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EPA

NEWSLETTER

Quality Assurance

CONTENTS

U.S. Environmental Protection Agency
Office of Research and Development
Environmental Monitoring and Support Laboratory
Cincinnati, Ohio 45268

Scientific/Technical Highlight

Atmospheric Sciences Research Laboratory—Research Triangle Park (ASRL-Research Triangle Park)

Quality Assurance (QA) for Smog Chambers

Some of the most important aspects of air pollution research are to know where the pollutants come from, how were they transported and were they transformed or produced in the transport. To track the reactions that cause changes in existing pollutants or form new ones, several types of reaction chambers have been designed, built and operated at ASRL. One group of such chambers that are designed to follow the photochemical reactions of gaseous pollutants are known as smog chambers. While smog chambers have been used to determine end products of photochemical reactions, that is light-induced reactions, one of the main uses of the chambers at ASRL is to determine the reaction rate constants of chemical reactions involved in the formation of photochemical smog. These rate constants are indicators of how fast and under what conditions these photochemical reactions occur. They are very important parameters in many of the air quality prediction models.

In general, these reaction rates are affected by the purity of the reacting species, the physical properties of the chambers and the measurements of the end products. Each of these areas must be carefully measured and controlled. The quality control and assurance of each area is essential to obtain a usable rate constant. The pollutants for which the rate constant are to be determined must be of the highest quality possible since certain impurities may produce the same end products, but at different rates. The impurities may also act as a catalyst or reaction blockers. Therefore, a careful check of the starting materials are made generally by GC or GC/MS run under the ASRL's standard QA Protocols.

The second area that must be carefully measured and tracked through the experiments is the physical parameters of the chambers. These parameters include the flow rates (if any), temperature distributions in the chambers, the light intensities, the amounts of the gases and reactants in the chambers and the run time. While the time and gas volumes are easy to measure the light intensities and temperature distributions are not. Attempts have been made to determine distribution patterns, but light intensity measurements that can be traced back to some NBS standard are complex and not practical for day-to-day operation. The technique used by ASRL to calibrate smog chambers is to run a compound with a known rate constant, but one that will not interfere with the reaction being studied in the chamber. The reaction rate constants obtained from the known reaction are used to check on the reasonableness of the experiment, and to determine needed physical parameters such as temperature and light intensities.

The final area is the measurement of the reactants. These are generally done with standard measurement techniques such as gas monitors, integrated bag sampling and selective absorption. All methods used are carefully calibrated and frequently checked with an appropriate QA procedure.

A good usable rate constant of known quality can only be obtained if all three areas of the experiment are carefully monitored with a good quality assurance protocol.

(Kenneth Knapp, FTS: 629-2194; COML: 919-541-2194)

Environmental Monitoring and Support Laboratory—Cincinnati (EMSL-Cincinnati)

Reminders for this Publication

- For information on articles appearing in this Newsletter, contact the individual whose name and phone number(s) appears at the end of the article. We have tried to include both numbers for those persons who can be called by either Federal Telecommunications System (FTS) or commercial number.
- For analytical quality control, contact your Regional Coordinator for information on such things as new or revised analytical methods for air and water, publications, procedures for certification of laboratories, and reference standards/samples. See listing for each region at the end of this issue.

- As described in the February, 1986 QA Newsletter, semi-annually (January and July), until further notice.
- Writers, continue to send information by electronic mail whenever possible, or through use of magnafax (FTS: 684-7274 and 684-7276), or mail articles to:

  Betty Thomas, Publications Assistant, EMSL-Cincinnati, 26 West Martin Luther King Drive, Cincinnati, Ohio 45268.

Our sincere thanks for your continued support and cooperation.

(Betty Thomas, FTS: 684-7302; COML: 513-569-7302)

Physical and Chemical Methods Branch

Inorganic Analyses

Sample Collection and Preservation

Recent inquiries concerning the topic of sample collection, preservation and holding times for composite samples suggest that a clarification needs to be restated. It is Agency policy that a sample is considered collected and holding times begin at the end not the beginning of the composite period. This includes refrigeration at 4°C.

Samples for some analytes cannot be preserved with chemical preservatives at the beginning of the composite period due to other sample treatment requirements such as sub-sampling, filtration or elimination of interferences. In these cases, the composite sample may be collected and treated prior to the addition of chemical preservatives. An available alternative in the sample collection scheme is to use grab sampling and immediate on-site sample treatment, preservation and/or analysis.

(Larry Lobring, FTS: 684-7372; COML: 513-569-7372)

Instrumentation

Liquid-Solid Extraction, Capillary Column Gas Chromatography, and High Sensitivity Full Mass Range Mass Spectrometry

A number of pesticides and industrial organic compounds are routinely determined in water using liquid-liquid-extraction, capillary column gas chromatography (GC), and full mass range mass spectrometry (MS). For many monitoring activities including industrial or municipal wastewater, landfill leachate, and groundwater near waste sites, conventional GC/MS methods with quantitation limits of about 10 μg/L (10 parts per billion, ppb) is adequate. But for the determination of organics in drinking water, quantitation limits in the range of 0.1-10 μg/L are needed, and it is highly desirable to retain the full mass range data acquisition of conventional GC/MS to ensure reliable identifications.

A project was started to develop, for drinking water analyses, a general purpose analytical method with the following characteristics: (a) sensitivity for complete electron impact (EI) mass spectra with 0.1 ng injected (corresponding to 0.1 μg/L or 100 parts per trillion after extraction and concentration); (b) applicability to a minimum of 40 organic compounds of concern; (c) isolation of analytes with liquid-solid extraction (LSE) cartridges; (d) minimization of use and worker exposure to solvent (methylene chloride); (e) quantitative accuracy of 70% or better and precision of 30% RSD or better; and (f) strong quality control procedures incorporated into the method.

A group of 40 compounds which have been found in drinking water supplies, and which are under study for potential adverse health effects, were added to water at 2 μg/L and 0.2 μg/L. These were extracted by passing one liter of water through commercially available LSE cartridges containing 0.9-l.g of reverse phase liquid chromatography packing materials. The compounds were eluted with 10 mL of methylene chloride, and determined with capillary column high sensitivity full mass range GC/MS. The recoveries of most compounds were greater than 80% with detection limits in the target range. This method has been proposed as method 525.

(William Budde, FTS: 684-7309; COML: 513-569-7309)

Cyclohexene: Source of Interference in Samples Extracted with Methylene Chloride

A phenomen of nonendogenous sample compounds being present in extracts prepared by extraction of samples which contain free residual chlorine with methylene chloride has been reported in this Newsletter in the past. Since this phenomenon continues to cause problems for some analysts, it is worth describing again.

Interference peaks occur as a result of chemical reactions between free residual chlorine (present in the sample) and cyclohexene (present in methylene chloride; it is used as a stabilizer). Chlorine reacts with cyclohexene to form chlorinated cyclohexanes and other chlorinated derivatives which than appear as peaks in the chromatgraphic analysis of the sample.

To preclude the formation of these spurious compounds, dechlorination of the sample must be accomplished prior to extraction and analysis of samples which contain residual chlorine.

Please be advised that this phenomenon does not reveal itself when analyzing method blanks because they are normally prepared using reagent water, hence no residual chlorine is present.

(Robert Graves, FTS: 684-7315; COML: 513-569-7315)

Biological Methods Branch

*Sea Urchins (*Arbacia punctulata*) Cultured and Tested in Artificial Water*

Adult sea urchins were maintained in a fertile condition for as long as 10 months at EMSL-Cincinnati, using FORTY FATHOMS^R^O artificial seawater. Also, during this period, five short-term fertilization tests were successfully completed with each of two reference toxicants, copper sulfate and sodium dodecyl sulfate, in FORTY FATHOMS^R^O artificial seawater. Results were comparable with those obtained when this species is maintained and tested in natural seawater. This work indicates that (1) sea urchins can be successfully maintained in a fertile condition in artificial seawater over an extended period of time, and (2) the short-term fertilization test for estimating chronic toxicity can be successfully performed using artificial seawater. Inland laboratories without easy access to natural seawater can maintain sea urchins and perform toxicity tests in artificial seawater, which will permit the sea urchin test to be more widely employed in National Pollutant Discharge Elimination System (NPDES) permits than was originally anticipated.

For more information, contact the writer.

(Dennis McMullen, FTS: 778-8350; COML: 513-527-8350)

Proceedings Available for an International Symposium on Ecotoxicological Testing for the Marine Environment

The purpose of this Newsletter item is to bring to the attention of the readers an excellent but little-known European publication of the proceedings of a 1983 international symposium held at Ghent, Belgium. The symposium was attended by 200 ecotoxicologists from 18 countries. The proceedings were published in two volumes, containing more than 1300 pages. Volume 1 consists of reviews of the state-of-the-art of marine toxicity tests in Europe and North America, tests with different groups of marine organisms, and special topics. Volume 2 consists of a section on research reports on tests with specific species and chemicals, and sections on specific test technology and test endpoints. The two-volume set was published by the Laboratory for Biological Research in Aquatic Pollution, State University of Ghent, Belgium, and is distributed by the European Aquaculture Society, Pr. Elisabethlaan 69, B-8401 Bredene, Belgium.

(Cornelius Weber, FTS: 684-7337; COML: 513-569-7337)

Proceedings of EMSL-Cincinnati Co-Sponsored Symposium Available

The papers presented at the symposium, "Chemical and Biological Characterization of Municipal Sludges, Sediments, Dredge Spoils, and Drilling Muds," held in Cincinnati, May 20-22, 1986, have been published in a Special Technical Publication (STP 976) by the American Society for Testing and Materials (ASTM), Philadelphia, Pennsylvania. The symposium was sponsored by EMSL-Cincinnati, the Environmental Criteria and Assessment Office (ECAO), Cincinnati, Ohio, and the Water Engineering Research Laboratory, Cincinnati, Ohio. Publication of the STP was sponsored by EMSL-Cincinnati, ECAO, and ASTM Committees D19 on Water and D34 on Waste Disposal. The report, edited by James Lichtenberg, John Winter, Cornelius Weber, and Larry Fradkin, includes 42 papers (512 pp), beginning with the keynote address on sludge and risk assessment, followed by sections on "Regulations Related to Sewage Disposal, Sediment Quality, and Analytical Methodology," "Chemical Characterization," "Biological Characterization," and "Risk Assessment." The cost of the STP is $55.20 for ASTM members, and $69.00 for non-members.

To obtain copies of the STP, contact the Customer Service Department, ASTM, 1903 Race Street, Philadelphia, Pennsylvania 19103 (Phone: 214-299-5585).

