.6)	(13)			(15.5)	(11.0)	7.22
Cadmium, Cd	13.7	(0.82)	(<5)	0.47	15.4	1.20	3.10	0.92	2.15
Calcium, Ca	119000	2940	23500	22600	25600	5430	27200	5420	5530
Chromium, Cr	41.3	48.1	14.3	14.5	13.6	10.7	18.8	31.0	25.4
Cobalt, Co	6.18	11.2	6.04	5.96	4.51	(2.7)	5.70	4.68	
Copper, Cu	465	36.4	16.1	15.5	729	4790	12.4	8.90	8.70
Iron, Fe	12700	33000	17100	16800	192000	6480	13600	10700	10200
Lead, Pb	89.2	95.3	15.0	14.1	5110	(145000)	415	213	15.7
Magnesium, Mg	6700	6740	13600	13200	2690	(2370)	9520	3060	2940
Manganese, Mn	172	261	183	180	945	174	318	206	199
Mercury, Hg	3.23	0.720	0.100	0.158	1.12	4.70	(0.02)	77.8	0.710
Molybdenum, Mo	14.2	(1.84)	(1.16)	(0.97)			(<0.8)		0.580
Nickel, Ni	26.0	26.0	175	16.7	16.9	12.6	15.8	11.0	15.0
Potassium, K	6230	3950	2070	1960	(857)	1010	3170	2230	2100
Selenium, Se	19.9	(0.69)	(0.8)	(1)	6.57		(0.3)	105	(0.54)
Silicon, Si		(471)	(491)	(347)			(80)	(353)	(404)
Silver, Ag	36.3	(0.89)	(<1)	(0.7)	38.5	6.50	(<0.5)		13.3
Sodium, Na	2490	8700	401	292	(79.2)	380	268	296	287
Strontium, Sr		(41.5)	(62)	(61)	(24.7)		(54.4)	32.6	35.4
Thallium, Tl	(2.99)	(0.28)	(<5)	(4.6)	5.91	(0.6)	(<0.2)	111	(13.6)
Tin, Sn						(304)			
Titanium, Ti									
Vanadium, V	109	44.4	22.1	22.5	6.47	(8.70)	23.2	21.7	20.8
Zinc, Zn	625	134	69.9	69.7	3010	546	45.7	93.8	37.3
Cyanide			6.04				26.6		
Fluoride									
Phosphorus, total	(10100)								

All values are given in mg/Kg.

Values in parentheses are not certified and are given for information only.

*These CRMs are Natural-Matrix, Real-World*



These CRMs were produced and certified from matrices that have been fortified to achieve analyte profiles that meet the requirements of laboratories meeting NELAC and other similar requirements. We have developed proprietary technology to ensure that the fortified matrices perform in a manner similar to naturally accrued matrices and are superior to simply spiked clean sand.

Certification was carried out using analytical data obtained after using USEPA SW846, 3rd edition methods 3050 (hot block) and 3051 (microwave) using nitric acid extraction. Analysis was carried out according to USEPA methods 6010 (ICP-EOS), 6020 (ICP-MS) and 7000 (AES).

The samples are intended for use in analytical systems using these and related methods. Note that nitric acid extraction is not as rigorous as aqua regia, and these samples may not be suitable for method validation where an aqua regia extraction is used.

### SANDY LOAM 8

#### CRM025-050

From a moderately contaminated site located in the Western United States. This CRM has been analyzed by 25 laboratories in a round-robin.

- 50 grams
- pH 7.21

### SANDY LOAM 9

#### CRM026-050

From a slightly contaminated site located in the Rocky Mountain Region of the United States. This CRM has been analyzed by a 20 laboratories in a round-robin.

- 50 grams
- pH 4.29

### SANDY LOAM 10

#### CRM027-050

From a moderately contaminated site located in the Western United States. This CRM has been analyzed by 23 laboratories in a round-robin.

- 50 grams
- pH 7.17

### SANDY LOAM 11

#### CRM028-050

From a moderately contaminated site located in the Western United States. The sample has been analyzed by multiple independent laboratory round-robin studies.

- 50 grams
- pH 7.35

### LOAMY SAND 2

#### CRM030-050

From a moderately contaminated site located in the Western United States. The sample has been analyzed by multiple independent laboratory round-robin studies.

- 50 grams
- pH 6.54

### LOAMY SAND 4

#### CRM036-050

From a site located in the Western United States. This CRM has been analyzed by 20 laboratories in a round-robin.

- 50 grams
- pH 4.34

### LOAM 2

#### CRM039-050

From a site located in the Western United States. The sample has been analyzed by 42 laboratories in a round-robin.

- 50 grams
- pH 2.94

### LOAM 3

#### CRM042-050

From a site located in the Western United States. This CRM has been analyzed by 50 laboratories in a round-robin.

- 50 grams
- pH 1.76

### SILT LOAM 1

#### CRM044-050

From a site located in the Western United States. This CRM has been analyzed by 51 laboratories in a round-robin.

- 50 grams
- pH 8.09

### SANDY CLAY NEW!

#### CRM049-050

From a site located in the Western United States. This CRM has been analyzed by 67 laboratories in a round-robin.

- 50 grams
- pH 2.23

### CLAY NEW!

#### CRM051-050

From a site located in the Western United States. This CRM has been analyzed by 65 laboratories in a round-robin.

- 50 grams
- pH 8.31

	CRM025-050	CRM026-050	CRM027-050	CRM028-050	CRM030-050	CRM036-050	CRM039-050	CRM042-050	CRM044-050	CRM049-050	CRM051-050
Aluminium, Al	7640	17700	8540	7560	4811	5320	17600	16700	3540	560	5530
Antimony, Sb	(<3.2)	(<3.2)	3.28		(2.32)	(1.59)	70.6	68.1	106	123	274
Arsenic, As	339	5.41	12.4	3.83	13.1	148	352	265	57.4	65.3	22.7
Barium, Ba	1840	214	166	73.2	56.1	61.4	1010	763	145	12.7	145
Beryllium, Be	0.330	18.0	2.73	0.380	5.97	5.38	53.9	129	37.3	60.5	1.09
Boron, B	(17.2)	(25.4)	(18.1)	(12.7)	(5.29)	67.8	148	146	113	59.0	11.8
Cadmium, Cd	369	11.7	12.0	0.500	58.4	254	265	281	63.1	80.0	42.2
Calcium, Ca	28300	6220	5970	5880	14200	14300	13300	6140	206000	4790	1220
Chromium, Cr	441	272	26.9	19.0	43.8	41.0	165	268	84.1	355	246
Cobalt, Co	4.07	6.77	4.7	4.30		67.1	123	168	46.0	84.0	65.1
Copper, Cu	7.76	18.8	9.87	8.51	5.68	66.4	171	128	57.1	88.5	58.5
Iron, Fe	9440	21900	11200	10000	8320	8210	13300	12900	3180	9170	4520
Lead, Pb	1450	25.6	51.9	10.4	7.13	132	178	182	67.5	111	44.1
Magnesium, Mg	4380	2840	2760	3000	2470	2590	4840	3830	8920	899	925
Manganese, Mn	173	633	259	209	127	138	372	594	200	636	757
Mercury, Hg	99.8	2.42	3.80		6.55	27.9	41.2	46.7	9.41	13.5	29.9
Molybdenum, Mo	(<0.8)	(1.25)	(1.05)		8.78	87.4	171	104	14.5	98.6	61.0
Nickel, Ni	12.2	14.4	10.5	13.4	6.63	119	206	130	76.4	344	96.8
Potassium, K	1990	3600	2120	2050	1480	3560	1830	1900	1480	3020	1690
Selenium, Se	518	(1.86)	14.0		18.5	16.2	220	155	81.1	72.1	165
Silicon, Si	171	(166)	(340)	(796)	(169)		(1640)	(717)	991	168	1020
Silver, Ag	132	(0.57)	5.98		(0.04)	(0.335)	73.1	133	114	125	79.5
Sodium, Na	313	119	241	231	997	1950	602	1520	651	665	3630
Strontium, Sr	(408)	38.4	43.0	(38.5)	(54.4)		526	761	4520	8.62	93.8
Thallium, Tl	(<4.8)	(<4.8)	(4.81)			(0.347)	152	195	65.3	125	55.9
Tin, Sn						183	153	173	94.8	236	81.9
Titanium, Ti							413	435	138	47.1	15.7
Vanadium, V	19.3	32.0	21.4	19.2	29.0	23.3	165	139	82.1	578	56.7
Zinc, Zn	51.8	140	51.3	75.0	74.8	182	374	529	114	542	44.0
Cyanide					(10.4)						
Fluoride					(29.4)						
Phosphorus, total											

All values are given in mg/Kg.

Values in parentheses are not certified and are given for information only.





Our range of aqua regia digested CRMs include both naturally contaminated matrices that have not been fortified or modified in any way and matrices that have been fortified to achieve analyte profiles that meet the requirements of laboratories meeting US NELAC and other similar requirements. We have developed proprietary technology to ensure that the fortified matrices perform in a manner similar to naturally accrued matrices and are superior to simply spiked clean sand.

Certification was carried out using analytical data obtained after aqua regia digestion according to European and other standards, including ISO 11466 and similar procedure including USEPA 3052.

Analysis was by atomic absorption spectrometry (FLAAS, HGAAS, CVAAS, GFAAS), inductively coupled plasma emission spectrometry (ICP-OES) and inductively coupled plasma mass spectrometry (ICP-MS). Digestion with aqua regia is empirical and will not necessarily release all elements completely. However for most environmental applications the results are fit for the purpose. The samples are intended for use in analytical systems using these and related methods.

## SEDIMENT 2

### CRM015-050

From a stream located in the Western United States. This CRM has been analyzed by 20 laboratories in a round-robin to meet the requirements specified by the EPA/AALA RM-03, ISO 34 and 35.

- Certified for 27 analytes plus Cyanide
- 50 grams
- pH 7.53

## SILTY CLAY 1

### CRM045-050

From a site located in Central Taiwan. This CRM has been analyzed by 51 laboratories in a round-robin to meet the requirements specified by the EPA/AALA RM-03 and ISO Guide 34 and 35.

- 50 grams
- pH 6.15

## SEDIMENT 3

### CRM016-050

From a stream located in the Western United States. This CRM has been analyzed by 20 laboratories in a round-robin to meet the requirements specified by the EPA/AALA RM-03, ISO 34 and 35.

- 50 grams
- pH 7.85

## CLAY 1

### CRM046-050

From a site located in Southern Taiwan. This CRM has been analyzed by 51 laboratories in a round-robin to meet the requirements specified by the EPA/AALA RM-03 and ISO Guide 34 and 35.

- 50 grams
- pH 5.39

## SANDY LOAM 9

### CRM026-050

From a slightly contaminated site located in the Rocky Mountain Region of the United States. This CRM has been analyzed by a 20 laboratories in a round-robin to meet the requirements specified by the EPA/AALA RM-03, ISO 34 and 35.

- 50 grams
- pH 4.29

## LOAMY CLAY NEW!

### CRM052-050

From a moderately contaminated site located in the Western United States. The sample has been analyzed by multiple independent laboratory round-robin studies.

- Particle Size Distribution: 200 micron to 1 mm
- 50 grams
- pH 6.54

## SILT LOAM 1

### CRM044-050

From a site located in the Western United States. This CRM has been analyzed by 51 laboratories in a round-robin to meet the requirements specified by the EPA/AALA RM-03 and ISO Guide 34 and 35.

- 50 grams
- pH 8.09

## SLUDGE NEW!

### CRM055-050

From a sewage works serving a residential area with light industrial influence and is located in the Western United States.

- Particle Size Distribution: 200 micro to 1 mm
- 50 grams



# AQUA REGIA METALS - SOIL/SEDIMENT/SLUDGE

CRM

	CRM015-050	CRM016-050	CRM026-050	CRM044-050	CRM045-050	CRM046-050	CRM052-050	CRM055-050
Aluminium, Al	(21900)						10900	13200
Antimony, Sb							20.1	3.33
Arsenic, As	7.74	7.76	5.41	52.3	18.4**	7.47**	14.6	3.3
Barium, Ba	(128)						137	347
Beryllium, Be							(26.1)	(1.17)
Cadmium, Cd	(0.29)	0.613	12.9	71.6	1.61	70.1	35.6	1.74
Calcium, Ca	24400							
Chromium, Cr	(36.1)	29.2	36.9	88.5	85.3	45.7	30.7	40.4
Cobalt, Co	(7.04)			50.6	13.5	8.22	26.3	2.97
Copper, Cu	17.0	174	22.5	64.0	122	62.2	44.2	402
Iron, Fe	20800						12400	22500
Lead, Pb	(15.2)	18.6	30.7	778	42.8	45.3	82.6	25.4
Magnesium, Mg	(14300)							
Manganese, Mn	207			204	292	118	187	232
Mercury, Hg	(0.110)	0.158	2.42	9.70	0.795	0.153**	0.815	(1.71)
Molybdenum, Mo							38.9	10.4
Nitrogen, N	0.750							
Nickel, Ni	20.2	21.2	19.3	87.1	199	37.5	28.6	19.2
Phosphorus, total	0.730							
Potassium, K	(4300)							
Selenium, Se							8.24	(6.21)
Silver, Ag							2.35	18
Tin, Sn							2.48	
Vanadium, V							88.4	12
Zinc, Zn	78.8	80.0	169	136	330	114	89	563
Cyanide	6.74							
Chemical oxygen demand (COD)							10.7	771
Fluoride								
Kjeldahl nitrogen (TKN)							0.0627 wt%	4.11 wt%
Phosphorus, total							0.0348 wt%	2.31 wt%

All values are given in mg/Kg.

Values in parentheses are not certified and are given for information only.

\*\* These values have been certified by USEPA methods.



The following products were certified using methods USEPA SW846, 3rd edition, 3050 (hot block), 3051 (microwave), 6010 (ICP-EOS), 6020 (ICP-MS) and 7000 (AES) series. These samples have not been spiked or fortified in any way. They were tested, and are suitable, for lead-abatement program.

These samples have been analyzed, and the certified values have been verified at the smaller subsample sizes that are required by methods used under the lead-abatement program

## **PAINT SLUDGE (DRY)**

**CRM006-050**

From an industrial painting facility in the Eastern United States.

- Certified Lead Value - 753 mg/Kg
- NIST Traceable
- 50 grams
- pH 10.84

## **POWDERED PAINT**

**CRM017-020**

From a variety of painted surfaces, with an attempt to be as representative as possible of all the samples received for routine analysis by a laboratory.

- Certified Lead Value - 7418 mg/Kg
- NIST Traceable
- 20 grams
- pH 7.48

## **PAINT CHIPS**

**CRM013-050**

From an industrial blasting process in the Western United States, using plastic beads to remove paint.

- Certified Lead Value - 643 mg/Kg
- NIST Traceable
- 50 grams
- pH 6.35

## **BLANK POWDERED LEAD-FREE PAINT**

**CRM050-020**

▪ Certified Lead Value - <0.01 mg/Kg

- NIST Traceable
- 20 grams
- pH 7.50

## **BAGHOUSE DUST**

**CRM014-050**

From an industrial dust collection baghouse facility in the Eastern United States. Suitable for OSHA method OSS 1.

- Certified Lead Value - 1910 mg/Kg
- NIST Traceable
- 50 grams
- pH 5.48

## **SOIL - CLAY LOAM**

**Pb-2000**

▪ Certified Lead Value - 2040 mg/Kg


- NIST Traceable
- 50 grams



# CLEAN SOIL - NONPOLLUTED BLANK SOILS

These clean matrices cover all commonly found soil types and are not contaminated in any way. They are intended for use as a clean control and as a base for fortification when no suitable CRM is available for use in method validation, method development or matrix recovery applications.

The analytical report covers most parameters of interest.



2931 Soldier Springs Road  
Laramie, WY 82070  
Phone: 800.576.5690 or 307.742.5452  
Fax: 307.745.7936  
Web: www.RT-Corp.com

**REFERENCE MATERIAL**

**Clean Soil No. 1**  
Inorganics and Physical

**METALS ANALYSIS**

Element	MDL	Value
Aluminum (Al)	3	1,400
Antimony (Sb)	1	ND
Arsenic (As)	0.5	0.33
Barium (Ba)	0.3	23.1
Beryllium (Be)	0.2	ND
Cadmium (Cd)	0.3	ND
Calcium, soluble (Sat. Paste)	0.01	5.8
Cation Exchange Capacity (CEC)	0.03	2.0
Chromium (Cr)	1	3.3
Cobalt (Co)	1	0.33
Copper (Cu)	1	2.0
Iron (Fe)	1	2,173
Lead (Pb)	2	4.0
Manganese (Mn)	0.5	90.8
Magnesium (Mg)	0.02	0.74
Mercury (Hg)	0.02	ND
Nickel (Ni)	1	2.3
Potassium, soluble (Sat. Paste)	0.008	0.65
Selenium (Se)	0.1	ND
Silver (Ag)	0.5	ND
Sodium, soluble (Sat. Paste)	0.01	0.26
Thallium (Tl)	1	ND
Vanadium (V)	0.5	3.6
Zinc (Zn)	1	10.0

All values given in mg/Kg except Cation Exchange meq/100g, and Calcium, Magnesium, Potassium, and Sodium meq/L.

**WET CHEMISTRY**

Parameter	MDL	Value
Cyanide, reactive	0.03	ND
Nitrate as N, soluble (Water)	0.5	1.2
Nitrogen, ammonia (KCL)	0.3	2.0
Nitrogen, total Kjeldahl	0.01	ND
Phosphorus, extractable (AB-DTPA)	1	6.7
Phosphorus, total	0.01	0.01
Sulfide, reactive	0.1	ND

All values given in mg/Kg except Nitrogen, total Kjeldahl and Phosphorus, total which are given in %.

**Methods**

**Analysis**

All Metals analyzed by SW-846 6010 and 7000 series, 3051 digestion.

Cation Exchange	USDA No. 60(19)
TC	ASTM D4129
Carbonate	ASTM D4129
Conductivity	M120.1 - Meter
Exchangeable Acidity	ASA No. 9 9-4.1
Organic Matter	USDA No. 60 Method 24
pH, Saturated Paste	USDA No. 60 (21A)
Solids, %	CLPSW390, Part F, D-98
Sulfate, soluble H2O	M375.3-Gravimetric
Sulfur, total	ASTM D-4239-85C, LECO Furn.
Texture	ASTM D 422 Hydrometer

**Soil Preparation**

AB-DPTA Extraction	ASA No. 9,3-5.34
Air Dry at 34 C	USDA No. 1, 1972
Digestion	M3051, HNO3
KCL Extraction	ASA No. 9 33-3.22
Sat. Paste Ext.	M2, USDA Handbook 66
Water Ext.	ASA No. 9 10-2.3.2

**Wet Chemistry**

CN, reactive	Section 8.3 SW-846 & M9012
Nitrate as N	M353.2
	M350.1
	M351.2-TKN by 13
	65.1 Auto A
	tion 8.3 SW-

**SOIL ANALYSIS**

Parameter	MDL	Value
Carbon, total (TC)		5.617 ug/g
Carbonate, total (as CaCO <sub>3</sub> )	0.01	2.5 %
Conductivity @ 25° C	0.001	0.67mmhos/cm
Exchangeable Acidity	0.2	9.9 meq/100g
Organic Matter	0.01	0.48 %
pH, Saturated Paste	0.1	7.5 units
Solids, Percent	0.1	99.6 %
Sulfate, soluble (Water)	30	130 mg/Kg
Sulfur, total	0.01	ND %

**Texture by Hydrometer**

Clay	
Sand	
Silt	
Texture Classification	

## CLEAN SANDY SOIL

CLN SOIL-1

• 100 grams

## CLEAN CLAY LOAM

CLN SOIL-2

• 100 grams

## CLEAN SANDY LOAM

CLN SOIL-3

• 100 grams

## CLEAN SAND

CLN SAND-4

• 100 grams

## CLEAN CLAY NEW!

CLN SOIL-5

• 100 grams



CRM



The following products include sludges that are naturally contaminated matrices that have not been fortified or modified in any way and matrices that have been fortified to achieve analyte profiles that meet the requirements of laboratories subject to US NELAC and other similar requirements.

Certification was carried out using analytical data obtained using both USEPA SW846, 3rd edition methods 3050 (hot block) and 3051 (microwave) using nitric acid extraction and aqua regia digestion according to European and other standards, including ISO 11466 and similar procedure including USEPA 3052.

Analysis was carried out according to USEPA methods 6010 (ICP-EOS), 6020 (ICP-MS) and 7000 (AES) and European CEN methods for atomic absorption spectrometry (FLAAS, HGAAS, CVAAS, GFAAS), inductively coupled plasma emission spectrometry (ICP-OES) and inductively coupled plasma mass spectrometry (ICP-MS).

## PAINT SLUDGE (DRY)

CRM006-050

From an industrial painting facility in the Eastern United States.

- Certified Lead value - 753
- 50 grams
- pH 10.84

## SEWAGE SLUDGE (WET)

CRM018-050

Representative of a residential area with industrial influence located in the Western United States.

- 50 grams
- pH 8.07

## ELECTROPLATING SLUDGE #1 (WET)

CRM009-100

From the copper electroplating process of a circuit-board manufacturer in the Midwestern United States.

- 100 grams
- pH 7.99

## SEWAGE SLUDGE (DRY)

CRM029-050

Representative of a residential area with industrial influence located in the Western United States.

- 50 grams
- pH 7.20

## ELECTROPLATING SLUDGE #2 (WET)

CRM010-100

From an electroplating facility in the Western United States.

- 100 grams
- pH 3.86

## SEWAGE SLUDGE (DRY)

CRM031-040

Representative of a residential area with industrial influence located in the Western United States.

- 40 grams
- pH 6.53

## ELECTROPLATING SLUDGE #3 (WET)

CRM011-100

From a chrome-plating facility in the Western United States.

- 100 grams
- pH 3.46

## SEWAGE SLUDGE (DRY) NEW!

CRM055-050 (CNS311-04-050)

From a sewage works serving a residential area with light industrial influence and is located in the Western United States.

- Particle Size Distribution: 200 micro to 1 mm
- 50 grams



	CRM006-050	CRM009-100	CRM010-100	CRM011-100	CRM018-050	CRM029-050	CRM031-040	CRM055-050
Aluminium, Al	73.4	(890)	693	(20)	22400	18200	21700	13200
Antimony, Sb		(9)		(10)	(<2)	(2.41)	38.4	3.33
Arsenic, As		(20)		(20)	6.63	26.5	6.45	3.3
Barium, Ba	9970	(50)	173	(5)	1100	806	906	347
Beryllium, Be					0.300	4.35	88.3	(1.17)
Boron, B		(150)		(18000)	(25.8)	(16.6)	(17.5)	
Cadmium, Cd	32.4	(1)		(4)	5.57	537	5.74	1.74
Calcium, Ca	111	(1100)	563	(180)	49100	37300	45900	48000
Chromium, Cr	11.1	50.3	79.5	59200	40.1	325	37.2	40.4
Cobalt, Co		(7)		(10)	3.22	3.07	2.96	2.97
Copper, Cu		121000	63200	108	840	665	805	402
Iron, Fe	64.4	(3800)	2700	(4700)	9900	8640	9810	22500
Lead, Pb	753	14200	119000	269	126	277	119	25.4
Magnesium, Mg	47.0	(150)	(80)	(50)	4300	3900	4290	
Manganese, Mn		(40)	17.5	(30)	200	165	199	232
Mercury, Hg		(1)	(1.4)	(10)	4.78	4.17	5.18	(1.71)
Molybdenum, Mo		(20)			10.5	8.77	11.4	10.4
Nickel, Ni		343	194	42000	20.4	150	19.6	19.2
Potassium, K	8710	(640)		(49000)	2660	2340	2420	
Selenium, Se				(4)	8.38	19.0	8.23	(6.21)
Silicon, Si					(609)	(782)		
Silver, Ag		8.90	56.4	(1)	72.1	54	101	18
Sodium, Na	91.3	(18000)	(1580)	(23000)	1000	1110	880	(715)
Strontium, Sr		(30)		(1)	420	(372)		
Thallium, Tl		(30)		(20)	(<1)		85.9	
Tin, Sn		(38000)		(120)			134	
Vanadium, V		(1)		(20)	39.2	30.9	114	12
Zinc, Zn	737000	(40)	183		1120	847	1060	563
Ammonia as N					(7170)	(6230)	(6950)	(2420)
Chemical oxygen demand (COD)								771
Kjeldahl nitrogen, total (TKN)					(2.6) wt%	2.33 wt%	(4.1) wt%	4.11 wt%
Phosphorus, total					(2.29) wt%	2.04 wt%	(3.51) wt%	2.31 wt%
Residue, total (TS)					(55.3) wt%	88.2 wt%	(93) wt%	(92.1)
Total organic carbon (TOC)					(15.4) wt%	(12.3) wt%	(15.3) wt%	

All values are given in mg/Kg, unless otherwise stated.  
 Values in parentheses are not certified and are given for information only.

*These CRMs are Natural Matrix, Real World*



The following products were certified using methods USEPA SW846, 3rd edition, 3050 (hot block), 3051 (microwave), 6010 (ICP-EOS) and 7000 (AES) series. These samples are natural-matrix and have not been spiked or fortified in any manner.



## FLY ASH

CRM001-100

From a power plant in the Western United States.

- 100 grams
- pH 10.98

## ASH #2

CRM012-100

From an industrial facility in the Western United States.

- 100 grams
- pH 2.86

## ACTIVATED CHARCOAL WATER FILTER

CRM002-100

From a commercial water treatment system.

- 100 grams
- pH 7.87

## PAINT CHIPS

CRM013-050

From an industrial blasting process in the Western United States, using plastic beads to remove paint.

- 50 grams
- pH 6.35

## DIATOMACEOUS EARTH FILTER

CRM004-100

From a commercial water treatment system in the Eastern United States.

- 100 grams
- pH 9.35

## BAGHOUSE DUST

CRM014-050

From an industrial dust collection baghouse facility in the Eastern United States.

- 50 grams
- pH 5.48

## ASH #3

CRM019-050

From a municipal water incinerator located in the Western United States.

- 50 grams
- pH 6.64

# TRACE METALS - MISCELLANEOUS MEDIA

CRM

	CRM001-100	CRM002-100	CRM004-100	CRM012-100	CRM013-050	CRM014-050	CRM019-050
Aluminium, Al		(1800)	(29000)	2160	(1200)	(6000)	(32800)
Antimony, Sb		(2)	(5)		(20)	(20)	(223)
Arsenic, As		(30)			(1)	(2)	772
Barium, Ba	428	(80)	1600	18.7	(1200)	(1930)	352
Beryllium, Be							(2)
Boron, B		(80)	(1160)		(12)	(50)	(336)
Cadmium, Cd		(1)	2.40	362	378	510	432
Calcium, Ca		(980)	(28000)	2110	(1150)	(3900)	(51949)
Chromium, Cr	29.1	36300	21.4	162000	618	2230	55.2
Cobalt, Co		(10)	(140)	(22.4)	(10)	(10)	(26)
Copper, Cu	40.7	96900	(20)	3020	(30)	(110)	279
Iron, Fe	(16300)	(1150)		28700	(1400)	(5860)	(12700)
Lead, Pb		(5)	11900	120	643	1910	4540
Magnesium, Mg		(190)	(17000)	1510	(403)	(1100)	6310
Manganese, Mn	(306)	(8)	(90)	202	(120)	(110)	(480)
Mercury, Hg		(5)	(3)			(2)	(2)
Molybdenum, Mo			(4)		(1)	(30)	(26)
Nickel, Ni	19.8	(30)	(140)	13300	(10)	(10)	22.2
Potassium, K		(490)		73300	(170)	(340)	(49300)
Selenium, Se		(4)	(2000)			(1)	4.11
Silver, Ag		18.3	(1)	54.8		(10)	7.35
Sodium, Na		(480)	(4200)	29200	(310)	(780)	(50500)
Strontium, Sr	(1010)	(110)	(80)		(950)	(1900)	(173)
Thallium, Tl		(20)	(30)		(4)	(10)	(42)
Tin, Sn		(120)	(580)		(80)	(140)	(410)
Titanium, Ti	(465)	(210)	(100)		(70)	(130)	(2870)
Vanadium, V		(40)	(28)	(51.8)	(1)	(2)	28.9
Zinc, Zn			(8500)	635	(2370)		22400

All values are given in mg/Kg.

Values in parentheses are not certified and are given for information only.

*These CRMs are Natural-Matrix, Real-World*



*Speciation* is the determination of chemical form and distribution of the element, which has important consequences for their toxicity and bioavailability. Interest is increasing in the levels of differing elemental species found in environmental samples.

To meet the need for suitable CRMs, RTC has put together a collection of CRMs from its European partner, BCR. The matrix CRMs are all naturally accrued materials and are not fortified in any way.

For more information about speciation analysis visit, [www.speciation.net](http://www.speciation.net)

## Tin, Sn Species

### COASTAL SEDIMENT

BCR-462

Glass bottle containing about 25 grams of powder material.

- 25 grams

### MUSSEL TISSUE

ERM-CE477

Formerly product number BCR-477.

- 14 grams

### FRESHWATER SEDIMENT

BCR-646

Glass bottle containing about 40 grams of powder.

- 40 grams

	BCR-462	BCR-646	ERM-CE477
Tributyltin (TBT)	54.0 µg/Kg	480 µg/Kg	2.20 mg/Kg
Dibutyltin (DBT)	68.0 µg/Kg	770 µg/Kg	1.54 mg/Kg
Monobutyltin (MBT)		610 µg/Kg	1.50 mg/Kg
Triphenyltin (TPhT)		29.0 µg/Kg	
Diphenyltin (DPhT)		36.0 µg/Kg	
Monophenyltin (MPhT)		69.0 µg/Kg	

## Mercury, Hg Species

### TUNA FISH

BCR-463

This material consists of a freeze-dried fish powder in a glass bottle. The bottle contains about 15 grams of powder. Additional information on the preparation and the certified values is given in the certification report.

- 15 grams

### ESTUARINE SEDIMENT

ERM-CC580

Formerly product number BCR-580. Glass bottle containing about 40 grams of powder.

- 40 grams

### TUNA FISH

ERM-CE464

Formerly product number BCR-464.

- 15 grams

	BCR-463	ERM-CE464	ERM-CC580
Methylmercury	3.04 µg/g	5.24 mg/Kg	0.075 mg/Kg
Mercury, Hg	2.85 µg/g	5.50 mg/Kg	132 mg/Kg



## Lead, Pb Species

### URBAN DUST

BCR-605

Glass bottle containing about 15 grams of powder.

- 15 grams

	BCR-605
Trimethyllead	7.90 µg/Kg

## Chromium, Cr Species

### LYOPHILIZED SOLUTION

BCR-544

This material consists of lyophilized solution in a glass vial. The vial contains about 2 mg of powder. Additional information on the preparation and the certified values is given in the certification report.

- 2 mg

### WELDING DUST LOADED ON A FILTER

BCR-545

This material consists of a glass/fiber filter loaded with welding dust, containing approximately 100 µg Cr VI. Additional information on the preparation and the certified values is given in the certification report.

- 100 µg

	BCR-544	BCR-545
Chromium, Cr	49.4 µg/L	39.5 g/Kg
Chromium, Cr(III)	26.8 µg/L	
Chromium VI, Cr(VI)	22.8 µg/L	40.2 g/Kg

## Arsenic, As Species

### ARSENOBETAINE SOLUTION

BCR-626

The sample is a homogeneous aqueous solution of arsenobetaine obtained from a freshly synthesized arsenobetaine powder with verified identity, purity and stoichiometry. It is provided in sealed glass bottles containing approximately 10 mL, with a septum and an aluminium seal. Bottles must be kept at a temperature of less than +20 °C in the dark.

- 10 mL

### TUNA FISH TISSUE

BCR-627

The sample is a dried, homogenized and sterilized tuna fish muscle tissue in brown glass bottles each containing at least 10 grams of material.

- 10 grams

	BCR-626	BCR-627
Arsenobetaine	1031 mg/Kg	52.0 µmol/Kg
Dimethylarsenic		2.00 µmol/Kg
Arsenic, As		4.80 mg/Kg



The following products were collected from superfund (contaminated) sites in the Western United States and certified using USEPA SW846 3rd Edition method 1311 Toxicity Characteristic Leaching Procedure (TCLP) and the California Waste Extraction Method (WET). These methods are designed to replicate natural leaching from a contaminated site.

Analysis of eight metals specified by the TCLP was carried out according to USEPA methods 6010 (ICP-EOS), 6020 (ICP-MS) and 7000 (AES). Analysis of 10 extractable organic analytes was carried out by EPA methods 8081 (pesticides by GC), 8150 (herbicides by GC) and 8270 (semi-volatile organics by GC-MS)

WET is an acronym for *Waste Extraction Test* and is used in the classification of metals as hazardous waste. WET is often used interchangeably with “STLC” or “soluble” when referring to the amount of a metal that is leachable, i.e. “WET lead.” The correct scientific nomenclature is CAL-WET or California Waste Extraction Test as defined in CCR Title 22.

Results of the WET are compared to the Soluble Threshold Limit Concentration (STLC). The WET determines the amount of a specific constituent that can be leached from the soil using a solution designed to simulate landfill leaching

The TCLP is a leaching procedure that uses a slightly less aggressive leaching agent than is used by the WET.

†These samples are also certified by the California WET Method.