(Cornelius Weber, FTS: 684-7337; COML: 513-569-7337; John Winter, FTS: 684-7325; COML: 513-569-7325; James Lichtenberg, FTS: 684-7306; COML: 513-569-7306; Larry Fradkin; FTS: 684-7584; COML: 513-569-7584)

Short-Term Tests to Estimate the Chronic Toxicity of Effluents to Marine and Estuarine Organisms

A manual has been completed which describes six short-term (one-hour to nine-day) methods for estimating the chronic toxicity of effluents and receiving waters to five species, as follows: the sheepshead minnow, *Cyprinodon variegatus* (embryo-larval survival and teratogenicity, and larval survival and growth); the inland silverside, *Menidia beryllina* (larval survival and growth); the mysid, *Mysidopsis bahia* (survival, growth, and fecundity); the sea urchin, *Arbacia punctulata* (fertilization); and the red, macroalga, *Champia parvula* (cystocarp formation). Also included are guidelines on laboratory safety, quality assurance, facilities and equipment, dilution water, effluent sampling and holding, data analysis, report preparation, and organism culturing and handling. Listings of computer programs for Dunnett's Procedure and Probit Analysis are provided in the Appendix.

For further information about the methods contact Cornelius Weber, FTS: 684-7337; COML: 513-569-7337. For copies of the manual, contact Betty Thomas, FTS: 684-7302; COML: 513-569-7302.

(Cornelius Weber, FTS: 684-7337; COML: 513-569-7337)

Microbiology

American Society for Microbiology (ASM) Workshop on Microbiological Quality of Water

A workshop on "Water Quality: Current Status of Indicator Organisms and Newly Emerging Problems," sponsored by the Office of Continuing Education, American Society for Microbiology, was held at the Annual Meeting of the ASM, Miami Beach, Florida, May 7, 1988. The workshop was moderated by Robert Bordner, EMSL-Cincinnati, and included presentations and discussions on "New Directions to Water Quality Enhancement," Edwin E. Geldreich, Water Engineering Research Laboratory - Cincinnati (WERL-Cincinnati); "Sampling and Immunoassay Methods for *Giardia* and *Cryptosporidium*," Judith F. Sauch, Toxicology and Microbiology Division, Health Effects Research Laboratory (TMD-HERL); "New Bacterial Indicators for Monitoring Recreational Waters," Alfred P. Dufour, TMD-HERL; "Application of the INT Direct Microscopic Technique to the Detection and Enumeration of Microorganisms in Water," Diane S. Herson, School of Life and Health Sciences, University of Delaware; "Significance of *Legionella* in Drinking Water," Gerald N. Stelma, TMD-HERL; and "Current Concepts of Water Quality Monitoring," Robert H. Bordner. Requests for more information should be addressed to the individual speakers.

(Robert Bordner, FTS: 684-7319; COML: 513-569-7319)

Drinking Water Certification Courses

EMSL-Cincinnati held two Drinking Water Laboratory Certification courses in July at the Andrew W. Breidenbach Environmental Research Center (AWBERC), Cincinnati, for Laboratory Certification Officers from USEPA regions and the states in support of the Agency's QA program. The chemistry course was held during the week of July 18, and the microbiology course during the week of July 25. Both courses were filled to capacity. The course contents included the legislative mandate and development of the national certification program, proposed revisions in the drinking water regulations, current analytical methodology and QA procedures, essential background information, and procedures for on-site laboratory visits.

(Robert Bordner, FTS: 684-7319; COML: 513-569-7319; Jack Pfaff, FTS: 684-7312; COML: 513-569-7312)

Virology

Chapter Updates of the "USEPA Manual of Methods for Virology"

Several chapter revisions for the "USEPA Manual of Methods for Virology" (EPA/600/4-84/013) have been completed since its publication in 1984. To ensure that all interested persons receive copies of updated chapters, the chapter numbers, titles and revision dates are listed below. Requests for these chapters should be addressed to Betty J. Thomas, Publications Assistant, Environmental Monitoring and Support Laboratory, U.S. Environmental Protection Agency, Cincinnati, Ohio 45268.

Chapter 8.	Method for Reduction of Cytotoxicity of Sample Concentrates. Revised April 1986.
Chapter 9.	Cell Culture Preparation and Maintenance. Revised January 1987.
Chapter 10.	Cell Culture Procedures for Assaying Plaque-Forming Viruses. Revised December 1987.
Chapter 11.	Virus Plaque Confirmation Procedure. Revised March 1987.
Chapter 12.	Identification of Enteroviruses. Revised May 1988.
Appendix	Vendors. Revised June 1988.

Copies of the complete manual can be obtained by addressing request to Betty Thomas at the above address.

(Robert S. Safferman, FTS: 684-7334; COML: 513-569-7334)

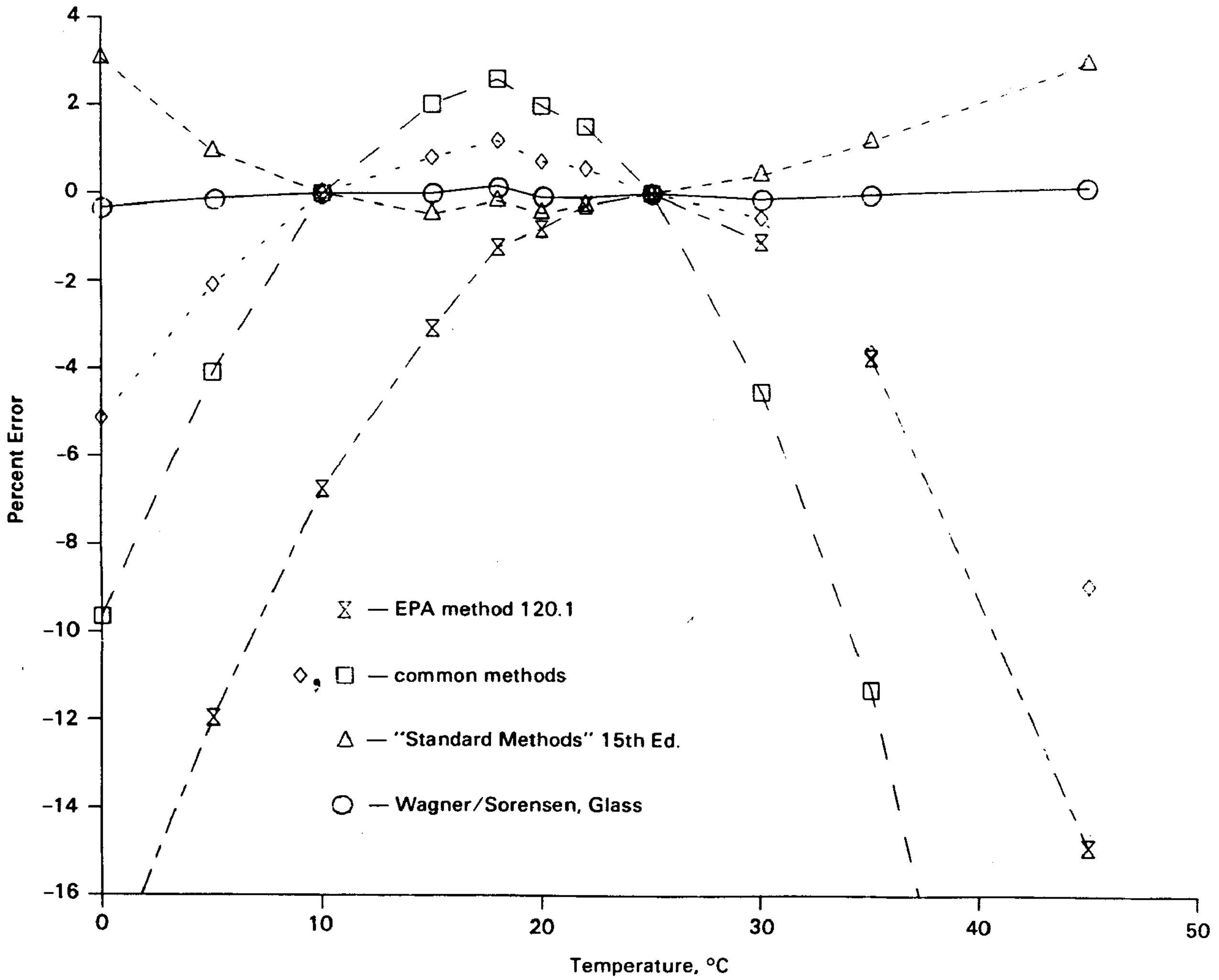
Environmental Research Laboratory—Duluth (ERL-Duluth)

Cautionary Note on Temperature Correction of Electrical Conductance for Natural Waters

The measurement of electrical conductance of a water sample is a most useful, accurate and cost-effective measure of water quality. However, significant errors may be introduced if the sample is measured in the field at ambient temperatures and a "correction" is applied to make the measurement "comparable" at standard temperature of 25°C. Four methods for temperature correction were compared and evaluated (Anal. Chem. *59*, 1594-1597 (1987)). It is possible that errors as large as 10% can be introduced for temperature corrections of 10°C, for example, if EPA method 120.1 is used *outside* of its recommended temperature range (23-27°C), as shown in Figure 1.

The most convenient method to use, giving good accuracy, for wide temperature ranges is that given in Standard Methods, 15th Edition, p. 73, and the most accurate is our approach to using the Wagner/Sorensen, Glass method referenced above. For more information contact the writer.

(Gary Glass, FTS: 780-5526; COML: 218-720-5526)



Region III

Central Regional Laboratory - Annapolis, Maryland (CRL-Annapolis)

Note on Dechlorination for Test Method 625 (Base/Neutrals and Acids)

Method 625 (Base/Neutrals and Acids) states that samples containing residual chlorine must be dechlorinated using 80 mg of sodium thiosulfate per liter of sample (Section 9.2) at the time of sampling. Field conditions are difficult to control and it is conceivable that excess amounts could be added. Analytical problems have been encountered using this reagent when *excess* thiosulfate has been added to samples. Sulfur crystal formation occurred in the Kuderna-Danish concentration process and caused frothing of the concentrate. This can easily cause the sample to go to dryness. Also, the elution of molecular sulfur caused severe chromatographic interferences. These problems were especially evident when the samples were extracted using continuous liquid/liquid extraction. The sulfur formation occurred under acid ($pH<2$) extract conditions as a result of the decomposition/disproportionation of thiosulfate to sulfur and sulfite/sulfur dioxide.

Two alternate dechlorination agents were tested: L-ascorbic acid and sodium arsenite. Both were efficient at reducing the chlorine. Sodium arsenite treatment resulted in a clean chromatogram and no analytical problems. L-ascorbic acid treatment generated five chromatographic interference peaks when the extraction was performed with the *continuous extractor.* These were: 2-furancarboxylic acid; 3-furancarboxylic acid, methyl ester; 2-furancarboxaldehyde; 3,5-dihydroxy-2-methyl-4H-pyran-4-one; and 1 unidentified compound (tentatively identified using the EPA-NIH spectral library). The mass spectrum of 2-furancarboxylic acid contained a fragment with mass 45 AMU and would be expected to elute near bis(2-chloroisopropyl)ether. The base peak of this priority pollutant is also 45 AMU. This contaminant could cause a positive interference which should be resolvable by manual quantitation or by reducing the automated target search windows. No contaminating peaks were detected when samples were dechlorinated with L-ascorbic acid and extracted using *separatory funnels.*

Sodium arsenite is listed as extremely toxic to humans with an oral lethal dose of 5 mg/kg and would be too dangerous for routine field use. L-ascorbic acid is non-toxic and is more soluble in water than sodiuim arsenite. L-ascorbic acid has been recently recommended as a dechlorinating agent of choice for VOCs (QA Newsletter, January 1988) and it would be convenient to use the same material to dechlorinate samples for extractable organics. However, low recoveries (about 30% of a 50 ng spike) of 2,4-dinitrotoluene were obtained when the extraction was carried out in the presence of excess L-ascorbic acid using Method 625 (continuous extractor).

For more information and a summary of these study results, contact: Joseph Slayton and Susan Warner, USEPA, Region III, Central Regional Laboratory, Annapolis, Maryland 21401.
(Joseph Slayton and Susan Warner, FTS: None; COML: 301-266-9180)

Note: The interference from sulfur has been observed from time to time when determining very low levels of analytes in water that has been dechlorinated using thiosulfate. EMSL-Cincinnati is presently investigating alternate dechlorinating agents. Results from these studies will be published as soon as available.
(James Lichtenberg, FTS: 684-7306; COML: 513-569-7306)

Robert S. Kerr Environmental Research Laboratory - Ada, Oklahoma (RSKERL-Ada)

Capillary Column GC Method for Water Pollution Performance Evaluation (PE) Volatiles Samples

A method developed by James F. Pankow [High Resolution Chromatography and Chromatographic Communication 10 (1987) 409] of the Oregon Graduate Center for purging an aqueous sample directly to a cryogenically-cooled fused silica capillary column for volatiles analysis by GC has been used successfully at RSKERL-Ada in the Water Pollution Performance Evaluation Study, WP019. The method was expanded at RSKERL-Ada to include a Nafion tube drier to strip water from the analyte-containing purge stream before its introduction to the GC column. Advantages over purge-and-trap/packed column GC include: (1) background contamination is minimized because no sorbent trap is used; (2) sensitivity, resolution and speed of analysis are increased when a capillary column is used; and (3) analysis time is shortened because the trap desorption step is eliminated.

RSKERL WP019 Results — Concentrations in Micrograms Per Liter

Volatile Halocarbons	Sample Number	Report Value	True Value	Acceptance Limits
1,2-Dichloroethane	1	53.6	54.8	37.3 - 72.9
	2	3.66	3.65	.694- 7.74
Chloroform	1	90.6	92.9	52.8 -129.
	2	14.8	14.7	8.21 - 21.7
1,1,1-Trichloroethane	1	32.5	32.6	18.4 - 52.7
	2	9.26	9.38	4.84 - 15.5
Trichloroethene	1	48.5	48.2	30.3 - 67.6
	2	2.47	2.41	1.02 - 3.74

RSKERL WP019 Results — Concentrations in Micrograms Per Liter

Volatile Halocarbons	Sample Number	Report Value	True Value	Acceptance Limits
Carbon tetrachloride	1	27.3	27.2	16.7 - 38.7
	2	6.56	6.81	3.31 - 11.0
Tetrachloroethene	1	29.3	28.9	15.7 - 42.0
	2	5.30	5.36	1.65 - 9.06
Bromodichloromethane	1	33.2	32.2	24.5 - 45.4
	2	7.41	7.24	4.11 - 11.5
Dibromochloromethane	1	67.2	67.7	37.7 -108.
	2	2.41	2.26	.643- 4.15
Bromoform	1	32.9	32.9	21.8 - 48.8
	2	5.04	4.93	2.23 - 7.22
Methylene Chloride	1	46.0	42.6	25.8 - 67.3
	2	3.36	2.13	D.L.- 5.51
Chlorobenzene	1	30.9	30.8	18.7 - 43.8
	2	3.81	3.85	1.48 - 6.07
<u>Purgeable Aromatics</u>				
Benzene	1	9.89	9.89	6.29 - 14.0
	2	46.1	42.9	29.4 - 57.7
Ethylbenzene	1	8.42	8.47	4.52 - 11.6
	2	27.6	26.1	16.3 - 35.5
Toluene	1	6.04	5.95	3.24 - 8.80
	2	32.2	29.7	20.8 - 39.4
1,2-Dichlorobenzene	1	5.19	5.42	1.20 - 9.58
	2	64.8	61.4	36.0 - 89.4
1,3-Dichlorobenzene	1	3.34	3.46	.773- 5.89
	2	26.1	26.0	10.7 - 38.1
1,4-Dichlorobenzene	1	4.53	4.47	1.15 - 8.26
	2	38.4	35.8	18.8 - 55.0

Report values are the means of replicate determinations where n = 7,3,4 and 3 for Volatile Halocarbons, Samples 1 and 2 and Purgeable Aromatics, Samples 1 and 2, respectively.

The relative standard deviations ranged from 0.32 to 5.74% except for methylene chloride, Sample 2 for which the dilution water was contaminated.

Information on this work is available from: Jack Cochran, Northrop Services, Inc., Robert S. Kerr Environmental Research Laboratory, Post Office Box 1198, Ada, Oklahoma 74820.
(Jack Cochran, FTS: 743-2306; COML: 405-332-8800)

QA SUPPORT FOR WATER AND WASTEWATER ANALYSES EMSL-CINCINNATI

The QC Sample series are intended for periodic use (quarterly) as independent checks on each laboratory's own QC activities. They are not intended to replace the standards, check samples, blind samples or replicates incorporated into analytical runs as part of the laboratory's QC program. There is no certification or other formal evaluative function resulting from the use of QC samples and data return is not expected. The Quality Control Sample Program covers the ambient water quality, drinking water, water pollution, priority pollutant, hazardous, and toxic waste programs for chemical, biological and microbiological analytes. Most samples are prepared as concentrates in water or organic solvent and sealed in glass ampuls. Instructions are provided for dilution of samples to volume with water or wastewater prior to analysis.

Limit of Numbers of Quality Control (QC) and Performance Evaluation (PE) Samples Distributed/Laboratory

The anticipated initiation of a user-free program in the U.S. Environmental Protection Agency (USEPA) caused a significant increase in requests for large numbers of QC samples and PE samples (outside of the Agency's formal studies), from regional, state, and local laboratories. To prevent a loss of sample inventories until the user fee decision is made, distribution was limited to *two QC samples of a type per quarter year* (first quarter is October through December, second quarter is January through March, etc.).

Hopefully, even this limit will only be necessary temporarily. We ask for your understanding and forebearance.

Single Concentration QC Sample Series

To increase efficiency and economy in the preparation and distribution of QC samples, new or re-made series are being prepared at one concentration/analyte. For USEPA methods which specify use of a specific QC sample concentration for analytes, the concentration of the QC sample will be so set. For other analytes, a mid-range concentration will be provided.

Availability of PCB Congeners

An iso-octane solution of twenty PCB congeners for use as an instrumental check has been prepared for EMSL-Cincinnati by the National Bureau of Standards (NBS). The PCB congeners are in ampules containing approximately 1.5 mL solution.

****Notice****

As an economy measure, QC samples are now sent by the least expensive means which may be United Parcel Service (UPS). *Therefore, street addresses must be provided.* The following samples are available now:

Approximate Ranges of Concentration for QC Samples for Water Quality Analyses

DEMAND ANALYSES (1-200 mg/L)	*BOD, COD, and TOC*
EPA/API STANDARD REFERENCE OILS (Neat Oils)	*Arabian Light Crude Oil, Prudhoe Bay Crude Oil, South Louisiana Crude Oil, No. 2 Fuel Oil (high aromatics), and No. 6 Fuel Oil (high viscosity) Bunker C (laboratory must request specific oil).*
LINEAR ALKYLATE SULFONATE (5-6%)	*LAS, the anionic surfactant standard for the MBAS Test*

MINERAL/PHYSICAL ANALYSES (1-100 mg/L)	*sodium, potassium, calcium, magnesium, pH, sulfate, chloride, fluoride, alkalinity/acidity, total hardness, total dissolved solids, and specific conductance.*
NONIONIC SURFACTANT (CTAS TEST) STANDARD	*Reference Nonionic Surfactant,* $C_{12-18}E_{11}$ *Standard Methods Method 512 C*
NUTRIENTS	*nitrate-N, ammonia-N, Kjeldahl-N, orthophosphate, and total P*
OIL AND GREASE (20 mg/L)	*analyzable by IR and gravimetrically in propanol*
PESTICIDES IN FISH (0.01-3 mg/Kg)	*alpha-BHC, endrin, DDD, DDE, and DDT*
PHENOLS, TOTAL (4AAP Method) (45 µ/L)	*total phenols in water*
POLYCHLORINATED BIPHENYL (PCB) CONGENERS (Calibration Solution) (180-200 ng/mL)	*2,4-dichlorophenyl, 2,2',5-trichlorobiphenyl, 2,4,4'-trichlorobiphenyl, 2,2',3,5'-tetrachlorobiphenyl, 2,2',5,5'-tetrachlorobiphenyl, 2,3',4,4'-tetrachlorobiphenyl, 3,3',4,4'-tetrachlorobiphenyl, 2,2',4,5,5'-pentachlorobiphenyl, 2,3,3',4,4'-pentachlorobiphenyl, 2,3',4,4',5-pentachlorobiphenyl, 3,3',4,4',5-pentachlorobiphenyl, 2,2',3,3',4,4'-hexachlorobiphenyl, 2,2',3,4,4',5'-hexachlorobiphenyl, 2,2',3,4,4',5'-hexachlorobiphenyl, 2,2',4,4',5,5'-hexachlorobiphenyl, 2,2'3,4,4',5,5'-heptachlorobiphenyl, 2,2',3,3',4,4',5-heptachlorobiphenyl, 2,2',3,3',4,4',5,6-octachlorobiphenyl, 2,2',3,3',4,4',5,5',6-nonachlorobiphenyl, and 2,2',3,3',4,4',5,5',6,6'-decachlorobiphenyl, in isooctane*
POLYCHLORINATED BIPHENYLS (PCBs) IN OILS (10-500 µg/L)	*Aroclor 1016, 1242, 1254, and 1260 in transformer, hydraulic, and capacitor oils, (specify Aroclor and oil)*
POLYCHLORINATED BIPHENYLS (PCBs) IN SEDIMENTS (5-10 mg/Kg)	*Aroclor 1242 and 1254*
SUSPENDED SOLIDS (0-500 mg/L)	*non-filterable, volatile and total filterable residue*
TRACE METALS - WP I	*aluminum, arsenic, beryllium, cadmium, chromium, cobalt, copper, iron, lead, manganese, mercury, nickel, selenium, vanadium, and zinc*
TRACE METALS - WP II	*antimony, silver, and thallium*
TRACE METALS - WP III	*barium, calcium, potassium, sodium, magnesium, and molybdenum*