## **SUPERFUND SANDY LOAM**

CRM202-225

- 225 grams
- pH 6.22

## **SANDY LOAM**

CRM209-225

- 225 grams
- pH 6.36

## **SUPERFUND SANDY LOAM**

CRM204-225

- 225 grams
- pH 2.60

## **SANDY LOAM**

CRM210-225

- 225 grams
- pH 4.93

## **INCINERATOR ASH**

CRM205-225

- 225 grams
- pH 5.97

## **SANDY LOAM**

CRM211-225

- 225 grams
- pH 6.78

## **SUPERFUND SANDY LOAM†**

CRM206-225

- 225 grams
- pH 6.72

## **LOAMY SAND**

CRM212-225

- 225 grams
- pH 6.75

## **SUPERFUND LOAMY SAND†**

CRM207-225

- 225 grams
- pH 6.45

## **LOAMY SAND**

CRM213-225

- 225 grams
- pH 6.34

## **SANDY LOAM**

CRM208-225

- 225 grams
- pH 5.76

## **SANDY LOAM**

CRM214-225

- 225 grams
- pH 6.70

## SANDY LOAM†

- CRM215-225
- 225 grams
  - pH 6.58

## SANDY LOAM

- CRM216-225
- 225 grams
  - pH 6.69

## SANDY LOAM

- CRM217-225
- 225 grams
  - pH 6.26

## CLAY LOAM

- CRM221-225
- 225 grams
  - pH 6.61

## SANDY LOAM

- CRM222-225
- 225 grams
  - pH 6.86

	CRM202-225	CRM204-225	CRM205-225	CRM206-225†	CRM207-225†	CRM208-225	CRM209-225	CRM210-225	CRM211-225	CRM212-225	CRM213-225	CRM214-225	CRM215-225†	CRM216-225	CRM217-225	CRM221-225	CRM222-225
Arsenic, As	1.44	0.506	42.5	14.0	9.51	3.93	4.96	1.98	0.749	(0.09)	4.10	2.92	5.76	5.45	1.84	6.87	2.50
Barium, Ba	5.85	(0.016)	0.339	0.38	0.400	32.8	0.23	0.500	0.352	0.67	2.37	751	174	0.653	3.43	0.571	0.778
Cadmium, Cd	19.6	14.8	149	8.34	7.45	46.7	5.65	6.50	3.53	0.35	12.0	0.410	54.1	2.39	8.85	5.66	3.66
Chromium, Cr	11.1	3.31	3.97	0.130	1.36	0.87	1.06	0.460	1.06	(0.03)	0.550	3.20	2.09	0.370	0.467	0.465	0.261
Lead, Pb	48.5	4.51	45.3	2.16	2.76	2.14	61.4	133	1.48	(0.06)	4.90	0.320	1.93	0.624	1.75	1.55	0.339
Mercury, Hg	5.58	(0.007)	<0.01	0.65	0.020	0.620	<0.01	0.450	0.012	0.007	0.440	0.060	1.78	0.050	0.198	0.109	0.060
Selenium, Se	1.38	(0.341)	<0.1	20.6	20.8	<0.100	<0.100		1.35	0.33	7.15	5.48	1.87	4.28	8.63	3.85	3.39
Silver, Ag	5.01	(0.028)	<0.1	1.04	0.990	<0.100	<0.100	0.120	0.013	(0.02)	(0.03)	0.240	<0.02	0.042	0.037	0.0227	0.046

All values are given in mg/L.

Values in parentheses are not certified and are given for information only.

†These samples are also certified by the California WET Method.

# TCLP ORGANICS - SOIL

## SLUDGE

- CRM401-225
- 225 grams
  - pH 7.03

## SANDY LOAM

- CRM402-225
- 225 grams
  - pH 6.06

## SEDIMENT

- CRM404-225
- 225 grams
  - pH 7.52

	CRM401-225	CRM402-225	CRM404-225
2-Methylphenol (o-Cresol)	888		2.44
3+4-Methylphenol (m+p-Cresol)	(2123)		8.71
Total Cresol	2660		10.7
2,4-D	(164)	67.1	0.285
2,4-Dinitrotoluene (2,4-DNT)		0.619	
gamma-BHC	1.05	1.28	
Hexachloroethane		(2.87)	
Nitrobenzene		12.2	0.0614
Pentachlorophenol	117		1.54
2,4,6-Trichlorophenol	58.7		

All values are given in mg/L.

Values in parentheses are not certified and are given for information only.

These CRMs are Natural-Matrix, Real-World



The control of pollution caused by leaking underground fuel storage tanks is an increasingly important aspect of environmental analysis. We have developed a comprehensive range of CRMs intended for method validation, method development or matrix recovery applications. This range of matrix CRMs were designed to include most common soil types and analytes found in fuels. They are supported by a comprehensive range of calibration standards, proficiency testing samples and Quality Control Standards.

TPH is an acronym for *Total Petroleum Hydrocarbons*. It is a measure of the total amount of fuel present in the sample, i.e., TPH-gasoline or TPH-diesel. TPH results can be quantified or calculated as either as specific fuels types, i.e. TPH as diesel, crude or gasoline, or as specific carbon ranges, i.e. 500 ppm C<sub>10</sub>-C<sub>25</sub>.

The following products were CRMs were certified using data obtained by analysis using EPA Method 418.1, (TPH by Infrared) and are typical of contamination that is found in backfill soil surrounding a leaking underground storage tank.

## **TPH CONTAMINATED SANDY LOAM (TPH SOURCE DIESEL #2)**

CRM350-100

- Certified TPH Concentration - 8300 mg/Kg
- 100 grams
- pH 7.50

## **TPH CONTAMINATED LOAMY SAND (TPH SOURCE DIESEL #3)**

CRM356-100

- Certified TPH Concentration - 3810 mg/Kg
- 100 grams
- pH 7.65

## **TPH CONTAMINATED LOAMY SAND (TPH SOURCE LIGHT REFINERY OIL)**

CRM352-100

- Certified TPH Concentration - 2340 mg/Kg
- 100 grams
- pH 7.50

## **TPH CONTAMINATED SANDY LOAM (TPH SOURCE GASOLINE/DIESEL)**

CRM357-100

- Certified TPH Concentration - 3221 mg/Kg
- 100 grams
- pH 7.67

## **TPH CONTAMINATED SANDY LOAM (TPH SOURCE DIESEL #2)**

CRM353-100

- Certified TPH Concentration - 2490 mg/Kg
- 100 grams
- pH 7.46

## **TPH CONTAMINATED CLAY LOAM (TPH SOURCE DIESEL #2)**

CRM359-100

- Certified TPH Concentration - 1060 mg/Kg
- 100 grams
- pH 7.31

## **TPH CONTAMINATED SANDY LOAM (TPH SOURCE GASOLINE/DIESEL)**

CRM355-100

- Certified TPH Concentration - 7040 mg/Kg
- 100 grams
- pH 7.51

## **TPH CONTAMINATED SANDY LOAM (TPH SOURCE LUBRICATING OIL)**

CRM360-100

- Certified TPH Concentration - 750 mg/Kg
- 100 grams
- pH 5.26

These CRMs have been analyzed using EPA Method 8015M (Diesel range TPH Screening), a GC-FID procedure that allows the reporting of a specific carbon range.

## TPH/DRO CONTAMINATED LOAMY SAND (TPH SOURCE DIESEL #3)

CRM356-100

- Certified TPH Concentration - 3810 mg/Kg
- Certified DRO Concentration (C<sub>10</sub> - C<sub>20</sub>) - 611 mg/Kg
- 100 grams
- pH 7.65

## DIESEL CONTAMINATED SILT LOAM

CRM554-100

- Certified DRO Concentration (C<sub>12</sub> - C<sub>28</sub>) - 117 mg/Kg
- 100 grams
- pH 5.87

## DIESEL CONTAMINATED CLAY LOAM

CRM558-100

- Certified DRO Concentration (C<sub>10</sub> - C<sub>28</sub>) - 1030 mg/Kg
- 100 grams
- pH 7.81

## DIESEL CONTAMINATED SOIL

CRM560-050

- Certified DRO Concentration - 661 mg/Kg
- 100 grams

BTEX is an acronym for benzene, toluene, ethylbenzene and xylene. This group of volatile organic compounds (VOCs) is found in petroleum hydrocarbons, such as gasoline, and other common environmental contaminants. Gasoline range organics are defined as having a hydrocarbon range from C<sub>6</sub> to C<sub>10</sub> and a boiling range from 60°C to 220°C.

The following CRMs were certified using EPA SW846 3rd Edition Methods 8020 (GC-PID), 8021 (halogenated volatiles by GC) and 8260 (VOCs by GC-MS).

## BTEX CONTAMINATED SOIL

CRM304-030

- 30 grams

## BTEX CONTAMINATED SOIL *NEW!*

CRM305-030

- 30 grams

## BTEX/GRO CONTAMINATED SOIL

CRM307-030

- 30 grams

## BTEX CONTAMINATED SOIL

CRM308-030

- 30 grams

## BTEX/GRO CONTAMINATED SOIL

CRM500-030

- 30 grams

## BTEX/GRO CONTAMINATED SOIL *NEW!*

CRM504-030

- 30 grams

	CRM304-030	CRM305-030	CRM307-030	CRM308-030	CRM500-030	CRM504-030
Benzene	3.57	2.95	13.0	4.42	5.34	8.15
Ethylbenzene	8.73	5.73	9.20	8.37	3.82	5.94
Naphthalene						1.47
Methyl tert-butyl ether			(2.92)	8.61	0.318	2.28
Toluene	3.84	35.0	39.0	12.3	178	26.3
m+p-Xylene	2.43	23.4	36.0	7.33	14.5	23.3
o-Xylene	2.40	10.6	13.2	3.69	5.50	8.74
Xylene, total		35.2	49.9	11.2	20.1	32.1
Gasoline range organics			414		247	343

All values are given in mg/Kg.

Values in parentheses are not certified and are given for information only.



# VOCs (HIGH LEVEL) - SOIL

CRM

Volatile Organic Compounds are a group of more than 40 organic compounds, from Acetone to Xylene and included some chlorinated species that are to be analyzed by EPA Method 8260. These natural-matrix soils are composites; they contain most of the VOA's at high levels. They are ready for methanol extraction "as is." These CRMs are shipped on ice to ensure maximum stability and have a shelf life of 90 days from receipt by the customer.

Analytical data for certification was obtained using USEPA SW846, 3rd edition method 8260 (VOCs by GC/MS). The samples are intended for use in analytical systems using these and related methods.

## **SANDY LOAM**

CRM610-030

- 30 grams

## **SANDY LOAM**

CRM626-030

- 30 grams

## **LOAM**

CRM612-030

- 30 grams

## **SANDY LOAM**

CRM628-030

- 30 grams

## **CLAY LOAM**

CRM614-030

- 30 grams

## **SILTY CLAY NEW!**

CRM630-030

- 30 grams

## **LOAMY SAND**

CRM622-030

- 30 grams

## **LOAMY SAND NEW!**

CRM632-030

- 30 grams

## **CLAY NEW!**

CRM634-030

- 30 grams



# VOCs (HIGH LEVEL) - SOIL

CRM

	CRM610-030	CRM612-030	CRM614-030	CRM622-030	CRM626-030	CRM628-030	CRM630-030	CRM632-030	CRM634-030
Acetone	(9.31)	10.6	8.08	6.57	1.10		6.16	1.35	3.04
Benzene	15.2	11.2	9.37	3.50	2.81	3.57	6.41	9.92	1.96
Bromobenzene								5.66	
Bromodichloromethane	7.56	7.77					9.33	10.9	7.91
Bromoform	(0.099)	6.69		5.04			10.4	0.142	7.26
2-Butanone (Methyl ethyl ketone)				2.62		0.307	1.78	3.52	
Carbon disulfide					(4.40)	1.36	3.92		
Carbon tetrachloride	8.19				3.04	3.68		8.66	7.27
Chlorobenzene	5.95	5.83	4.79	5.42	2.62	5.22	13.9	9.70	3.30
Chloroethane							4.83	1.19	
Chloroform		4.71	8.33	4.75		5.13	5.45	13.0	4.96
1,2-Dibromo-3-chloropropane					4.86			3.70	
Dibromochloromethane	9.75						12.9	10.4	14.4
1,2-Dibromoethane (EDB)			(7.43)		4.51	4.16		7.67	
Dibromomethane				3.27			12.5	5.66	
1,2-Dichlorobenzene	7.54	8.26	8.73	4.84	2.09	3.43	11.9	12.0	22.2
1,3-Dichlorobenzene	5.53	6.62	7.72	5.91	3.67	1.92	8.58		18.7
1,4-Dichlorobenzene		93.4	0.490	(0.338)	3.92	5.79	8.52	14.3	15
1,1-Dichloroethane	5.20	6.77	7.29	3.85	3.25		7.57	1.84	1.8
1,2-Dichloroethane		4.52	8.80			1.23	0.193	9.64	19.0
1,1-Dichloroethylene				4.93	8.03	0.506	6.76		
1,2-Dichloropropane			5.11	2.89		3.17	5.18		5.11
cis-1,3-Dichloropropene							1.83		
cis-1,2-Dichloroethylene							10.6		
trans-1,2-Dichloroethylene				4.06			0.194		
trans-1,3-Dichloropropylene							6.15		
Ethylbenzene	6.63	8.77	6.44	3.92	4.20	8.73	11.5	4.05	15.3
Hexachloroethane					(4.54)	1.65	5.51		
2-Hexanone						1.13			17.8
Isopropylbenzene							5.68		
Methyl bromide (Bromomethane)							3.02	3.35	
Methyl chloride (Chloromethane)					0.984		0.558	5.52	
Methylene chloride (Dichloromethane)	11.1		7.64	4.71		0.125	12.3		6.15
4-Methyl-2-pentanone (MIBK)	13.2	5.48	7.66	3.78	3.40	3.43	6.69		4.85
Methyl tert-butyl ether (MTBE)	15.9	9.23	9.46	6.44	5.96	1.03	9.55	10.2	10.4
Naphthalene					5.02				
Styrene				8.21	2.01	4.20		2.93	
1,1,1,2-Tetrachloroethane		6.91		5.12	6.44		8.83		4.53
1,1,2,2-Tetrachloroethane	8.67	4.73		6.17	5.07	5.76	2.10	10.4	1.93
Tetrachloroethylene		6.11	6.70	7.14	(0.503)	3.83	0.112		16.3
Toluene	10.2	4.87	8.92	3.55	3.61	3.84		1.95	18.2
1,2,4-Trichlorobenzene					2.66				
1,1,1-Trichloroethane	13.5			5.97		4.29	4.24	10.3	17.9
1,1,2-Trichloroethane			6.53	6.95	3.92			9.00	
Trichloroethene (Trichloroethylene)	(0.383)		8.07			5.71	3.38	0.307	0.623
Trichlorofluoromethane					(17.13)		3.07		
1,2,3-Trichloropropane			5.89	5.39	2.93	6.17	2.29	3.84	
1,2,4-Trimethylbenzene				16.7	4.17	2.47	11.0	4.90	7.54
1,3,5-Trimethylbenzene				14.7	5.74	0.968	2.12	4.43	1.96
Vinyl chloride				1.32	(0.559)				
m+p-Xylene	4.59	8.33	12.3	8.21	3.05	2.42	8.80	24.5	8.96
o-Xylene	1.56	2.74	5.53	6.57	2.43	2.40	8.24	2.47	8.58
Xylene, total	5.98	11.5	18.8	14.9	5.52	4.89	16.2	26.7	18.5

All values are given in mg/Kg.

Values in parentheses are not certified and are given for information only.

RTC CRMs are Natural-Matrix



Volatile Organic Compounds are a group of more than 40 organic compounds, from Acetone to Xylene and included some chlorinated species that are to be analyzed by EPA Method 8260. These natural matrix soils are composites; they contain most of the VOAs at low levels. They are ready for methanol extraction "as is." These CRMs are shipped on ice to ensure maximum stability and have a shelf life of 90 days from receipt by the customer.

Analytical data for certification was obtained using USEPA SW846, 3rd edition method 8260 (VOCs by GC/MS). The samples are intended for use in analytical systems using these and related methods.

## **CLAY LOAM**

CRM615-030

- 30 grams

## **SANDY LOAM**

CRM629-030

- 30 grams

## **LOAMY SAND**

CRM623-030

- 30 grams

## **SILTY CLAY NEW!**

CRM631-030

- 30 grams

## **CLAY LOAM**

CRM625-030

- 30 grams

## **LOAMY SAND NEW!**

CRM633-030

- 30 grams

## **SANDY LOAM**

CRM627-030

- 30 grams

## **CLAY NEW!**

CRM635-030

- 30 grams





# VOCs (LOW LEVEL) - SOIL

CRM

	CRM615-030	CRM623-030	CRM625-030	CRM627-030	CRM629-030	CRM631-030	CRM633-030	CRM635-030
Acetone	6700		9610	(966)	(6830)	6760	822	6710
Benzene	203	88.0	157	56.5	160	72.0	96.4	42.9
Bromobenzene		120			177		56.2	
Bromodichloromethane					95.2	74.9	104	90.6
Bromoform			24.9		61.8	64.1		74.5
2-Butanone (Methyl ethyl ketone)	875	185	1870	(37.8)	200	113	73.0	118
Carbon disulfide				(83.5)	(45.4)	43.3		
Carbon tetrachloride			107	44.8	92.6		75.2	83.7
Chlorobenzene	87.8	125	164	52.6	134	145	95.7	22.3
Chloroethane						61.9	11.9	
Chloroform	180	121	12.8		141	60.4	125	98.7
1,2-Dibromo-3-chloropropane				(69.7)			33.6	
1,2-Dibromoethane (EDB)	(133)			75.2	78.6		72.0	
Dibromochloromethane						84.2	95.0	131
Dibromomethane		71.7	59.3				56.5	
1,2-Dichlorobenzene	131	117	112	40.9	273	114	118	89.9
1,3-Dichlorobenzene	113	152	118	70.4	152	79.0		45.6
1,4-Dichlorobenzene		(10.3)	181	74.9	101	80.4	138	64.3
1,1-Dichloroethane	150	106			(213)	82.5	18.4	91.4
1,1-Dichloroethylene		106		(130)	223			
1,2-Dichloroethane	197		108	60.7	86.1		94.4	110
1,1-Dichloropropene						878		
1,2-Dichloropropane	105	72.8	145		129	54.7		125
cis-1,2-Dichloroethylene			75.5			114		
trans-1,2-Dichloroethylene		103				4.02		
trans-1,3-Dichloropropylene						46.7		
Ethylbenzene	120	87.3	72.2	88.4	152	124	40.6	133
Hexachloroethane						30.7		
2-Hexanone	(105)	137	75.0		108	15.4		50.4
Isopropylbenzene						94.5		
Methyl bromide (Bromomethane)						58.3	272	
Methyl chloride (Chloromethane)				(23.3)		15.9	62.1	
Methylene chloride (Dichloromethane)	(175)		162		1180	162	12.6	55.1
4-Methyl-2-pentanone (MIBK)	(201)	124	141	70.4	166	69.5		21.4
Methyl tert-butyl ether (MTBE)	(237)	177	156	121	181	445	101	28.1
Styrene		162	82.3	39.0	101		107	
T-amylmethylether (TAME)							32.0	
1,1,1,2-Tetrachloroethane		106	139	99.8		80.2		62.9
1,1,2,2-Tetrachloroethane		146	93.9	878	130	26.3	101	
Tetrachloroethylene	122	164		(30.7)		18.2		112
Toluene	362	91.5	123	75.7	134	775	24.5	129
1,2,4-Trichlorobenzene				48.9	50.5			
1,1,1-Trichloroethane		135				44.7	93.3	65.1
1,1,2-Trichloroethane	132	166		71.3	177		88.7	
Trichloroethene (Trichloroethylene)	167	(11.1)			(7.77)	35.7	5.17	62.0
Trichlorofluoromethane				(253)		42.2		
1,2,3-Trichloropropane	(132)	130	86.3	53.0	181	24.2	41.8	
1,2,4-Trimethylbenzene		371	362	90.5	341	109	50.9	144
1,3,5-Trimethylbenzene		(332)	404	(111)	227	24.3	45.3	85.7
Vinyl acetate		(315)	299					
Vinyl chloride		35.7		(14.2)				
m+p-Xylene	247	183	164	67.3	127		228	206
o-Xylene	105	144	136	49.9	156	79.9	26.0	53.0
Xylene, total	352	317	302	117	299	173	256	263

All values are given in µg/Kg.

Values in parentheses are not certified and are given for information only.

These CRMs are Natural-Matrix



BNAs are a group of more than 60 organic compounds, including PAHs and related structures. The group is also commonly referred to as SVOCs. EPA Method 8270 describes the analysis of BNAs. We offer an extensive range of CRMs for BNA analysis, covering sludges, sediments and all major soil types. These natural matrix CRMs were collected from various sites across the Western United States of America.

Analytical data for certification was obtained using USEPA SW846, 3rd edition extraction methods 3540B/3541 (soxhlet) and 3550A (sonication). Analysis was carried out according to USEPA method 8270 (Semi-volatile organics by GC/MS). The samples are intended for use in analytical systems using these and related methods.

## API SEPARATOR SLUDGE

CRM101-100

Oily sludge from refinery located in the Western United States.

- 100 grams
- pH 7.69

## SANDY LOAM

CRM111-100

From a site in the Rocky Mountain Region of the United States.

- 100 grams
- pH 7.36

## SEDIMENT

CRM104-100

- 100 grams
- pH 7.19

## SANDY LOAM

CRM112-100

From a wood-treating site in the Western United States.

- 100 grams
- pH 6.96

## SANDY LOAM

CRM106-100

- 100 grams
- pH 7.72

## LOAMY SAND

CRM113-100

From a site in the Western United States.

- 100 grams
- pH 7.95

## SANDY LOAM<sup>†</sup>

CRM107-100

From superfund site in the Western United States.

- 100 grams
- pH 7.83

## LOAM

CRM114-100

From a site in the Western United States.

- 100 grams
- pH 8.47

## SANDY LOAM

CRM109-100

From a site in the Western United States.

- 100 grams
- pH 7.70

## SANDY LOAM

CRM110-100

From a site in the Western United States.

- 100 grams
- pH 5.58

*<sup>†</sup>This product is also certified for Pesticides; see page 34.*

# BASE NEUTRAL ACIDS (BNAs) - SOIL

	CRM 101-100	CRM 104-100	CRM 106-100	CRM 107-100	CRM 109-100	CRM 110-100	CRM 111-100	CRM 112-100	CRM 113-100	CRM 114-100
Acenaphthene		0.544		61.9	4.31	55.6	21.3			
Acenaphthylene										
Aniline										
Anthracene		0.365								
Benzo(a)anthracene		5.41								11.5
Benzo(b)fluoranthene		5.22							3.53	
Benzo(b+k)fluoranthene										
Benzo(k)fluoranthene		3.49								
Benzo(g,h,i)perylene		0.378								6.68
Benzo(a)pyrene		0.396							3.17	33.8
Benzoic acid										
Benzyl alcohol										
bis(2-Ethylhexyl) phthalate (DEHP)		1.34	24.1	38.5	8.99	13.1	36.0		0.967	
4-Bromophenyl phenyl ether		1.98								
Butyl benzyl phthalate		0.491								
Carbazole										
4-Chloroaniline										
bis(2-Chloroethoxy)methane										
bis(2-Chloroethyl) ether										
4-Chloro-3-methylphenol								4.94		
1-Chloronaphthalene										
2-Chloronaphthalene										
2-Chlorophenol			178	375		21.4		2.38		30.7
4-Chlorophenyl phenylether										
Chrysene	10.6	6.59								
Dibenz(a,h) anthracene		1.08								
Dibenzofuran		0.429		40.1	2.27	47.8	6.91		7.21	
1,2-Dichlorobenzene		(0.0499)								
1,3-Dichlorobenzene										
1,4-Dichlorobenzene										
Di-n-butyl phthalate		0.465								
2,4-Dichlorophenol				0.230				2.53		24.6
2,6-Dichlorophenol										
Diethyl phthalate		6.25								
2,4-Dimethylphenol										
Dimethyl phthalate										
Di-n-octyl phthalate		0.764								
2,4-Dinitrophenol			3.90	9.03		9.98		(0.650)		
2,4-Dinitrotoluene (2,4-DNT)		1.73	29.3	43.1	5.24	44.6	33.7		16.0	30.2
2,6-Dinitrotoluene (2,6-DNT)			16.6			19.4	15.4			
bis(2-Ethylhexyl) phthalate (DEHP)										
Fluoranthene		9.20		19.2	(0.160)	11.8	56.1		6.51	54.4
Fluorene	68.4	0.626		30.8	3.10	14.2	21.4		8.41	25.4
Hexachlorobenzene		0.609		42.9	4.15	71.3	23.1		14.3	77.1
Hexachlorobutadiene										
Hexachloroethane				2.31		8.79	75.1		1.65	11.0
Hexachlorocyclopentadiene										
Indeno(1,2,3-cd) pyrene										
Isophorone										
2-Methyl-4,6-dinitrophenol								4.75		
1- and 2-Methylnaphthalene										61.3
2-Methylnaphthalene	250	0.280								
2-Methylphenol (o-Cresol)										
3-Methylphenol (m-Cresol)										
4-Methylphenol (p-Cresol)			1.71						7.55	
3+4-Methylphenol (m+p-Cresol)								4.00		
Naphthalene	89.5	0.565		36.8	1.00	30.3	10.8			
2-Nitroaniline				15.1	6.78	46.3	30.0		14.5	
3-Nitroaniline			11.6	4.27	(0.7)	(3.53)	5.85		0.975	29.2
4-Nitroaniline										
Nitrobenzene				35.0		15.1	30.7		5.88	29.9
2-Nitrophenol		0.363		15.1				4.33		
4-Nitrophenol			15.2	70.8	1.67	26.2	8.70	5.66	4.56	45.4
n-Nitrosodi-n-propylamine										
Pentachlorophenol			29.9	25.0	7.18	27.1	22.0	5.05		30.9
Phenanthrene	169	4.66	0.630							
Phenol	(30.9)	0.888	19.5			13.9		2.45		
Pyrene	17.4	7.43							37.0	9.20
Pyridine										
1,2,4-Trichlorobenzene		1.12								
2,4,5-Trichlorophenol		1.60								
2,4,6-Trichlorophenol		0.908								

All values are given in mg/Kg.

Values in parentheses are not certified and are given for information only.

*These CRMs are Natural-Matrix*



CRM

## LOAMY SAND

CRM115-100

- pH 6.80
- 100 grams

## SANDY LOAM

CRM121-100

- 100 grams
- pH 6.82

## SILT LOAM

CRM123-100

- 100 grams
- pH 7.83

## LOAM

CRM125-100

- 100 grams
- pH 7.04

## CLAY LOAM

CRM131-100

- pH 7.35
- 100 grams

## LOAMY CLAY NEW!

CRM134-050

- Also certified for pesticides and PCB congeners.
- Particle Size Distribution 200 micro to 1 mm
- 50 grams
- pH 6.54

## SILTY CLAY NEW!

CRM135-100

- Particle Size <100 mesh
- 100 grams
- pH 6.9

## CLAY NEW!

CRM136-100

- Particle Size <100 mesh
- 100 grams
- pH 7.1



# BASE NEUTRAL ACIDS (BNAs) - SOIL

CRM

	CRM115-100	CRM121-100	CRM123-100	CRM125-100	CRM131-100	CRM134-100	CRM135-100	CRM136-100
Acenaphthene	4.60		7.52	3.24	2.35	2.56	1.39	0.173
Acenaphthylene			7.24	1.66	3.3	1.16	1.21	
Aniline							2.31	
Anthracene	(0.04)		6.94	1.64	4.35	2.27	0.848	
Benzo(a)anthracene	12.1		8.38	2.22	6.36	4.90	3.52	0.838
Benzo(b)fluoranthene	0.930				2.10	(0.043)		0.442
Benzo(b+k)fluoranthene								1.10
Benzo(k)fluoranthene					1.39	4.07		0.661
Benzo(g,h,i)perylene						4.90		0.583
Benzo(a)pyrene		5.34	7.77	2.15	5.16	1.40	0.347	0.673
Benzoic acid					0.428		1.90	
Benzyl alcohol							1.56	
bis(2-Ethylhexyl) phthalate (DEHP)	(0.300)	1.49	8.90	8.54	7.11			
4-Bromophenyl phenyl ether		11.8	13.0	7.03	8.73		5.26	6.46
Butyl benzyl phthalate		5.66					3.13	7.47
Carbazole		(0.174)	<0.500				5.40	1.37
4-Chloroaniline							0.749	
bis(2-Chloroethoxy)methane								6.97
bis(2-Chloroethyl) ether							0.694	
4-Chloro-3-methylphenol		8.80	7.60	3.87	3.55		0.602	
1-Chloronaphthalene							2.75	
2-Chloronaphthalene		8.17	7.42	2.80			2.03	2.64
2-Chlorophenol		8.30	8.45	5.72	3.53		1.67	
4-Chlorophenyl phenylether		9.37	9.39	3.67			7.62	
Chrysene	16.8	4.94	11.3	1.80	2.02	8.19		0.927
Dibenz(a,h) anthracene					3.57			0.458
Dibenzofuran	10.6	6.10	8.19	5.89	4.53		5.10	5.16
1,2-Dichlorobenzene		4.19	5.15	0.937	4.37		0.673	
1,3-Dichlorobenzene		4.24	4.25	1.35	3.54		0.329	
1,4-Dichlorobenzene		3.15	3.98	1.55	4.65		0.163	0.350
Di-n-butyl phthalate		10.2	16.8	9.87	7.51		4.60	0.720
2,4-Dichlorophenol		6.66	10.6	5.63	6.8		1.55	0.605
2,6-Dichlorophenol		12.9	<0.500					
Diethyl phthalate		6.74		4.54			0.246	1.47
2,4-Dimethylphenol			9.25		2.92		3.27	
Dimethyl phthalate		7.38	9.56	2.41			3.78	3.13
Di-n-octyl phthalate			11.4	4.08			5.14	5.25
2,4-Dinitrophenol			6.40	9.18	0.577		2.22	1.60
2,4-Dinitrotoluene (2,4-DNT)		19.7	17.4	10.8	8.53			
2,6-Dinitrotoluene (2,6-DNT)				10.2				2.51
bis(2-Ethylhexyl) phthalate (DEHP)								0.891
Fluoranthene	22.1	5.65	9.31	4.81	2.17	4.19	0.328	5.35
Fluorene	13.0	5.42	6.88	3.28	6.16	6.84		49.4
Hexachlorobenzene		6.26	6.81	7.05				0.551
Hexachlorobutadiene			5.46				0.155	2.01
Hexachloroethane			10.6	0.708	4.37		0.156	
Hexachlorocyclopentadiene					3.27			3.93
Indeno(1,2,3-cd) pyrene					0.744	0.343		0.425
Isophorone		9.53	8.07	7.10	4.96		0.742	6.07
2-Methyl-4,6-dinitrophenol		11.4		9.30	(0.571)		4.28	
1- and 2-Methylnaphthalene								
2-Methylnaphthalene			<0.500					6.19
2-Methylphenol (o-Cresol)		9.65	7.70	0.484	4.60		3.50	
3-Methylphenol (m-Cresol)		(13.0)	9.80					
4-Methylphenol (p-Cresol)		(10.8)	7.04	1.14	6.53		5.90	2.94
3+4-Methylphenol (m+p-Cresol)					6.55		6.83	3.27
Naphthalene	1.34	8.63	9.73	4.19	3.51	1.33	0.640	44.1
2-Nitroaniline							5.09	
3-Nitroaniline							4.93	
4-Nitroaniline							1.73	
Nitrobenzene		9.42	10.6	4.72			4.37	4.67
2-Nitrophenol			6.30	5.32	3.56		3.82	0.668
4-Nitrophenol				5.83	3.53		3.68	
n-Nitrosodi-n-propylamine								2.63
Pentachlorophenol				5.25	3.25		3.42	2.56
Phenanthrene	0.080	5.87	7.94	3.39	2.80		2.01	0.973
Phenol		9.60	<0.500	5.85	1.91			1.20
Pyrene	7.66	8.20	6.75	4.46	2.30	6.58		6.62
Pyridine					1.14		0.415	
1,2,4-Trichlorobenzene		6.79			2.95		1.71	0.698
2,4,5-Trichlorophenol		6.98	5.29	1.45	2.38			
2,4,6-Trichlorophenol				1.43				3.48

All values are given in mg/Kg.

Values in parentheses are not certified and are given for information only.

These CRMs are Natural-Matrix



The following products were designed, produced and verified for accuracy and stability under a Cooperative Research and Development Agreement between RTC (USA & UK), RIZA Institute for Inland Water Management and Waste Water Treatment (Netherlands) and C N Schmidt BV (Netherlands), in accordance with ISO 17025, ISO Guides 34 and 35, and ILAC G13 2000.

In Europe, PCB analysis is aimed at 7 "marker" congeners: PCB 28, PCB 52, PCB 101, PCB 118, PCB 138, PCB 153 and PCB 180. To meet market needs, RTC has introduced three new Congener PCB CRMs.

CRM

## PAHs, PCBs AND PESTICIDES ON FRESH WATER SANDY LOAM SEDIMENT

CNS300-04-050

The Reference Values were determined by GC-MS, ECD (USEPA 8270 and Dutch standard methods NEN 5771, 5718 and 5719).

- Particle Size Distribution: 200 micron to 1 mm
- 50 grams
- pH 6.54

## PAHs, PCBs AND PESTICIDES ON SEWAGE SLUDGE

CNS312-04-050

The Reference Values were determined by GC-MS, ECD (USEPA 8270 and Dutch standard methods NEN 5771, 5718 and 5719).