QC Samples for Priority Pollutants/Hazardous Wastes/Toxic Chemicals

n-ALKANES	*dodecane, eicosane, heptadecane, hexacosane, tetradecane, tricosane in acetone*
CHLORINATED HYDROCARBONS (Method 612)	*hexachloroethane, hexachlorobenzene, 1,2,4-trichlorobenzene, o-dichlorobenzene, p-dichlorobenzene, m-dichlorobenzene, hexachloro-butadiene, 2-chloronaphthalene in acetone*
CHLORINATED HYDROCARBON PESTICIDES - WP I (Method 608)	*aldrin, dieldrin, DDT, DDE, DDD, and heptachlor in acetone*

CHLORINATED HYDROCARBON PESTICIDES - WP II (Method 608)	*chlordane in acetone*
CHLORINATED HYDROCARBON PESTICIDES - WP III (Method 608)	*alpha-BHC, beta-BHC, heptachlor epoxide, endrin, aldehyde, and alpha and beta endosulfan in acetone*
CYANIDE, TOTAL	
EP METALS	*arsenic, barium, cadmium, chromium, lead, mercury, selenium, silver in acetic acid*
EP PESTICIDES & HERBICIDES	*lindane, endrin, methoxychlor, 2,4-D, and Silvex in acetone*
GC/MS ACIDS (Method 625)	*2-chlorophenol, 2-nitrophenol, phenol, 2,4-dimethylphenol, 2,4-dichlorophenol, 2,4,6-trichlorophenol, 4-chloro-3-methylphenol, pentachlorophenol, and 4-nitrophenol in methanol*
GC/MS BASE NEUTRALS - I (Method 625)	*bis-2-chloroethyl ether, 1,3-dichlorobenzene, 1,2-dichlorobenzene, nitrosodipropylamine, isophorone, bis-2-chloroethoxy methane, 1,2,4-trichlorobenzene, hexachlorobutadiene, 2-chloronaphthalene, 2,6-dinitrotoluene, 2,4-dinitrotoluene, diethyl phthalate, hexachlorobenzene, phenanthrene, dibutyl phthalate, pyrene, benzo(a)anthracene, dioctyl phthalate, benzo(k)fluoranthene in methanol*
GC/MS BASE NEUTRALS - II (Method 625)	*1,4-dichlorobenzene, bis-2-chloroisopropyl ether, hexachloroethane, nitrobenzene, naphthalene, dimethyl phthalate, acenaphthene, fluorene, 4-chlorophenyl phenyl ether, 4-bromophenyl phenyl ether, anthracene, fluoranthene, butyl benzyl phthalate, benzo(a)pyrene, benzo(b)fluoranthene, benzo(a,h)anthracene, benzo(g,h,i)perylene in methanol*
GC/MS BASE NEUTRALS- III (Method 625)	*4-chlorobenzotrifluoride, m-chlorotoluene, 2,4-dichlorotoluene, 1,3,5-trichlorobenzene, 1,2,4,5-tetrachlorobenzene, 1,2,3,4-tetrachloro-benzene, 2,4,6-trichloroaniline, and pentachlorobenzene in acetone*
GC/MS PESTICIDES - I (Method 625)	*heptachlor, heptachlor epoxide, dieldrin, endrin, DDD, alpha BHC and gamma BHC*
GC/MS PESTICIDES - II (Method 625)	*beta-BHC, delta-BHC, aldrin, alpha and beta Endosulfan, 4,4'-DDE, and 4,4'-DDT in acetone*
HALOETHERS (Method 611)	*bis(2-chloroisopropyl)ether, bis(2-chloroethoxy)methane, bis(2-chloro-ethyl)ether, 4-chlorophenyl phenyl ether, 4-bromophenyl phenyl ether in acetone*
ICAP - 19	*As, Be, Ca, Cd, Co, Cr, Cu, Fe, Mg, Mn, Mo, Ni, Pb, Sb, Se, Ti, Tl, V and Zn in dilute nitric acid*
ICAP - 7	*Ag, Al, B, Ba, K, Na, and Si in dilute nitric acid*
NITROAROMATICS AND ISOPHORONE (Method 609)	*isophorone, nitrobenzene, 2,4-dinitrotoluene, and 2,6-dinitrotoluene in acetone*
PHENOLS (GC) (Method 604)	*phenol, 2,4-dimethylphenol, 2-chlorophenol, 4-chloro-3-methylphenol, 2,4-dichlorophenol, 2,4,6-trichlorophenol, pentachlorophenol, 2-nitrophenol, 4-nitrophenol, and 2,4-dinitrophenol in acetone*

PHTHALATE ESTERS (Method 606)	*dimethyl phthalate, diethyl phthalate, di-n-butyl phthalate, butyl benzyl phthalate, diethyl hexyl phthalate and dioctyl phthalate in acetone*
POLYCHLORINATED BIPHENYLS (Method 608)	*separate samples available for Aroclor 1016, 1221, 1232, 1242, 1248, 1254, and 1260 in acetone (laboratory must request specific Aroclor needed)*
POLYNUCLEAR AROMATICS - I (Method 610)	*acenaphthene, anthracene, benzo(k)fluoranthene, chrysene, naphthalene, and pyrene in acetone*
POLYNUCLEAR AROMATICS - II (Method 610)	*acenaphythylene, 1,2-benzanthracene, benzo(b)fluoranthene, benzo-(g,h,i)perylene, benzo(a)pyrene, dibenzo(a,h)anthracene, fluoranthene, and phenanthrene in acetone*

PLEASE NOTE: Distribution of limited quantities of Standard Reference Material (SRM) 1647 is restricted to USEPA laboratories, USEPA contractor laboratories, and state or local government laboratories. Others may purchase SRM 1647 directly from the National Bureau of Standards, Office of Standard Reference Materials, B-311 Chemistry Building, Washington, DC 20234, (301) 921-2045.

Approximate Ranges of Concentration for QC Samples for Drinking Water Analyses

CORROSIVITY/SODIUM	*Langlier's Index Value and Sodium in water*
HERBICIDES	*2,4-D, 2,4,5-TP (Silvex) in methanol*
NITRATE/FLUORIDE	*nitrate-N and fluoride*
CHLORINATED HYDROCARBON PESTICIDES - WS I	*lindane, endrin, and methoxychlor*
CHLORINATED HYDROCARBON PESTICIDES - WS II	*toxaphene in acetone*
RESIDUAL FREE CHLORINE	*solvent in water*
TRACE METALS - WS	*arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver*
TRIHALOMETHANES (20 µg/L)	*chloroform, bromoform, dichlorobromomethane, and chlorodibromomethane in methanol*
TURBIDITY (0.5-5 NTU)	
VOLATILE ORGANIC CONTAMINANTS - I (Methods 503, 524, 602 and 624) (20 µg/L)	*benzene, ethylbenzene, m-xylene, n-propylbenzene, p-chlorotoluene, 1,3,5-trimethylbenzene and p-dichlorobenzene*
VOLATILE ORGANIC CONTAMINANTS - II (Methods 503, 524, 602 and 624) (20 µg/L)	*trichloroethane, p-xylene, o-xylene, t-butylbenzene, p-cymene and n-dichlorobenzene*
VOLATILE ORGANIC CONTAMINANTS - III (Methods 503, 524, 602 and 624) (20 µg/L)	*toluene, chlorobenzene, isopropylbenzene, sec-butylbenzene, 1,2,4-trimethylbenzene, n-butylbenzene, and o-dichlorobenzene*

VOLATILE ORGANIC CONTAMINANTS - IV (Methods 502, 524, 601 and 624) (20 µg/L)	*1,1-dichloroethylene, cis-1,2-dichloroethylene, 1,1,1-trichloroethane, 1,1-dichloropropene, 1,1,2-trichloroethane, 1,1,2,2-tetrachloroethylene, bromoform, and bis(2-chloroethyl)ether in methanol*
VOLATILE ORGANIC CONTAMINANTS - V (Methods 502, 524, 601 and 624) (20 µg/L)	*bromochloromethane, chloroform, carbon tetrachloride, 1,1,2-trichloroethylene, 1,2-dibromoethane, 1,1,2,2-tetrachloroethane, pentachloroethane, 1,2-dibromo-3-chloropropane and m-dichlorobenzene in methanol*
VOLATILE ORGANIC CONTAMINANTS - VI (Methods 502, 524, 601 and 624) (20 µg/L)	*dichloromethane, 1,1-dichloroethane, 1,2-dichloroethane, bromodichloromethane, 1,3-dichloropropane, 2-chloroethyl ethyl ether, 1,2,3-trichloropropane, chlorobenzene, bromobenzene and o-dichlorobenzene in methanol*
VOLATILE ORGANIC CONTAMINANTS - VII (Methods 502, 524, 601 and 624) (20 µg/L)	*trichlorofluoromethane, trans 1,2-dichloroethane, dibromomethane, 1,2-dichloropropane, chlorodibromomethane, 1,1,2,2-tetrachloroethane, chlorohexane, o-chlorotoluene, and p-dichlorobenzene in methanol*

Approximate Ranges of Concentration for QC Samples for Biology/Microbiology

ALGAE FOR IDENTIFICATION	*Samples contain algae preserved in 5% formalin for microscopic identification:* *Sample No. 1 contains: 1 green, 1 bluegreen* *Sample No. 2 contains: 3 bluegreens* *Sample No. 3 contains: 1 green, 1 bluegreen* *Sample No. 4 contains: 1 diatom (Hyrax mounted slide)* *(Laboratory must specify sample needed.)*
BACTERIA INDICATOR STRAINS (10^8-10^9 organisms/vial)	Enterobacter aerogenes, Escherichia coli, Klebsiella peumoniae, Pseudomonas aeruginosa *and* Streptococcus faecalis, *lyophilized (laboratory must request specific organisms needed). Also available are sterile lyophilized blanks for evaluation of aseptic technique.*
CHLOROPHYLL (3-80 µg/L)	*fluorometric analyses, calibration sample approximately 80 µg/L pure chlorophyll* a*; 1 check sample approximately 3 µg/L pure chlorophyll* a*; 1 check sample approximately 20 µg/L mix of pigments. A 3 ampul set.*
CHLOROPHYLL (0.20-80 mg/L)	*spectrophotometric analyses, (#1 is pigment mixture and #2 is pure chlorophyll* a*), two levels in acetone. A 2 ampul set.*
REFERENCE TOXICANTS	*sodium lauryl sulfate, (15-60 mg/mL) in aqueous solution, and cadmium chloride, (10 mg/mL) in aqueous solution copper sulfate (50 mg/mL) in aqueous solution (available 6/30/88) (laboratory must specify toxicant(s) needed)*
SIMULATED PLANKTON	*20 mL aqueous suspension of latex spheres for particle counting, and a permanent, glass slide mount of latex spheres for particle size distribution determinations*

The USEPA Repository for Toxic and Hazardous Materials

EMSL-Cincinnati maintains the USEPA Repository for Toxic and Hazardous Materials to provide a continuing source of calibration materials, standards, reference compounds, and spiking solutions for all trace organics of interest to the Agency. The Repository provides support for Ambient Monitoring, Drinking Water, NPDES/Priority Pollutants, Hazardous Waste/Solid Waste, and Toxics and Superfund Programs.

Compounds are prepared individually as 1.5 mL solutions in water-miscible solvents sealed in all-glass ampuls. A data sheet with each ampul contains general chemical data, solution specifications, storage and preservation recommendations, information on purity and health hazards, and safe handling instructions. Included with each data sheet is a GC or high performance liquid chromatograph (HPLC) showing relative peak areas, retention times of the compound, and impurities, if any. The chromatograms are obtained using detector conditions specified in USEPA's methods.

Three grades of materials will be distributed:

- QA Standards (QAS) ≥99 percent purity
- QA Reagents (QAR) 95-98 percent purity
- QA Technical Materials (QAT) <95 percent purity

The Repository will move as many compounds as possible from the QAT and QAR categories into the QAS category by use of purification techniques. Exceptions are multicomponent materials such as PCBs, toxaphene, chlordane, and halowaxes which will be categorized as QAR or QAT and will not be purified further. The current list of the Repository materials distributed is given in the following table:

Concentrations are 5000 µg of QAS-pure compound per mL of methanol solvent unless otherwise noted.

E001 Acenaphthene
E002 Acrolein**
E003 Acrylonitrile (10,000 µg/mL)
E004 Benzene (10,000 µg/mL)
E005 Benzidine
E006 Chlorobenzene (10,000 µg/mL)
E007 1,2,4-Trichlorobenzene
E008 Hexachlorobenzene (1,000 µg/mL)*
E009 1,2-Dichloroethane
E010 1,1,1-Trichloroethane (10,000 µg/mL) (QAR)
E011 Hexachloroethane
E012 1,1-Dichloroethane (5,500 µg/mL)
E013 1,1,2-Trichloroethane (QAR)
E014 1,1,2,2-Tetrachloroethane (10,000 µg/mL) (QAR)
E015 Chloroethane (11,000 µg/mL)***
E016 bis(2-Chloroethyl) ether
E017 2-Chloroethyl vinyl ether
E018 2-Chloronaphthalene
E019 2,4,6-Trichlorophenol (QAR)
E020 p-Chloro-m-cresol
E021 Chloroform
E022 2-Chlorophenol
E023 1,2-Dichlorobenzene
E025 1,4-Dichlorobenzene
E026 3,3'-Dichlorobenzidine
E027 1,1-Dichloroethylene (1,000 µg/mL)
E028 trans-1,2-Dichloroethylene (11,500 µg/mL)
E029 2,4-Dichlorophenol
E030 1,2-Dichloropropane (10,000 µg/mL)
E033 2,4-Dinitrotoluene
E034 2,6-Dinitrotoluene
E036 Ethylbenzene (10,000 µg/mL)
E037 Fluoranthene
E038 4-Chlorophenyl phenyl ether
E039 4-Bromophenyl phenyl ether
E040 bis(2-Chloroisopropyl) ether (QAR)
E041 bis(2-Chloroethoxy) methane (QAR)
E042 Methylene chloride (10,000 µg/mL)
E043 Methyl chloride***
E044 Methyl bromide (9,940 µg/mL)***
E046 Dichlorobromomethane
E047 Fluorotrichloromethane
E050 Hexachlorobutadiene (QAR)
E051 Hexachlorocyclopentadiene
E052 Isophorone
E053 Naphthalene
E054 Nitrobenzene
E055 2-Nitrophenol
E056 4-Nitrophenol
E057 2,4-Dinitrophenol (QAR)
E058 4,6-Dinitro-o-cresol
E059 N-Nitrosodimethylamine
E060 N-Nitrosodiphenylamine
E061 N-Nitrosodi-n-propylamine
E062 Pentachlorophenol
E063 Phenol
E064 bis(2-Ethyl hexyl) phthalate
E065 Butyl benzyl phthalate
E066 Di-n-butyl phthalate
E067 Di-n-octyl phthalate
E068 Diethyl phthalate
E069 Dimethyl phthalate
E070 Benzo(a)anthracene (1,000 µg/mL)
E071 Benzo(a)pyrene (1,000 µg/mL) (QAR)*
E072 Benzo(b)fluoranthene (2,500 µg/mL)*
E073 Benzo(k)fluoranthene (1,000 µg/mL)*
E074 Chrysene (1,000 µg/mL)*
E075 Acenaphthylene (QAR)
E076 Anthracene (1,000 µg/mL)*
E077 Benzo(g,h,i)perylene (1,000 µg/mL)**
E078 Fluorene (QAR)
E079 Phenanthrene
E081 Indeno(1,2,3-c,d)pyrene (500 µg/mL)*
E082 Pyrene (1,000 µg/mL)
E083 Tetrachloroethylene (10,000 µg/mL)
E084 Toluene (10,000 µg/mL)
E085 Trichloroethylene
E088 Dieldrin (1,000 µg/mL)
E089 Chlordane (QAT)
E091 4,4'-DDE
E092 4,4'-DDD
E093 alpha-Endosulfan 1,000 µg/mL**
E094 beta-Endosulfan 1,000 µg/mL**
E095 Endosulfan sulfate 1,000 µg/mL (QAR)**
E096 Endrin (QAR)
E097 Endrin aldehyde (2,500 µg/mL)
E098 Heptachlor
E099 Heptachlor epoxide (2,500 µg/mL)
E100 alpha-BHC (2,500 µg/mL)
E101 beta-BHC (2,500 µg/mL)*
E102 gamma-BHC (Lindane)
E103 delta-BHC (1,000 µg/mL)
E104 PCB-Aroclor 1242 (QAT)
E105 PCB-Aroclor 1254 (QAT)
E107 PCB-Aroclor 1232 (QAT)
E108 PCB-Aroclor 1248 (QAT)
E110 PCB-Aroclor 1016 (QAT)
E111 Toxaphene (QAT)
E124 4,4'-DDT (QAR)
E125 PCB-Aroclor 1016 (1,000 µg/mL) (QAT)++
E126 PCB-Aroclor 1221 (QAT)++
E129 PCB-Aroclor 1260 (500 µg/mL) (QAT)++

E129 PCB-Aroclor 1260 (1,000 µg/mL) (QAT)++
E129 PCB-Aroclor 1260 (3,000 µg/mL) (QAT)++
E130 PCB-Aroclor 1262 (QAT)++
E131 PCB-Aroclor 1268 (2,500 µg/mL)* (QAT)
E132 PCB-Aroclor 1242 (500 µg/mL) (QAT)++
E132 PCB-Aroclor 1242 (1,000 µg/mL) (QAT)++
E132 PCB-Aroclor 1242 (3,000 µg/mL) (QAT)++
E135 PCB-Aroclor 1254 (500 µg/mL) (QAT)++
E135 PCB-Aroclor 1254 (1,000 µg/mL) (QAT)++
E135 PCB-Aroclor 1254 (3,000 µg/mL) (QAT)++
E136 Bromochloromethane (10,000 µg/mL)
E149 2,4-Dichlorotoluene
E150 2-Chlorotoluene
E151 3-Chlorotoluene
E152 4-Chlorotoluene (QAR)
E153 4-Chlorobenzotrifluoride
E156 Pentachloronitrobenzene
E168 alpha, alpha,2,6-Tetrachlorotoluene
E169 Benzyl chloride (QAR)****
E170 2,3-Dichloro-1-propylene (10,000 µg/mL)
E171 1,2-Dibromoethane (EDB)
E173 cis-1,2-Dichloroethylene (10,000 µg/mL) (QAR)
E175 1,2,3-Trichlorobenzene
E176 1,3,5-Trichlorobenzene
E177 1,2,4,5-Tetrachlorobenzene (2,500 µg/mL) (QAR)****
E179 2,4,5-Trichlorophenol (QAR)
E180 2,4,6-Trichloroaniline
E182 3-Chlorophenol
E183 4-Chlorophenol
E200 Chlorodibromomethane (QAR)
E201 ortho-Xylene
E202 meta-Xylene
E203 para-Xylene
E212 Bromoform
E214 1,3-Dichlorobenzene
E218 cis- and trans-1,3-Dichloropropylene (QAR)
E219 Mirex (1,000 µg/mL)*
E220 Aldrin
E222 2,3,5-Trichlorophenol (QAR)
E224 2,4-Dimethylphenol (QAR)
E225 1,2,3,4-Tetrachlorobenzene (2,500 µg/mL)
E231 Dibenzo(a,h)anthracene (1,000 µg/mL)**
E236 n-Decane
E237 n-Undecane
E238 n-Dodecane
E239 n-Tridecane
E240 n-Tetradecane
E241 n-Pentadecane
E242 n-Heptadecane (2,500 µg/mL)
E244 n-Nonadecane (1,000 µg/mL)
E250 ortho-Cresol (QAR)
E251 meta-Cresol (QAR)
E252 para-Cresol
E255 Dibutyl ether
E257 Styrene
E258 Epichlorohydrin****
E260 Pentachlorobenzene (2,500 µg/mL)
E261 Dibenzofuran
E262 Diphenyl ether
E263 Diphenylamine
E270 Acrylamide (10,000 µg/mL)
E271 Pyridine (10,000 µg/mL)
E275 para-Phenylenediamine (1,000 µg/mL)****
E282 Diisodecyl phthalate
E284 Acetone
E285 Diethyl ether (4,500 µg/mL)
E286 1,2-Epoxybutane****
E292 1-Acetyl-2-thiourea (1,000 µg/mL)****
E294 Thiourea
E295 Phenacetin
E297 4-Aminopyridine
E298 N-Nitrosopyrrolidine
E299 2-Fluoroacetamide
E300 Pentachloroethane
E302 2,6-Dichlorophenol
E305 4-Chloroaniline
E311 Methyl ethyl ketone (10,000 µg/mL)
E322 Methylene bis (o-chloroaniline)
E323 Hexachlorophene (QAR)
E324 o-Nitroaniline
E325 m-Nitroaniline
E327 Vinyl acetate****
E329 Ethylenethiourea
E330 2,4-Dichlorophenoxyacetic acid (2,4-D)****
E334 N-Nitrosodiethylamine
E335 1,1,1,2-Tetrachloroethane (QAR)
E337 Malononitrile
E338 Propionitrile
E342 4-Nitroaniline
E344 5-Nitro-o-toluidine
E349 4-Methyl-2-pentanone
E358 Ethylenediamine (1,000 µg/mL)
E360 Carbon tetrachloride (10,000 µg/mL)
E363 Carbon disulfide
E364 Hexachloropropylene (1,000 µg/mL)
E366 Safrole
E368 1,2,3-Trichloropropane
E369 Saccharin (2,000 µg/mL)
E375 3-Chloropropionitrile (1,000 µg/mL
E378 Methyl thiouracil (1,000 µg/mL)
E379 Thiram (QAR) (1,000 µg/mL)****
E403 1,3-Propane Sultone (1,000 µg/mL)****
E406 Bromobenzene
E411 Acetophenone
E419 1-Naphthylamine (1,000 µg/mL)
E429 para-Dimethylaminoazobenzene
E439 Methyl methacrylate (1,000 µg/mL)
E455 Dinoseb****
E458 1-Nitrosopiperidine
E470 PCN Halowax 1099 (QAT)
E471 PCN Halowax 1001 (QAT)
E472 PCN Halowax 1000 (QAT)
E473 Acetonitrile***
E475 Allyl alcohol (1,000 µg/mL)
E476 Allyl chloride (1,000 µg/mL)
E480 para-Dioxane (10,000 µg/mL)
E485 N-Nitrosomorpholine
E503 o-Tuluidine hydrochloride (2,000 µg/mL)
E527 1,3-Dinitrobenzene
E536 Vinyl chloride***
E541 Benzoic acid****
E542 Aniline
E543 Propargyl alcohol (1,000 µg/mL)+++
E548 N,N-Dimethylformamide
E552 2,4,5-TP (Silvex) (QAR)****
E559 Reserpine (1,000 µg/mL)****
E560 Ethyl parathion (1,000 µg/mL)****
E565 2-Naphthylamine (1,000 µg/mL)
E566 Chlorambucil****
E567 7,12-Dimethylbenz(a)anthracene (1,000 µg/mL) (QAR)
E572 Methyl parathion (1,000 µg/mL)****
E573 Kepone (1,000 µg/mL) (QAR)+++
E623 Diallate (1,000 µg/mL) (QAR)****
E657 1-Propanamine (1,000 µg/mL)
E659 2-Methyl-1-propanol (Isobutyl alcohol)
E662 3-Nitrophenol
E669 1-Methyl ethyl benzene (Cumene)
E673 Propionic Acid****
E688 2-Picoline
E700 Resorcinol