- Particle Size Distribution: 200 micron to 1 mm
- 50 grams
- pH 6.54

**Certificate of Analysis**  
**NATURAL MATRIX CERTIFIED REFERENCE MATERIAL**  
 Produced and Certified by a Partnership between  
 Resource Technology Corporation (USA and UK)  
 RIZA Institute for Inland Water Management and Waste Water Treatment  
 C N Schmidt BV

**PAHs, PCBs and Pesticides on Sewage Sludge**  
 Lot No: 002554  
 Catalog No: CRM CNS312-04-050

Analyte	CERTIFIED ANALYTE CONCENTRATIONS				
	Reference Value	S.D.	Units	Confidence Interval	Prediction Interval
Acenaphthene	2.99	0.764	µg/Kg	2.53 - 3.44	1.24 - 4.73
Acenaphthylene	2.42	0.774	µg/Kg	1.90 - 2.95	0.820 - 4.23
Anthracene	1.87	0.486	µg/Kg	1.40 - 1.94	0.821 - 2.73
Benzo(a)anthracene	1.45	0.272	µg/Kg	1.27 - 1.55	0.826 - 1.92
Benzo(a)pyrene	0.872	0.195	µg/Kg	0.751 - 0.994	0.482 - 0.420
Benzo(b)fluoranthene	0.241	0.079	µg/Kg	0.186 - 0.287	0.287 - 1.28
Benzo(g,h)perylene	0.635	0.237	µg/Kg	0.666 - 1.30	0.358 - 0.997
Benzo(k)fluoranthene	0.678	0.140	µg/Kg	0.590 - 0.796	0.559 - 1.67
Chrysene	1.12	0.240	µg/Kg	0.971 - 1.26	0.159 - 0.656
Dibenz(a,h)anthracene	0.407	0.108	µg/Kg	0.336 - 0.479	2.06 - 6.32
Fluoranthene	4.19	0.932	µg/Kg	3.62 - 4.76	0.704 - 3.31
Fluorene	2.01	0.574	µg/Kg	1.65 - 2.32	0.095 - 0.984
Indeno(1,2,3-cd)pyrene	0.540	0.195	µg/Kg	0.421 - 0.558	0.574 - 4.58
Naphthalene	2.55	0.878	µg/Kg	2.05 - 3.10	0.057 - 0.867
Phenanthrene	0.462	0.177	µg/Kg	0.354 - 0.570	2.29 - 6.05
Pyrene	4.17	0.823	µg/Kg	3.66 - 4.68	5.43 - 22.2
PAK16	13.8	3.57	µg/Kg	11.5 - 16.1	10.1 - 40.1
PAK16 (All 16 PAH)	25.1	8.44	µg/Kg	21.3 - 28.7	0.00 - 430
PCB 28	205	101	µg/Kg	131 - 280	159 - 366
PCB 52	263	50.0	µg/Kg	228 - 297	126 - 367
PCB 101	257	63.0	µg/Kg	213 - 300	42.4 - 105
PCB 118	73.6	15.0	µg/Kg	63.2 - 84.0	80.5 - 191
PCB 138	136	26.5	µg/Kg	117 - 154	132 - 295
PCB 153	214	39.0	µg/Kg	187 - 241	157 - 307
PCB 180	232	36.0	µg/Kg	207 - 257	968 - 1730
Total PCB	1350	159	µg/Kg	1220 - 1480	

**ADDITIONAL INFORMATION**

According to VROM, the Dutch Ministry of Housing and  
 benzo(a)pyrene, benzo(ghi)perylene,  
 benzo(k)fluoranthene, phenanthrene,  
 NEN 5771, 5718, and 5719). All values were  
 Product Information Sheet for certifying  
 Prediction Interval (P.I.) is the 95%  
 The Certified Reference  
 QUALITY under a  
 (NEN 5771 and C N  
 G13 2000.

RESOURCE TECHNOLOGY CORPORATION  
 2931 Soldier Springs Road  
 Laramie, WY 82070 USA  
 (307) 742-5452  
 FAX (307) 745-7936

	CNS300-04-050	CNS312-04-050
<b>PAHs (mg/Kg)</b>		
Acenaphthene	2.56	2.99
Acenaphthylene	1.16	2.42
Anthracene	2.27	1.67
Benzo(a)anthracene	4.90	1.45
Benzo(a)pyrene	1.40	0.872
Benzo(b)fluoranthene	(0.043)	0.241
Benzo(g,h,i)perylene	4.90	0.835
Benzo(k)fluoranthene	4.07	0.678
Chrysene	8.19	1.12
Dibenz(a,h) anthracene		0.407
Fluoranthene	4.19	4.19
Fluorene	6.84	2.01
Indeno(1,2,3-cd) pyrene	0.343	0.540
Naphthalene	1.33	2.58
Phenanthrene		0.462
Pyrene	6.58	4.17
PAH 10	33.0	13.8
PAH 16 (All 16 PAH)	50.6	25.1
<b>PCBs (µg/Kg)</b>		
2,4,4'-Trichlorobiphenyl (PCB 28)	240	205
2,2', 5,5'-Tetrachlorobiphenyl (PCB 52)	204	263
2,2', 4,5,5'-Pentachlorobiphenyl (PCB 101)	354	257
2,3',4,4',5-Pentachlorobiphenyl (PCB 118)	195	73.6
2,2', 3,4,4', 5'-Hexachlorobiphenyl (PCB 138)	98.7	136
2,2', 4,4',5,5'-Hexachlorobiphenyl (PCB 153)	245	214
2,2', 3,4,4', 5,5'-Heptachlorobiphenyl (PCB 180)	215	232
Total PCBs	(1620)	1350
<b>Pesticides (µg/Kg)</b>		
2,4'-DDD	63.6	625
2,4'-DDE		258
2,4'-DDT	233	223
4,4'-DDD	287	809
4,4'-DDE	299	229
4,4'-DDT		23.5
Aldrin	125	221
alpha-BHC (alpha-Hexachlorocyclohexane)	284	137
beta-BHC (beta-Hexachlorocyclohexane)		111
Dieldrin	370	569
Endosulfan I	93.0	296
Endrin	370	336
gamma-BHC (gamma-Hexachlorocyclohexane)	363	578
Heptachlor	398	197
Heptachlor epoxide	49.2	104
Hexachlorobenzene	789	689

Values in parentheses are not certified and are given for information only.



The demand for CRMs containing explosive and other nitro residues in soil has grown rapidly over the last 5 years, driven by both concerns over terrorist activity and an increasing worldwide concern about soil pollution found in former military bases and munitions factories. This range of natural matrix CRMs is unique. It covers the three main soil types: loam, sand and clay and the key markers of pollution by explosives.

Analytical data for certification was obtained using USEPA SW846, 3rd edition extraction methods 3540B/3541 (soxhlet) and 3550A (sonication). Analysis was carried out according to USEPA method 8330 (Nitroaromatics & Nitramines by HPLC). The samples are intended for use in analytical systems using these and related methods.

## CLAY

CRM127-010

- 10 grams
- pH 7.00

## CLAY LOAM

CRM133-010

- 10 grams
- pH 7.49

## SANDY LOAM

CRM128-010

- 10 grams
- pH 7.25

## LOAMY SAND *NEW!*

CRM137-010

- 10 grams
- pH 7.00

## CLAY LOAM

CRM130-010

- 10 grams
- pH 7.31

## SILT LOAM *NEW!*

CRM138-010

- 10 grams
- pH 7.67

## SEDIMENT

CRM132-010

- 10 grams
- pH 7.50

	CRM127-010	CRM128-010	CRM130-010	CRM132-010	CRM133-010	CRM137-010	CRM138-010
1,3-Dinitrobenzene	27.1	12.4		2.83	12.3	1.72	
2,4-Dinitrotoluene	32.1		33.9	9.42	16.0	4.62	14.4
2,6-Dinitrotoluene	27.2	8.82	8.10	4.86	20.2	1.57	20.9
Nitrobenzene	18.0	10.4	36.1	3.61	7.46	4.88	16.2
2-Nitrotoluene		16.1	82.9	5.41	19.7	3.65	12.0
3-Nitrotoluene		19.6	39.3	8.77	6.47	3.13	14.3
4-Nitrotoluene	49.5		32.1	3.68	10.7	3.10	15.3
2-Amino-4,6-dinitrotoluene				2.96		6.86	
4-Amino-2,6-dinitrotoluene				1.02	1.83		
HMX				1.58	2.00	1.96	
Nitroglycerin							
RDX				2.27		1.16	
2,4,6-Trinitrotoluene					13.8		
Tetryl						1.96	

All values are given in mg/Kg.



Chlordane is an insecticide used in fire ant control, on lawns and on a variety of crops. The term chlordane refers to a complex mixture of chlordane isomers, other chlorinated hydrocarbons and by-products. In most temperate climates, only the two chlordane isomers, alpha and gamma chlordane, generally exist in the environment. The half-life of chlordane is more than 20 years.

Toxaphene is a persistent organic pollutant is an insecticide and acaricide that is most often used in cotton cultivation. Toxaphene is not a single compound but a mixture of over 177 congeners, some of which are reported to change over time, depending on storage and ground conditions. The production of toxaphene was halted more than 20 years ago; however half-life of toxaphene in soil is believed to exceed 12 years.

Both toxaphene and chlordane are known to be bioaccumulative. Testing of soil for both pesticides is mandatory in many parts of the world.

These CRMs are natural matrix, real-world and are not fortified in any way. Analytical data for certification was obtained using USEPA SW846, 3rd edition extraction methods 3540B/3541 (soxhlet) and 3550A (sonication). Analysis was carried out according to USEPA method 8081 (Pesticides by GC). The samples are intended for use in analytical systems using these and related methods.

## Chlordane

CHARACTERISTIC	CONCENTRATION	PH	CATALOGUE #	QUANTITY
<b>Loamy Sand</b>	7190 µg/Kg	7.92	CRM806-100	100 g
<b>Loam</b>	245 µg/Kg	4.75	CRM815-050	50 g
<b>Sandy Loam</b>	392 µg/Kg	6.73	CRM825-050	50 g
<b>Silt Loam</b>	294 µg/Kg	8.38	CRM830-050	50 g
<b>Sediment</b>	235 µg/Kg	6.57	CRM852-050	50 g



## Toxaphene

CHARACTERISTIC	CONCENTRATION	PH	CATALOGUE #	QUANTITY
<b>Sandy Loam</b>	254 µg/Kg	6.98	CRM813-050	50 g
<b>Loam</b>	229 µg/Kg	5.30	CRM816-050	50 g
<b>Silt Loam</b>	221 µg/Kg	8.43	CRM829-050	50 g
<b>Sediment</b>	245 µg/Kg	7.34	CRM850-050	50 g
<b>Clay NEW!</b>	306 µg/Kg	7.10	CRM853-050	50 g

*These CRMs are Natural-Matrix, Real-World*



For many years, the analysis of soil for pesticide residues has been an important part of the workload of environmental laboratories. As a result, we have developed a comprehensive program of CRMs.

These CRMs are natural matrix, real-world and are not fortified in any way.

Analytical data for Certification was obtained using USEPA SW846, 3rd edition extraction methods 3540B/3541 (soxhlet) and 3550A (sonication). Analysis was carried out according to USEPA method 8081 (Pesticides by GC). The samples are intended for use in analytical systems using these and related methods.

## SANDY LOAM\*

CRM107-100

From a superfund site in the Western United States.

- Also certified for BNAs.
- 100 grams
- pH 7.83

## SANDY LOAM\*

CRM804-050

From an agricultural region of the Western United States.

- 50 grams
- pH 7.61

## SANDY LOAM\*

CRM805-050

From an agricultural region of the Western United States.

- 50 grams
- pH 7.78

## LOAM

CRM818-050

Fortified to meet the requirements of NELAC Fields of Testing, RCRA Solid.

- 50 grams
- pH 4.89

## SANDY LOAM

CRM824-050

Fortified to meet the requirements of NELAC Fields of Testing, RCRA Solid.

- 50 grams
- pH 6.65



## SILT LOAM

CRM828-050

Fortified to meet the requirements of NELAC Fields of Testing, RCRA Solid.

- 50 grams
- pH 7.48

## SEDIMENT

CRM846-050

Fortified to meet the requirements of NELAC Fields of Testing, RCRA Solid.

- 50 grams
- pH 7.12

## CLAY LOAM

CRM847-050

Fortified to meet the requirements of NELAC Fields of Testing, RCRA Solid.

- 50 grams
- pH 7.38

	CRM 107-100*	CRM 804-050*	CRM 805-050*	CRM 818-050	CRM 824-050	CRM 828-050	CRM 846-050	CRM 847-050
Aldrin		18.0		182		126	248	115
alpha-BHC				394	361	338	387	225
beta-BHC				333	382	272	304	92.4
delta-BHC							50.2	67.6
gamma-BHC (Lindane)	34300	491	10600	416	371	384	125	340
alpha-Chlordane							60.2	
2,4-D	22900							
4,4'-DDD	11100	1530	19500	553	367	397	256	228
4,4'-DDE		1520	18600	417	396	293	98.0	218
4,4'-DDT	38500	1060	786	446	363	302	335	172
Dalapon	8090							
Dicamba	28400							
Dichloroprop								
Dieldrin	10800	1860		344		225	194	125
Endosulfan I		1460	6900	318	361	170	137	160
Endosulfan II		1130	5940	357	340	223	345	233
Endosulfan sulfate				345	327	319	311	270
Endrin		62.2	13000	340	358	336	247	377
Endrin aldehyde			95.5		398	<5.00	40.6	49.3
Endrin ketone					(15.2)	<50.0		
Heptachlor				194	338	136	190	109
Heptachlor epoxide					317	<5.00	75.5	98.7
Hexachlorobenzene						<10.0		
Methoxychlor			15800	280	365	279	156	172
2,4,5-T	15000							
Trifluralin								
Aroclor-1248 (PCB-1248)	(1570)							

All values are given in µg/Kg.

Values in parentheses are not certified and are given for information only.

\* These CRMs are Natural-Matrix



Analytical data for certification was obtained using USEPA SW846, 3rd edition extraction methods 3540B/3541 (soxhlet) and 3550A (sonication). Analysis was carried out according to USEPA method 8141A (Organophosphorus pesticides by capillary column GC). The samples are intended for use in analytical systems using these and related methods.

## SANDY LOAM

CRM821-050

- 50 grams
- pH 7.69

## SILT LOAM

CRM837-050

- 50 grams
- pH 7.83

## SANDY LOAM

CRM827-050

- 50 grams
- pH 6.63

## SEDIMENT

CRM851-050

- 50 grams
- pH 6.79

## SILT LOAM

CRM832-050

- 50 grams
- pH 8.17

	CRM821-050	CRM827-050	CRM832-050	CRM837-050	CRM851-050
Azinphos-methyl (Guthion)	4410	1520		587	1760
Chlorfenvinphos					1760
Chlorpyrifos	3880			10300	
Demeton-o		710		257	
Demeton-s	1380	525		667	
Diazinon	337	3760	7470	14400	217
Dichlorovos (DDVP, Dichlorvos)	(238)	887			
Disulfoton	2950.0		5280	5220	5180
Malathion	5090	8020	5470	2790	4140
Parathion, methyl	4460		10500	26200	5800
Parathion, ethyl	5620	4880	3500	4400	3230
Phorate	1360	480	1770		
Ronnel	2180	830	2290		2140
Sulfotepp					
Tetrachlorvinphos (Stirophos, Gardona)	12900	4240	(694)		(673)
Tetraethyl pyrophosphate (TEPP)					

All values are given in µg/Kg.  
Values in parentheses are not certified and are given for information only.

Analytical data for Certification was obtained using USEPA SW846, 3rd edition extraction methods 3540B/3541 (soxhlet) and 3550A (sonication). Analysis was carried out according to USEPA method 8270 (Semi-volatile Organics by GC/MS). The samples are intended for use in analytical systems using these and related methods.

## SANDY LOAM

### CRM803-050

Contaminated with herbicides from an agricultural region of the Western United States.

- 50 grams
- pH 7.38

## LOAM

### CRM808-050

Fortified to meet the requirements of NELAC Fields of Testing, RCRA Solid.

- 50 grams
- pH 6.59

## LOAMY SAND

### CRM810-050

Fortified to meet the requirements of NELAC Fields of Testing, RCRA Solid.

- 50 grams
- pH 6.59

## LOAM

### CRM817-050

Fortified to meet the requirements of NELAC Fields of Testing, RCRA Solid.

- 50 grams
- pH 5.27

## SILT LOAM

### CRM831-050

Fortified to meet the requirements of NELAC Fields of Testing, RCRA Solid.

- 50 grams
- pH 8.17

## CLAY LOAM

### CRM845-050

Fortified to meet the requirements of NELAC Fields of Testing, RCRA Solid.

- 50 grams
- pH 7.42

	CRM803-050	CRM808-050	CRM810-050	CRM817-050	CRM831-050	CRM845-050
Acifluorfen	(15100)					
Bentazon	(<300)					
Chloramben	(20000)					
2,4-D	44600	314	311	250	315	262
2,4-DB	(49200)	252		188	261	187
Dalapon	(26300)		156	112	158	31.6
Dicamba	(59000)	307	369	247	374	220
Disulfoton				(256)		
3,5-Dichlorobenzoic acid	(34000)					
Dichloroprop	(46000)					
MCPA	(182000)					
MCPP	(82000)			(4800)		
Pentachlorophenol	(51000)	(200)	(224)	267	161	113
Picloram	(40200)					
Silvex (2,4,5-TP)	41300	302	249	188	297	81.7
2,4,5-T	25700	222	171	84.5	172	124

All values are given in µg/Kg.

Values in parentheses are not certified and are given for information only.



# POLYCHLORINATED BIPHENYLS (PCBs)

CRM

PCBs, also referred to by the trade names Aroclor, Phenoclor and Kanechlor, are a family of chlorinated compounds that comprise 209 congeners, with different physical and chemical characteristics. Most PCB mixtures are oily liquids whose colour darkens and viscosity increases with rising chlorine content. PCBs with fewer chlorine atoms are more soluble, more amenable to chemical and biological degradation, and less persistent in the environment than those PCBs with more chlorine atoms. PCBs are thermally stable and excellent electrical insulators.

Chronic exposure of animals to PCBs can lead to disrupted hormone balances, reproductive failures, teratomas and/or carcinomas. A more significant health impact of PCBs may be caused by their incomplete combustion during thermal treatment processes. Incomplete oxidation of PCBs may form polychlorinated dibenzofuran (PCDF) “dioxin” emissions. These are of concern because of their toxicological and environmental properties.

For the following CRMs analytical data for certification was obtained using USEPA SW846, 3rd edition extraction methods 3540B / 3541 (soxhlet) and 3550A (sonication). Analysis was carried out according to USEPA method 8081 (Pesticides by GC). The samples are intended for use in analytical systems using these and related methods.

NOTE: For PCBs Congeners CRMs, see pages 30-31.

AROCLOR	VALUE	PH	MATRIX	CATALOGUE #	UNIT
<b>1016</b>	8.30 mg/Kg	4.90	Sandy Loam	CRM922-050	50 g
<b>1016</b>	25.8 mg/Kg	5.00	Transformer Oil	CRM929-010	10 g
<b>1221</b>	22.0 mg/Kg	7.19	Sandy Loam	CRM919-050	50 g
<b>1242</b>	5.05 mg/Kg	7.81	Sandy Loam	CRM917-050	50 g
<b>1242</b>	7.06 mg/Kg	7.35	Clay Loam	CRM927-050	50 g
<b>1242</b>	8.27 mg/Kg	8.47	Silt Loam	CRM924-050	50 g
<b>1242</b>	25.3 mg/Kg	5.00	Transformer Oil	CRM926-010	10 g
<b>1242</b>	29.8 mg/Kg	7.26	Sandy Loam	CRM921-050	50 g
<b>1242</b>	39.4 mg/Kg	4.37	Loamy Sand	CRM910-050	50 g
<b>1248</b>	1.77 mg/Kg	7.25	Loamy Clay	CRM928-050	50 g
<b>1248</b>	10.7 mg/Kg	7.66	Sandy Loam	CRM916-050	50 g
<b>1254</b>	0.274 mg/Kg	7.59	Sandy Loam	CRM918-050	50 g
<b>1254</b>	1.28 mg/Kg	8.03	Loamy Sand	CRM911-050	50 g
<b>1254</b>	5.47 mg/Kg	8.47	Sandy Loam	CRM923-050	50 g
<b>1254</b>	23.3 mg/Kg	5.00	Transformer Oil	CRM925-010	10 g
<b>1260</b>	1.44 mg/Kg	7.52	Sandy Loam	CRM915-050	50 g
<b>1260</b>	35.2 mg/Kg	5.00	Transformer Oil	CRM920-010	10 g

The need for CRMs for the validation and control of the analysis of water is steadily increasing as efforts to improve the quality of ground water and waste water increase.

The production and distribution of natural-water CRMs is beset with particular difficulties, including maintaining sterility without altering the matrix, the weight of liter volumes of water and the associated packaging. One consequence of these difficulties is there are very few whole-volume natural water CRMs available.

We have taken the procedures used to develop the range of water quality control RMs, which are supplied as concentrates, and used them to produce a range of water CRMs that suffer none of the problems associated with natural matrices, yet have analytical values and uncertainties comparable with the best whole-volume water CRMs.

Analytical data for certification was obtained using USEPA SW846, 3rd edition methods 3050 (hot block) and 3051 (microwave) using nitric acid extraction. Analysis was carried out according to USEPA methods 6010 (ICP-EOS), 6020 (ICP-MS) and 7000 (AES).

All our constant value water CRMs are supplied in concentrate form, and when diluted according to the instructions supplied, will give the certified values. But the analyst is free to dilute to larger, or smaller, volumes to give a value at a particular value.

## DEMAND - CONSTANT VALUE

### QCI-040

A single sample for dilution up to 2 L of reagent water.

Biochemical oxygen demand (BOD)	85.4 mg/L
Carbonaceous BOD (CBOD)	73.5 mg/L
Chemical oxygen demand (COD)	132 mg/L
Total organic carbon (TOC)	54.0 mg/L

## RESIDUE - CONSTANT VALUE

### QCI-039

A two-sample set of solids for dilution up to 2 L of residue-free water.

#### Sample 1

Residue, total (TS)	491 mg/L
Residue-filterable (TDS)	441 mg/L
Residue-nonfilterable (TSS)	57.1 mg/L

#### Samples 2

Residue, total (TS)	500 mg/L
Residue-filterable (TDS)	250 mg/L
Residue-nonfilterable (TSS)	250 mg/L
Residue-volatile	50 mg/L

## PHENOLICS - CONSTANT VALUE

### QCI-043

A two-sample set for dilution up to 2 L of reagent water.

#### Sample 1

Total phenolics	6.60 mg/L
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#### Sample 2

Total phenolics	5.0 mg/L
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## PH - CONSTANT VALUE

### QCI-041

A single sample for direct measurement of pH.

pH	7.2 units
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## OIL AND GREASE - CONSTANT VALUE

### QCI-045

A single sample for dilution, the values listed below are ampule concentration.

Oil & Grease (Freon Extraction)	7.64 mg/mL
Oil & Grease (Hexane Extraction)	9.88 mg/mL

## NUTRIENTS - CONSTANT VALUE

### QCI-042

A two-sample set for dilution up to 2 L of reagent water.

#### Sample 1

Ammonia as N	2.02 mg/L
Nitrate as N	2.01 mg/L
Nitrite as N	1.49 mg/L
Orthophosphate as P	0.753 mg/L

#### Sample 2

Kjeldahl nitrogen (TKN)	7.49 mg/L
Phosphorus, total	1.75 mg/L

## MINERALS - CONSTANT VALUE

### QCI-046

A two-sample set for dilution up to 2 L of reagent water.

Alkalinity as CaCO <sub>3</sub>	40.3 mg/L
Calcium, Ca	25.3 mg/L
Chloride	84.9 mg/L
Conductivity	460 µmhos/cm
Corrosivity (Langelier Index)	-1.50
Corrosivity (pH)	6.95
Fluoride	6.00 mg/L
Hardness	102 mg/L
Magnesium, Mg	10.1 mg/L
Potassium, K	7.98 mg/L
Residue-filterable (TDS)	262 mg/L
Sodium, Na	40.2 mg/L
Sulfate	24.5 mg/L



## RESIDUAL CHLORINE - CONSTANT VALUE

### QCI-044

A single sample for dilution up to 2 L of reagent water.

Residual Free Chlorine 2.60 mg/L

## CYANIDE - CONSTANT VALUE

### QCI-047

A two-sample set for dilution up to 2 L of reagent water.

#### Sample 1

Cyanide (from Potassium Ferricyanide) 0.242 mg/L

#### Sample 2

Cyanide (from Potassium Cyanide) 0.480 mg/L

## TRACE METALS BY AA - CONSTANT VALUE

### QCI-049

A three-sample set for dilution in 2 L of reagent water.

#### Sample 1

Arsenic, As	30.2 µg/L
Barium, Ba	109 µg/L
Cadmium, Cd	41 µg/L
Chromium, Cr	71.5 µg/L
Copper, Cu	61.6 µg/L
Lead, Pb	51.2 µg/L
Mercury, Hg	40.8 µg/L
Selenium, Se	28.9 µg/L
Silver, Ag	19.2 µg/L

#### Sample 2

Aluminium, Al	105 µg/L
Antimony, Sb	115 µg/L
Beryllium, Be	40.2 µg/L
Cobalt, Co	30.3 µg/L
Iron, Fe	83.5 µg/L
Manganese, Mn	29.9 µg/L
Molybdenum, Mo	61.6 µg/L
Nickel, Ni	92 µg/L
Thallium, Tl	41.2 µg/L
Vanadium, V	69.9 µg/L

#### Sample 3

Barium, Ba	2030 µg/L
Calcium, Ca	2080 µg/L
Iron, Fe	775 µg/L
Magnesium, Mg	617 µg/L
Potassium, K	1030 µg/L
Sodium, Na	1010 µg/L
Zinc, Zn	844 µg/L

## CORROSIVITY/SODIUM - CONSTANT VALUE

### QCI-052

A two-sample set for dilution up to 2 L of reagent water.

Alkalinity as CaCO <sub>3</sub>	63 mg/L
Calcium, Ca	99.9 mg/L
Corrosivity (Langelier Index)	1.45
pH	9.12 mg/L
Residue-filterable (TDS)	578 mg/L
Sodium, Na	25 mg/L



## TURBIDITY - CONSTANT VALUE

### QCI-048

A single sample for dilution up to 2 L of turbidity-free reagent water.

Turbidity 9.12 NTU

## TRACE METALS BY ICP - CONSTANT VALUE

### QCI-050

A two-sample set for dilution, the values listed below are ampule concentration.

#### Sample 1

Antimony, Sb	30.7 µg/L
Arsenic, As	61.3 µg/L
Beryllium, Be	71.6 µg/L
Cadmium, Cd	102 µg/L
Calcium, Ca	112 µg/L
Chromium, Cr	40.9 µg/L
Cobalt, Co	61.1 µg/L
Copper, Cu	71.2 µg/L
Iron, Fe	30.7 µg/L
Lead, Pb	71.5 µg/L
Lithium, Li	61.6 µg/L
Magnesium, Mg	91.9 µg/L
Manganese, Mn	40.9 µg/L
Molybdenum, Mo	91.9 µg/L
Nickel, Ni	71.2 µg/L
Selenium, Se	122 µg/L
Strontium, Sr	143 µg/L
Thallium, Tl	133 µg/L
Titanium, Ti	72.1 µg/L
Vanadium, V	91.7 µg/L
Zinc, Zn	30.6 µg/L

#### Sample 2

Aluminium, Al	561 µg/L
Barium, Ba	664 µg/L
Boron, B	816 µg/L
Potassium, K	3780 µg/L
Silicon, Si	3060 µg/L
Silver, Ag	256 µg/L
Sodium, Na	765 µg/L



# CALIBRATION REFERENCE MATERIALS AND STANDARDS

The availability of high quality calibration reference materials is fundamental to reliable instrument calibration. In the certification of CRMs and QCs, we use significant numbers of pure substance RMs for instrument calibration. We have discovered that the quality of RMs is crucial to analytical reliability.

When selecting a pure substance or calibration RM, it is important to ensure that it properly complies with the full definition of a RM. There have been some recent changes to the definitions. The new and simplified definition of a reference material was agreed by ISO REMCO in April, 2005: a material, sufficiently homogeneous and stable with respect to one or more specified properties, which has been established to be fit for its intended use, in a measurement process. This new definition is pending approval and once approved it will be published in the "VIM", the International Vocabulary of Basic and General Terms in Metrology.

Whereas a certified reference material is defined as  
A reference material, characterized by a metrologically valid procedure for one or more specified properties, and accompanied by a certificate that states the value of the specified property, its associated uncertainty and a statement of metrological traceability.

The key issue is the demonstration of uncertainty and traceability.

RTC offers a comprehensive range of reference materials: single element CRMs and ICP Standards; Ion Chromatography and hydrocarbon RMs; and a unique range of environmental "biomarker" RMs from Chiron AS (available in North America only.)

## Chiron AS

For more than 20 years, Chiron AS has been synthesizing organic standards and reference materials for environmental analysis. In this catalogue we list only a very small selection of those that complement the RTC range of CRMs. In North America, all Chiron AS Products are available from RTC.

Some of the most significant RMs categories in the Chiron range:

Petroleum Hydrocarbons  
Exploration and Environmental Aspects  
Hopanes  
Steranes  
Alkanes  
Aromatics  
Oil Spill Analysis

Environmental Standards  
Standards  
Toxicology  
Metabolism and Exposure kits  
PAHs PBDEs P-PHOS POPS others  
Endocrine disruption  
Forensics and Narcotics

Mono-F Internal standards  
Principles  
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CAL



## PCBs

### Native PCBs

Chiron offers single native PCBs in solution and as neat material for analysis and toxicological studies. Mixtures are offered according to international methods and upon request.

PCB congeners are classified as:

- Coplanar, dioxin like with no substitution or monosubstitution in the ortho-positions
- Nonplanar with two or more substitutions in the ortho-positions

PCB NO	PRODUCT NAME	PROD #	CAS	CONCEN	SOLVENT	UNIT
PCB-28	2,4,4'-Trichlorobiphenyl	1999.12	7012-37-5	10 µg/mL	Isooctane	1.1 mL
PCB-52	2,2',5,5'-Tetrachlorobiphenyl	2000.12	35693-99-3	10 µg/mL	Isooctane	1.1 mL
PCB-77	3,3',4,4'-Tetrachlorobiphenyl	2006.12	32598-13-3	10 µg/mL	Isooctane	1.1 mL
PCB-81	3,4,4',5-Tetrachlorobiphenyl	2007.12	70362-50-4	10 µg/mL	Isooctane	1.1 mL
PCB-101	2,2',4,5,5'-Pentachlorobiphenyl	2001.12	37680-73-2	10 µg/mL	Isooctane	1.1 mL
PCB-105	2,3,3',4,4'-Pentachlorobiphenyl	2008.12	32598-14-4	10 µg/mL	Isooctane	1.1 mL
PCB-114	2,3,4,4',5-Pentachlorobiphenyl	2009.12	74472-37-0	10 µg/mL	Isooctane	1.1 mL
PCB-118	2,3',4,4',5-Pentachlorobiphenyl	2002.12	31508-00-6	10 µg/mL	Isooctane	1.1 mL
PCB-123	2',3,4,4',5-Pentachlorobiphenyl	2011.12	65510-44-3	10 µg/mL	Isooctane	1.1 mL
PCB-126	3,3',4,4',5-Pentachlorobiphenyl	2012.12	57465-28-8	10 µg/mL	Isooctane	1.1 mL
PCB-138	2,2',3,4,4',5'-Hexachlorobiphenyl	2003.12	35065-28-2	10 µg/mL	Isooctane	1.1 mL
PCB-153	2,2',4,4',5,5'-Hexachlorobiphenyl	2004.12	35065-27-1	10 µg/mL	Isooctane	1.1 mL
PCB-156	2,3,3',4,4',5-Hexachlorobiphenyl	2013.12	38380-08-4	10 µg/mL	Isooctane	1.1 mL
PCB-157	2,3,3',4,4',5'-Hexachlorobiphenyl	2014.12	69782-90-7	10 µg/mL	Isooctane	1.1 mL
PCB-167	2,3',4,4',5,5'-Hexachlorobiphenyl	2015.12	52663-72-6	10 µg/mL	Isooctane	1.1 mL
PCB-180	2,2',3,4,4',5,5'-Heptachlorobiphenyl	2005.12	35065-29-3	10 µg/mL	Isooctane	1.1 mL
PCB-189	2,3,3',4,4',5,5'-Heptachlorobiphenyl	2016.12	39635-31-9	10 µg/mL	Isooctane	1.1 mL

*In Addition to these products, all 209 PCBs are available.*

*Please inquire with your specifications (quantity, concentration, etc.).*

## PBDEs

Polybrominated Diphenylethers (PBDEs) have been used as flame retardants over the past two decades and are globally distributed in the environment. PBDEs accumulate in the food chain, and there is a strong concern about the health effects of PBDE exposure.