*E713 Picloram (1,000 μg/mL)****
E715 Carbofuran
E856 Isodrin
E862 2-Cyclohexyl-4,6-dinitrophenol (Dinex) (1,000 μg/mL)
E928 1,3-Dichloro-2-propanol
E952 p,p'-Methoxychlor
E954 Aldicarb (1,000 μg/mL)****
E993 1,2-Dibromo-3-chloropropane (QAT)
E995 Aldicarb sulfone (1,000 μg/mL)****
E996 Aldicarb sulfoxide (1,000 μg/mL) (QAR)****
E1089 Alachlor (1,000 μg/mL)
E1090 Atrazine (1,000 μg/mL)*

*E1097 Dibromomethane
E1103 1,3,5-Trimethylbenzene (Mesitylene)
E1104 sec-Butylbenzene
E1105 n-Butylbenzene
E1106 tert-Butylbenzene
E1107 1,2,4-Trimethylbenzene (QAR)
E1108 4-Isopropyltoluene (p-Cymene) (QAR)
E1109 1,3-Dichloropropane
E1112 n-Propylbenzene
E1166 1,1-Dichloro-1-propylene (QAR)
E1167 2,2-Dichloropropane*

**In Acetone **In para-Dioxane ***In 2-Propanol ****Acetonitrile +Methylene chloride ++In Isooctane +++In Cyclohexanone*

Surrogates and Internal Standard for USEPA/GC/MS Methods 624 and 625

*E188 Phenanthrene - d_{10} (150 μg/mL)
E189 Phenol - d_5 (100 μg/mL)*
E190 2,4-Dimethylphenol-3,5,6-d_3 (100 μg/mL) (QAR)*
E191 Pentachlorophenol - $^{13}C_6$ (100 μg/mL)*
E192 Dimethyl phthalate - d_6 (150 μg/mL)*
E193 2-Fluorophenol (QAR) (100 μg/mL)*
E194 2-Fluorobiphenyl (100 μg/mL)*
E195 1-Fluoronaphthalene (100 μg/mL)**

*E196 1,4-Dichlorobutane-d_8 (150 μg/mL)
E197 2-Bromo-1-chloropropane-d_6 (150 μg/mL) (QAT)
E198 Bromochloromethane-d_2 (150 μg/mL)
E199 Benzo(g,h,i)perylene-$^{13}C_{12}$ (100 μg/mL)*
E232 Fluorobenzene (150 μg/mL)
E233 4-Bromofluorobenzene (150 μg/mL)
E234 4,4-Dibromooctafluorobiphenyl (100 μg/mL)*
E776 1,2-Dichlorobenzene-d_4 (150 μg/mL)*

**In Acetone **In para-Dioxane ***In 2-Propanol ****Acetonitrile +Methylene chloride ++In Isooctane +++In Cyclohexanone*

To obtain QC Samples or Repository Standards, please fill out the attached request form(s) completely and legibly and return to EMSL-Cincinnati. Due to initial small production runs, current Repository orders will be limited to a single ampul per compound. Allow a minimum four to five weeks for delivery.

To insure that the QC Samples and Repository Materials will be used to the best advantage in your laboratory, we require that the request sheet(s) be signed by the Laboratory Director or his designee. *Without this approval, QC sample/repository requests will not be honored.*

Please Print or Type

Form Approved O.M.B. 2080-0016
4-30-89

Quality Control Sample Request

Name ______________________________ Telephone ____________
Company ______________________________
Laboratory ______________________________
Street ______________________________
City ____________________ State ____________ Zip Code ____________
Approval of Laboratory Director ______________________________
Check Activity for which samples are requested: ___ Ambient Monitoring ___ Superfund (CERCLA)
___ Drinking Water ___ Wastewater ___ Toxics (TSCA) ___ Solid Wastes/Hazardous Wastes (RCRA)

Water Quality/Water Pollution Samples

___ *Demand*
EPA/API Reference Oils
- ___ *Arabian Light Crude*
- ___ *Prudhoe Bay Crude*
- ___ *South Louisiana Crude*
- ___ *No. 2 Fuel (high arom.)*
- ___ *No. 6 Fuel (high visc.) Bunker C*

___ *LAS*
___ *Mineral*
___ *Nonionic Surfactant Std.*
___ *Nutrients*
___ *Oil & Grease*
___ *Pesticides in Fish*
___ *Phenols (4AAP Method)*
___ *Suspended Solids*
___ *Other* ____________

PCBs in Oils
___ *Aro. 1016 in Capac.*
___ *Aro. 1016 in Hydraul.*
___ *Aro. 1016 in Trans.*
___ *Aro. 1242 in Capac.*
___ *Aro. 1242 in Hydraul.*
___ *Aro. 1242 in Trans.*
___ *Aro. 1254 in Capac.*
___ *Aro. 1254 in Hydraul.*
___ *Aro. 1254 in Trans.*
___ *Aro. 1260 in Capac.*
___ *Aro. 1260 in Hydraul.*
___ *Aro. 1260 in Trans.*
___ *Trace Metals WP - I*
___ *Trace Metals WP - II*
___ *Trace Metals WP - III*
___ *Trace Metals in Fish*
___ *Other* ____________

Water Supply Samples

___ *WS Corrosivity/Sodium*
___ *WS Herbicides*
___ *WS Nitrate/Fluoride*
___ *WS Chl. Hyd. Pest. I*
___ *WS Chl. Hyd. Pest. II*
___ *WS Res. Free Chlorine*
___ *WS Trace Metals*
___ *WS Trihalomethanes*
___ *WS Turbidity*
___ *WS Vol. Org. Cont. - I*
___ *WS Vol. Org. Cont. - II*
___ *WS Vol. Org. Cont. - III*
___ *WS Vol. Org. Cont. - IV*
___ *WS Vol. Org. Cont. - V*
___ *WS Vol. Org. Cont. - VI*
___ *WS Vol. Org. Cont. - VII*
___ *Other* ____________

Priority Pollutants/Hazardous Wastes/Toxic Chemicals

___ *n-Alkanes*
___ *Chlorinated Hydrocarbons*
___ *Chl. Hyd. Pest. WP - I*
___ *Chl. Hyd. Pest. WP - II*
___ *Chl. Hyd. Pest. WP - III*
___ *Cyanide*
___ *EP Pest. & Herb.*
___ *EP Metals*
___ *GC/MS Acids*
___ *GC/MS Base Neutrals - I*
___ *GC/MS Base Neutrals - II*
___ *GC/MS Base Neutrals - III*
___ *GC/MS Pesticides - I*
___ *GC/MS Pesticides - II*
___ *Other* ____________

___ *Haloethers*
___ *ICAP - 19*
___ *ICAP - 7*
___ *Nitroaro. & Isophorone*
PCBs (specific Aroclors)
___ *Aroclor 1016*
___ *Aroclor 1221*
___ *Aroclor 1232*
___ *Aroclor 1242*
___ *Aroclor 1248*
___ *Aroclor 1254*
___ *Aroclor 1260*
___ *Phenols (GC)*
___ *Phthalate Esters*
___ *Polynuclear Aromatics I*
___ *Polynuclear Aromatics II*
___ *Other* ____________

Biological Samples

___ *Algae for Ident. #1*
___ *Algae for Ident. #2*
Bacteria Indicator Strains
___ Enter. aerogenes
___ E. coli
___ Klebsiella pneumoniae
___ Pseudomonas aeruginosa
___ Streptococcus faecalis
___ *Sterile Lyophil. Blank*
___ *Chlorophyll Fluoro.*
___ *Chlorophyll Spectro.*
Reference Toxicants
___ *Sod. Lauryl Sulfate*
___ *Cadmium Chloride*
___ *Simulated Plankton*
___ *Other* ____________
___ *Other* ____________

Date Requested: ______________________________ Date Shipped: ____________
EPA-360 (Cin) (Rev. 6/83, Pt. 1)

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Environmental Monitoring and Support Laboratory
U.S. Environmental Protection Agency
Cincinnati, Ohio 45268

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U.S. ENVIRONMENTAL PROTECTION AGENCY
CINCINNATI, OH 45268

Form Approved O.M.B. 2080-0016
4-30-89
Date Request Received________
Laboratory Code Number________
Request Number________
Verified________

The USEPA Repository for Toxic and Hazardous Materials
Request for Materials

Please Print or Type

Name________ Telephone________
Company________
Laboratory________
Street________
City________ State________ Zip Code________
Approval of Laboratory Director________
Check Activity for which materials are requested: ___ Ambient Monitoring ___ Superfund (CERCLA)
___ Drinking Water ___ Wastewater ___ Toxics (TSCA) ___ Solid Wastes/Hazardous Wastes (RCRA)

Concentrations are 5000 µg of QAS-pure compound per mL of methanol solvent unless otherwise noted.