BDE NO	PRODUCT NAME	PROD #	CONCEN	SOLVENT	UNIT
BDE-25	2,3',4-Tribromodiphenyl ether	1960.12	50 µg/mL	Isooctane	1 mL
BDE-28	2,4,4'-Tribromodiphenyl ether	1961.12	50 µg/mL	Isooctane	1.1 mL
BDE-47	2,2',4,4'-Tetrabromodiphenyl ether	1962.12	50 µg/mL	Isooctane	1 mL
BDE-49	2,2',4,5'-Tetrabromodiphenyl ether	1963.12	50 µg/mL	Isooctane	1 mL
BDE-66	2,3',4,4-Tetrabromodiphenyl ether	1964.12	50 µg/mL	Isooctane	1 mL
BDE-71	2,3',4',6-Tetrabromodiphenyl ether	1965.12	50 µg/mL	Isooctane	1 mL
BDE-75	2,4,4',6-Tetrabromodiphenylether	1990.12	50 µg/mL	Isooctane	1 mL
BDE-77	3,3',4,4'-Tetrabromodiphenylether	1991.12	50 µg/mL	Isooctane	1.1 mL
BDE-85	2,2',3,4,4'-Pentabromodiphenyl ether	1966.12	50 µg/mL	Isooctane	1 mL
BDE-99	2,2',4,4',5-Pentabromodiphenyl ether	1967.12	50 µg/mL	Isooctane	1 mL
BDE-100	2,2',4,4',6-Pentabromodiphenyl ether	1968.12	50 µg/mL	Isooctane	1 mL
BDE-119	2,3',4,4',6-Pentabromodiphenyl ether	1969.12	50 µg/mL	Isooctane	1 mL
BDE-138	2,2',3,4,4',5-Hexabromodiphenyl ether	1970.12	50 µg/mL	Isooctane	1.1 mL
BDE-153	2,2',4,4',5,5'-Hexabromodiphenyl ether	1971.12	50 µg/mL	Isooctane	1 mL
BDE-154	2,2',4,4',5,6'-Hexabromodiphenyl ether	1972.12	50 µg/mL	Isooctane	1 mL
BDE-183	2,2',3,4,4',5',6'-Heptabromodiphenyl ether	1973.12	50 µg/mL	Isooctane	1.1 mL
BDE-190	2,3,3',4,4',5,6-Heptabromodiphenyl ether	1992.12	50 µg/mL	Isooctane	1 mL
BDE-203	2,2',3,4,4',5,5',6'-Octabromodiphenyl ether	1975.12	50 µg/mL	Isooctane	1.1 mL
BDE-209	Decabromodiphenyl ether	1811.12	50 µg/mL	Isooctane	1 mL



The Fluorinated internal standards offered by Chiron have several advantages over the more traditionally used <sup>13</sup>C isotopes and unlabeled internal standards:

- Cost efficient - cheaper than the <sup>13</sup>C isotopes
- Gives one single, pure isotope (Fluoro has only one isotope)
- Can be used with GC-ECD detection; <sup>13</sup>C cannot because they will coelute with the native
- Do not discriminate from the native upon work-up
- “Designer retention times” (ortho-, meta-, para-Fluoro) possible for optimal elution rate

## Fluoro-PCBs (Internal Standards)

FLUORO-PCB No.	PRODUCT NAME	PROD. #	CONCEN.	SOLVENT	UNIT
<b>Fluoro-PCB-3 (para)</b>	4-Chloro-4'-fluorobiphenyl	2654.12	100 µg/mL	Isooctane	1 mL
<b>Fluoro-PCB-15</b>	3-Fluoro-4,4'-dichlorobiphenyl	2655.12	100 µg/mL	Isooctane	1 mL
<b>Fluoro-PCB-18 (meta)</b>	3-Fluoro-2,2',5-trichlorobiphenyl	2656.12	100 µg/mL	Isooctane	1 mL
<b>Fluoro-PCB-22 (meta)</b>	3'-Fluoro-2,3,4'-trichlorobiphenyl	2657.12	100 µg/mL	Isooctane	1 mL
<b>Fluoro-PCB-28 (meta)</b>	3',-Fluoro-2,4,4'-trichlorobiphenyl	2228.12	100 µg/mL	Isooctane	1 mL
<b>Fluoro-PCB-29 (meta)</b>	3'-Fluoro-2,4,5-trichlorobiphenyl	2223.12	100 µg/mL	Isooctane	1 mL
<b>Fluoro-PCB-30 (meta)</b>	3'-Fluoro-2,4,6-trichlorobiphenyl	2225.12	100 µg/mL	Isooctane	1 mL
<b>Fluoro-PCB-30 (ortho)</b>	2'-Fluoro-2,4,6-trichlorobiphenyl	2224.12	100 µg/mL	Isooctane	1 mL
<b>Fluoro-PCB-30 (para)</b>	4'-Fluoro-2,4,6-trichlorobiphenyl	2229.12	100 µg/mL	Isooctane	1 mL
<b>Fluoro-PCB-31 (meta)</b>	3'-Fluoro-2,4',5-trichlorobiphenyl	2175.12	100 µg/mL	Isooctane	1 mL
<b>Fluoro-PCB-37 (meta)</b>	3'-Fluoro-3,4,4'-trichlorobiphenyl	2658.12	100 µg/mL	Isooctane	1 mL
<b>Fluoro-PCB-39</b>	3'-Fluoro-3,4',5-trichlorobiphenyl	2666.12	100 µg/mL	Isooctane	1 mL
<b>Fluoro-PCB-44</b>	3-Fluoro-2,2',3,5'-tetrachlorobiphenyl	2659.12	100 µg/mL	Isooctane	1 mL
<b>Fluoro-PCB-49 (meta)</b>	3-Fluoro-2,2',4,5-tetrachlorobiphenyl	2667.12	100 µg/mL	Isooctane	1 mL
<b>Fluoro-PCB-52 (meta)</b>	3-Fluoro-2,2',5,5'-tetrachlorobiphenyl	2660.12	100 µg/mL	Isooctane	1 mL
<b>Fluoro-PCB-67</b>	4'-Fluoro-2,3',4,5-tetrachlorobiphenyl	2222.12	100 µg/mL	Isooctane	1 mL
<b>Fluoro-PCB-81</b>	3'-Fluoro-2,3,4,4',5-Tetrachlorobiphenyl	2344.12	100 µg/mL	Isooctane	1 mL

## Fluoro-PBDEs (Internal Standards)

FLUORO-BDE No.	PRODUCT NAME	PROD. #	CONCEN.	SOLVENT	UNIT
<b>Fluoro-BDE-25</b>	4'-Fluoro-2,3',4-tribromodiphenyl ether	1926.12	15 µg/mL	Isooctane	1 mL
<b>Fluoro-BDE-27</b>	4'-Fluoro-2,3',6-tribromodiphenyl ether	1927.12	15 µg/mL	Isooctane	1 mL
<b>Fluoro-BDE-28</b>	3'-Fluoro-2,4,4'-tribromodiphenyl ether	2160.12	50 µg/mL	Toluene	1 mL
<b>Fluoro-BDE-47</b>	6-Fluoro-2,2',4,4'-tetrabromodiphenyl ether	2161.12	50 µg/mL	Toluene or Isooctane	1 mL
<b>Fluoro-BDE-66</b>	6-Fluoro-2,3',4,4'-tetrabromodiphenyl ether	2162.12	50 µg/mL	Isooctane	1 mL
<b>Fluoro-BDE-69</b>	4'-Fluoro-2,3',4,6-tetrabromodiphenyl ether	1928.12	15 µg/mL	Isooctane	1 mL
<b>Fluoro-BDE-100</b>	3-Fluoro-2,2',4,4',6-pentabromodiphenyl ether	2163.12	50 µg/mL	Toluene	1 mL
<b>Fluoro-BDE-119</b>	3-Fluoro-2,3',4,4',6-pentabromodiphenyl ether	2164.12	50 µg/mL	Isooctane	1 mL
<b>Fluoro-BDE-160</b>	4'-Fluoro-2,3,3',4,5,6-hexabromodiphenyl ether	1929.12	50 µg/mL	Toluene	1 mL
<b>FF-BDE-201 (IUPAC)</b>	2,4'-Difluoro-2,3,3',4,5,5',6,6'-octabromodiphenyl ether	2167.12	50 µg/mL	Toluene	1 mL
<b>Fluoro-BDE-208</b>	4'-Fluoro-2,2',3,3',4,5,5',6,6'-nonabromodiphenyl ether	2168.12	50 µg/mL	Isooctane	1 mL

CAL

We have entered into an arrangement with Inorganic Ventures to supply their line of single-element CRMs to support the range of RTC environmental CRMs and QCs intended to be used in trace element analysis. There are many suppliers of single element reference materials, but only Inorganic Ventures has accreditation to ISO 17025:1999 as a producer of certified reference materials. The importance of using CRMs for trace element calibration cannot be overstated. They are the key to reliable instrument calibration and a cornerstone of good analytical quality.



Single Element CRMs are:

- NIST Traceable
- Produced and Certified to ISO 17025 ( A2LA Certificate # 0883-2)
- Available in a range of concentrations and pack sizes
- Accompanied by a Certificate of Analysis that meets all ISO Requirements.

**All Single Element CRMs are supplied in an acid matrix and can be shipped by any means, there will be a Hazardous Materials Fee per shipment.**

ELEMENT	STARTING MATERIAL, MATRIX	VOL.	CONCENTRATION			
			10 µG/ML	100 µG/ML	1000 µG/ML	10000 µG/ML
			PRODUCT #	PRODUCT #	PRODUCT #	PRODUCT #
Aluminium, Al	Al, HNO <sub>3</sub>	125 mL	MSAL-10PPM	MSAL-100PPM	CGAL1-1	CGAL10-1
		250 mL			CGAL1-2	
		500 mL			CGAL1-5	CGAL10-5
	Al, HCl	125 mL			CGALCL1-1	
		250 mL			CGALCL1-2	
		500 mL			CGALCL1-5	
Antimony, Sb	Sb, Tartaric Acid/ HNO <sub>3</sub>	125 mL	MSSB-10PPM	MSSB-100PPM	CGSB1-1	CGSB10-1
		250 mL			CGSB1-2	
		500 mL			CGSB1-5	CGSB10-5
Arsenic, As	As, HNO <sub>3</sub>	125 mL	MSAS-10PPM	MSAS-100PPM	CGAS1-1	CGAS10-1
		250 mL			CGAS1-2	
		500 mL			CGAS1-5	CGAS10-5
Barium, Ba	Ba(NO <sub>3</sub> ) <sub>2</sub> , HNO <sub>3</sub>	125 mL	MSBA-10PPM	MSBA-100PPM	CGBA1-1	CGBA10-1
		250 mL			CGBA1-2	
		500 mL			CGBA1-5	CGBA10-5
Beryllium, Be	Be <sub>4</sub> O(C <sub>2</sub> H <sub>3</sub> O <sub>2</sub> ) <sub>6</sub> , HNO <sub>3</sub>	125 mL	MSBE-10PPM	MSBE-100PPM	CGBE1-1	CGBE10-1
		250 mL			CGBE1-2	
		500 mL			CGBE1-5	CGBE10-5
Bismuth, Bi	Bi, HNO <sub>3</sub>	125 mL	MSBI-10PPM	MSBI-100PPM	CGBI1-1	CGBI10-1
		250 mL			CGBI1-2	
		500 mL			CGBI1-5	CGBI10-5
Boron, B	H <sub>3</sub> BO <sub>3</sub> , NH <sub>4</sub> OH	125 mL			CGB1-1	CGB10-1
		250 mL			CGB1-2	CGB10-5
		500 mL			CGB1-5	
Cadmium, Cd	Cd, HNO <sub>3</sub>	125 mL	MSCD-10PPM	MSCD-100PPM	CGCD1-1	CGCD10-1
		250 mL			CGCD1-2	
		500 mL			CGCD1-5	CGCD10-5
Calcium, Ca	CaCO <sub>3</sub> , HNO <sub>3</sub>	125 mL	MSCA-10PPM	MSCA-100PPM	CGCA1-1	CGCA10-1
		250 mL			CGCA1-2	
		500 mL			CGCA1-5	CGCA10-5
Carbon, C	CH <sub>3</sub> CO <sub>2</sub> H, H <sub>2</sub> O	125 mL			CGC1-1	CGC10-1
		500 mL			CGC1-5	CGC10-5
Cerium, Ce	Ce, HNO <sub>3</sub>	125 mL			CGCE1-1	CGCE10-1
		500 mL			CGCE1-5	CGCE10-5
Cesium, Cs	Cs <sub>2</sub> CO <sub>3</sub> , HNO <sub>3</sub>	125 mL			CGCS1-1	CGCS10-1
		500 mL			CGCS1-5	CGCS10-5
Chromium, Cr	Cr(NO <sub>3</sub> ) <sub>3</sub> , HNO <sub>3</sub>	125 mL	MSCR3-10PPM	MSCR3-100PPM	CGCR(3)1-1	CGCR(3)10-1
		250 mL			CGCR(3)1-2	
		500 mL			CGCR(3)1-5	CGCR(3)10-5
Chromium VI, Cr VI	(Na <sub>2</sub> ) <sub>2</sub> Cr <sub>2</sub> O <sub>7</sub> , H <sub>2</sub> O	125 mL			CGCR(3)1-1	CGCR(3)10-1
		500 mL			CGCR(3)1-2	CGCR(3)10-5

ELEMENT	STARTING MATERIAL, MATRIX	CONCENTRATION				
		VOL.	10 µG/ML PRODUCT #	100 µG/ML PRODUCT #	1000 µG/ML PRODUCT #	10000 µG/ML PRODUCT #
<b>Cobalt, Co</b>	Co, HNO <sub>3</sub>	125 mL	MSCO-10PPM	MSCO-100PPM	CGC01-1	CGC010-1
		250 mL			CGC01-2	
		500 mL			CGC01-5	CGC010-5
<b>Copper, Cu</b>	Cu, HNO <sub>3</sub>	125 mL	MSCU-10PPM	MSCU-100PPM	CGCU1-1	CGCU10-1
		250 mL			CGCU1-2	
		500 mL			CGCU1-5	CGCU10-5
<b>Dysprosium, Dy</b>	Dy <sub>2</sub> O <sub>3</sub> , HNO <sub>3</sub>	125 mL			CGDY1-1	CGDY10-1
		500 mL			CGDY1-5	CGDY10-5
<b>Erbium, Er</b>	Er <sub>2</sub> O <sub>3</sub> , HNO <sub>3</sub>	125 mL			CGER1-1	CGER10-1
		500 mL			CGER1-5	CGER10-5
<b>Europium, Eu</b>	Eu <sub>2</sub> O <sub>3</sub> , HNO <sub>3</sub>	125 mL			CGEU1-1	CGEU10-1
		500 mL			CGEU1-5	CGEU10-5
<b>Gadolinium, Gd</b>	Gd <sub>2</sub> O <sub>3</sub> , HNO <sub>3</sub>	125 mL			CGGD1-1	CGGD10-1
		500 mL			CGGD1-5	CGGD10-5
<b>Gallium, Ga</b>	Ga, HNO <sub>3</sub>	125 mL			CGGA1-1	CGGA10-1
		500 mL			CGGA1-5	CGGA10-5
<b>Germanium, Ge</b>	Ge, HNO <sub>3</sub> /tr. HF	125 mL	MSGE-10PPM	MSGE-100PPM	CGGE1-1	CGGE10-1
		500 mL			CGGE1-5	CGGE10-5
<b>Gold, Au</b>	AuCl <sub>3</sub> , HCl	125 mL			CGAU1-1	CGAU10-1
		500 mL			CGAU1-5	CGAU10-5
	AuCl <sub>3</sub> , HNO <sub>3</sub> tr. Cl	125 mL			CGAUN1-1	
		500 mL			CGAUN1-5	
<b>Hafnium, Hf</b>	HfCl <sub>2</sub> O, HCl	125 mL			CGHF1-1	CGHF10-1
		500 mL			CGHF1-5	CGHF10-5
<b>Holmium, Ho</b>	Ho <sub>2</sub> O <sub>3</sub> , HNO <sub>3</sub>	125 mL	MSHO-10PPM	MSHO-100PPM	CGHO1-1	CGHO10-1
		500 mL			CGHO1-5	CGHO10-5
<b>Indium, In</b>	In, HNO <sub>3</sub>	125 mL	MSIN-10PPM	MSIN-100PPM	CGIN1-1	CGIN10-1
		500 mL			CGIN1-5	CGIN10-5
<b>Iridium, Ir</b>	IrCl <sub>3</sub> , HCl	125 mL			CGIR1-1	CGIR10-1
		500 mL			CGIR1-5	CGIR10-5
<b>Iron, Fe</b>	Fe, HNO <sub>3</sub>	125 mL	MSFE-10PPM	MSFE-100PPM	CGFE1-1	CGFE10-1
		250 mL			CGFE1-2	
		500 mL			CGFE1-5	CGFE10-5
<b>Lanthanum, La</b>	La <sub>2</sub> O <sub>3</sub> , HNO <sub>3</sub>	125 mL			CGLA1-1	CGLA10-1
		500 mL			CGLA1-5	CGLA10-5
<b>Lead, Pb</b>	Pb, HNO <sub>3</sub>	125 mL	MSPB-10PPM	MSPB-100PPM	CGPB1-1	CGPB10-1
		250 mL			CGPB1-2	
		500 mL			CGPB1-5	CGPB10-5
<b>Lithium, Li</b>	Li <sub>2</sub> CO <sub>3</sub> , HNO <sub>3</sub>	125 mL			CGLI1-1	CGLI10-1
		500 mL			CGLI1-5	CGLI10-5
<b><sup>6</sup>Lithium, Li</b>	Li, HNO <sub>3</sub> (Isotopically Enriched)	125 mL	MSLI-10PPM	MSLI-100PPM	CG6LI1-1	
		500 mL			CG6LI1-5	
<b>Lutetium, Lu</b>	Lu <sub>2</sub> O <sub>3</sub> , HNO <sub>3</sub>	125 mL			CGLU1-1	CGLU10-1
		500 mL			CGLU1-5	CGLU10-5
<b>Magnesium, Mg</b>	Mg, HNO <sub>3</sub>	125 mL	MSMG-10PPM	MSMG-100PPM	CGMG1-1	CGMG10-1
		250 mL			CGMG1-2	
		500 mL			CGMG1-5	CGMG10-5
<b>Manganese, Mn</b>	Mn, HNO <sub>3</sub>	125 mL	MSMN-10PPM	MSMN-100PPM	CGMN1-1	CGMN10-1
		250 mL			CGMN1-2	
		500 mL			CGMN1-5	CGMN10-5
<b>Mercury, Hg</b>	Hg, HNO <sub>3</sub>	125 mL	MSHG-10PPM	MSHG-100PPM	CGHG1-1	CGHG10-1
		250 mL			CGHG1-2	
		500 mL			CGHG1-5	CGHG10-5
<b>Molybdenum, Mo</b>	(NH <sub>4</sub> ) <sub>2</sub> MoO <sub>4</sub> ·H <sub>2</sub> O	125 mL	MSMO-10PPM	MSMO-100PPM	CGMO1-1	CGMO10-1
		250 mL			CGMO1-2	
		500 mL			CGMO1-5	CGMO10-5
<b>Neodymium, Nd</b>	Nd <sub>2</sub> O <sub>3</sub> , HNO <sub>3</sub>	125 mL			CGND1-1	CGND10-1
		500 mL			CGND1-5	CGND10-5
<b>Nickel, Ni</b>	Ni, HNO <sub>3</sub>	125 mL	MSNI-10PPM	MSNI-100PPM	CGNI1-1	CGNI10-1
		250 mL			CGNI1-2	
		500 mL			CGNI1-5	CGNI10-5
<b>Niobium, Nb</b>	NbCl <sub>5</sub> , HF	125 mL			CGNB1-1	CGNB10-1
		500 mL			CGNB1-5	CGNB10-5
<b>Osmium, Os</b>	(NH <sub>4</sub> ) <sub>2</sub> OsCl <sub>6</sub> ·HCl	125 mL			CGOS1-1	
		500 mL			CGOS1-5	

CAL

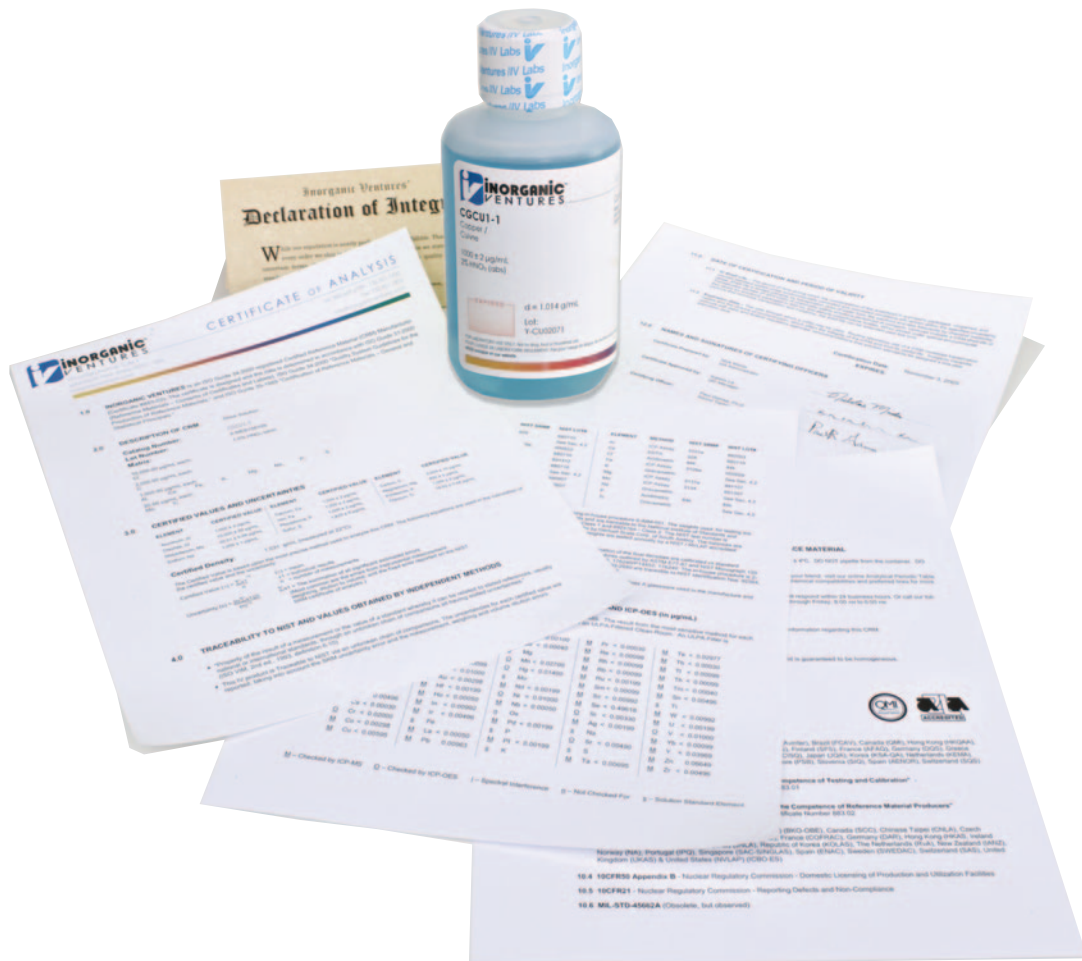


# SINGLE-ELEMENT SAMPLES

CAL

ELEMENT	STARTING MATERIAL, MATRIX	CONCENTRATION				
		VOL.	10 µG/ML	100 µG/ML	1000 µG/ML	10000 µG/ML
			PRODUCT #	PRODUCT #	PRODUCT #	PRODUCT #
Palladium, Pd	Pd, HCl	125 mL			CGPD1-1	CGPD10-1
		500 mL			CGPD1-5	CGPD10-5
	Pd, HNO <sub>3</sub>	125 mL			CGPDN1-1	
		500 mL			CGPDN1-5	
Phosphorus, P	P, HNO <sub>3</sub>	125 mL			CGP1-1	CGP10-1
		250 mL			CGP1-2	
		500 mL			CGP1-5	CGP10-5
Platinum, Pt	Pt, HCl	125 mL			CGPT1-1	CGPT10-1
		500 mL			CGPT1-5	CGPT10-5
	Pt, HNO <sub>3</sub> tr. Cl	125 mL			CGPTN1-1	
		500 mL			CGPTN1-5	
Potassium, K	KNO <sub>3</sub> , HNO <sub>3</sub>	125 mL	MSK-10PPM	MSK-100PPM	CGK1-1	CGK10-1
		250 mL			CGK1-2	
		500 mL			CGK1-5	CGK10-5
Praseodymium, Pr	Pr <sub>6</sub> O <sub>11</sub> , HNO <sub>3</sub>	125 mL			CGPR1-1	CGPR10-1
		500 mL			CGPR1-5	CGPR10-5
Rhenium, Re	Re, HNO <sub>3</sub>	125 mL			CGRE1-1	CGRE10-1
		500 mL			CGRE1-5	CGRE10-5
Rhodium, Rh	RhCl <sub>3</sub> , HCl	125 mL	MSRH-10PPM	MSRH-100PPM	CGRH1-1	CGRH10-1
		500 mL			CGRH1-5	CGRH10-5
Rubidium, Rb	Rb <sub>2</sub> CO <sub>3</sub> , HNO <sub>3</sub>	125 mL			CGRB1-1	CGRB10-1
		500 mL			CGRB1-5	CGRB10-5
Ruthenium, Ru	RuCl <sub>3</sub> , HCl	125 mL			CGRU1-1	CGRU10-1
		500 mL			CGRU1-5	CGRU10-5
Samarium, Sm	Sm <sub>2</sub> O <sub>3</sub> , HNO <sub>3</sub>	125 mL			CGSM1-1	CGSM10-1
		500 mL			CGSM1-5	CGSM10-5
Scandium, Sc	Sc <sub>2</sub> O <sub>3</sub> , HNO <sub>3</sub>	125 mL	MSSC-10PPM	MSSC-100PPM	CGSC1-1	CGSC10-1
		500 mL			CGSC1-5	CGSC10-5
Selenium, Se	Se, HNO <sub>3</sub>	125 mL	MSSE-10PPM	MSSE-100PPM	CGSE1-1	CGSE10-1
		250 mL			CGSE1-2	
		500 mL			CGSE1-5	CGSE10-5
Silicon, Si	Si, HNO <sub>3</sub> /HF	125 mL			CGSI1-1	CGSI10-1
		250 mL			CGSI1-2	
		500 mL			CGSI1-5	CGSI10-5
	SiO <sub>2</sub> , NaOH	125 mL			CGSIONA1-1	
500 mL				CGSIONA1-5		
Silica, SiO <sub>2</sub>	SiO <sub>2</sub> , HNO <sub>3</sub> /HF	125 mL			CGSIO1-1	
		500 mL			CGSIO1-5	
	SiO <sub>2</sub> , NaOH	125 mL			CGSINA1-1	
		500 mL			CGSINA1-5	
Silver, Ag	Ag, HNO <sub>3</sub>	125 mL			CGAG1-1	CGAG10-1
		250 mL			CGAG1-2	
		500 mL			CGAG1-5	CGAG10-5
Sodium, Na	Na <sub>2</sub> CO <sub>3</sub> , HNO <sub>3</sub>	125 mL	MSNA-10PPM	MSNA-100PPM	CGNA1-1	CGNA10-1
		250 mL			CGNA1-2	
		500 mL			CGNA1-5	CGNA10-5
Strontium, Sr	Sr(NO <sub>3</sub> ) <sub>2</sub> , HNO <sub>3</sub>	125 mL	MSSR-10PPM	MSSR-100PPM	CGSR1-1	CGSR10-1
		250 mL			CGSR1-2	
		500 mL			CGSR1-5	CGSR10-5
Sulfur, S	(NH <sub>4</sub> ) <sub>2</sub> SO <sub>4</sub> , H <sub>2</sub> O	125 mL			CGMSA1-1	CGMSA10-1
		500 mL			CGMSA1-5	CGMSA10-5
	(NH <sub>4</sub> ) <sub>2</sub> SO <sub>4</sub> , H <sub>2</sub> O	125 mL			CGS1-1	CGS10-1
		500 mL			CGS1-5	CGS10-5
Tantalum, Ta	NH <sub>4</sub> TaF <sub>6</sub> , tr.F	125 mL			CGTA1-1	CGTA10-1
		500 mL			CGTA1-5	CGTA10-5
Tellurium, Te	Te, HCl	125 mL			CGTE1-1	CGTE10-1
		500 mL			CGTE1-5	CGTE10-5
	Te, HNO <sub>3</sub>	125 mL		MSTEN-100PPM	CGTEN1-1	
		500 mL			CGTEN1-5	
Terbium, Tb	Tb <sub>4</sub> O <sub>7</sub> , HNO <sub>3</sub>	125 mL	MSTB-10PPM	MSTB-100PPM	CGTB1-1	CGTB10-1
		500 mL			CGTB1-5	CGTB10-5
Thallium, Tl	Tl, HNO <sub>3</sub>	125 mL	MSTL-10PPM	MSTL-100PPM	CGTL1-1	CGTL10-1
		250 mL			CGTL1-2	
		500 mL			CGTL1-5	CGTL10-5
Thorium, Th	Th(NO <sub>3</sub> ) <sub>4</sub> , HNO <sub>3</sub>	125 mL	MSTH-10PPM	MSTH-100PPM	CGTH1-1	CGTH10-1
		500 mL			CGTH1-5	CGTH10-5

ELEMENT	STARTING MATERIAL, MATRIX	CONCENTRATION				
		VOL.	10 µG/ML	100 µG/ML	1000 µG/ML	10000 µG/ML
Thulium, Tm	Tm <sub>2</sub> O <sub>3</sub> , HNO <sub>3</sub>	125 mL			CGTM1-1	CGTM10-1
		500 mL			CGTM1-5	CGTM10-5
Tin, Sn	Sn, HCl	125 mL			CGSNCL1-1	
		500 mL			CGSNCL1-5	
	Sn, HNO <sub>3</sub> , tr. HF	125 mL	MSSN-10PPM	MSSN-100PPM	CGSN1-1	CGSN10-1
		250 mL			CGSN1-2	
		500 mL			CGSN1-5	CGSN10-5
Titanium, Ti	Ti, HNO <sub>3</sub> /tr. HF	125 mL	MSTI-10PPM	MSTI-100PPM	CGTI1-1	CGTI10-1
		250 mL			CGTI1-2	
	500 mL			CGTI1-5	CGTI10-5	
Tungsten, W	W, HNO <sub>3</sub> , tr. HF	125 mL			CGW1-1	CGW10-1
		500 mL			CGW1-5	CGW10-5
Uranium, U	U <sub>3</sub> O <sub>8</sub> , HNO <sub>3</sub>	125 mL	MSU-10PPM	MSU-100PPM	CGU1-1	CGU10-1
		500 mL			CGU1-5	CGU10-5
Vanadium, V	V <sub>2</sub> O <sub>5</sub> , HNO <sub>3</sub>	125 mL	MSV-10PPM	MSV-100PPM	CGV1-1	CGV10-1
		250 mL			CGV1-2	
	500 mL			CGV1-5	CGV10-5	
Ytterbium, Yb	Yb <sub>2</sub> O <sub>3</sub> , HNO <sub>3</sub>	125 mL			CGYB1-1	CGYB10-1
		500 mL			CGYB1-5	CGYB10-5
Yttrium, Y	Y <sub>2</sub> O <sub>3</sub> , HNO <sub>3</sub>	125 mL	MSY-10PPM	MSY-100PPM	CGY1-1	CGY10-1
		500 mL			CGY1-5	CGY10-5
Zinc, Zn	Zn, HNO <sub>3</sub>	125 mL	MSZN-10PPM	MSZN-100PPM	CGZN1-1	CGZN10-1
		250 mL			CGZN1-2	
	500 mL			CGZN1-5	CGZN10-5	
Zirconium, Zr	ZrCl <sub>2</sub> O, HCl	125 mL			CGZR1-1	CGZR10-1
		500 mL			CGZR1-5	CGZR10-5



CAL



## CALIBRATION STANDARD 1A

### WW-CAL-1A

- Matrix: 3.5% (abs) HNO<sub>3</sub>
- Volume: 125 mL
- Dilution: 1:100

Arsenic, As	1000 µg/mL
Barium, Ba	100 µg/mL
Boron, B	100 µg/mL
Cadmium, Cd	200 µg/mL
Calcium, Ca	1000 µg/mL
Copper, Cu	200 µg/mL
Manganese, Mn	200 µg/mL
Selenium, Se	500 µg/mL
Silver, Ag	50 µg/mL
Strontium, Sr	100 µg/mL

## 200.7 CALIBRATION STANDARD

### WW-CAL-2

- Matrix: 3.5% (abs) HNO<sub>3</sub>
- Volume: 125 mL
- Dilution: 1:100

Lithium, Li	500 µg/mL
Molybdenum, Mo	1000 µg/mL
Potassium, K	2000 µg/mL
Sodium, Na	1000 µg/mL
Titanium, Ti	1000 µg/mL

## 200.7 CALIBRATION STANDARD

### WW-CAL-3

- Matrix: 3.5% (abs) HNO<sub>3</sub>
- Volume: 125 mL
- Dilution: 1:100

Cesium, Ce	200 µg/mL
Cobalt, Co	200 µg/mL
Phosphorus, P	1000 µg/mL
Vanadium, V	200 µg/mL

## QC STANDARD FOR 200.7

### IV-19

- Matrix: 5% (abs) HNO<sub>3</sub>
- Volume: 125 mL
- Dilution: 1:100 or as required