___ E001 Acenaphthene
*___ E002 Acrolein***
___ E003 Acrylonitrile (10,000 µg/mL)
___ E004 Benzene
___ E005 Benzidine
___ E006 Chlorobenzene
___ E007 1,2,4-Trichlorobenzene
*___ E008 Hexachlorobenzene (1,000 µg/mL)**
___ E009 1,2-Dichloroethane
___ E010 1,1,1-Trichloroethane (10,000 µg/mL) (QAR)
___ E011 Hexachloroethane
___ E012 1,1-Dichloroethane
___ E013 1,1,2-Trichloroethane (QAR)
___ E014 1,1,2,2-Tetrachloroethane (10,000 µg/mL) (QAR)
*___ E015 Chloroethane (11,000 µg/mL)****
___ E016 bis(2-Chloroethyl) ether
___ E017 2-Chloroethyl vinyl ether (QAR)
___ E018 2-Chloronaphthalene
___ E019 2,4,6-Trichlorophenol
___ E020 p-Chloro-m-cresol
___ E021 Chloroform
___ E022 2-Chlorophenol
___ E023 1,2-Dichlorobenzene
___ E025 1,4-Dichlorobenzene
___ E026 3,3'-Dichlorobenzidine (QAR)
___ E027 1,1-Dichloroethylene (1,000 µg/mL)
___ E028 trans-1,2-Dichloroethylene (11,500 µg/mL)
___ E029 2,4-Dichlorophenol
___ E030 1,2-Dichloropropane (10,000 µg/mL)
___ E033 2,4-Dinitrotoluene
___ E034 2,6-Dinitrotoluene
___ E036 Ethylbenzene (10,000 µg/mL)
___ E037 Fluoranthene
___ E038 4-Chlorophenyl phenyl ether
___ E039 4-Bromophenyl phenyl ether
___ E040 bis(2-Chloroisopropyl) ether (QAR)
___ E041 bis(2-Chloroethoxy) methane (QAR)
___ E042 Methylene chloride (10,000 µg/mL)
*___ E043 Methyl chloride****
*___ E044 Methyl bromide (9,940 µg/mL) (QAR)****
___ E046 Dichlorobromomethane
___ E047 Fluorotrichloromethane
___ E050 Hexachlorobutadiene (QAR)
___ E051 Hexachlorocyclopentadiene
___ E052 Isophorone
___ E053 Naphthalene
___ E054 Nitrobenzene
___ E055 2-Nitrophenol
___ E056 4-Nitrophenol
___ E057 2,4-Dinitrophenol (QAR)
___ E058 4,6-Dinitro-o-cresol
___ E059 N-Nitrosodimethylamine
___ E060 N-Nitrosodiphenylamine
___ E061 N-Nitrosodi-n-propylamine
___ E062 Pentachlorophenol
___ E063 Phenol
___ E064 bis(2-Ethyl hexyl) phthalate
___ E065 Butyl benzyl phthalate
___ E066 Di-n-butyl phthalate
___ E067 Di-n-octyl phthalate
___ E068 Diethyl phthalate

(compounds continued on reverse)

**In Acetone **In para-Dioxane ***In 2-Propanol ****In Acetonitrile +In Methylene chloride ++In Isooctane +++In Cyclohexanone*

Date Requested:________ Date Shipped:________

EPA-360 (Cin) (Rev. 6/83, Pt. 3)

___ E069 Dimethyl phthalate
___ E070 Benzo(a)anthracene (1,000 μg/mL)
___ E071 Benzo(a)pyrene (1,000 μg/mL) (QAR)*
___ E072 Benzo(b)fluoranthene (2,500 μg/mL)*
___ E073 Benzo(k)fluoranthene (1,000 μg/mL)*
___ E074 Chrysene (1,000 μg/mL)*
___ E075 Acenaphthylene (QAR)
___ E076 Anthracene (1,000 μg/mL)*
___ E077 Benzo(g,h,i)perylene (1,000 μg/mL)**
___ E078 Fluorene (QAR)
___ E079 Phenanthrene
___ E081 Indeno(1,2,3-c,d)pyrene (500 μg/mL)*
___ E082 Pyrene (1,000 μg/mL)
___ E083 Tetrachloroethylene
___ E084 Toluene (10,000 μg/mL)
___ E085 Trichloroethylene (10,000 μg/mL)
___ E088 Dieldrin (1,000 μg/mL)
___ E089 Chlordane (QAT)
___ E091 4,4'-DDE
___ E092 4,4'-DDD
___ E093 alpha-Endosulfan (1,000 μg/mL)**
___ E094 beta-Endosulfan (1,000 μg/mL)**
___ E095 Endosulfan sulfate (1,000 μg/mL) (QAR)**
___ E096 Endrin (QAR)
___ E097 Endrin aldehyde (2,500 μg/mL)
___ E098 Heptachlor
___ E099 Heptachlor epoxide (2,500 μg/mL)
___ E100 alpha-BHC (2,500 μg/mL)
___ E101 beta-BHC (2,500 μg/mL)*
___ E102 gamma-BHC (Lindane)
___ E103 delta-BHC (1,000 μg/mL)
___ E104 PCB-Aroclor 1242 (QAT)
___ E107 PCB-Aroclor 1232 (QAT)
___ E108 PCB-Aroclor 1248 (QAT)
___ E110 PCB-Aroclor 1016 (QAT)
___ E111 Toxaphene (QAT)
___ E124 4,4'-DDT
___ E125 PCB-Aroclor 1016 (QAT)++
___ E126 PCB-Aroclor 1221 (QAT)++
___ E129 PCB-Aroclor 1260 (500 μg/mL) (QAT)++
___ E129 PCB-Aroclor 1260 (1,000 μg/mL) (QAT)++
___ E129 PCB-Aroclor 1260 (3,000 μg/mL) (QAT)++
___ E130 PCB-Aroclor 1262 (QAT)++
___ E131 PCB-Aroclor 1268 (2,500 μg/mL) (QAT)
___ E132 PCB-Aroclor 1242 (500 μg/mL) (QAT)++
___ E132 PCB-Aroclor 1242 (1,000 μg/mL) (QAT)++
___ E132 PCB-Aroclor 1242 (3,000 μg/mL) (QAT)++
___ E135 PCB-Aroclor 1254 (500 μg/mL) (QAT)++
___ E135 PCB-Aroclor 1254 (1,000 μg/mL) (QAT)++
___ E135 PCB-Aroclor 1254 (3,000 μg/mL) (QAT)++
___ E136 Bromochloromethane (10,000 μg/mL)
___ E149 2,4-Dichlorotoluene
___ E150 2-Chlorotoluene
___ E151 3-Chlorotoluene
___ E152 4-Chlorotoluene (QAR)
___ E153 4-Chlorobenzotrifluoride
___ E156 Pentachloronitrobenzene
___ E168 alpha, alpha,2,6-Tetrachlorotoluene
___ E169 Benzyl chloride (QAR)****
___ E170 2,3-Dichloro-1-propylene (10,000 μg/mL)
___ E171 1,2-Dibromoethane (EDB) (10,000 μg/mL)
___ E173 cis-1,2-Dichloroethylene (10,000 μg/mL) (QAR)
___ E175 1,2,3-Trichlorobenzene
___ E176 1,3,5-Trichlorobenzene
___ E177 1,2,4,5-Tetrachlorobenzene**** (2,500 μg/mL) (QAR)+
___ E179 2,4,5-Trichlorophenol (QAR)
___ E180 2,4,6-Trichloroaniline
___ E182 3-Chlorophenol
___ E183 4-Chlorophenol
___ E200 Chlorodibromomethane (10,000 μg/mL) (QAR)
___ E201 ortho-Xylene
___ E202 meta-Xylene
___ E203 para-Xylene
___ E212 Bromoform (10,000 μg/mL) (QAR)
___ E214 1,3-Dichlorobenzene
___ E218 cis- and trans-1,3-Dichloropropylene (QAR)
___ E219 Mirex (1,000 μg/mL)*
___ E220 Aldrin
___ E222 2,3,5-Trichlorophenol (QAR)
___ E224 2,4-Dimethylphenol (QAR)
___ E225 1,2,3,4-Tetrachlorobenzene (2,500 μg/mL)
___ E231 Dibenzo(a,h)anthracene (1,000 μg/mL)**
___ E236 n-Decane
___ E237 n-Undecane
___ E238 n-Dodecane
___ E239 n-Tridecane
___ E240 n-Tetradecane
___ E241 n-Pentadecane
___ E242 n-Heptadecane (2,500 μg/mL)
___ E244 n-Nonadecane (1,000 μg/mL)
___ E250 ortho-Cresol (QAR)
___ E251 meta-Cresol (QAR)
___ E252 para-Cresol
___ E255 Dibutyl ether
___ E257 Styrene
___ E258 Epichlorohydrin****
___ E260 Pentachlorobenzene (2,500 μg/mL)
___ E261 Dibenzofuran
___ E262 Diphenyl ether

(compounds continued on reverse)

*In Acetone   **In para-Dioxane   ***In 2-Propanol   ****In Acetonitrile   +++In Cyclohexanone

Date Requested: ______________ Date Shipped: ______________

EPA-360 (Cin) (Rev. 6/83, Pt. 4)

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The USEPA Repository for Toxic and Hazardous Materials
Request for Materials

Please Print or Type

Name____________________ Telephone__________
Company____________________
Laboratory____________________
Street____________________
City____________________ State__________ Zip Code__________
Approval of Laboratory Director____________________
Check Programs for which materials are requested: ___ Ambient Monitoring ___ Superfund (CERCLA)
___ Drinking Water ___ Wastewater ___ Toxics (TSCA) ___ Solid Wastes/Hazardous Wastes (RCRA)

Concentrations are 5000 µg of QAS-pure compound per mL of methanol solvent unless otherwise noted.