Antimony, Sb	100 µg/mL
Arsenic, As	100 µg/mL
Beryllium, Be	100 µg/mL
Cadmium, Cd	100 µg/mL
Calcium, Ca	100 µg/mL
Chromium, Cr	100 µg/mL
Cobalt, Co	100 µg/mL
Copper, Cu	100 µg/mL
Iron, Fe	100 µg/mL
Lead, Pb	100 µg/mL
Magnesium, Mg	100 µg/mL
Manganese, Mn	100 µg/mL
Molybdenum, Mo	100 µg/mL
Nickel, Ni	100 µg/mL
Selenium, Se	100 µg/mL
Thallium, Tl	100 µg/mL
Titanium, Ti	100 µg/mL
Vanadium, V	100 µg/mL
Zinc, Zn	100 µg/mL

## 200.7 CALIBRATION STANDARD A

### WW-CAL-4A

- Matrix: 3.5% (abs) HNO<sub>3</sub> tr. HF
- Volume: 125 mL
- Dilution: 1:1000

Aluminium, Al	1000 µg/mL
Chromium, Cr	500 µg/mL
Mercury, Hg	200 µg/mL
Zinc, Zn	500 µg/mL

## 200.7 CALIBRATION STANDARD B

### WW-CAL-4B

- Matrix: 3.5% (abs) HNO<sub>3</sub> tr. HF
- Volume: 125 mL
- Dilution: 1:100

Silica, SiO <sub>2</sub>	1000 µg/mL
Tin, Sn	400 µg/mL

## 200.7 CALIBRATION STANDARD

### WW-CAL-5

- Matrix: 3.5% (abs) HNO<sub>3</sub>
- Volume: 125 mL
- Dilution: 1:100

Iron, Fe	1000 µg/mL
Lead, Pb	1000 µg/mL
Magnesium, Mg	1000 µg/mL
Nickel, Ni	200 µg/mL
Thallium, Tl	500 µg/mL

## 6020 CALIBRATION SOLUTION

### 6020CAL-1

- Matrix: 3.5% (abs) HNO<sub>3</sub>
- Volume: 125 mL
- Dilution: 1:100

Aluminium, Al	20 µg/mL
Antimony, Sb	20 µg/mL
Arsenic, As	20 µg/mL
Barium, Ba	20 µg/mL
Beryllium, Be	20 µg/mL
Cadmium, Cd	20 µg/mL
Calcium, Ca	20 µg/mL
Chromium, Cr	20 µg/mL
Cobalt, Co	20 µg/mL
Copper, Cu	20 µg/mL
Iron, Fe	20 µg/mL
Lead, Pb	20 µg/mL
Magnesium, Mg	20 µg/mL
Manganese, Mn	20 µg/mL
Nickel, Ni	20 µg/mL
Potassium, K	20 µg/mL
Selenium, Se	20 µg/mL
Silver, Ag	20 µg/mL
Sodium, Na	20 µg/mL
Thallium, Tl	20 µg/mL
Vanadium, V	20 µg/mL
Zinc, Zn	20 µg/mL



## 200.8 CALIBRATION STANDARD

### 2008CAL-2

- Matrix: 3.5% (abs) HNO<sub>3</sub>
- Volume: 125 mL
- Dilution: 1:100

Aluminium, Al	20 µg/mL
Arsenic, As	20 µg/mL
Barium, Ba	20 µg/mL
Beryllium, Be	20 µg/mL
Cadmium, Cd	20 µg/mL
Chromium, Cr	20 µg/mL
Cobalt, Co	20 µg/mL
Copper, Cu	20 µg/mL
Lead, Pb	20 µg/mL
Manganese, Mn	20 µg/mL
Nickel, Ni	20 µg/mL
Selenium, Se	20 µg/mL
Silver, Ag	20 µg/mL
Thallium, Tl	20 µg/mL
Thorium, Th	20 µg/mL
Uranium, U	20 µg/mL
Vanadium, V	20 µg/mL
Zinc, Zn	20 µg/mL

## 200.8 CALIBRATION SOLUTION

### WW-MSCAL-2

- Matrix: 3.5% (abs) HNO<sub>3</sub>
- Volume: 125 mL
- Dilution: 1:100

Aluminium, Al	20 µg/mL
Arsenic, As	20 µg/mL
Barium, Ba	20 µg/mL
Beryllium, Be	20 µg/mL
Cadmium, Cd	20 µg/mL
Chromium, Cr	20 µg/mL
Cobalt, Co	20 µg/mL
Copper, Cu	20 µg/mL
Lead, Pb	20 µg/mL
Manganese, Mn	20 µg/mL
Nickel, Ni	20 µg/mL
Selenium, Se	100 µg/mL
Silver, Ag	20 µg/mL
Thallium, Tl	20 µg/mL
Thorium, Th	20 µg/mL
Uranium, U	20 µg/mL
Vanadium, V	20 µg/mL
Zinc, Zn	20 µg/mL

## 200.8 CALIBRATION SOLUTION

### WW-MSCAL-1

- Matrix: 3.5% (abs) HNO<sub>3</sub>
- Volume: 125 mL
- Dilution: 1:100

Mercury, Hg	5 µg/mL
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## 200.8 CALIBRATION STANDARD

### 2008CAL-1

- Matrix: 3.5% (abs) HNO<sub>3</sub> tr. HF
- Volume: 125 mL
- Dilution: 1:100

Antimony, Sb	20 µg/mL
Molybdenum, Mo	20 µg/mL

CAL

# INORGANIC CALIBRATION STANDARDS\*

SOLUTION DESCRIPTION	CONCENTRATION	VOLUME	PRODUCT NUMBER
Alkalinity	500 µg/mL	100 mL	ALK-100
BOD	200 mg/L	100 mL	BOD200-100
COD	500 mg/L	500 mL	COD-500
MBAS	1000 mg/L	100 mL	MBA-100
Oil and Grease	1000 µg/mL	100 mL	OG-1000
Salinity	20% by Wt.	250 mL	SAL-20-250
Total Dissolved Solids	1000 mg/L	100 mL	TDS-100
TOC	1000 mg/L	100 mL	TOC-100
Total Suspended Solids	500 mg/L	100 mL	TSS-100
Turbidity	5 NTU	500 mL	TURB5-500
Phenol, total	800 µg/mL	100 mL	CAL-0220

\* For different volumes, concentrations or other inorganic solutions, contact us.



The use of Ion Chromatography in environmental analysis has increased rapidly over the last 2 years, as EPA Method 300 (Anions by Ion Chromatography) has been utilized by laboratories.

The range of RTC Ion Chromatography RMs is:

- Designed for use as both LCS and Calibration Standards in EPA Method 300.0 (Inorganic Anions by Ion Chromatography).
- Manufactured by RTC ISO Standard 17025 and ISO Guide 34.
- Traceable to NIST SRMs, where they exist (the RTC range is more extensive than that offered by NIST).

## Anions (Concentration 1000 µg/mL)

ION	RAW MATERIAL, MATRIX	VOLUME	PRODUCT NUMBER
<b>Acetate</b>	CH <sub>3</sub> CO <sub>2</sub> Na, H <sub>2</sub> O	100 mL	ICS-001-100
		500 mL	ICS-001-500
<b>Bromate</b>	BrNaO <sub>3</sub> , H <sub>2</sub> O	100 mL	ICS-002-100
		500 mL	ICS-002-500
<b>Bromide</b>	NaBr, H <sub>2</sub> O	100 mL	ICS-003-100
		500 mL	ICS-003-500
<b>Chlorate</b>	NaClO <sub>3</sub> , H <sub>2</sub> O	100 mL	ICS-004-100
		500 mL	ICS-004-500
<b>Chloride</b>	KCl, H <sub>2</sub> O	100 mL	ICS-005-100
		500 mL	ICS-005-500
<b>Chlorite</b>	NaClO <sub>2</sub> , H <sub>2</sub> O	100 mL	ICS-006-100
		500 mL	ICS-006-500
<b>Chromate</b>	K <sub>2</sub> CrO <sub>4</sub> , H <sub>2</sub> O	100 mL	ICS-007-100
		500 mL	ICS-007-500
<b>Cyanide, Complex</b>	K <sub>3</sub> Fe(CN) <sub>6</sub> , 1%KOH	100 mL	ICS-008-100
		500 mL	ICS-008-500
<b>Dichromate</b>	Na <sub>2</sub> Cr <sub>2</sub> O <sub>7</sub> , H <sub>2</sub> O	100 mL	ICS-009-100
		500 mL	ICS-009-500
<b>Fluoride</b>	NaF, H <sub>2</sub> O	100 mL	ICS-010-100
		500 mL	ICS-010-500
<b>Formate</b>	HCO <sub>2</sub> Na, H <sub>2</sub> O	100 mL	ICS-011-100
		500 mL	ICS-011-500
<b>Free Cyanide</b>	KCN 1%, KOH	100 mL	ICS-012-100
		500 mL	ICS-012-500
<b>Iodide</b>	KI, H <sub>2</sub> O	100 mL	ICS-013-100
		500 mL	ICS-013-500
<b>Nitrate</b>	NaNO <sub>3</sub> , H <sub>2</sub> O	100 mL	ICS-014-100
		500 mL	ICS-014-500
<b>Nitrate as N,</b>	NaNO <sub>3</sub> , H <sub>2</sub> O	100 mL	ICS-015-100
		500 mL	ICS-015-500
<b>Nitrite</b>	NaNO <sub>2</sub> , H <sub>2</sub> O	100 mL	ICS-016-100
		500 mL	ICS-016-500
<b>Nitrite as N</b>	NaNO <sub>2</sub> , H <sub>2</sub> O	100 mL	ICS-017-100
		500 mL	ICS-017-500
<b>Oxalate</b>	Na <sub>2</sub> C <sub>2</sub> O <sub>4</sub> , H <sub>2</sub> O	100 mL	ICS-018-100
		500 mL	ICS-018-500
<b>Perchlorate</b>	AgClO <sub>4</sub> , H <sub>2</sub> O	100 mL	ICS-019-100
		500 mL	ICS-019-500
<b>Phosphate</b>	KH <sub>2</sub> PO <sub>4</sub> , H <sub>2</sub> O	100 mL	ICS-020-100
		500 mL	ICS-020-500
<b>Phosphate as P</b>	KH <sub>2</sub> PO <sub>4</sub> , H <sub>2</sub> O	100 mL	ICS-021-100
		500 mL	ICS-021-500
<b>Sulfate</b>	K <sub>2</sub> SO <sub>4</sub> , H <sub>2</sub> O	100 mL	ICS-022-100
		500 mL	ICS-022-500
<b>Sulfide</b>	Na <sub>2</sub> S, 1% NaOH	100 mL	ICS-023-100
		500 mL	ICS-023-500
<b>Thiosulfate</b>	Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> , H <sub>2</sub> O	100 mL	ICS-024-100
		500 mL	ICS-024-500
<b>Thiocyanate</b>	NaSCN, H <sub>2</sub> O	100 mL	ICS-025-100
		500 mL	ICS-025-500

## Cations (Concentration 1000 µg/mL)

ION	RAW MATERIAL, MATRIX	VOLUME	PRODUCT NUMBER
<b>Ammonia as N</b>	(NH <sub>4</sub> ) <sub>2</sub> SO <sub>4</sub> , H <sub>2</sub> O	100 mL	ICS-026-100
		500 mL	ICS-026-500
<b>Ammonium as NH<sub>3</sub></b>	(NH <sub>4</sub> ) <sub>2</sub> SO <sub>4</sub> , H <sub>2</sub> O	100 mL	ICS-027-100
		500 mL	ICS-027-500
<b>Calcium</b>	CaCO <sub>3</sub> , H <sub>2</sub> O	100 mL	ICS-028-100
		500 mL	ICS-028-500
<b>Lithium</b>	Li <sub>2</sub> CO <sub>3</sub> , H <sub>2</sub> O	100 mL	ICS-029-100
		500 mL	ICS-029-500
<b>Magnesium</b>	Mg, H <sub>2</sub> O	100 mL	ICS-030-100
		500 mL	ICS-030-500
<b>Potassium</b>	KNO <sub>3</sub> , H <sub>2</sub> O	100 mL	ICS-031-100
		500 mL	ICS-031-500
<b>Sodium</b>	Na <sub>2</sub> CO <sub>3</sub> , H <sub>2</sub> O	100 mL	ICS-032-100
		500 mL	ICS-032-500
<b>Sodium</b>	NaCl, H <sub>2</sub> O	100 mL	ICS-033-100
		500 mL	ICS-033-500

## Multi-Ion Solution Standards

CATALOGUE NUMBER	SAMPLE SIZE	MATRIX	ELEMENT CONCENTRATIONS (µG/ML)					
<b>Anions</b>								
			<b>BR<sup>-</sup></b>	<b>CL<sup>-</sup></b>	<b>F<sup>-</sup></b>	<b>NO<sub>3</sub><sup>-</sup></b>	<b>PO<sub>4</sub><sup>-3</sup></b>	<b>SO<sub>4</sub><sup>-2</sup></b>
<b>MSS-001</b>	100 mL	H <sub>2</sub> O	100	100	100	100	100	100
<b>MSS-002</b>	100 mL	H <sub>2</sub> O		100	100			100
<b>MSS-003</b>	100 mL	H <sub>2</sub> O		30	20	100	150	150
<b>MSS-004</b>	100 mL	H <sub>2</sub> O	400	200	100	400	600	400
<b>Cations</b>								
			<b>CA<sup>+2</sup></b>	<b>K<sup>+</sup></b>	<b>LI<sup>+</sup></b>	<b>MG<sup>+</sup></b>	<b>NA<sup>+</sup></b>	<b>NH<sub>4</sub><sup>+</sup></b>
<b>MSS-005</b>	100 mL	H <sub>2</sub> O	500	500	50	250	200	250
<b>MSS-006</b>	100 mL	H <sub>2</sub> O	1000	200	50	200	200	400

These standards have been traced to NIST Standard Reference Materials (where available) and are guaranteed stable for 1 year.



The United States and Europe requires that underground storage tanks (UST) be constructed and managed in a way that minimizes leaks from the tanks and any subsequent leaks are properly cleaned up.

In most cases, there is a responsibility to mitigate releases from leaking underground storage tanks (LUSTs) by reporting spills to authorities within a specified time and by promptly cleaning up any spills and discharges. Mitigation efforts are required to take place immediately to prevent further release (e.g., remaining products should be removed from the leaking tank), prevent the spread of contamination into soil and groundwater, and to investigate contamination. All of this has placed an increasing work load on analytical laboratories. At the same time the clean-up of old industrial, military and chemical industry sites has further increased demand for UST analysis.

To complement RTC's range of TPH, Diesel and Gasoline in soil CRMs (pages 20 and 21). QCs (pages 77 and 78 ), we offer a comprehensive range of RMs intended for calibration of analytical systems.

## Gasoline Range Organics

### WIP VOA STANDARD

UST-104 (1.5 mL)

UST-104P (4 x 1.5 mL)

UST-104TP (10 x 1.5 mL)

- 2000 µg/mL in Methanol

Benzene	m-Xylene
Chlorobenzene	Methyl tert-butyl ether (MTBE)
1,2-Dichlorobenzene	o-Xylene
1,3-Dichlorobenzene	p-Xylene
1,4-Dichlorobenzene	Toluene
Ethylbenzene	

### REVISED PVOC MIX

UST-105 (1.5 mL)

UST-105P (4 x 1.5 mL)

UST-105TP (10 x 1.5 mL)

- 2000 µg/mL in Methanol

Benzene	o-Xylene
Ethylbenzene	p-Xylene
m-Xylene	Toluene
Methyl tert-butyl ether (MTBE)	

### REVISED PVOC MIXTURE

UST-106 (1.5 mL)

UST-106P (4 x 1.5 mL)

UST-106TP (10 x 1.5 mL)

- 1000 µg/mL in Methanol

1,2,4-Trimethylbenzene	Methyl tert-butyl ether (MTBE)
1,3,5-Trimethylbenzene	Naphthalene
Benzene	o-Xylene
Ethylbenzene	p-Xylene
m-Xylene	Toluene

### UST Mix

UST-111 (1.5 mL)

UST-111P (4 x 1.5 mL)

UST-111TP (10 x 1.5 mL)

- 2000 µg/mL in Methanol

Benzene	Methyl tert-butyl ether (MTBE)
1,2-Dibromoethane	Naphthalene
1,2-Dichloroethane	o-Xylene
Ethylbenzene	p-Xylene
Isopropylbenzene	Toluene
m-Xylene	

### NYSDEC STARS VOA

UST-109 (1.5 mL)

UST-109P (4 x 1.5 mL)

UST-109TP (10 x 1.5 mL)

- 2000 µg/mL in Methanol

1,2,4-Trimethylbenzene	n-Butylbenzene
1,3,5-Trimethylbenzene	n-Propylbenzene
4-Isopropyltoluene	Naphthalene
Benzene	o-Xylene
Ethylbenzene	p-Xylene
Isopropylbenzene	sec-Butylbenzene
m-Xylene	tert-Butylbenzene
Methyl tert-butyl ether (MTBE)	Toluene

### PRIMARY VPH STOCK STANDARD

UST-119 (1.5 mL)

UST-119P (4 x 1.5 mL)

UST-119TP (10 x 1.5 mL)

- 20000 µg/mL in Methanol

Benzene	n-Octane
Ethylbenzene	n-Pentane
m-Xylene	Naphthalene
1-Methylnaphthalene	1,2,3-Trimethylbenzene
Methyl tert-butyl ether (MTBE)	o-Xylene
n-Decane	p-Xylene
n-Dodecane	Toluene
n-Hexane	

### VPH MATRIX SPIKING SOLUTION

UST-120 (1.5 mL)

UST-120P (4 x 1.5 mL)

UST-120TP (10 x 1.5 mL)

- 50 µg/mL in Methanol

Benzene	n-Octane
Ethylbenzene	n-Pentane
Hexane	Naphthalene
m-Xylene	o-Xylene
1-Methylnaphthalene	p-Xylene
Methyl tert-butyl ether (MTBE)	1,2,3-Trimethylbenzene
n-Decane	Toluene
n-Dodecane	

## Gasoline Range Organics

### NWTPH-Gx SURROGATE STANDARD

UST-114 (1.5 mL)  
 UST-114P (4 x 1.5 mL)  
 UST-114TP (10 x 1.5 mL)

- 2500 µg/mL in Methanol

1,4-Difluorobenzene  
 4-Bromofluorobenzene

### PRIMARY VPH STANDARD

UST-124 (1.5 mL)  
 UST-124P (4 x 1.5 mL)  
 UST-124TP (10 x 1.5 mL)

- Methanol at specific concentrations

Benzene	500 µg/mL
2,5-Dibromotoluene	1000 µg/mL
Ethylbenzene	500 µg/mL
m-Xylene	1000 µg/mL
2-Methylpentane	1500 µg/mL
Methyl tert-butyl ether (MTBE)	1500 µg/mL
n-Nonane	1000 µg/mL
n-Pentane	1500 µg/mL
Naphthalene	1000 µg/mL
o-Xylene	1000 µg/mL
p-Xylene	1000 µg/mL
Toluene	1500 µg/mL
1,2,4-Trimethylbenzene	1000 µg/mL
2,2,4-Trimethylpentane	1500 µg/mL

### UNLEADED GASOLINE

Collected from three sources and compounded prior to formulation.

UST-155 (1.5 mL)  
 UST-155P (4 x 1.5 mL)  
 UST-155TP (10 x 1.5 mL)

- 5000 µg/mL in Methanol

UST-156 (1.5 mL)  
 UST-156P (4 x 1.5 mL)  
 UST-156TP (10 x 1.5 mL)

- 50000 µg/mL in Methanol

W-1366 (1 g)

- Neat

### AROMATIC HYDROCARBON STANDARD

UST-122 (1.5 mL)  
 UST-122P (4 x 1.5 mL)  
 UST-122TP (10 x 1.5 mL)

- 1000 µg/mL in Methylene chloride

2-Methylnaphthalene	Chrysene
Acenaphthene	Dibenz(a,h) anthracene
Acenaphthylene	Fluoranthene
Anthracene	Fluorene
Benzo(a)anthracene	Indeno(1,2,3-cd) pyrene
Benzo(b)fluoranthene	Naphthalene
Benzo(g,h,i)perylene	Phenanthrene
Benzo(k)fluoranthene	Pyrene

### PRIMARY VPH STANDARD

#### WITHOUT SURROGATE

UST-125 (1.5 mL)  
 UST-125P (4 x 1.5 mL)  
 UST-125TP (10 x 1.5 mL)

- Methanol at specific concentrations

Benzene	500 µg/mL
Ethylbenzene	500 µg/mL
m-Xylene	1000 µg/mL
2-Methylpentane	1500 µg/mL
Methyl tert-butyl ether (MTBE)	1500 µg/mL
n-Nonane	1000 µg/mL
n-Pentane	1000 µg/mL
Naphthalene	1000 µg/mL
o-Xylene	1000 µg/mL
p-Xylene	1000 µg/mL
Toluene	1500 µg/mL
1,2,4-Trimethylbenzene	1000 µg/mL
2,2,4-Trimethylpentane	1500 µg/mL

### GASOLINE RANGE ORGANICS (GRO)

UST-153 (1.5 mL)  
 UST-153P (4 x 1.5 mL)  
 UST-153TP (Data Package)

- 1000 µg/mL in Methylene chloride

Benzene	o-Xylene
Ethylbenzene	p-Xylene
m-Xylene	Toluene
Methyl tert-butyl ether (MTBE)	1,2,4-Trimethylbenzene
Naphthalene	1,3,5-Trimethylbenzene

## Diesel Range Organics

### NEW JERSEY - TRPH Mix, 1.5 mL

UST-100 (1.5 mL)  
 UST-100P (4 x 1.5 mL)  
 UST-100TP (10 x 1.5 mL)

- 2000 µg/mL in Methylene chloride/Carbon disulfide

n-Decane	n-Octadecane
n-Docosane	n-Octane
n-Dodecane	n-Octatriacontane
n-Eicosane	n-Tetracosane
n-Heptadecane	n-Tetradecane
n-Hexacosane	n-Tetraatriacontane
n-Hexadecane	n-Triacontane
n-Hexatriacontane	Phytane
n-Octacosane	Pristane

### DRO MIXTURE

UST-107 (1.5 mL)  
 UST-107P (4 x 1.5 mL)  
 UST-107TP (10 x 1.5 mL)

- 1000 µg/mL in Methylene chloride

n-Decane	n-Octadecane
n-Docosane	n-Pentacosane
n-Dodecane	n-Pentadecane
n-Eicosane	n-Tetracosane
n-Heneicosane	n-Tetradecane
n-Heptadecane	n-Tricosane
n-Hexadecane	n-Tridecane
n-Nonadecane	n-Undecane

CAI



## Diesel Range Organics

### EPH BY GC/FID

UST-108-1 (1.5 mL)

UST-108-1P (4 x 1.5 mL)

UST-108-1TP (10 x 1.5 mL)

- 50000 µg/mL in Methyl chloride.

10W30 Oil/#2 Diesel (1:1)

### EPH BY GC/FID

UST-108-2 (1.5 mL)

UST-108-2P (4 x 1.5 mL)

UST-108-2TP (10 x 1.5 mL)

- 5000 mg/mL in Methanol

### RETENTION TIME MIX

UST-110 (1.5 mL)

UST-110P (4 x 1.5 mL)

UST-110TP (10 x 1.5 mL)

- 1000 µg/mL in Methylene chloride

n-Docosane  
n-Dotriacotane  
n-Hexane

### NWTPH-HCID RETENTION TIME

#### STANDARD

UST-112 (1.5 mL)

UST-112P (4 x 1.5 mL)

UST-112TP (10 x 1.5 mL)

- 2500 µg/mL in Methylene chloride

n-Dodecane  
n-Tetracosane  
Toluene

### NWTPH-HCID SURROGATE

#### STANDARD

UST-113 (1.5 mL)

UST-113P (4 x 1.5 mL)

UST-113TP (10 x 1.5 mL)

- 5000 µg/mL in Methylene chloride

4-Bromofluorobenzene  
n-Pentacosane

### EPH AROMATIC HYDROCARBON

#### STANDARD

UST-115 (1.5 mL)

UST-115P (4 x 1.5 mL)

UST-115TP (10 x 1.5 mL)

- 2000 µg/mL in Methylene chloride

Acenaphthene  
Benzo(g,h,i)perylene  
Naphthalene  
Pyrene  
1,2,3-Trimethylbenzene  
Toluene

### EPH AROMATIC HYDROCARBON STANDARD

UST-116 (1.5 mL)

UST-116P (4 x 1.5 mL)

UST-116TP (10 x 1.5 mL)

- 1000 µg/mL in Methylene chloride

n-Decane  
n-Dodecane  
n-Heneicosane  
n-Hexadecane  
n-Octane  
n-Tetatriacontane

### EPH FRACTIONATION SOLUTION

UST-117 (1.5 mL)

UST-117P (4 x 1.5 mL)

UST-117TP (10 x 1.5 mL)

- 25 µg/mL in Hexane

Acenaphthene  
Acenaphthylene  
Benzo(a)anthracene  
Benzo(a)pyrene  
Benzo(b)fluoranthene  
Benzo(g,h,i)perylene  
Benzo(k)fluoranthene  
Chrysene  
Dibenz(a,h)anthracene  
Fluoranthene  
Fluorene  
Indeno(1,2,3-cd)pyrene  
n-Decane  
n-Dodecane  
n-Heneicosane  
n-Hexadecane  
n-Octane  
n-Tetatriacontane  
Naphthalene  
Phenanthrene  
Pyrene

### EPH SURROGATE SPIKING SOLUTION

UST-118 (1.5 mL)

UST-118P (4 x 1.5 mL)

UST-118TP (10 x 1.5 mL)

- 2000 µg/mL in Acetone

1-Chlorooctadecane  
o-Terphenyl

### EPH MATRIX SPIKE

UST-123 (4 x 25 mL)

- 50 µg/mL in Acetone

Acenaphthene  
Anthracene  
Chrysene  
n-Eicosane  
n-Nonadecane  
n-Nonane  
n-Octacosane  
n-Tetradecane  
Naphthalene  
Pyrene

### EPH ALIPHATICS

UST-126 (1.5 mL)

UST-126P (4 x 1.5 mL)

UST-126TP (10 x 1.5 mL)

- 1000 µg/mL in Hexane

n-Decane  
n-Dodecane  
n-Eicosane  
n-Hexacosane  
n-Hexadecane  
n-Hexatriacontane  
n-Nonadecane  
n-Nonane  
n-Octacosane  
n-Octadecane  
n-Tetracosane  
n-Tetradecane  
n-Triacontane

## Diesel Range Organics

### DIESEL FUEL NO. 2

Collected from three sources and compounded prior to formulation.

UST-147 (1.5 mL)

UST-147P (4 x 1.5 mL)

UST-147TP (10 x 1.5 mL)

- 5000 µg/mL in Methylene chloride

UST-148 (1.5 mL)

UST-148P (4 x 1.5 mL)

UST-148TP (10 x 1.5 mL)

- 50000 µg/mL in Methylene chloride

UST-149 (1.5 mL)

UST-149P (4 x 1.5 mL)

UST-149TP (10 x 1.5 mL)

- 5000 µg/mL in Methanol

W-1361 (1 g)

- Neat

### DIESEL RANGE ORGANICS (DRO)

UST-152 (1.5 mL)

UST-152P (4 x 1.5 mL)

UST-152TP (Data Package)

- 1000 µg/mL in Methylene chloride

n-Decane  
n-Docosane  
n-Dodecane  
n-Eicosane  
n-Hexacosane

n-Hexadecane  
n-Octacosane  
n-Octadecane  
n-Tetracosane  
n-Tetradecane

### TPH MIX

UST-127 (1.5 mL)

UST-127P (4 x 1.5 mL)

UST-127TP (10 x 1.5 mL)

- 2000 µg/mL in Methylene chloride/Carbon disulfide

n-Decane  
n-Docosane  
n-Dodecane  
n-Dotriacotane  
n-Eicosane  
n-Hexacosane  
n-Hexadecane  
n-Hexatriacontane  
n-Octacosane

n-Octadecane  
n-Octane  
n-Octatriacontane  
n-Tetracontane  
n-Tetracosane  
n-Tetradecane  
n-Tetratriacontane  
n-Triacontane

## Residual Range Organics

### RRO STANDARD

RRO-10 (1.5 mL)

RRO-10P (4 x 1.5 mL)

RRO-10TP (10 x 1.5 mL)

- 10000 µg/mL in Methylene chloride

UST-50 (1.5 mL)

UST-50P (4 x 1.5 mL)

UST-50TP (10 x 1.5 mL)

- 50000 µg/mL in Methylene chloride

RRO-NEAT (5 g)

- Neat

### TPH SURROGATE

UST-101 (1.5 mL)

UST-101P (4 x 1.5 mL)

UST-101TP (10 x 1.5 mL)

- 2000 µg/mL in Methylene chloride/Carbon disulfide

Tetracosane-d50

### TPH SURROGATE

UST-102 (1.5 mL)

UST-102P (4 x 1.5 mL)

UST-102TP (10 x 1.5 mL)

- 6000 µg/mL in Methylene chloride/Carbon disulfide

Nonatricotane (C-39)

### TNRCC METHOD 1005

#### WINDOW DEFINING MIX

UST-103 (1.5 mL)

UST-103P (4 x 1.5 mL)

UST-103TP (10 x 1.5 mL)

- 200 µg/mL in Pentane

n-Decane  
n-Hexane  
n-Octacosane

### TNRCC METHOD 1005

#### RETENTION TIME MARKER

UST-133 (1.5 mL)

UST-133P (4 x 1.5 mL)

UST-133TP (10 x 1.5 mL)

- 500 µg/mL in n-Pentane

n-Decane  
n-Dodecane  
n-Heptacosane  
n-Heptane  
n-Hexadecane

n-Hexane  
n-Octacosane  
n-Octadecane  
n-Octane  
n-Pentatriacontane

### TERT-BUTYL ALCOHOL

UST-154 (1.5 mL)

UST-154P (4 x 1.5 mL)

UST-154TP (10 x 1.5 mL)

- 5000 µg/mL in Methanol

CAL



## Hydrocarbon Mixes

### TNRCC METHOD 1005 MATRIX SPIKE MIX

UST-132 (1.5 mL)

UST-132P (4 x 1.5 mL)

UST-132TP (10 x 1.5 mL)

- 10000 µg/mL in n-Pentane

Diesel Fuel #2 Composite  
Unleaded Gasoline Composite

### TNRCC METHOD 1005 CALIBRATION MIX

UST-131 (1.5 mL)

UST-131P (4 x 1.5 mL)

UST-131TP (10 x 1.5 mL)

- 10000 µg/mL in n-Pentane

Diesel Fuel #2 Composite  
Unleaded Gasoline Composite

## Refinery Products

### JP-8 MILITARY JET FUEL

Collected from a single source.

UST-134 (1.5 mL)

UST-134P (4 x 1.5 mL)

UST-134TP (10 x 1.5 mL)

- 5000 µg/mL in Methylene chloride

UST-135 (1.5 mL)

UST-135P (4 x 1.5 mL)

UST-135TP (10 x 1.5 mL)

- 5000 µg/mL in Methylene chloride

W-1371 (1 mL)

- Neat

### COMMERCIAL JET FUEL

Collected from a single source.

UST-139 (1.5 mL)

UST-139P (4 x 1.5 mL)

UST-139TP (10 x 1.5 mL)

- 5000 µg/mL in Methylene chloride

UST-140 (1.5 mL)

UST-140P (4 x 1.5 mL)

UST-140TP (10 x 1.5 mL)

- 50000 µg/mL in Methylene chloride

W-1367 (1 mL)

- Neat

### No. 8 FUEL OIL

Collected from a single source.

UST-136 (1.5 mL)

UST-136P (4 x 1.5 mL)

UST-136TP (10 x 1.5 mL)

- 5000 µg/mL in Methylene chloride

UST-137 (1.5 mL)

UST-137P (4 x 1.5 mL)

UST-137TP (10 x 1.5 mL)

- 50000 µg/mL in Methylene chloride

W-1371 (1 mL)

- Neat

### AVIATION GAS

Collected from a single source - low lead, high octane for piston aircraft.

UST-141 (1.5 mL)

UST-141P (4 x 1.5 mL)

UST-141TP (10 x 1.5 mL)

- 5000 µg/mL in Methylene chloride

UST-142 (1.5 mL)

UST-142P (4 x 1.5 mL)

UST-142TP (10 x 1.5 mL)

- 50000 µg/mL in Methylene chloride

W-1368 (1 mL)

- Neat

### 10W30 OIL

UST-138 (1.5 mL)

UST-138P (4 x 1.5 mL)

UST-138TP (10 x 1.5 mL)

Collected from a single source.

- 5000 µg/mL in Methylene chloride



## Refinery Products

### WASTE MOTOR OIL

Collected from a commercial oil service center.

UST-143 (1.5 mL)

UST-143P (4 x 1.5 mL)

UST-143TP (10 x 1.5 mL)

- 5000 µg/mL in Methylene chloride

UST-144 (1.5 mL)

UST-144P (4 x 1.5 mL)

UST-144TP (10 x 1.5 mL)

- 50000 µg/mL in Methylene chloride

W-1362 (1 mL)

- Neat

### UNLEADED GASOLINE

Collected from four sources and compounded prior to formulation.

UST-145 (1.5 mL)

UST-145P (4 x 1.5 mL)

UST-145TP (10 x 1.5 mL)

- 5000 µg/mL in Methylene chloride

UST-146 (1.5 mL)

UST-146P (4 x 1.5 mL)

UST-146TP (10 x 1.5 mL)

- 50000 µg/mL in Methylene chloride

W-1366 (1 mL)

- Neat

### DIESEL FUEL No. 2

Collected from three sources and compounded prior to formulation.