___ *E263 Diphenylamine*
___ *E270 Acrylamide (10,000 µg/mL)*
___ *E271 Pyridine (10,000 µg/mL)*
___ *E282 Diisodecyl phthalate*
___ *E284 Acetone*
___ *E285 Diethyl ether*
___ *E286 1,2-Epoxybutane*****
___ *E295 Phenacetin*
___ *E298 N-Nitrosopyrrolidine*
___ *E299 2-Fluoroacetamide*
___ *E300 Pentachloroethane*
___ *E305 4-Chloroaniline*
___ *E311 Methyl ethyl ketone (10,000 µg/mL)*
___ *E322 Methylene bis(o-chloroaniline)*
___ *E324 o-Nitroaniline*
___ *E325 m-Nitroaniline*
___ *E329 Ethylenethiourea*
___ *E330 2,4-Dichlorophenoxyacetic acid (2,4-D)*****
___ *E334 N-Nitrosodiethylamine*
___ *E335 1,1,1,2-Tetrachloroethane (QAR)*
___ *E337 Malononitrile*
___ *E338 Propionitrile*
___ *E342 p-Nitroaniline*
___ *E349 4-Methyl-2-pentanone*
___ *E360 Carbon tetrachloride*
___ *E363 Carbon disulfide*
___ *E364 Hexachloropropylene (1000 µg/mL)*
___ *E366 Safrole*
___ *E368 1,2,3-Trichloropropane*
___ *E369 Saccharin (2000 µg/mL)*
___ *E375 3-Chloropropionitrile (1000 µg/mL)*
___ *E406 Bromobenzene*
___ *E411 Acetophenone*
___ *E439 Methylmethacrylate (1000 µg/mL)*
___ *E455 Dinoseb*****
___ *E458 1-Nitrosopiperidine*
___ *E470 PCN Halowax 1099 (QAT)*
___ *E471 PCN Halowax 1001 (QAT)*
___ *E472 PCN Halowax 1000 (QAT)*
___ *E473 Acetonitrile****
___ *E475 Allyl alcohol (1000 µg/mL)*
___ *E480 para-Dioxane (10,000 µg/mL)*
___ *E536 Vinyl chloride ****
___ *E541 Benzoic acid*****
___ *E542 Aniline*
___ *E543 Propargyl alcohol (1000 µg/mL)+++*
___ *E548 N,N-Dimethylformamide*
___ *E552 2,4,5-TP (Silvex) (QAR)*****
___ *E560 Ethylparathion (1000 µg/mL)*****
___ *E565 2-Naphthylamine (1000 µg/mL)*
___ *E567 7,12-Dimethylbenz(a)anthracene (1000 µg/mL) (QAR)*
___ *E572 Methylparathion (1000 µg/mL)*****
___ *E573 Kepone (1000 µg/mL) (QAR)+++*
___ *E662 3-Nitrophenol*
___ *E669 1-Methyl ethyl benzene (Cumene)*
___ *E686 Methacrylonitrile (1000 µg/mL)*
___ *E687 Ethylmethacrylate (1000 µg/mL)*
___ *E688 2-Picoline*
___ *E700 Resorcinol*
___ *E713 Picloram (1000 µg/mL)*****
___ *E715 Carbofuran*
___ *E952 p,p'-Methoxychlor*
___ *E954 Aldicarb (1000 µg/mL)*****
___ *E993 1,2-Dibromo-3-chloropropane*
___ *E995 Aldicarb sulfone (1000 µg/mL)*****
___ *E996 Aldicarb sulfoxide (1000 µg/mL)*****
___ *E1089 Alachlor (1000 µg/mL)*
___ *E1090 Atrazine (1000 µg/mL)*
___ *E1097 Dibromomethane*
___ *E1103 1,3,5-Trimethylbenzene (Mesitylene)*
___ *E1104 sec-Butylbenzene*
___ *E1105 n-Butylbenzene*
___ *E1106 tert-Butylbenzene*
___ *E1107 1,2,4-Trimethylbenzene (QAR)*
___ *E1108 4-Isopropyltoluene (p-Cymene) (QAR)*
___ *E1109 1,3-Dichloropropane*
___ *E1112 n-Propylbenzene (1-Phenylpropane)*
___ *E1166 1,1-Dichloro-1-propylene (QAR)*
___ *E1167 2,2-Dichloropropane*

Surrogates and Internal Standard for USEPA GC/MS Methods 624 and 625

___ *E188 Phenanthrene - d_{10} (150 µg/mL)*
___ *E189 Phenol - d_6 (100 µg/mL)**
___ *E190 2,4-Dimethylphenol-3,5,6-d_3 (100 µg/mL) (QAR)**
___ *E191 Pentachlorophenol $^{13}C_6$ (100 µg/mL)**
___ *E192 Dimethyl phthalate - d_6 (150 µg/mL)**
___ *E193 2-Fluorophenol (QAR) (100 µg/mL)**
___ *E194 2-Fluorobiphenyl (100 µg/mL)**
___ *E195 1-Fluoronaphthalene (100 µg/mL)**
___ *E196 1,4-Dichlorobutane-d_8 (150 µg/mL)*
___ *E197 2-Bromo-1-chloropropane-d_6 (150 µg/mL) (QAT)*
___ *E198 Bromochloromethane-d_2 (150 µg/mL)*
___ *E199 Benzo(g,h,i)perylene-$^{13}C_{12}$ (100 µg/mL)**
___ *E232 Fluorobenzene (150 µg/mL)*
___ *E233 4-Bromofluorobenzene (150 µg/mL)*
___ *E234 4,4-Dibromooctafluorobiphenyl (100 µg/mL)**
___ *E776 1,2-Dichlorobenzene-d_4 (150 µg/mL)*

**In Acetone* ***In para-Dioxane* ****In 2-Propanol* *****In Acetonitrile* *+Methylene chloride* *++In Isooctane*

Date Requested:________________________ Date Shipped:________________

EPA-360 (Cin) (Rev. 6/83, Pt. 5)

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Publications Available

The following publications are now available. The name of the EMSL-Cincinnati staff person who served as a project officer or who authored the report is italicized. Please direct all requests for publications to the appropriate organization as is indicated below. Project officers cannot fill publication requests but welcome technical inquiries.

Organic Analyses

Screening of Semivolatile Organic Compounds for Extractability and Aqueous Stability by SW-846 Method 3510
EPA/600/4-88/005
NTIS: PB 88-161 559/AS ($14.95 per copy)
T. M. Engel, R. A. Kornfield, J. S. Warner, K. D. Andrews, and *James Longbottom*

Validation of SW-846 Methods 8010, 8015, and 8020
EPA/600/4-88/006
NTIS: PB 88-161 567/AS ($14.95 per copy)
J. E. Gebhart, S. V. Lucas, S. J. Nader, A. M. Berry, T. H. Danison, H. M. Burkholder, and *James Longbottom*

Virology

Improved Methods for Hepatitis a Virus and Rotavirus Concentration and Detection in Recreational, Raw Potable, and Finished Waters
EPA/600/4-87/029
NTIS: PB 88-158 944 ($14.95 per copy)
Joseph Melnick and *Daniel Dahling*

****Correction Notice****

Availability of Publication: User Friendly IBM PC Computer Programs for Solving Sampling and Statistical Problems, EPA/600/4-86/023
Free disks are no longer available from EMSL-Cincinnati. Both the report and disk are available from NTIS, 5285 Port Royal Road, Springfield, Virginia 22161. (Phone: 703-487-4650 or 487-4690). Order by using the following information:

EPA No. 600/4-86/023
NTIS Accession No. PB 87-126 041
Cost: $75.00 (report and disk)

WHERE TO WRITE

ORD, USEPA, has centralized its publications distribution procedures. When ordering EMSL-Cincinnati publications cited in the Quality Assurance Newsletter, address all requests to:

ORD Publications
CERI
U.S. Environmental Protection Agency
Cincinnati, OH 45268

Include in your request the appropriate title and the EPA number.

EMSLs can be reached by writing to the following:

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Las Vegas, Nevada 89114

U.S. Environmental Protection Agency
Environmental Monitoring Systems Laboratory — Research Triangle Park (MD-75)
Research Triangle Park, NC 27711

U.S. Environmental Protection Agency
Environmental Monitoring and Support Laboratory — Cincinnati
Cincinnati, Ohio 45268

U.S. Environmental Protection Agency (RD-680)
Quality Assurance Management Staff
Office of Acid Deposition,
Environmental Monitoring, and Quality Assurance
Washington, DC 20460

U.S. Environmental Protection Agency
Atmospheric Sciences Research Laboratory— Research Triangle Park (MD-59)
Research Triangle Park, North Carolina 27711

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RESPONSE SHEET*

Subject Matter: ____ Water ____ Air ____ Solid Waste

Author: ______________________________

Comments: ______________________________

(Use Additional sheets if needed.)

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Reader's Name

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Address

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City State Zip Code

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Professional Affiliation Phone Number Date

Mail to:

Betty J. Thomas, Publications Assistant
Environmental Monitoring and Support Laboratory-Cincinnati
U.S. Environmental Protection Agency
Cincinnati, OH 45268

(Betty Thomas, FTS: 684-7302; COML: 513-569-7302)

*This response sheet is provided for the reader's use on a voluntary basis. Your thoughts for consideration, suggestions, and comments are welcome. All inquiries and responses received will be sent to the responsible Agency personnel who have expertise in the applicable field/subject for review and consideration.

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Area of Interest: Circle Applicable Subjects For Each Section

(1) Water:
- (a) Chemical Analysis — Inorganic
- (b) Chemical Analysis — Organic
- (c) Aquatic Biology
- (d) Microbiology
- (e) Viruses
- (f) Quality Assurance
- (g) Sampling and Automatic Measurements
- (h) Monitoring Systems
- (i) Radiochemical Analysis
- (j) All Subjects

(2) Air:
- (a) Chemical Analysis
- (b) Ambient Monitoring
- (c) Source Monitoring
- (d) Monitoring Systems
- (e) Quality Assurance
- (f) All Subjects

(3) Solid Waste:
- (a) Chemical Analysis
- (b) All Subjects

(4) Affiliation: Circle One
- (a) US EPA
- (b) Other Federal Government
- (c) State or Regional Government
- (d) Local Government
- (e) Industry
- (f) Academia
- (g) Consultant
- (h) Individual
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