UST-147 (1.5 mL)

UST-147P (4 x 1.5 mL)

UST-147TP (10 x 1.5 mL)

- 5000 µg/mL in Methylene chloride

UST-148 (1.5 mL)

UST-148P (4 x 1.5 mL)

UST-148TP (10 x 1.5 mL)

- 50000 µg/mL in Methylene chloride

UST-149 (1.5 mL)

UST-149P (4 x 1.5 mL)

UST-149TP (10 x 1.5 mL)

- 5000 µg/mL in Methanol

W-1361 (1 mL)

- Neat

### KEROSENE

Collected from two sources and compounded prior to formulation.

UST-150 (1.5 mL)

UST-150P (4 x 1.5 mL)

UST-150TP (10 x 1.5 mL)

- 5000 µg/mL in Methylene chloride

UST-151 (1.5 mL)

UST-151P (4 x 1.5 mL)

UST-151TP (10 x 1.5 mL)

- 50000 µg/mL in Methylene chloride

W-1360 (1 mL)

- Neat

CAL

## Internal Standards and Surrogates

CATALOGUE #	COMPOUND NAME	CONCENTRATION	SOLVENT
0194	<b>2-Fluorobiphenyl</b>	10000 µg/mL	Methylene chloride
0233H	<b>4-Bromofluorobenzene</b>	2000 µg/mL	Methanol
1024	<b>p-Terphenyl</b>	10000 µg/mL	Methylene chloride
1261	<b>alpha, alpha, alpha-Trifluorotoluene</b>	2000 µg/mL	Methanol
1341AC	<b>o-Terphenyl</b>	2000 µg/mL	Acetone
1341H	<b>o-Terphenyl</b>	10000 µg/mL	Methylene chloride
1342	<b>5-alpha-Adrostane</b>	2000 µg/mL	Methylene chloride
1373	<b>1-Chlorooctadecane</b>	10000 µg/mL	Methylene chloride
1374	<b>1-Chlorooctane</b>	10000 µg/mL	Methanol



## QUALITY CONTROL REFERENCE MATERIALS

Our range of CRMs are designed to be used for method validation, to assess laboratory performance and to check analytical performance. For day to day quality control, we have developed an extensive range of QCs.

### OUR QCs INCLUDE SAMPLES FOR:

#### Waste Water (Water Pollution)

Choice of more than 60 inorganic and organic samples, available in a range of kits and sample groups. Available as concentrates or whole-volume samples.

#### Drinking Water (Water Supply)

Choice of more than 35 inorganic and organic samples, available in a range of kits and sample groups. Available as concentrates or whole-volume samples.

#### RCRA and NELAC Soils and Solids

Choice of more than 35 inorganic and organic samples, available in a range of kits and sample groups.

#### Underground Storage Tank Samples

Choice of more than 25 samples, available in a range of kits and State-specific sample groups.

### RTC QC FEATURES

Our QCs are developed from the samples we send out as LPTP samples, and for every LPTP sample there is a matching QC. For example:

- PEI-245, Boron by colorimetric method is the PT sample
- QCI-245, Boron by colorimetric method is the QC sample

We offer substantial discounts on our QCs to our LPTP customers and when ordered on a subscription or standing order basis for regular users, see page 110.

RTC QCs are produced and certified to the same strict quality standards as our CRMs.

The values certified on the QCs change regularly to provide an ongoing challenge, but the values will always be within the range stated.

### RTC NEW QC LABEL

We have redesigned the label for our Quality Control Products – it is now a three-part “piggy-back” label. On each end is a half-inch label that can be peeled off and placed into your log book or dilution container. The remaining sample can be transferred to a clean vial for use later and labeled with the remaining section.



Contents  
 Waste Water (Water Pollution)  
 Drinking Water (Water Supply)  
 Waste Water Whole-Volume  
 Drinking Water Whole-Volume  
 Solids  
 UST Quality Control  
 UST State-Specific  
 Microbiological QC  
 MDL Standards



# WASTE WATER (WATER POLLUTION)

The RTC range of Waste Water QCs has been developed to complement our Water Pollution PT Program.

The actual certified value will always fall within the range shown for each analyte, but from lot to lot the values will change to provide a varying challenge to the analyst. For specific concentrations, contact us and we will match a lot to meet your requirements.

## DEMAND

### QCI-026

A single sample for dilution to 2 L.

Biochemical oxygen demand (BOD)	15 to 250 mg/L
Carbonaceous BOD (CBOD)	15 to 250 mg/L
Chemical oxygen demand (COD)	30 to 250 mg/L
Total organic carbon (TOC)	6 to 100 mg/L

## MINERALS

### QCI-027-12

A two-sample set for dilution to 2 L.

Alkalinity as CaCO <sub>3</sub>	10 to 120 mg/L
Calcium, Ca	3.5 to 110 mg/L
Chloride	35 to 275 mg/L
Conductivity	200 to 930 µmhos/cm
Fluoride	0.3 to 4 mg/L
Hardness, total as CaCO <sub>3</sub>	17 to 440 mg/L
Magnesium, Mg	2 to 40 mg/L
Potassium, K	4 to 40 mg/L
Residue, total (TS)	140 to 675 mg/L
Residue-filterable (TDS)	140 to 650 mg/L
Sodium, Na	6 to 100 mg/L
Sulfate	5 to 125 mg/L

## PH

### QCI-027-3 (20 mL)

### QCI-027-100 (100 mL)

A single sample for analysis.

pH	5 to 10 UNITS
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## SIMPLE NUTRIENTS

### QCI-028-1

A two-sample set for dilution to 2 L.

Ammonia as N	0.65 to 19 mg/L
Nitrate as N	0.25 to 40 mg/L
Nitrite as N <sup>1</sup>	0.4 to 4 mg/L
Nitrate+nitrite as N	0.25 to 40 mg/L
Orthophosphate as P	0.5 to 5.5 mg/L

## COMPLEX NUTRIENTS

### QCI-028-2

A single sample for dilution to 2 L.

Kjeldahl nitrogen (TKN)	1.5 to 35 mg/L
Phosphorus, total	0.5 to 10 mg/L

## Total Nutrients Kit

### QCI-028K

Contains both Simple and Complex Nutrients Samples.

## OIL AND GREASE

### QCI-029

A single sample for dilution to 2 L.

Oil & Grease	20 to 100 mg/L
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## RESIDUE (WHOLE-VOLUME)

### QCI-079

A 500 mL whole-volume sample for dilution to 2 L.

Residue, total (TS)	140 to 675 mg/L
Residue-filterable (TDS)	140 to 650 mg/L
Residue-nonfilterable (TSS)	23 to 100 mg/L

## RESIDUE (CONCENTRATE)

### QCI-030

A single sample for dilution to 2 L.

Residue, total (TS)	140 to 675 mg/L
Residue-filterable (TDS)	140 to 650 mg/L
Residue-nonfilterable (TSS)	23 to 100 mg/L



The analytes and concentrations will vary lot to lot but will always be certified within the concentration range shown.

## TOTAL CYANIDE

### QCI-031

A single sample for dilution to 2 L.

Total cyanide 0.1 to 1 mg/L

## TOTAL PHENOLICS

### QCI-032

A single sample for dilution to 2 L.

Total phenolics 0.06 to 5 mg/L

## TOTAL RESIDUAL CHLORINE

### QCI-033

A single sample for dilution to 2 L.

Total residual chlorine 0.5 to 3 mg/L

## TRACE METALS 1

### QCI-034-1

A single sample for dilution to 2 L.

Aluminium, Al	200 to 4000 µg/L
Arsenic, As	70 to 900 µg/L
Beryllium, Be	8 to 900 µg/L
Cadmium, Cd	8 to 750 µg/L
Chromium, Cr (total)	17 to 1000 µg/L
Cobalt, Co	28 to 1000 µg/L
Copper, Cu	40 to 900 µg/L
Iron, Fe	200 to 4000 µg/L
Lead, Pb	70 to 3000 µg/L
Manganese, Mn	70 to 4000 µg/L
Mercury, Hg	2 to 30 µg/L
Nickel, Ni	80 to 3000 µg/L
Selenium, Se	90 to 2000 µg/L
Vanadium, V	55 to 2000 µg/L
Zinc, Zn	100 to 2000 µg/L

## TRACE METALS 2

### QCI-034-2

A single sample for dilution to 2 L.

Antimony, Sb	95 to 900 µg/L
Boron, B	800 to 2000 µg/L
Molybdenum, Mo	60 to 600 µg/L
Silver, Ag	26 to 600 µg/L
Strontium, Sr	30 to 300 µg/L
Thallium, Tl	60 to 900 µg/L
Titanium, Ti	80 to 300 µg/L

## BARIUM AND TIN

### QCI-034-5

A single sample for dilution to 2 L.

Barium, Ba	100 to 2500 µg/L
Tin, Sn	1000 to 5000 µg/L

## TRACE METALS KIT

### QCI-034K

Contains Trace Metals 1 and 2 plus Barium & Tin.

## MERCURY, WASTE WATER

### QCI-089

A single sample for dilution to 2 L.

Mercury, Hg	2 to 30 µg/L
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## CHROMIUM VI

### QCI-034-3

A single sample for dilution to 2 L.

Hexavalent Chromium, Cr(VI)	45 to 880 µg/L
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## WASTE WATER KIT

### COMPLETE WASTE WATER QC INORGANIC KIT

Contains: Demand, Minerals, Total Nutrients Kit, Oil and Grease, pH, Residue, Total Cyanide, Total Phenolics, Total Residual Chlorine, Trace Metals Kit

### QCI-035K

## Anions

### QCI-051

A single sample for dilution up to 2 L of reagent water.

Bromide	1 to 10 mg/L
Chloride	35 to 275 mg/L
Fluoride	0.3 to 4 mg/L
Nitrate as N	0.25 to 40 mg/L
Nitrite as N	0.4 to 4 mg/L
Orthophosphate as P	0.5 to 5.5 mg/L
Sulfate	5 to 125 mg/L



# WASTE WATER (WATER POLLUTION)

The analytes and concentrations will vary lot to lot but will always be certified within the concentration range shown.

## SILICA

### QCI-243

A single sample for dilution to 2 L. Please specify desired concentration when ordering.

Silica as SiO<sub>2</sub> 50 to 250 mg/L

## ANIONIC SURFACTANT

### QCI-244

A single sample for dilution to 2 L.

Surfactants - MBAS 0.2 to 1 mg/L

## SURFACTANTS - CATIONIC *NEW!*

### QCI-269

A single sample for dilution to 2 L.

Surfactants - Cationic 0.05 to 5 mg/L

## BORON (COLORIMETRIC METHOD)

### QCI-245

A single sample for dilution to 2 L.

Boron, B 0.8 to 2 mg/L

## BROMIDE

### QCI-246

A single sample for dilution to 2 L.

Bromide 1 to 10 mg/L

## TOTAL ORGANIC HALIDES (TOX)

### QCI-247

A single sample for dilution to 2 L.

Total organic halides (TOX) 300 to 1500 µg/L

## ACIDITY

### QCI-248

A single sample for dilution to 2 L.

Acidity, as CaCO<sub>3</sub> 650 to 1800 mg/L

## TANNIN AND LIGNIN

### QCI-249

A single sample for dilution to 2 L.

Tannin & Lignin 0.1 to 20 mg/L

## TURBIDITY

### QCI-250

A single sample for dilution to 2 L.

Turbidity 1 to 20 NTU

## CYANIDE AMENABLE TO CHLORINATION

### QCI-251

A single sample for dilution to 2 L.

Amenable cyanide 0.1 to 1 mg/L  
Total cyanide 0.1 to 1 mg/L

## TOTAL RECOVERABLE PETROLEUM HYDROCARBONS (TRPH)

### QCI-254

A single sample for dilution to 2 L and analysis by IR methods.

TRPH 20 to 170 mg/L

## ASBESTOS

### QCI-255

A single sample for dilution to 2 L.

Asbestos 1.5 to 20 MF/L

## SULFIDE (INCLUDING TOTAL AND SOLUBLE)

### QCI-257

A single sample for dilution to 2 L.

Sulfide 1 to 10 mg/L

## COLOUR

### QCI-258

A single sample for dilution to 2 L.

Colour 10 to 75 UNITS

## SETTLABLE SOLIDS

### QCI-253

A single sample for dilution to 2 L.

Residue-settleable 5 to 100 mL/L

## VOLATILE RESIDUE *NEW!*

### QCI-270

A single sample for analysis of Residue.

Residue-volatile 100 to 500 mg/L



## SALINITY (WHOLE-VOLUME)

QCI-260

A 500 mL whole-volume sample for analysis of Salinity.

Salinity	2 to 30 wt%
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## DISSOLVED OXYGEN

QCI-263

A single sample for dilution to 2 L.

Oxygen, dissolved	1 to 100 mg/L
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## FIXED SOLIDS AND BICARBONATE

QCI-261

A single sample for dilution up to 2 L.

Bicarbonate (as CO <sub>3</sub> )	10 to 2000 mg/L
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## URANIUM

QCI-264

A single sample for dilution to 2 L.

Uranium, U	100 to 200 µg/L
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## OXIDATION -REDUCTION (WHOLE-VOLUME)

QCI-262

A 500 mL whole-volume sample for analysis of Oxidation Reduction.

Potential	-1000 to 1000 mV
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## PERCHLORATE - WP NEW!

QCI-266

A single sample for dilution up to 2 L.

Perchlorate	1 to 50 µg/L
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# NEW ORGANIC LOW-LEVEL QCS

## OPPs IN WATER NEW!

QCO-402

A single concentrate for dilution to 1 liter for the analysis of organophosphorus pesticides in water.

Atrazine	10 to 200 ng/L
Azinphos-ethyl (Ethyl guthion)	10 to 100 ng/L
Azinphos-methyl (Guthion)	10 to 100 ng/L
Chlorfenvinphos	10 to 100 ng/L
Chlorothalonil	10 to 100 ng/L
Chlorpyrifos	10 to 100 ng/L
Diazinon	10 to 100 ng/L
Dichlorvos	10 to 100 ng/L
Dimethoate	10 to 100 ng/L
Fenitrothion	10 to 100 ng/L
Fenthion	10 to 100 ng/L
Malathion	10 to 100 ng/L
Methyl parathion (Parathion, methyl)	10 to 100 ng/L
Parathion, ethyl	10 to 100 ng/L
Pendimethaline (Penoxalin)	10 to 100 ng/L
Primidicarb	10 to 100 ng/L
Propetamphos	10 to 100 ng/L
Simazine	10 to 200 ng/L
Terbutryn	10 to 100 ng/L
Trietazine	10 to 100 ng/L

## TRICHLOROBENZENES IN WATER

NEW!

QCO-405

A single concentrate for dilution to 1 liter for the analysis of trichlorobenzenes in water.

1,2,3-Trichlorobenzene	5 to 500 ng/L
1,2,4-Trichlorobenzene	5 to 500 ng/L
1,3,5-Trichlorobenzene	5 to 500 ng/L
Hexachlorbenzene	3 to 500 ng/L
Hexachlorbutadiene	5 to 500 ng/L

## ORGANOTINS IN WATER NEW!

QCO-411

A single concentrate for dilution to 1 liter for the analysis of organometallic tins in ground water.

Tributylethyl tin	0.5 to 50 ng/L
Tributyltin (TBT)	0.5 to 50 ng/L
Triphenylethyl tin	0.5 to 50 ng/L
Triphenyltin (TPHT)	0.5 to 50 ng/L

## PYRETHROIDS IN WASTE WATER

NEW!

QCO-410

A single concentrate for dilution to 1 liter for the analysis of pyrethroids in waste water.

cis-Permethrin	0.5 to 800 ng/L
Cypermethrin (sum of 4 isomers)	1 to 800 ng/L
Deltamethrin	1 to 800 ng/L
Flumethrin (sum of 2 isomers)	2 to 500 ng/L
Pentachlorophenol	1 to 500 ng/L
trans Permethrin	0.5 to 800 ng/L

## PCBS IN WATER NEW!

QCO-403

A single concentrate for dilution to 1 liter for the analysis of pcb congeners in water.

2,2',3,4,4',5'-Hexachlorobiphenyl (PCB 138)	1 to 10 ng/L
2,2',3,4,4',5,5'-Heptachlorobiphenyl (PCB 180)	1 to 10 ng/L
2,2',4,4',5,5'-Hexachlorobiphenyl (PCB 153)	1 to 10 ng/L
2,2',4,5,5'-Pentachlorobiphenyl (PCB 101)	1 to 10 ng/L
2,2',5,5'-Tetrachlorobiphenyl (PCB 52)	1 to 10 ng/L
2,3',4,4',5-Pentachlorobiphenyl (PCB 118)	1 to 10 ng/L
2,4,4'-Trichlorobiphenyl (PCB 28)	1 to 10 ng/L
PCBs, total	1 to 10 ng/L

## LOW-LEVEL PAHS NEW!

QCO-259

A single sample for analysis by methods 610/625/8270/8310 and 550.

Acenaphthene	2 to 10 µg/L
Acenaphthylene	2 to 10 µg/L
Anthracene	0.5 to 2 µg/L
Benzo(a)anthracene	0.3 to 2 µg/L
Benzo(a)pyrene	0.5 to 2 µg/L
Benzo(b)fluoranthene	0.3 to 2 µg/L
Benzo(g,h,i)perylene	0.3 to 2 µg/L
Benzo(k)fluoranthene	0.3 to 2 µg/L
Chrysene	0.3 to 2 µg/L
Dibenz(a,h) anthracene	0.5 to 2 µg/L
Fluoranthene	0.3 to 2 µg/L
Fluorene	2 to 10 µg/L
Indeno(1,2,3-cd) pyrene	0.5 to 2 µg/L
Naphthalene	2 to 10 µg/L
Phenanthrene	0.3 to 2 µg/L
Pyrene	0.3 to 2 µg/L



# WASTE WATER (WATER POLLUTION)

The analytes and concentrations will vary lot to lot but will always be certified within the concentration range shown.

## GASOLINE IN WATER

### QC0-010

Analyze for gasoline by Purge and Trap, modified 8015 and NWTPH-Gx methods.

Benzene	0.5 to 100 µg/L
Ethylbenzene	0.5 to 100 µg/L
m+p-Xylene	0.5 to 100 µg/L
Methyl tert-butyl ether (MTBE)	0.5 to 100 µg/L
Naphthalene	0.5 to 100 µg/L
o-Xylene	0.5 to 100 µg/L
Toluene	0.5 to 100 µg/L
1,2,4-Trimethylbenzene	0.5 to 100 µg/L
1,3,5-Trimethylbenzene	0.5 to 100 µg/L
Xylene, total	0.5 to 300 µg/L
Gasoline range organics (GRO), C <sub>6</sub> -C <sub>12</sub>	200 to 4000 µg/L

## DIESEL IN WATER

### QC0-011

Diesel No. 2. Use with modified 8015 and NWTPH-Dx methods.

Diesel range organics (DRO)	500 to 4000 µg/L
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## PCBs IN WATER

### QC0-020

A two-sample set for analysis by methods 608/8080/8081. Each sample contains one Aroclor.

Aroclor-1016 (PCB-1016)	3.8 to 13 µg/L
Aroclor-1221 (PCB-1221)	1 to 15 µg/L
Aroclor-1232 (PCB-1232)	1.4 to 4 µg/L
Aroclor-1242 (PCB-1242)	3.8 to 13 µg/L
Aroclor-1248 (PCB-1248)	1.5 to 5.5 µg/L
Aroclor-1254 (PCB-1254)	1.7 to 5.5 µg/L
Aroclor-1260 (PCB-1260)	1.6 to 5 µg/L

## PCBs IN OIL

### QC0-072

A two-sample set for analysis by methods 608/8080/8082. Each sample contains one unspecified Aroclor.

Aroclor-1016 (PCB-1016)	17 to 50 mg/Kg
Aroclor-1221 (PCB-1221)	10 to 50 mg/Kg
Aroclor-1232 (PCB-1232)	10 to 50 mg/Kg
Aroclor-1242 (PCB-1242)	17 to 50 mg/Kg
Aroclor-1248 (PCB-1248)	10 to 50 mg/Kg
Aroclor-1254 (PCB-1254)	16 to 50 mg/Kg
Aroclor-1260 (PCB-1260)	12 to 50 mg/Kg

## ACIDS

### QC0-022

A single sample for analysis by methods 625/8270.

2,4,5-Trichlorophenol	50 to 200 µg/L
2,4,6-Trichlorophenol	50 to 200 µg/L
2,4-Dichlorophenol	40 to 190 µg/L
2,4-Dimethylphenol	65 to 200 µg/L
2,4-Dinitrophenol	100 to 180 µg/L
2,6-Dichlorophenol	50 to 200 µg/L
2-Chlorophenol	30 to 200 µg/L
2-Methyl-4,6-dinitrophenol	60 to 200 µg/L
2-Methylphenol (o-Cresol)	50 to 200 µg/L
2-Nitrophenol	50 to 190 µg/L
3+4-Methylphenol (m+p-Cresol)	50 to 200 µg/L
3-Methylphenol (m-Cresol)	50 to 200 µg/L
3-Nitrophenol	10 to 200 µg/L
4-Chloro-3-methylphenol	30 to 200 µg/L
4-Methylphenol (p-Cresol)	50 to 200 µg/L
4-Nitrophenol	100 to 180 µg/L
Benzoic acid	50 to 200 µg/L
Pentachlorophenol	55 to 200 µg/L
Phenol	100 to 200 µg/L

## HERBICIDES

### QC0-094

A single sample for analysis by methods 625/8270.

2,4,5-T	2 to 10 µg/L
2,4-D	2 to 10 µg/L
2,4-DB	5 to 10 µg/L
3,5-Dichlorobenzoic acid	2 to 10 µg/L
5-Hydroxydicamba	2 to 10 µg/L
Acifluorfen	2 to 10 µg/L
Bentazon	2 to 10 µg/L
Dicamba	2 to 10 µg/L
Dichloroprop	2 to 10 µg/L
Dinoseb (2-sec-butyl-4,6-dinitrophenol, DNBP)	2 to 10 µg/L
Pentachlorophenol	2 to 10 µg/L
Picloram	2 to 10 µg/L
Silvex (2,4,5-TP)	2 to 10 µg/L

## TOXAPHENE

### QC0-093

A single sample for analysis by methods 608/8080/8081.

Toxaphene (Chlorinated camphene)	20 to 100 µg/L
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## CHLORDANE (TOTAL)

### QC0-024-2

A single sample for analysis by methods 608/8080/8081.

Chlordane (total)	3 to 25 µg/L
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The analytes and concentrations will vary lot to lot but will always be certified within the concentration range shown.

## VOLATILES 1

### QCO-120-1

A single sample for analysis by methods 601/8010, 602/8020/8021 or 624/8260.

1,2,4-Trimethylbenzene	8 to 100 µg/L
1,2-Dichlorobenzene	8 to 100 µg/L
1,3,5-Trimethylbenzene	8 to 100 µg/L
1,3-Dichlorobenzene	9 to 125 µg/L
1,4-Dichlorobenzene	8 to 115 µg/L
Benzene	8 to 120 µg/L
Ethylbenzene	9 to 100 µg/L
m+p-Xylene	8 to 300 µg/L
Methyl tert-butyl ether (MTBE)	15 to 100 µg/L
Naphthalene	8 to 190 µg/L
o-Xylene	8 to 300 µg/L
Toluene	7 to 100 µg/L
Xylene, total	20 to 300 µg/L

## VOLATILES 2

### QCO-120-2

A single sample for analysis by methods 601/8010, 602/8020/8021 or 624/8260.

1,1,1-Trichloroethane	10 to 90 µg/L
1,2-Dichloroethane	10 to 150 µg/L
Bromodichloromethane	8 to 115 µg/L
Bromoform	11 to 100 µg/L
Carbon tetrachloride	10 to 140 µg/L
Chlorobenzene	10 to 120 µg/L
Chloroform	12 to 95 µg/L
Dibromochloromethane	11 to 140 µg/L
Methylene chloride (Dichloromethane)	10 to 125 µg/L
Tetrachloroethylene (Perchloroethylene)	10 to 150 µg/L
Trichloroethene (Trichloroethylene)	10 to 95 µg/L

## TRADITIONAL VOLATILE QC KIT

### QCO-120-12

Contains Volatile Organic Compounds 1 & 2.

## VOLATILES 3

### QCO-120-3

A single sample for analysis by methods 601/8010, 602/8020/8021 or 624/8260.

Acetone	10 to 150 µg/L
Acetonitrile	10 to 150 µg/L
Acrolein (Propenal)	10 to 150 µg/L
Acrylonitrile	10 to 150 µg/L
2-Butanone (Methyl ethyl ketone, MEK)	10 to 150 µg/L
Carbon disulfide	10 to 150 µg/L
Chloroethane	20 to 100 µg/L
2-Chloroethyl vinyl ether	10 to 150 µg/L
1,2-Dibromo-3-chloropropane (DBCP)	10 to 150 µg/L
1,2-Dibromoethane (EDB)	10 to 150 µg/L
Dibromomethane	10 to 150 µg/L
Dichlorodifluoromethane	10 to 150 µg/L
Dichlorofluoromethane	10 to 150 µg/L
1,1-Dichloroethane	15 to 150 µg/L
1,1-Dichloroethylene	11 to 120 µg/L
cis-1,2-Dichloroethylene	15 to 150 µg/L
1,2-Dichloropropane	10 to 150 µg/L
cis-1,3-Dichloropropene	15 to 100 µg/L
trans-1,3-Dichloropropylene	8 to 90 µg/L
trans-1,2-Dichloroethylene	10 to 150 µg/L
2-Hexanone	20 to 150 µg/L
Methyl bromide (Bromomethane)	20 to 100 µg/L
Methyl chloride (Chloromethane)	20 to 100 µg/L
4-Methyl-2-pentanone (MIBK)	20 to 200 µg/L
Styrene	20 to 100 µg/L
1,1,1,2-Tetrachloroethane	10 to 150 µg/L
1,1,2,2-Tetrachloroethane	10 to 150 µg/L
1,1,2-Trichloroethane	25 to 150 µg/L
Trichlorofluoromethane	20 to 100 µg/L
1,2,3-Trichloropropane	10 to 150 µg/L
Vinyl acetate	10 to 150 µg/L
Vinyl chloride	20 to 100 µg/L

## COMPLETE VOLATILE QC KIT

### QCO-120K

Contains Volatile Organic Compounds 1, 2 & 3





The analytes and concentrations will vary lot to lot but will always be certified within the concentration range shown.

## BASE/NEUTRALS 1

### QC0-121-1

A single sample for analysis by methods 625/8270/8310 or 550.

Naphthalene	30 to 190 µg/L
Acenaphthene	10 to 200 µg/L
Acenaphthylene	10 to 200 µg/L
Anthracene	10 to 200 µg/L
Benzo(a)anthracene	10 to 200 µg/L
Benzo(a)pyrene	20 to 160 µg/L
Benzo(b)fluoranthene	20 to 125 µg/L
Benzo(g,h,i)perylene	20 to 200 µg/L
Benzo(k)fluoranthene	25 to 200 µg/L
Benzo(b+k)fluoranthene	20 to 325 µg/L
Chrysene	10 to 200 µg/L
Dibenz(a,h) anthracene	20 to 100 µg/L
Fluoranthene	30 to 190 µg/L
Fluorene	30 to 190 µg/L
Indeno(1,2,3-cd) pyrene	30 to 125 µg/L
Phenanthrene	30 to 140 µg/L
Pyrene	30 to 200 µg/L

## BASE/NEUTRALS 2

### QC0-121-2

A single sample for analysis by methods 625/8270/8310 or 550.

Concentration Range	10 to 200 µg/L
1,2,4-Trichlorobenzene	bis(2-Chloroethyl) ether
1,2-Dichlorobenzene	bis(2-Chloroisopropyl) ether
1,3-Dichlorobenzene	bis(2-Ethylhexyl) phthalate (DEHP)
1,4-Dichlorobenzene	Butyl benzyl phthalate
1-Chloronaphthalene	Carbazole
1-Methylnaphthalene	Di-n-butyl phthalate
2,4-Dinitrotoluene (2,4-DNT)	Di-n-octyl phthalate
2,6-Dinitrotoluene (2,6-DNT)	Dibenzofuran
2-Chloronaphthalene	Diethyl phthalate
2-Methylnaphthalene	Dimethyl phthalate
2-Nitroaniline	Hexachlorobenzene
3,3'-Dichlorobenzidine	Hexachlorobutadiene
3-Nitroaniline	Hexachlorocyclopentadiene
4-Bromophenyl phenyl ether	Hexachloroethane
4-Chloroaniline	Isophorone
4-Chlorophenyl phenylether	n-Nitrosodi-n-propylamine
4-Nitroaniline	n-Nitrosodiethylamine
Aniline	n-Nitrosodimethylamine
Benzidine	n-Nitrosodiphenylamine
Benzyl alcohol	Nitrobenzene
bis(2-Chloroethoxy)methane	Pyridine

## COMPLETE BASE/NEUTRALS

### QC0-121K

Contains Base/Neutrals 1 & 2 with at least 10 PNAs and 13 Base/Neutral compounds per lot.

## PESTICIDES 1

### QC0-122-1

A single sample for analysis by methods 608/8080/8081.

Aldrin	0.5 to 15 µg/L
4,4'-DDD	2 to 10 µg/L
4,4'-DDE	2 to 10 µg/L
4,4'-DDT	1 to 10 µg/L
Dieldrin	1 to 13 µg/L
Heptachlor	1 to 10 µg/L
Heptachlor epoxide	1 to 10 µg/L

## PESTICIDES 2

### QC0-122-2

A single sample for analysis by methods 608/8080/8081.

delta-BHC	2 to 15 µg/L
alpha-BHC (alpha-Hexachlorocyclohexane)	2 to 15 µg/L
beta-BHC (beta-Hexachlorocyclohexane)	2 to 15 µg/L
gamma-BHC (Lindane)	2 to 15 µg/L
alpha-Chlordane	1 to 9.8 µg/L
gamma-Chlordane	1.2 to 7.8 µg/L
Endosulfan I	4 to 17 µg/L
Endosulfan II	4 to 20 µg/L
Endosulfan sulfate	2 to 20 µg/L
Endrin aldehyde	4 to 20 µg/L
Endrin ketone	2 to 10 µg/L
Endrin	2 to 20 µg/L
Methoxychlor	2 to 15 µg/L

## COMPLETE PESTICIDES QC KIT

### QC0-122K

Contains Pesticides 1 & 2.

## WASTE WATER KITS

### COMPLETE WASTE WATER QC ORGANIC KIT

Contains: Acids, Complete Base/Neutrals Kit, Total Chlordane, Herbicides, PCBs in Oil, PCBs in Water, Pesticides Kit, Toxaphene, Complete Volatiles Kit

#### QC0-062K

### TRADITIONAL WASTE WATER QC ORGANIC KIT

Contains: Acids, Complete Base/Neutrals Kit, Total Chlordane, PCBs in Oil, PCBs in Water, Complete Pesticides, Complete Volatiles Kit

#### QC0-025K



The analytes and concentrations will vary lot to lot but will always be certified within the concentration range shown.

## ACROLEIN/ACRYLONITRILE

### QC0-250

A single sample for analysis by methods 603 and 604.

Acrolein (Propenal)	2 to 50 µg/L
Acrylonitrile	2 to 50 µg/L

## NITROSAMINES/NITROAROMATICS

### QC0-251

A single sample for analysis by methods 607/609.

Concentration Range	1 to 20 µg/L
Nitrobenzene	n-Nitrosodi-n-propylamine
1,3-Dinitrobenzene (1,3-DNB)	1,3,5-Trinitrobenzene (1,3,5-TNB)
2,4-Dinitrotoluene (2,4-DNT)	2-Amino-4,6-dinitrotoluene (2-am-dnt)
2,6-Dinitrotoluene (2,6-DNT)	4-Amino-2,6-dinitrotoluene (4-am-dnt)
Isophorone	RDX
Tetryl	2-Nitrotoluene
n-Nitrosodiethylamine	3-Nitrotoluene
n-Nitrosodimethylamine	4-Nitrotoluene
n-Nitrosodiphenylamine	HMX
	2,4,6-Trinitrotoluene (2,4,6-TNT)

## CARBAMATES

### QC0-253

A single sample for analysis for method 632.

Concentration Range	0.1 to 50 µg/L
Aldicarb sulfone	Methiocarb (Mesuroil)
Aldicarb sulfoxide	Methomyl (Lannate)
Carbaryl (Sevin)	Oxamyl
Carbofuran (Furaden)	Propham
Diuron	Propoxur (Baygon)
3-Hydroxycarbofuran	

## CHLORINATED HYDROCARBONS

### QC0-254

A single sample for analysis for method 612.

Concentration Range	1 to 200 µg/L
1,2-Dichlorobenzene	1,2,4-Trichlorobenzene
1,3-Dichlorobenzene	2-Chloronaphthalene
1,4-Dichlorobenzene	Hexachlorobenzene
Hexachlorobutadiene	Hexachlorocyclopentadiene
Hexachloroethane	

## Oxygenates (WHOLE-VOLUME) NEW!

### QC0-256

A single sample for analysis of Oxygenates in Water.

T-amylmethylether (TAME)	5 to 50 µg/L
tert-Butyl alcohol	5 to 50 µg/L
Carbon disulfide	5 to 50 µg/L
Ethyl-t-butylether (ETBE)	5 to 50 µg/L
Methyl tert-butyl ether (MTBE)	5 to 50 µg/L
Trichlorofluoromethane	5 to 50 µg/L
1,2,3-Trichloropropane	0.2 to 2 µg/L
Trichlorotrifluoroethane (Freon 113)	5 to 50 µg/L
Di-isopropylether (DIPE)	5 to 50 µg/L
1-Phenylpropane	5 to 50 µg/L

## OIL BY FTIR NEW!

### QC0-270

A single sample for analysis of oil in water by FTIR.

Oil by FTIR	20 to 170 mg/L
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## HALOETHERS

### QC0-252

A single sample for analysis by method 611.

Concentration Range	2 to 50 µg/L
4-Bromophenyl phenyl ether	bis(2-Chloroisopropyl) ether
bis(2-Chloroethoxy)methane	4-Chlorophenyl phenylether
bis(2-Chloroethyl) ether	

## ORGANOPHOSPHORUS PESTICIDES

### QC0-257

A single sample for analysis by method 622 and 1657.

Concentration Range	2 to 20 µg/L
Azinphos-methyl (Guthion)	Famphur
Carbophenothion	Fonophos
Chlorpyrifos	Malathion
Diazinon	Parathion, ethyl
Dioxathion	Parathion, methyl
Disulfoton	Phorate
Ethion	Phosmet (Imidan)
Ethoprop	Terbufos

## DIOXINS IN WATER

### QC0-258

A single sample for analysis by methods 613 and 1613.

1,2,3,4,6,7,8,9-OCDD	2,3,4,7,8-Pecdf
1,2,3,4,6,7,8,9-OCDF	2,3,7,8-TCDD
1,2,3,4,6,7,8-Hpccd	2,3,7,8-TCDF
1,2,3,4,6,7,8-Hpccdf	Hpccd, total
1,2,3,4,7,8,9-Hpccdf	Hpccdf, total
1,2,3,4,7,8-Hxcdd	Hxcdd, total
1,2,3,4,7,8-Hxcdf	Hxcdf, total
1,2,3,6,7,8-Hxcdd	PCDD + PCDF, total
1,2,3,6,7,8-Hxcdf	PCDD, total
1,2,3,7,8,9-Hxcdd	PCDF, total
1,2,3,7,8,9-Hxcdf	Pecdd, total
1,2,3,7,8-Peccd	Pecdf, total
1,2,3,7,8-Peccdf	TCDD, total
2,3,4,6,7,8-Hxcdf	TCDF, total

## LOW-LEVEL PAHS

### QC0-259

A single sample for analysis by methods 610/625/8270/8310 and 550.

Acenaphthene	2 to 10 µg/L
Acenaphthylene	2 to 10 µg/L
Anthracene	0.5 to 2 µg/L
Benzo(a)anthracene	0.3 to 2 µg/L
Benzo(a)pyrene	0.5 to 2 µg/L
Benzo(b)fluoranthene	0.3 to 2 µg/L
Benzo(g,h,i)perylene	0.3 to 2 µg/L
Benzo(k)fluoranthene	0.3 to 2 µg/L
Chrysene	0.5 to 2 µg/L
Dibenz(a,h)anthracene	0.3 to 2 µg/L
Fluoranthene	2 to 10 µg/L
Fluorene	2 to 10 µg/L
Indeno(1,2,3-cd)pyrene	1 to 10 µg/L
Naphthalene	2 to 50 µg/L
Phenanthrene	0.3 to 2 µg/L
Pyrene	0.3 to 2 µg/L



# DRINKING WATER (WATER SUPPLY)

The RTC range of Waste Water QCs has been developed to complement our Water Supply PT Program.

The actual certified value will always fall within the range shown for each analyte, but from lot to lot the values will change to provide a varying challenge to the analyst. For specific concentrations, contact us and we will match a lot to meet your requirements.

## CORROSIVITY/SODIUM

### QCI-010-12

A two-sample set for dilution to 2 L.

Alkalinity as CaCO <sub>3</sub>	25 to 200 mg/L
Calcium, Ca	30 to 90 mg/L
Chloride	5 to 100 mg/L
Conductivity	250 to 2500 µmhos/cm
Corrosivity	2 to 12 units
Corrosivity (pH)	-4 to 4 SI units
Fluoride	1 to 8 mg/L
Hardness, total as CaCO <sub>3</sub>	75 to 375 mg/L
Magnesium, Mg	2 to 20 mg/L
Potassium, K	10 to 40 mg/L
Residue-filterable (TDS)	200 to 450 mg/L
Sodium, Na	12 to 24 mg/L
Sulfate	5 to 500 mg/L

## PH

### QCI-010-3 (20 mL)

### QCI-010-100 (100 mL)

A single sample for analysis.

pH	5 to 10 UNITS
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## ANIONS

### QCI-011

A single sample for dilution to 2 L.

Fluoride	1 to 8 mg/L
Nitrate as N	3 to 10 mg/L
Nitrite as N	0.4 to 2 mg/L
Orthophosphate as P	0.5 to 5.5 mg/L
Potassium, K	10 to 40 mg/L
Total nitrate-nitrite as N	3.5 to 9 mg/L

## RESIDUAL FREE CHLORINE

### QCI-012

A single sample for dilution to 2 L.

Residual free chlorine	0.5 to 3 mg/L
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## TOC

### QCI-013

A single sample for dilution to 2 L.

Total organic carbon (TOC)	1.2 to 4.9 mg/L
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## TURBIDITY

### QCI-014

A single sample for dilution to 2 L.

Turbidity	0.5 to 8 NTU
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## TOTAL CYANIDE

### QCI-015

A single sample for dilution to 2 L.

Cyanide	0.1 to 0.5 mg/L
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## TRACE METALS (SAMPLE 1)

### QCI-016-1

A single sample for dilution to 2 L, and analysis with ICP and AA

methods.

Aluminium, Al	130 to 2500 µg/L
Arsenic, As	25 to 150 µg/L
Beryllium, Be	1 to 10 µg/L
Cadmium, Cd	2 to 50 µg/L
Chromium, Cr (total)	10 to 200 µg/L
Copper, Cu	50 to 2000 µg/L
Iron, Fe	100 to 1800 µg/L
Lead, Pb	5 to 100 µg/L
Manganese, Mn	40 to 900 µg/L
Mercury, Hg	0.5 to 10 µg/L
Nickel, Ni	10 to 500 µg/L
Selenium, Se	10 to 100 µg/L
Zinc, Zn	400 to 2500 µg/L

## TRACE METALS (SAMPLE 2)

### QCI-016-2

A single sample for dilution to 2 L, and analysis with ICP and AA

methods.

Antimony, Sb	6 to 50 µg/L
Barium, Ba	500 to 3000 µg/L
Boron, B	800 to 2000 µg/L
Magnesium, Mg	2000 to 20000 µg/L
Molybdenum, Mo	15 to 130 µg/L
Silver, Ag	20 to 300 µg/L
Thallium, Tl	2 to 10 µg/L
Vanadium, V	315 to 2500 µg/L

## TRACE METALS KIT (BOTH SAMPLES)

### QCI-016K

Contains Trace Metals 1 & 2.

## INORGANIC DISINFECTION BY-PRODUCTS

### QCI-017

A two-sample set for dilution to 2 L.

#### Sample 1

Bromate	7 to 50 µg/L
Bromide	75 to 500 µg/L

#### Sample 2

Chlorate	60 to 180 µg/L
Chlorite	100 to 1000 µg/L

## ASBESTOS

### QCI-081

A single sample for analysis.

Asbestos	1.5 to 20 MF/L
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## DRINKING WATER KIT

### TOTAL DRINKING WATER QC INORGANIC KIT

Contains: Anions, Corrosivity/Sodium, Inorganic Disinfection By-Products, pH, Residual Free Chlorine, Sulfate/TOC, Total Cyanide, Trace Metals Kit, Turbidity

### QCI-018K



The analytes and concentrations will vary lot to lot but will always be certified within the concentration range shown.

## ANIONIC SURFACTANT

### QCI-203

A single sample for dilution to 2 L.

Surfactants - MBAS 0.05 to 1 mg/L

## COMBINED/TOTAL CHLORINE

### QCI-224

A single sample for dilution to 2 L.

Total chlorine 0.5 to 35 mg/L

## DOC AND UV 254

### QCI-225

A single sample for dilution to 2 L.

Dissolved organic carbon (DOC) 1.2 to 4.9 mg/L  
UV 254 0.02 to 0.7 cm<sup>-1</sup>

## PERCHLORATE

### QCI-226

A single sample for dilution to 2 L.

Perchlorate 4 to 20 µg/L

## SILICA

### QCI-227

A single sample for dilution to 2 L and analysis by method SM4500Si/3120B.

Silica as SiO<sub>2</sub> 5 to 50 mg/L

## CHROMIUM VI

### QCI-229

A single sample for dilution to 2 L.

Hexavalent Chromium, Cr(VI) 5 to 50 µg/L

## COLOUR

### QCI-231

A single sample for dilution to 2 L.

Colour 5 to 300 UNITS

## URANIUM

### QCI-232

A single sample for dilution to 2 L.

Uranium, U 0.5 to 30 µg/L

## LOW-LEVEL DEMAND NEW!

### QCI-233

A single sample for dilution up to 2 L.

Biochemical oxygen demand (BOD) 5 to 50 mg/L  
Carbonaceous BOD (CBOD) 5 to 50 mg/L  
Chemical oxygen demand (COD) 5 to 50 mg/L  
Total organic carbon (TOC) 5 to 50 mg/L



## NEW ORGANIC LOW-LEVEL QCS

### PYRETHROIDS IN GROUND WATER

#### NEW!

#### QCO-409

A single concentrate for dilution to 1 liter for the analysis of pyrethroids in ground water.

cis-Permethrin	0.5 to 20 ng/L
Cypermethrin (sum of 4 isomers)	1 to 80 ng/L
Deltamethrin	1 to 20 ng/L
Flumethrin (sum of 2 isomers)	2 to 20 ng/L
Pentachlorophenol	1 to 20 ng/L
trans Permethrin	0.5 to 120 ng/L



# DRINKING WATER (WATER SUPPLY)

The analytes and concentrations will vary lot to lot but will always be certified within the concentration range shown.

## CARBAMATE PESTICIDES

### QC0-001

A single sample for analysis by method 531.

3-Hydroxycarbofuran	15 to 75 µg/L
Aldicarb (Temik)	15 to 50 µg/L
Aldicarb sulfone	19 to 50 µg/L
Aldicarb sulfoxide	15 to 50 µg/L
Carbaryl (Sevin)	20 to 100 µg/L
Carbofuran (Furaden)	15 to 150 µg/L
Methiocarb (Mesuro)	30 to 140 µg/L
Methomyl (Lannate)	15 to 90 µg/L
Oxamyl	30 to 80 µg/L
Propoxur (Baygon)	30 to 140 µg/L

## TRIHALOMETHANES

### QC0-002

A single sample for analysis by methods 501/502/524.

Bromodichloromethane	10 to 50 µg/L
Bromoform	10 to 50 µg/L
Chloroform	10 to 50 µg/L
Dibromochloromethane	10 to 50 µg/L
Total trihalomethanes	40 to 200 µg/L

## PCBs

### QC0-003

A single sample for analysis by methods 505/508.

Aroclor-1016 (PCB-1016)	0.5 to 5 µg/L
Aroclor-1221 (PCB-1221)	0.5 to 5 µg/L
Aroclor-1232 (PCB-1232)	0.5 to 5 µg/L
Aroclor-1242 (PCB-1242)	0.5 to 5 µg/L
Aroclor-1248 (PCB-1248)	0.5 to 5 µg/L
Aroclor-1254 (PCB-1254)	0.5 to 5 µg/L
Aroclor-1260 (PCB-1260)	0.5 to 5 µg/L
Decachlorobiphenyl	0.5 to 5 µg/L

## HERBICIDES

### QC0-005-4

A single sample for analysis by methods 515.1 and 555.

Concentration Range	1 to 150 µg/L
2,4,5-T	Dacthal (DCPA)
2,4-D	Dalapon
2,4-DB	Dicamba
3,5-Dichlorobenzoic acid	Dichloroprop
4-Nitrophenol	Dinoseb
5-Hydroxydicamba	Pentachlorophenol
Acifluorfen	Picloram
Bentazon	Silvex (2,4,5-TP)
Chloramben	

## CHLORAL HYDRATE

### QC0-077

A single sample for analysis by method 551.

Chloral hydrate	4 to 30 µg/L
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## ORGANOCHLORINE PESTICIDES

### QC0-005-12

A single sample for analysis by methods 505/507/508/525.

#### Sample 1

Aldrin	0.4 to 2 µg/L
Dieldrin	0.5 to 3 µg/L
Endrin	0.1 to 5 µg/L
gamma-BHC (Lindane)	0.2 to 5 µg/L
Heptachlor	0.4 to 5 µg/L

#### Sample 2

Heptachlor epoxide	0.2 to 5 µg/L
Hexachlorobenzene	0.5 to 4 µg/L
Hexachlorocyclopentadiene	2 to 30 µg/L
Methoxychlor	10 to 100 µg/L
Propachlor (Ramrod)	1 to 4 µg/L
Trifluralin (Treflan)	1 to 5 µg/L

## ORGANONITROGEN PESTICIDES

### QC0-005-3

A single sample for analysis by methods 505/507/508.

Alachlor	2 to 20 µg/L
Atrazine	3 to 30 µg/L
Bromacil	2 to 20 µg/L
Butachlor	8 to 80 µg/L
Metolachlor	8 to 80 µg/L
Metribuzin	2 to 60 µg/L
Molinate	5 to 50 µg/L
Simazine	4 to 40 µg/L

## CHLORDANE (TOTAL)

### QC0-005-5

A single sample for analysis by methods 505/508/525.

Chlordane (total)	2 to 20 µg/L
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## TOXAPHENE (TOTAL)

### QC0-005-6

A single sample for analysis by methods 505/508/525.

Toxaphene (Chlorinated camphene)	3 to 20 µg/L
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## DRINKING WATER KIT

### TOTAL DRINKING WATER QC ORGANIC KIT

Contains: Carbamate Pesticides, Chloral Hydrate, Diquat/Endothal/Glyphosate/Paraquat, EDB/DBCP, Herbicides, Organochlorine Pesticides, Organonitrogen Pesticides, Organic Disinfection By-Products, PCBs, Regulated SOCs Kit, Regulated VOCs, Total Chlordane, Total Toxaphene, Trihalomethanes, Unregulated VOCs.

### QC0-009K



The analytes and concentrations will vary lot to lot but will always be certified within the concentration range shown.

## ADIPATE/PHTHALATE

### QC0-006-1

A single sample for analysis by methods 506/525/550.

Benzo(a)pyrene	0.2 to 2.5 µg/L
bis(2-ethylhexyl)adipate	8 to 50 µg/L
bis(2-ethylhexyl)phthalate	9 to 50 µg/L

## PNAs

### QC0-006-2

A single sample for analysis by methods 506/525/550.

Concentration Range	1 to 50 µg/L
1-Methylnaphthalene	Di-n-butyl phthalate
2-Methylnaphthalene	Di-n-octyl phthalate
Acenaphthene	Dibenz(a,h) anthracene
Acenaphthylene	Diethyl phthalate
Anthracene	Dimethyl phthalate
Benzo(a)anthracene	Fluoranthene
Benzo(b)fluoranthene	Fluorene
Benzo(g,h,i)perylene	Indeno(1,2,3-cd) pyrene
Benzo(k)fluoranthene	Naphthalene
Butyl benzyl phthalate	Phenanthrene
Chrysene	Pyrene

## REGULATED SOCS KIT

### QC0-006K

Contains Adipate/Phthalate and PNAs samples.

## REGULATED VOCs

### QC0-007-12

A two-sample set for analysis by methods 502.2 and 524.2.

Concentration Range	1 to 50 µg/L
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#### Sample 1

1,1,1-Trichloroethane	cis-1,2-Dichloroethylene
1,1,2-Trichloroethane	Methylene chloride (Dichloromethane)
1,1-Dichloroethylene	Styrene
1,2,4-Trichlorobenzene	Tetrachloroethylene (Perchloroethylene)
1,2-Dichloroethane	trans-1,2-Dichloroethylene
1,2-Dichloropropane	Trichloroethene (Trichloroethylene)
Carbon tetrachloride	Vinyl chloride
Chlorobenzene	

#### Sample 2

1,2,4-Trimethylbenzene	m+p-Xylene
1,2-Dichlorobenzene	Methyl tert-butyl ether (MTBE)
1,3,5-Trimethylbenzene	Naphthalene
1,3-Dichlorobenzene	o-Xylene
1,4-Dichlorobenzene	Toluene
Benzene	Xylene, total
Ethylbenzene	

## EDB/DBCP

### QC0-007-4

A single sample for analysis by methods 504/511/524.

1,2,3-Trichloropropane	0.2 to 2 µg/L
1,2-Dibromo-3-chloropropane (DBCP)	0.1 to 2 µg/L
1,2-Dibromoethane (EDB, Ethylene dibromide)	0.2 to 2 µg/L

## ALCOHOLS IN WATER *NEW!*

### QC0-230

A single sample for analysis by methods 524.2 or 1666.

4-Methyl-2-pentanone (MIBK)	5 to 50 mg/L
Ethanol	5 to 50 mg/L
Methanol	5 to 50 mg/L
n-Butyl alcohol	5 to 50 mg/L
tert-Butyl alcohol	5 to 50 mg/L
Tetrahydrofuran (THF)	5 to 50 mg/L

## DIQUAT/ENDOTHALL/

## GLYPHOSPHATE/PARAQUAT

### QC0-097

A single sample for analysis by methods 547, 548 and 549.

Endothall	90 to 500 µg/L
Diquat	8 to 40 µg/L
Glyphosate	375 to 800 µg/L
Paraquat	8 to 100 µg/L

## UNREGULATED VOCs

### QC0-007-3

A single sample for analysis by methods 502 and 524.

Concentration Range	5 to 50 µg/L
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#### Sample 1

Chloroethane	Methyl tert-butyl ether (MTBE)
1,3-Dichlorobenzene	Methyl bromide (Bromomethane)
Dichlorodifluoromethane	Methyl chloride (Chloromethane)
1,1-Dichloroethane	1,1,1,2-Tetrachloroethane
cis-1,3-Dichloropropene	Trichlorofluoromethane
trans-1,3-Dichloropropylene	

#### Sample 2

Bromobenzene	1,1-Dichloropropene
Bromochloromethane	Hexachlorobutadiene
n-Butylbenzene	Isopropylbenzene
sec-Butylbenzene	1,4-Isopropyltoluene
tert-Butylbenzene	n-Propylbenzene
2-Chlorotoluene	1,1,2,2-Tetrachloroethane
4-Chlorotoluene	1,2,3-Trichlorobenzene
Dibromomethane	1,2,3-Trichloropropane
1,3-Dichloropropane	1,2,4-Trimethylbenzene
2,2-Dichloropropane	1,3,5-Trimethylbenzene

## ORGANIC DISINFECTION BY-PRODUCTS

### QC0-098

A single sample for analysis by method 551.1

Concentration Range	10 to 50 µg/L
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Bromoacetic acid	Dibromoacetic acid
Bromochloroacetic acid	Dichloroacetic acid
Chloroacetic acid	Trichloroacetic acid

## GASOLINE ADDITIVES

### QC0-075

A single sample for analysis by methods 502 and 524.

1,2,3-Trichloropropane	Methyl tert-butyl ether (MTBE)
1-Phenylpropane	T-amylmethylether (TAME)
Carbon disulfide	tert-Butyl alcohol
Di-isopropylether (DIPE)	Trichlorofluoromethane
Ethyl-t-butylether (ETBE)	Trichlorotrifluoroethane (Freon 113)



The analytes and concentrations will vary lot to lot but will always be certified within the concentration range shown.

## RESIDUE/PH (WHOLE-VOLUME)

### QCI-300

Ready-to-use 500 mL whole-volume to be analyzed.

pH	5 to 10 UNITS
Residue, total (TS)	140 to 675 mg/L
Residue-filterable (TDS)	140 to 650 mg/L
Residue-nonfilterable (TSS)	23 to 100 mg/L

## DEMAND (WHOLE-VOLUME)

### QCI-301

Ready-to-use 500 mL whole-volume to be analyzed.

Biochemical oxygen demand (BOD)	15 to 250 mg/L
Carbonaceous BOD (CBOD)	15 to 250 mg/L
Chemical oxygen demand (COD)	30 to 250 mg/L
Total organic carbon (TOC)	6 to 100 mg/L

## OIL AND GREASE (WHOLE-VOLUME)

### QCI-302

Ready-to-use 1 L whole-volume to be analyzed for oil and grease at 8 to 50 mg/bottle. Works with both Freon and Hexane extractions.

Oil & Grease	20 to 100 mg/L
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## NUTRIENTS (WHOLE-VOLUME)

### QCI-303

Ready-to-use, two 500 mL whole-volume standards to be analyzed.

Ammonia as N	0.65 to 19 mg/L
Kjeldahl nitrogen (TKN)	1.5 to 35 mg/L
Nitrate as N	0.25 to 5 mg/L
Orthophosphate as P	0.5 to 5.5 mg/L
Phosphorus, total	0.5 to 10 mg/L

## CYANIDE (WHOLE-VOLUME)

### QCI-306

Ready-to-use, 500 mL whole-volume standard to be analyzed.

Cyanide	0.03 to 1 mg/L
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## PHENOL (WHOLE-VOLUME)

### QCI-307

Ready-to-use 500 mL whole-volume standard to be analyzed.

Total phenolics	0.06 to 5 mg/L
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## MINERALS/HARDNESS (WHOLE-VOLUME)

### QCI-304

Ready-to-use 500 mL whole-volume standard to be analyzed.

Alkalinity as CaCO <sub>3</sub>	10 to 120 mg/L
Calcium, Ca	3.5 to 110 mg/L
Chloride	35 to 275 mg/L
Conductivity	200 to 930 µmhos/cm
Fluoride	0.3 to 4 mg/L
Hardness, total as CaCO <sub>3</sub>	17 to 440 mg/L
Magnesium, Mg	2 to 40 mg/L
pH	5 to 10 UNITS
Potassium, K	4 to 40 mg/L
Residue, total (TS)	140 to 675 mg/L
Residue-filterable (TDS)	140 to 650 mg/L
Sodium, Na	6 to 100 mg/L
Sulfate	5 to 125 mg/L

## TRACE METALS (WHOLE-VOLUME)

### QCI-305

Ready-to-use, two 500 mL whole-volume standards to be analyzed.

Aluminium, Al	200 to 4000 µg/L
Antimony, Sb	95 to 900 µg/L
Arsenic, As	70 to 900 µg/L
Barium, Ba	100 to 2500 µg/L
Beryllium, Be	8 to 900 µg/L
Cadmium, Cd	8 to 750 µg/L
Chromium, Cr (total)	17 to 1000 µg/L
Cobalt, Co	28 to 1000 µg/L
Copper, Cu	40 to 900 µg/L
Iron, Fe	200 to 4000 µg/L
Lead, Pb	70 to 3000 µg/L
Manganese, Mn	70 to 4000 µg/L
Mercury, Hg	2 to 30 µg/L
Molybdenum, Mo	60 to 600 µg/L
Nickel, Ni	80 to 3000 µg/L
Selenium, Se	90 to 2000 µg/L
Vanadium, V	55 to 2000 µg/L
Silver, Ag	26 to 600 µg/L
Strontium, Sr	30 to 300 µg/L
Thallium, Tl	60 to 900 µg/L
Tin, Sn	1000 to 5000 µg/L
Titanium, Ti	80 to 300 µg/L
Zinc, Zn	100 to 2000 µg/L

# OTHER WHOLE-VOLUME STANDARDS ARE AVAILABLE.

# CONTACT US FOR MORE INFORMATION.



The analytes and concentrations will vary lot to lot but will always be certified within the concentration range shown.

## WHOLE-VOLUME KITS

### COMPLETE WASTE WATER WHOLE-VOLUME QC KIT

Contains: Cyanide, Demand, Minerals/Hardness, Nutrients, Oil and Grease, pH, Phenol, Trace Metals

QCI-313K

### PARTIAL WASTE-WATER WHOLE-VOLUME KIT

Contains: Demand, Nutrients, Oil and Grease, Residue/pH

QCI-312K

## TRACE METALS (WHOLE-VOLUME)

QCI-308

Ready-to-use, two 500 mL whole-volume standards to be analyzed.

Aluminium, Al	130 to 2500 µg/L
Antimony, Sb	6 to 50 µg/L
Arsenic, As	25 to 150 µg/L
Barium, Ba	500 to 3000 µg/L
Beryllium, Be	1 to 10 µg/L
Boron, B	800 to 2000 µg/L
Cadmium, Cd	2 to 50 µg/L
Chromium, Cr (total)	10 to 200 µg/L
Copper, Cu	50 to 200 µg/L
Iron, Fe	100 to 1800 µg/L
Lead, Pb	5 to 100 µg/L
Magnesium, Mg	2 to 20 mg/L
Manganese, Mn	40 to 900 µg/L
Mercury, Hg	0.5 to 10 µg/L
Molybdenum, Mo	15 to 130 µg/L
Nickel, Ni	10 to 500 µg/L
Selenium, Se	10 to 100 µg/L
Silver, Ag	20 to 300 µg/L
Thallium, Tl	2 to 10 µg/L
Vanadium, V	315 to 2500 µg/L
Zinc, Zn	400 to 2500 µg/L

## CORROSIVITY/SODIUM (WHOLE-VOLUME)

QCI-309

Ready-to-use 500 mL whole-volume standard to be analyzed.

Alkalinity as CaCO <sub>3</sub>	25 to 200 mg/L
Calcium hardness as CaCO <sub>3</sub>	75 to 375 mg/L
Calcium, Ca	30 to 90 mg/L
Chloride	5 to 100 mg/L
Conductivity	250 to 2500 µmhos/cm
Corrosivity	-4 to 4 SI units
Residue-filterable (TDS)	200 to 450 mg/L
Sodium, Na	12 to 24 mg/L

## WS MINERALS (WHOLE-VOLUME)

QCI-310

Ready-to-use 500 mL whole-volume standard to be analyzed.

Alkalinity as CaCO <sub>3</sub>	25 to 200 mg/L
Calcium, Ca	30 to 90 mg/L
Chloride	5 to 100 mg/L
Conductivity	250 to 2500 µmhos/cm
Corrosivity	-4 to 4 SI units
Fluoride	1 to 8 mg/L
Hardness, total as CaCO <sub>3</sub>	83 to 307 mg/L
Magnesium, Mg	2 to 20 mg/L
Nitrate as N	3 to 10 mg/L
pH	5 to 10 UNITS
Potassium, K	10 to 40 mg/L
Residue-filterable (TDS)	200 to 450 mg/L
Sodium, Na	12 to 24 mg/L
Sulfate	5 to 500 mg/L

## ANIONS (WHOLE-VOLUME) NEW!

QCI-317

Ready-to-use, 500 mL whole-volume standard to be analyzed.

Fluoride	1 to 8 mg/L
Nitrate as N	3 to 10 mg/L
Nitrite as N	0.4 to 2 mg/L
Orthophosphate as P	0.5 to 5.5 mg/L
Potassium, K	10 to 40 mg/L
Total nitrate-nitrite as N	3 to 12 mg/L

## TOC (WHOLE-VOLUME) NEW!

QCI-318

Ready-to-use, 500 mL whole-volume standard to be analyzed.

Sulfate	5 to 500 mg/L
Total organic carbon (TOC)	1.2 to 4.9 mg/L

## RESIDUAL FREE CHLORINE

(WHOLE-VOLUME) NEW!

QCI-321

Ready-to-use, 500 mL whole-volume standard to be analyzed.

Residual free chlorine	0.5 to 3 mg/L
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## CYANIDE (WHOLE-VOLUME) NEW!

QCI-322

Ready-to-use, 500 mL whole-volume standard to be analyzed.

Cyanide	0.1 to 0.5 mg/L
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The RTC range of Soil and Sediment QCs has been developed to complement our NELAC and RCRA soil and solids PT Program.

The actual certified value will always fall within the range shown for each analyte, but from lot to lot the values will change to provide a varying challenge to the analyst. For specific concentrations, we recommend ordering Certified Reference Materials (pages 3 to 40).

## METALS IN SOIL

### SQC-001

A 50 g sample of trace metals suitable for use with AA or ICP methods.

Aluminium, Al	1000 to 50000 mg/Kg
Antimony, Sb	80 to 300 mg/Kg
Arsenic, As	50 to 400 mg/Kg
Barium, Ba	80 to 3000 mg/Kg
Beryllium, Be	30 to 200 mg/Kg
Boron, B	80 to 200 mg/Kg
Cadmium, Cd	40 to 300 mg/Kg
Calcium, Ca	1500 to 25000 mg/Kg
Chromium, Cr (total)	40 to 300 mg/Kg
Cobalt, Co	30 to 200 mg/Kg
Copper, Cu	40 to 200 mg/Kg
Iron, Fe	1000 to 22000 mg/Kg
Lead, Pb	50 to 250 mg/Kg
Magnesium, Mg	1200 to 25000 mg/Kg
Manganese, Mn	150 to 2000 mg/Kg
Mercury, Hg	1 to 50 mg/Kg
Molybdenum, Mo	5 to 250 mg/Kg
Nickel, Ni	40 to 250 mg/Kg
Potassium, K	1400 to 25000 mg/Kg
Selenium, Se	50 to 250 mg/Kg
Silicon, Si	540 to 10000 mg/Kg
Silver, Ag	50 to 250 mg/Kg
Sodium, Na	150 to 15000 mg/Kg
Strontium, Sr	20 to 500 mg/Kg
Thallium, Tl	50 to 250 mg/Kg
Tin, Sn	75 to 250 mg/Kg
Titanium, Ti	20 to 500 mg/Kg
Vanadium, V	50 to 250 mg/Kg
Zinc, Zn	70 to 1500 mg/Kg

## VOAs IN SOIL

### SQC-002

Two 30 g natural-matrix samples for analysis by method 8260.

High Level Concentration Range	0.5 to 30 mg/Kg
Low Level Concentration Range	20 to 500 µg/Kg
Acetone	trans-1,2-Dichloroethylene
Acetonitrile	Ethylbenzene
Acrolein (Propenal)	Hexachloroethane
T-amylmethylether (TAME)	2-Hexanone
Benzene	Isopropylbenzene
Bromobenzene	Methyl bromide (Bromomethane)
Bromodichloromethane	Methyl chloride (Chloromethane)
Bromoform	Methylene chloride (Dichloromethane)
2-Butanone (Methyl ethyl ketone, MEK)	4-Methyl-2-pentanone (MIBK)
Carbon disulfide	Methyl tert-butyl ether (MTBE)
Carbon tetrachloride	Styrene
Chlorobenzene	1,1,1,2-Tetrachloroethane
Chloroethane	1,1,2,2-Tetrachloroethane
2-Chloroethyl vinyl ether	Tetrachloroethylene (Perchloroethylene)
Chloroform	Toluene
1,2-Dibromo-3-chloropropane (DBCP)	1,2,4-Trichlorobenzene
Dibromochloromethane	1,1,1-Trichloroethane
1,2-Dibromoethane	1,1,2-Trichloroethane
Dibromomethane	Trichloroethene (Trichloroethylene)
1,2-Dichlorobenzene	Trichlorofluoromethane
1,3-Dichlorobenzene	1,2,3-Trichloropropane
1,4-Dichlorobenzene	1,2,4-Trimethylbenzene
Dichlorodifluoromethane	1,3,5-Trimethylbenzene
1,1-Dichloroethane	Vinyl acetate
1,2-Dichloroethane	Vinyl chloride
1,1-Dichloroethylene	m+p-Xylene
cis-1,2-Dichloroethylene	o-Xylene
1,2-Dichloropropane	Xylene, total
cis-1,3-Dichloropropene	Di-isopropylether (DIPE)
trans-1,3-Dichloropropylene	

## HERBICIDES IN SOIL

### SQC-004

A 50 g natural-matrix sample for analysis by methods 8151 and 8270.

Pentachlorophenol	5 to 500 µg/Kg
MCPP	5 to 500 µg/Kg
2,4-D	5 to 500 µg/Kg
Dalapon	5 to 500 µg/Kg
2,4-DB	5 to 500 µg/Kg
Dicamba	5 to 500 µg/Kg
Dinoseb (2-sec-butyl-4,6-dinitrophenol, DNBP)	5 to 500 µg/Kg
Silvex (2,4,5-TP)	5 to 500 µg/Kg
2,4,5-T	5 to 500 µg/Kg

## CHLORDANE IN SOIL

### SQC-027

A 50 g sample suitable for use with methods 8081, 8150 and 8151.

Chlordane (total)	100 to 500 µg/Kg
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## TOXAPHENE IN SOIL

### SQC-028

A 50 g sample suitable for use with methods 8081, 8150 and 8151.

Toxaphene (Chlorinated camphene)	100 to 500 µg/Kg
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## PCBs IN SOIL

### SQC-010.

A 50 g sample containing one unspecified Aroclor. For analysis by methods 8080, 8081 and 8082.

Concentration Range	500 to 50000 µg/Kg
Aroclor-1016 (PCB-1016)	Aroclor-1248 (PCB-1248)
Aroclor-1221 (PCB-1221)	Aroclor-1254 (PCB-1254)
Aroclor-1232 (PCB-1232)	Aroclor-1260 (PCB-1260)
Aroclor-1242 (PCB-1242)	



The analytes and concentrations will vary lot to lot but will always be certified within the concentration range shown.

## BNAs IN SOIL

### SQC-003

A 100 g sample suitable for use with method 8270.

Concentration Range	500 to 17000 µg/Kg
2-Amino-1methylbenzene	3,3'-Dichlorobenzidine
1,2-Dichlorobenzene	2,4-Dichlorophenol
1,3-Dichlorobenzene	2,6-Dichlorophenol
1,4-Dichlorobenzene	Diethyl phthalate
Hexachlorobutadiene	2,4-Dimethylphenol
Hexachloroethane	Dimethyl phthalate
Naphthalene	2,4-Dinitrophenol
Nitrobenzene	2,4-Dinitrotoluene (2,4-DNT)
Pyridine	2,6-Dinitrotoluene (2,6-DNT)
1,2,4-Trichlorobenzene	Di-n-octyl phthalate
Acenaphthene	bis(2-Ethylhexyl) phthalate (DEHP)
Acenaphthylene	Fluoranthene
Aniline	Fluorene
Anthracene	Hexachlorobenzene
Benzo(a)anthracene	Hexachlorocyclopentadiene
Benzo(a)pyrene	Indeno(1,2,3-cd) pyrene
Benzo(b)fluoranthene	Isophorone
Benzo(g,h,i)perylene	Maleic anhydride
Benzidine	2-Methyl-4,6-dinitrophenol
Benzo(k)fluoranthene	2-Methylnaphthalene
Benzo(b+k)fluoranthene	2-Methylphenol (o-Cresol)
Benzoic acid	3-Methylphenol (m-Cresol)
Benzyl alcohol	4-Methylphenol (p-Cresol)
4-Bromophenyl phenyl ether	3+4-Methylphenol (m+p-Cresol)
Butyl benzyl phthalate	2-Nitroaniline
Carbazole	3-Nitroaniline
4-Chloro-3-methylphenol	4-Nitroaniline
4-Chloroaniline	2-Nitrophenol
bis(2-Chloroethoxy)methane	3-Nitrophenol
bis(2-Chloroethyl) ether	4-Nitrophenol
bis(2-Chloroisopropyl) ether	n-Nitrosodimethylamine
1-Chloronaphthalene	n-Nitrosodiphenylamine
2-Chloronaphthalene	n-Nitrosodi-n-propylamine
2-Chlorophenol	Pentachlorophenol
4-Chlorophenyl phenylether	Phenanthrene
Chrysene	Phenol
Dibenz(a,h) anthracene	Pyrene
Dibenzofuran	2,4,5-Trichlorophenol
Di-n-butyl phthalate	2,4,6-Trichlorophenol

## CYANIDE IN SOIL

### SQC-011

A 100 g sample of cyanide in soil.

Cyanide	25 to 500 mg/Kg
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## SULFIDE IN SOIL

### SQC-102

A 100 g sample of sulfide in soil.

Sulfide	5 to 500 mg/Kg
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## CHLORINATED PESTICIDES IN SOIL

### SQC-009

A 50 g sample suitable for use with methods 8080, 8081 and 8151.

Concentration Range	5 to 500 µg/Kg
Hexachlorobenzene	Endosulfan I
Hexachlorocyclopentadiene	Endosulfan II
Aldrin	Endosulfan sulfate
delta-BHC	Endrin aldehyde
alpha-BHC	Endrin ketone
beta-BHC	Endrin
gamma-BHC	Heptachlor
alpha-Chlordane	Heptachlor epoxide
gamma-Chlordane	Methoxychlor
4,4'-DDD	Propachlor (Ramrod)
4,4'-DDE	Toxaphene (Chlorinated camphene)
4,4'-DDT	Trifluralin (Treflan)
Dieldrin	

## CHROMIUM VI IN SOIL

### SQC-012

A 30 g sample containing Hexavalent Chromium for use with methods 7196 and 7199.

Hexavalent Chromium, Cr(VI)	40 to 300 mg/Kg
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## SOLIDS KITS

### NELAC SOILS QC KIT

Contains: Anions 1, BNAs in Soil, Chlorinated Pesticides, Chlordane in Soil, Chromium VI, Herbicides, PCBs in Soil, Total Metals, Toxaphene in Soil, VOAs in Soil

SQC-020K

### BNA/PESTICIDES QC KIT

Contains: BNAs in Soil, Chlorinated Pesticides

SQC-035K

**EACH SAMPLE IS SUPPLIED  
WITH A CERTIFICATE  
OF ANALYSIS, WITH  
SUGGESTED QUALITY  
CONTROL VALUES.**



The analytes and concentrations will vary lot to lot but will always be certified within the concentration range shown.

## METALS IN SEWAGE SLUDGE

### SQC-001S

A 50 g sewage sludge sample suitable for use with AA or ICP.

Aluminium, Al	1000 to 50000 mg/Kg
Antimony, Sb	0 to 300 mg/Kg
Arsenic, As	0 to 400 mg/Kg
Barium, Ba	0 to 3000 mg/Kg
Beryllium, Be	0 to 200 mg/Kg
Boron, B	0 to 200 mg/Kg
Cadmium, Cd	0 to 300 mg/Kg
Calcium, Ca	1500 to 50000 mg/Kg
Chromium, Cr (total)	0 to 300 mg/Kg
Cobalt, Co	0 to 200 mg/Kg
Copper, Cu	0 to 1000 mg/Kg
Iron, Fe	1000 to 22000 mg/Kg
Lead, Pb	0 to 250 mg/Kg
Magnesium, Mg	100 to 25000 mg/Kg
Manganese, Mn	100 to 2000 mg/Kg
Mercury, Hg	0 to 50 mg/Kg
Molybdenum, Mo	0 to 250 mg/Kg
Nickel, Ni	0 to 250 mg/Kg
Potassium, K	1400 to 25000 mg/Kg
Selenium, Se	0 to 250 mg/Kg
Silicon, Si	500 to 25000 mg/Kg
Silver, Ag	0 to 250 mg/Kg
Sodium, Na	0 to 15000 mg/Kg
Strontium, Sr	0 to 500 mg/Kg
Thallium, Tl	0 to 250 mg/Kg
Tin, Sn	0 to 250 mg/Kg
Vanadium, V	0 to 250 mg/Kg
Zinc, Zn	0 to 1500 mg/Kg
Ammonia as N	
Kjeldahl nitrogen (TKN)	
pH	
Phosphorus, total	
Residue, total (TS)	
Total organic carbon (TOC)	

## ORGANIC LEAD IN SOIL

### SQC-001-Pb

Two 25 g samples containing organic lead.

Lead, Pb	1 to 100 mg/Kg
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## TCLP METALS IN SOIL

### SQC-005

A 50 g natural-matrix sample for analysis by methods 8081, 8150, 8151 and 8270.

## CA WET METALS IN SOIL

### SQC-006

A 225 g heavy-metal contaminated soil which contains the 16 CA-Waste Extraction Test methods.

## DIESEL IN SOIL

### SQC-007

A 100 g sample suitable for use with modified 8015.

Diesel range organics (DRO)	10 to 2000 mg/Kg
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## GASOLINE IN SOIL

### SQC-008

A 30 g sample suitable for use with modified methods 8015 and 8021.

Benzene	0.5 to 30 mg/Kg
Ethylbenzene	0.5 to 30 mg/Kg
Methyl tert-butyl ether (MTBE)	0.5 to 30 mg/Kg
Naphthalene	0.5 to 30 mg/Kg
Toluene	0.5 to 30 mg/Kg
m+p-Xylene	0.5 to 100 mg/Kg
o-Xylene	0.5 to 100 mg/Kg
Xylene, total	0.5 to 100 mg/Kg
Gasoline range organics (GRO), C <sub>6</sub> -C <sub>12</sub>	15 to 1000 mg/Kg

## PAHs BY HPLC

### SQC-017

A 100 g sample suitable for use with HPLC method 8310.

Naphthalene	Benzo(k)fluoranthene
Acenaphthene	Chrysene
Acenaphthylene	Dibenz(a,h) anthracene
Anthracene	Fluoranthene
Benzo(a)anthracene	Fluorene
Benzo(a)pyrene	Indeno(1,2,3-cd) pyrene
Benzo(b)fluoranthene	Phenanthrene
Benzo(g,h,i)perylene	Pyrene

## TCLP SEMI-VOAS

### SQC-015

A 225 g sample to be extracted by method 1311.

1,4-Dichlorobenzene	Pentachlorophenol
Hexachlorobutadiene	2,4,5-Trichlorophenol
Hexachloroethane	2,4,6-Trichlorophenol
Nitrobenzene	gamma-BHC (Lindane)
Pyridine	Chlordane (total)
2,4-Dinitrotoluene (2,4-DNT)	Endrin
Hexachlorobenzene	Heptachlor
2-Methylphenol (o-Cresol)	Methoxychlor
4-Methylphenol (p-Cresol)	Toxaphene (Chlorinated camphene)
3+4-Methylphenol (m+p-Cresol)	2,4-D
Total Cresol	Silvex (2,4,5-TP)

## PHENOLS

### SQC-018

A 100 g sample suitable for use with method 8041.

4-Chloro-3-methylphenol	2-Nitrophenol
2-Chlorophenol	4-Nitrophenol
2-Cyclohexyl-4,6-dinitrophenol	Pentachlorophenol
2,4-Dichlorophenol	Phenol
2,6-Dichlorophenol	2,3,4,5-Tetrachlorophenol
2,4-Dimethylphenol	2,3,4,6-Tetrachlorophenol
2,4-Dinitrophenol	2,3,5,6-Tetrachlorophenol
2-Methyl-4,6-dinitrophenol	2,4,5-Trichlorophenol
2-Methylphenol (o-Cresol)	2,4,6-Trichlorophenol
3-Methylphenol (m-Cresol)	Dinoseb
4-Methylphenol (p-Cresol)	

## ANIONS IN SOIL

### SQC-013

A 30 g sample containing Bromide, Chloride, Fluoride, Nitrate as N, Phosphate as P, Sulfate.



The analytes and concentrations will vary lot to lot but will always be certified within the concentration range shown.

## DIOXINS AND FURANS

### SQC-016

A 10 g sample suitable for use with methods 8280A or 8290.

1,2,3,4,6,7,8-HpCDF	1,2,3,4,6,7,8,9-OCDF
1,2,3,4,7,8,9-HpCDF	1,2,3,4,6,7,8,9-OCDD
1,2,3,4,6,7,8-HpCDD	1,2,3,7,8-PeCDF
HpCDF, total	2,3,4,7,8-PeCDF
HpCDD, total	PeCDF, total
1,2,3,4,7,8-HxCDD	PeCDD, total
1,2,3,6,7,8-HxCDD	2,3,7,8-TCDD
1,2,3,7,8,9-HxCDD	2,3,7,8-TCDF
HxCDD, total	TCDF, total
1,2,3,4,7,8-HxCDF	TCDD, total
1,2,3,6,7,8-HxCDF	PCDD, total
1,2,3,7,8,9-HxCDF	PCDD + PCDF, total
2,3,4,6,7,8-HxCDF	PCDF, total
HxCDF, total	

## ORGANOPHOSPHORUS PESTICIDES

### SQC-021

A 50 g sample suitable for use with method 8141.

Azinphos-methyl (Guthion)	Parathion, methyl
Chlorfenvinphos	Parathion, ethyl
Demeton-s	Phorate
Demeton-o	Ronnel
Diazinon	Sulfotepp
EPN	Tetrachlorvinphos
Ethoprop	Tetraethyl pyrophosphate (TEPP)
Famphur	Trichlorfon
Fenthion	Dichlorovos (DDVP, Dichlorvos)
Malathion	Disulfoton
Naled	

## NITROSAMINES/NITROAROMATICS

### SQC-022

A 10 g sample suitable for use with method 8330.

Nitrobenzene	RDX
1,3-Dinitrobenzene	2-Nitrotoluene
2,4-Dinitrotoluene	3-Nitrotoluene
2,6-Dinitrotoluene	4-Nitrotoluene
Nitroglycerin	HMX
1,3,5-Trinitrobenzene	Pentaerythritol tetranitrate)
2-Amino-4,6-dinitrotoluene	Tetryl
4-Amino-2,6-dinitrotoluene	2,4,6-Trinitrotoluene

## CORROSIVITY

### SQC-023

A 100 g sample suitable for use with method 9040B and 9045 C.

Corrosivity (pH)	2 to 12 pH Units
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## REACTIVITY

### SQC-024

A 30 g sample containing reactive cyanide.

Cyanide	50 to 500 mg/Kg
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## TOTAL RECOVERABLE PETROLEUM HYDROCARBONS (TRPH)

### SQC-019

A 100 g sample suitable for use by IR Screen or 418.

TRPH	100 to 10000 mg/Kg
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## FLASH POINT

### SQC-029

A 100 mL sample suitable for use with all promulgated ignitability methods.

Ignitability (Flash Point)	25 to 100 °C
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## CARBAMATES

### SQC-030

A 50 g sample for the analysis of carbamate pesticides.

Aldicarb (Temik)	5 to 500 µg/Kg
Aldicarb sulfone	5 to 500 µg/Kg
Carbaryl (Sevin)	5 to 500 µg/Kg
3-Hydroxycarbofuran	5 to 500 µg/Kg
Methiocarb (Mesuroil)	5 to 500 µg/Kg
Methomyl (Lannate)	5 to 500 µg/Kg
Promecarb	5 to 500 µg/Kg
Propoxur (Baygon)	5 to 500 µg/Kg
Dioxacarb	5 to 500 µg/Kg

## OIL AND GREASE IN SOIL

### SQC-037

A 100 g sample for the analysis of oil and grease by gravimetric or IR methods.

## PHENOLICS IN SOIL

### SQC-038

A 100 g sample to be analyzed using methods 9020B, 9065, 9066 and 9067.

Total phenolics	0.5 to 100 mg/Kg
Total organic halides (TOX)	0.5 to 100 mg/Kg

## METALS IN OIL

### SQC-060

A 25 mL sample for the analysis of Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Mercury, Lead, Silver, Thallium.

## FLUORIDE/CHLORINE IN OIL

### SQC-061

A 100 mL sample for the analysis of Fluoride and Chloride.

## HEAT OF COMBUSTION

### SQC-062

A 100 g sample for the analysis of Heat Content.

## SPECIFIC GRAVITY

### SQC-066

A 100 g sample for the analysis of Specific Gravity.

## OXIDIZER SCREEN

### SQC-067

A 100 g sample for the analysis of Oxidizer in Water.

## URANIUM IN SOIL NEW!

### SQC-071

A 30 g sample for analysis by methods 6020.



The RTC range of Underground Storage Tank QCs has been developed to complement our UST PT Program.

The actual certified value will always fall within the range shown for each analyte, but from lot to lot the values will change to provide a varying challenge to the analyst. For specific concentrations, we recommend ordering Certified Reference Materials (pages 3 to 40).

## BTEX/MTBE IN WATER

### QC0-114

For analysis by methods 602, 8020, 8021 and 8260.

Concentration Range	1 to 50 µg/L
Benzene	1,3,5-Trimethylbenzene
Ethylbenzene	m+p-Xylene
Methyl tert-butyl ether (MTBE)	o-Xylene
Toluene	Xylene, total
1,2,4-Trimethylbenzene	

## BTEX/MTBE IN SOIL

### SQC-025

For analysis by methods 602, 8020, 8021 and 8260.

Concentration Range	5 to 25 mg/Kg
Benzene	1,3,5-Trimethylbenzene
Ethylbenzene	m+p-Xylene
Methyl tert-butyl ether (MTBE)	o-Xylene
Toluene	Xylene, total
1,2,4-Trimethylbenzene	

## GASOLINE IN WATER

### QC0-010

Analyze for gasoline by Purge and Trap, modified 8015 and NWTPH-Gx methods.

Gasoline range organics (GRO), C <sub>6</sub> -C <sub>12</sub>	200 to 4000 µg/L
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## GASOLINE IN SOIL

### SQC-008

A 30 g sample suitable for use with modified methods 8015 and 8021.

Gasoline range organics (GRO), C <sub>6</sub> -C <sub>12</sub>	15 to 1000 mg/Kg
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## DIESEL IN WATER

### QC0-011

Diesel No. 2. Use with modified 8015 and NWTPH-Dx methods.

Diesel range organics (DRO)	500 to 4000 µg/L
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## DIESEL IN SOIL

### SQC-007

A 100 g sample suitable for use with modified 8015.

Diesel range organics (DRO)	10 to 2000 mg/Kg
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## TPH IN WATER

### QC0-115

Whole-Volume sample for analysis by methods 413, 418 and 1664.

Total Petroleum Hydrocarbons (TPH)	20 to 170 mg/L
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## TPH IN SOIL

### SQC-026

For analysis by methods 413, 418 and 1664.

Total Petroleum Hydrocarbons (TPH)	200 to 10000 mg/Kg
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## UST QC Kits

### COMPLETE UST QC KIT

Contains all 8 UST QC Samples.

SQC-031K

### UST SOIL QC KIT

Contain the 4 UST QC Soil Samples.

SQC-032K

### UST WATER KIT

Contains the 4 UST QC Water Samples.

SQC-033K



## Alaska

### BTEX/MTBE IN WATER

QCO-114AK

For analysis by methods AK101, 602, 8020 and 8260.

Benzene	Toluene
1,2-Dichlorobenzene	1,2,4-Trimethylbenzene
1,3-Dichlorobenzene	1,3,5-Trimethylbenzene
1,4-Dichlorobenzene	m+p-Xylene
Ethylbenzene	o-Xylene
MTBE	Xylene, total
Naphthalene	

### GASOLINE IN WATER

QCO-010AK

Analyze for gasoline by Purge and Trap, modified 8015, NWTPH-Gx and AK101 methods.

Gasoline range organics (GRO)	100 to 550 µg/L
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### DIESEL IN WATER

QCO-011AK

For analysis by modified 8015, NWTPH-Dx and AK102 methods.

Diesel range organics (DRO)	800 to 2300 µg/L
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### BTEX/MTBE IN SOIL

SQC-025AK

A single soil sample preserved with methanol, for analysis by methods 8021, 8260 and AK101.

Benzene	1,3,5-Trimethylbenzene
Ethylbenzene	m+p-Xylene
Methyl tert-butyl ether (MTBE)	o-Xylene
Toluene	Xylene, total
1,2,4-Trimethylbenzene	

### GASOLINE IN SOIL

SQC-008AK

A single soil sample containing a blended gasoline preserved with methanol, for analysis by methods 8015M and AK101.

Gasoline range organics (GRO)	30 to 1500 mg/Kg
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### DIESEL IN SOIL

SQC-007AK

A 14 g sample containing No. 2 diesel, for analysis by methods 8015M or AK102.

Diesel range organics (DRO)	30 to 1500 mg/Kg
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### RRO IN SOIL BY AK METHODS

SQC-026AK

A 14 g sample containing a blend of 30w and 40w oil for analysis by gravimetric or AK 103 methods.

RRO (Residual Range Organics)	1500 to 2000 mg/Kg
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### ALASKA UST QC KIT

SQC-034K

This kit includes products that are required for UST testing by the state of Alaska. Includes the above products.

## Texas

### TPH IN WATER

QCO-115TX

A two-sample set for analysis by TNRCC Methods 1005 or 1006.

Total Petroleum Hydrocarbons (TPH)	Gasoline range organics (GRO)
Diesel range organics (DRO)	

### TPH IN SOIL

SQC-026TX

A two-sample set for analysis by TNRCC Methods 1005 or 1006.

Residual Range Organics (RRO)	Diesel range organics (DRO)
Total Petroleum Hydrocarbons (TPH)	Gasoline range organics (GRO)

## Massachusetts

### GASOLINE IN WATER - VPH

QCO-010MA

For analysis of various VPH ranges and other gasoline components.

### DIESEL IN WATER - EPH

QCO-011MA

For analysis of various EPH ranges and other diesel components.

### GASOLINE IN SOIL - VPH

SQC-008MA

For analysis of various VPH ranges and other gasoline components.

### DIESEL IN SOIL - EPH

SQC-007MA

For analysis of various EPH ranges and other diesel components.

## Wisconsin (for MN Certification)

### BTEX/MTBE IN SOIL

SQC-025WI

A single soil sample preserved with methanol, for analysis by methods 8021, 8260 and WI GRO.

Benzene	1,3,5-Trimethylbenzene
Ethylbenzene	m+p-Xylene
Methyl tert-butyl ether (MTBE)	o-Xylene
Toluene	Xylene, total
1,2,4-Trimethylbenzene	

### GASOLINE IN SOIL

SQC-008WI

A single soil sample containing gasoline preserved with methanol, for analysis by methods 8015M and WI GRO.

Gasoline range organics (GRO), C<sub>6</sub>-C<sub>12</sub>

### DIESEL IN SOIL

SQC-007WI

A 100 g sample containing No. 2 diesel, for analysis by methods 8015M and WI DRO.

Diesel range organics (DRO)

## Washington

### GASOLINE IN WATER - VPH

QCO-010WA

For analysis of various VPH ranges and other gasoline components.

### DIESEL IN WATER - EPH

QCO-011WA

For analysis of various EPH ranges and other diesel components.

### GASOLINE IN SOIL - VPH

SQC-008WA

For analysis of various VPH ranges and other gasoline components.

### DIESEL IN SOIL - EPH

SQC-007WA

For analysis of various EPH ranges and other diesel components.



The growth of PT program for the analysis of microbiological contamination in water has allowed RTC to offer a limited range of QCs. The QCs have been developed to complement our Microbiological PT program.

## WS - MICROBIOLOGICAL QC

### MIC-QC1

Each standard contains four lyophilized samples, each to be reconstituted to as many as ten (10) 100 mL sample: one total and fecal positive, one total positive and fecal negative, one total and fecal negative, and one blank, to test and verify your microbiological analyses. Use for all SDWA promulgated methods - MF, MPN, Presence/Absence and ONPG-MUG. Each set can be used for total coliforms and/or fecal coliforms as E.coli.

## WP - MTF / MF

### MIC-QC3

Each set contains two lyophilized samples, one quantitative positive and one negative, to test and verify your microbiological analyses. The standards are formulated for all Clean Water Act promulgated quantitative methods - MF and MPN. The standards can also be used for all SDWA promulgated Presence/Absence methods - MF and MPN, Presence/Absence and ONPG-MUG. Each set can be used for total coliforms and/or fecal coliforms as E.coli, which are present at 20-2400 CFU/100 mL.

## WS - STANDARD PLATE COUNT

### MIC-QC2

One quantitative lyophilized sample containing a heterotrophic bacteria present at 5-500 CFU/mL, reconstituted volume as many as ten (10) 100 mL samples. The sample is used to test and verify your wastewater and/or recreation water analyses. The standard is designed to be used with Standard Method 9215B-Pour Plate Method.

## TOTAL AND/OR FECAL STREPTOCOCCUS/ENTEROCOCCUS

### MIC-QC5

Designed for use with quantitative methods for total and fecal streptococcus/enterococcus. Each PT contains one quantitative sample. The PT is shipped with instructions and sterile diluent.

## CERTAN® - The Ampule in the Vial

The CERTAN® capillary vial is a sample container with capillary opening. It has been specifically developed for use with, and storage of, reference solutions. The use of a screw-cap vial in sorting volatile standards can lead to losses due to evaporation.

The CERTAN® capillary bottle guarantees long-term safe storage of reference solutions.

### CERTAN® Advantages

- No change in concentration of standard solutions, even when opened.
- Totally secure storage, free of loss.
- Minimized risk of contamination.
- The filling and removal of aliquots can be easily achieved using a standard GC syringe.
- Proven usable from -30°C to +50°C.
- Serial filling is easy with an auto diluter.
- Almost impossible to spill.



The CERTAN® capillary vial combines the advantage of a sealed ampule with the flexibility of a screw cap bottle or septum vial.

Product Code	Description	Unit
CER 01	CERTAN 1.5 mL Capillary Bottle	10 x 1.5 mL
CER 05	CERTAN 4.5 mL Capillary Bottle	5 x 4.5 mL
CER 10	CERTAN 10 mL Capillary Bottle	5 x 10 mL



Water Supply and Water Pollution Study Program.

These samples have been specially designed to verify your method detection limits (MDL).

CATALOGUE NUMBER	ANALYTE	CONCENTRATION*
MDL-001	Alkalinity	20 mg CaCO <sub>3</sub> /L
MDL-002	Ammonia as N	0.5 mg/L
MDL-003	BOD	5.0 mg/L
MDL-004	Boron	0.2 mg/L
MDL-005	Bromide	0.1 mg/L
MDL-006	Chloride	1.0 mg/L
MDL-007	Chlorine	0.06 mg/L
MDL-008	Cyanide	0.05 mg/L
MDL-009	Fluoride	0.1 mg/L
MDL-010	Nitrite as N	0.2 mg/L
MDL-011	Oil and Grease	10 mg/L
MDL-012	Total phosphorous	0.200 mg/L
MDL-013	Sulfate	0.1 mg/L
MDL-014	Sulfate	1.0 mg/L
MDL-015	Sulfate	10 mg/L
MDL-016	TDS	10 mg/L
MDL-017	TSS One-liter (1 L)	10 mg/L
MDL-018	Mercury	0.100 µg/L
MDL-019	COD	5.23 mg/L
MDL-020	Nitrate as N	0.150 mg/L

\*All samples supplied as concentrates for dilution to 1 L, except where noted.  
Concentrations listed are diluted values.

**OTHER STANDARDS ARE AVAILABLE.  
CALL FOR MORE INFORMATION.**

*NIST Traceable (where available)*





Following are a list of terms that are commonly used in USA environmental analytical Laboratories and which are used throughout this catalogue.

**AA**

Atomic Absorption Spectroscopy: the detection of metals using a single wavelength/single element spectral analysis.

**Flame AA**

AA using an acetylene flame as heat source. EPA Method 7020 describes the analysis of trace elements using this technique.

**GFAA**

AA using an Electrothermal Graphite Furnace as heat source. EPA Method 7021 describes the analysis of trace elements using this technique.

**Cold Vapor AA**

A spectral analysis used in the detection of Mercury vapor. EPA Methods 7470/7471 describes the analysis of trace elements using this technique.

**Aroclor**

Trade name for PCBs in North America. They are defined by a 4 digit code of which the last 2 digits represent the % by weight of the chlorine content.

**BNAs**

Base Neutral Acid. BNA's include PAH's and related structures. The group is also commonly referred to as SVOCs. EPA Method 8270 describes the analysis of BNAs

**Calderon Metals**

A list of 22 toxic metals associated with metal extraction and smelting, hence the name "calderon". They are Antimony (Sb), Arsenic (As), Barium (Ba), Beryllium (Be), Cadmium (Cd), Chromium (Cr), Cobalt (Co), Copper (Cu), Iron (Fe), Lead (Pb), Magnesium (Mg), Manganese (Mn), Mercury (Hg), Molybdenum (Mo), Nickel (Ni), Potassium (K), Selenium (Se), Silver (Ag), Sodium (Na), Thallium (Tl), Vanadium (V) and Zinc (Zn).

**Carbon Range**

The amount of petroleum hydrocarbons in a specific section of a chromatogram based on the retention time of pure alkanes such as hexane, heptane, octane etc., i.e. C<sub>6</sub>-C<sub>7</sub>, C<sub>7</sub>-C<sub>8</sub>, C<sub>8</sub>-C<sub>9</sub> etc. Pure straight chain hydrocarbons (alkanes) have retention times that increase regularly with the number of carbon atoms. These retention times are used to divide a chromatogram into carbon ranges: C<sub>8</sub>-C<sub>10</sub> is the part of a chromatogram between the retention time of Octane (eight carbon atoms) and Decane (ten carbon atoms)

The TPH of a Carbon Range is defined as the area of a range of the sample compared to the area of the same range of the reference standard.

The carbon ranges of some typical hydrocarbon products:

C <sub>4</sub> -C <sub>12</sub>	Gasoline, Petrol
C <sub>4</sub> -C <sub>16</sub>	Jet Fuel JP-4
C <sub>9</sub> -C <sub>16</sub>	Kerosene, Parafin, Fuel Oil No 1,
C <sub>9</sub> -C <sub>20</sub>	Diesel No 2
C <sub>11</sub> -C <sub>20</sub>	Fuel Oil No 2
C <sub>12</sub> -C <sub>32</sub>	Fuel Oil No 6, Bunker Oil
C <sub>18</sub> -C <sub>40</sub> /C <sub>50</sub>	Motor Oil
C <sub>4</sub> -C <sub>40</sub> /C <sub>50</sub>	Crude Oil

**Chlorinated Hydrocarbons**

Volatile Organic Compounds detailed in EPA Method 8010 and EPA Method 601. This list is also known as Chlorinated Solvents or Purgeable Halocarbons.

**EPA 8260**

EPA Method for the identification of a specified list of Volatile Organic Compounds utilizing GC/MS (Gas Chromatography/Mass Spectrometry).

**EPA 8270**

EPA Method for the identification of a specified list of Semi-Volatile Organic Compounds utilizing GC/MS (Gas Chromatography/Mass Spectrometry).

**GC/MS**

Gas Chromatography with a Mass Spectrophotometer detector. EPA Method 8260 and 8270 describes the analysis of Volatile and Semi-volatile organic compounds using this technique.

**IC**

Ion Chromatography, a method for the detection of Phosphate (PO<sub>4</sub>), Sulfate (SO<sub>4</sub>), Chloride (Cl), Fluoride (F), Bromide (Br), Nitrite (NO<sub>2</sub>), and Nitrate (NO<sub>3</sub>).

**ICP**

Inductively Coupled Plasma. A form of AA instrumentation which utilizes a high temperature plasma to ionize trace elements for analysis. EPA Method 6010 describes the analysis of trace elements using this technique.

**ICP/MS**

Inductively Coupled Plasma spectrophotometer coupled to a mass Spectrophotometer. EPA Method 6020 describes the analysis of trace elements using this technique.

**Leachable**

A term which describes the ability of toxic materials to be extracted from the soil by water in a natural environment.

**LUFT**

Leaking Underground Fuel Tanks. US Regulations for treatment of leaking tanks, including designated analytical testing, are laid out in federal regulations and state programs.

**LUFT 5**

A list of 5 heavy metals commonly associated with leaking underground fuel tanks. The elements of concern are: Cadmium (Cd), Chromium (Cr), Nickel (Ni), Lead (Pb) and Zinc (Zn).

**MTBE**

Methyl Tertiary Butyl Ether. An oxygenate added to reformulated gasoline and intended to lower exhaust emission of CO and VOC's.

**PAH**

Polyaromatic hydrocarbons. Aromatic hydrocarbons containing more than one fused benzene ring.

**PCB**

Polychlorinated Biphenols. A class of organic compounds with 1 to 10 chlorine atoms attached to biphenol.

**Priority Pollutant Metals**

A list of 13 metals, Antimony (Sb), Arsenic (As), Beryllium (Be), Cadmium (Cd), Chromium (Cr), Copper (Cu), Lead (Pb), Mercury (Hg), Nickel (Ni), Selenium (Se), Silver (Ag), Thallium (Tl), and Zinc (Zn) .

**Priority Pollutants**

Volatile Organic Compounds covered by EPA Method 8240.

**Purgeable Halocarbons**

Volatile Organic Compounds Covered by EPA Method 8010 and EPA Method 601. Also known as Chlorinated Solvents or Chlorinated Halocarbons.

**SIM**

Selected or selective ion monitoring. SIM Analysis sets the MS detector to repeatedly scan a few selected ions rather than a full spectrum. In the acquisition method (GC/MS SIM or Gas Chromatography/Mass Spectrometry using Selected Ion Monitoring), the selected ions are set to reflect the compounds to be detected. The detector scans for a primary, secondary and tertiary ion set unique to the compound of interest in a particular retention time window.

**SIMDIS**

Simulated distillation. It is expressed as the percentage of the total amount of TPH present in each Carbon Range. For example, if 100 ppm of TPH  $C_{10}-C_{40}$  is detected and 30 ppm lies in the  $C_{10}-C_{25}$  range then the percentage would be 30%  $C_{10}-C_{25}$  and 70%  $C_{25}-C_{40}$ .

**SVOCs**

Semi-Volatile Organic Compound or BNAs (Base Neutral Acid) EPA Method 8270 describes the analysis of semi-volatile organic compounds using this technique.

**TCLP**

Toxicity Characteristic Leachate Procedure. Used to characterize the mobility of both organic and inorganic analytes present in liquid and solid wastes. An extraction method prescribed by CFR (Code of Federal Regulations.) The extraction process takes 18 hours.

**TPH**

Total Petroleum Hydrocarbons. A measure of the total amount of fuel present in the sample, i.e., TPH-gasoline or TPH-diesel. TPH results can be quantified or calculated as:

Totals as specific fuels types, i.e. TPH as diesel, crude or gasoline

Totals in specific carbon ranges, i.e. 500 ppm  $C_{10}-C_{25}$

**VOAs**

Volatile Organic Analysis or Analytes. The term is now less used, having been replaced by VOC's. "VOA Vials" refer to the 40 ml containers used for aqueous sampling of volatile compounds.

**VOCs**

Volatile Organic Compounds. Refers to the list of analytes specified by EPA Method 8240 or the longer list specified by EPA Method 8260.

**WET**

Waste Extraction Test and is used in the classification of metals as hazardous waste. It is often used interchangeably with "STLC" or "soluble" when referring to the amount of a metal that is leachable, i.e. WET lead. The correct scientific nomenclature is CAL-WET or California Waste Extraction Test as defined in CCR Title 22.

**ZHE**

Zero Headspace Extraction. A TCLP extraction method prescribed by CFR (Code of Federal Regulations) for Volatile Organic Compounds.





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by Greyhound Chromatography**

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