United States
Environmental Protection
Agency

Volume 11 Number 1 March 1989

EPA NEWSLETTER

Quality Assurance

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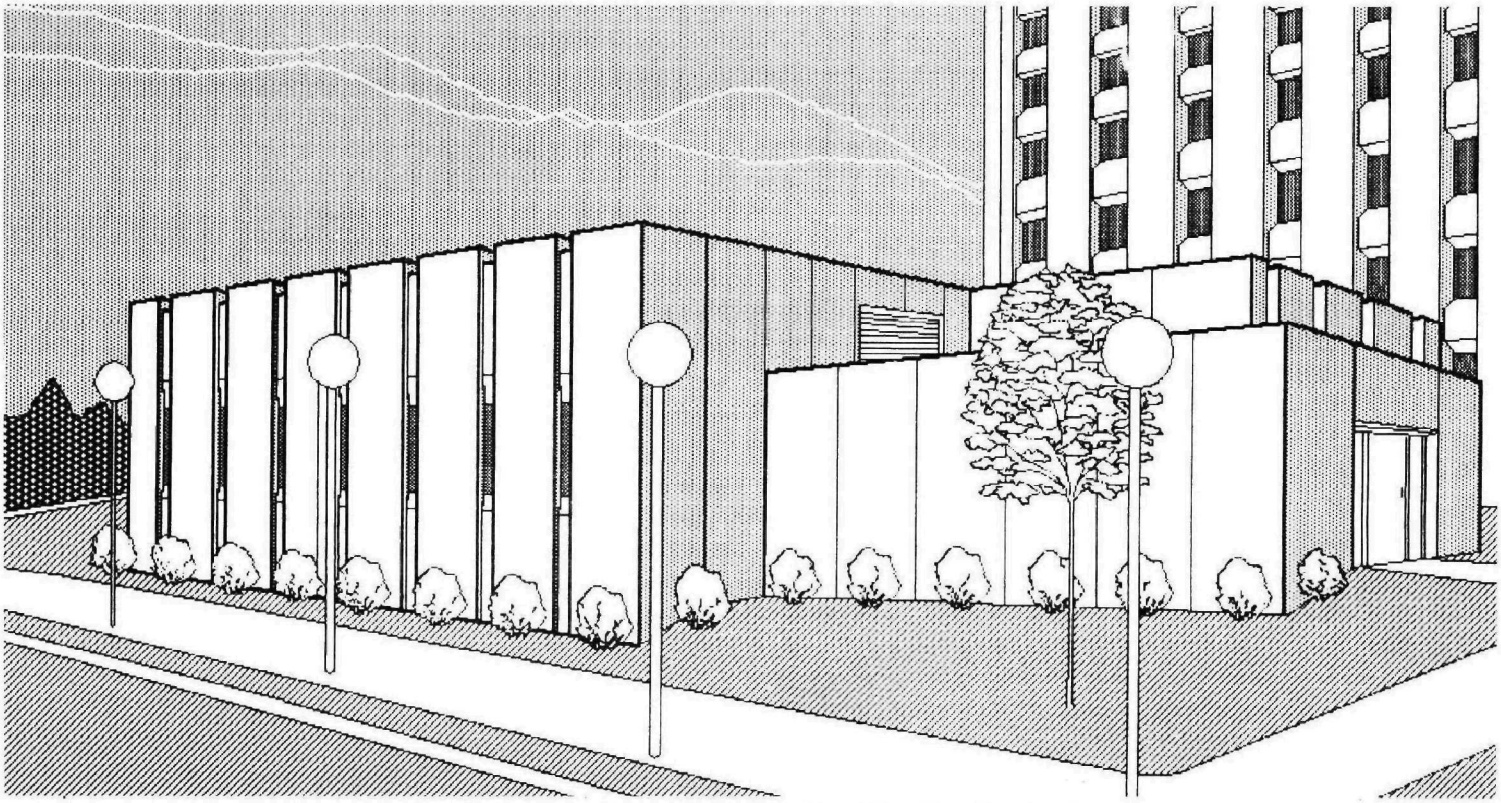
U.S. Environmental Protection Agency
Office of Research and Development
Environmental Monitoring Systems Laboratory
Cincinnati, Ohio 45268

Scientific/Technical Highlight

Andrew W. Breidenbach Environmental Research Center (AWBERC) – Cincinnati, Ohio



Research Containment Facility Dedicated

A new research containment facility (RCF) was dedicated on October 25, 1988, at the Andrew W. Breidenbach Environmental Research Center (AWBERC). It provides the Agency with its own capability for performing research on samples of hazardous and toxic material. It is a self-contained, freestanding facility that has an overall research area of 7,500 square feet. Designated areas are available for: (1) sample receiving, processing, and storage; (2) sample extraction and extract concentration; (3) measurement of toxic inorganics/metals and organic compounds of Agency interest; and (4) individual modules for doing research on hazardous materials and chemicals.

The major laboratories located here at the Center will use the RCF to conduct research on toxic materials related to control technology, health effects, monitoring methods, and quality assurance materials. Concurrently, specialized analytical support will be provided to assist the regions, states, and program offices with problem samples and special high priority projects that cannot be obtained through normal services.

Maximum safety features have been incorporated into the RCF to preclude exposure of employees within the containment area, and special precautions have been taken to avoid contamination of the outside area. These include card-controlled entry to the RCF and a special one-pass air system with necessary air locks to insure a negative air pressure within the containment area. All exhaust air from the RCF will be specially treated and monitored through an elaborate filtering system to prevent contamination of the surrounding area. Special locker rooms with shower-out capability and other state-of-the-art safety features are included. Any residual samples and solvents from all experiments will be removed by a licensed hazardous waste transport and treatment/disposal firm. We have worked closely with the health/safety experts in the overall design of the building and its daily operation to make this the safest research facility possible.

Some of the key research projects planned by the Risk Reduction Engineering Laboratory (RREL) staff will involve drinking water and wastewater research. For example, toxics treatability will be studied with

various treatment technologies. Toxics involved in these studies will include priority pollutants, azo dyes, and other chemical substances as designated by the Office of Toxic Substances. Bench scale studies on the removal of low levels of toxics from water will be performed using fume hoods specially designed to control toxic materials and glove boxes to prepare and spike sample.

The EMSL-Cincinnati staff will also be using the containment facility to prepare quality assurance samples for use by our regional, state, and local laboratories. They will conduct research on new laboratory procedures for the analyses of toxic materials and will process trace amounts of highly toxic substances in pure or highly concentrated form. "Real world" samples of unknown quality and contaminant concentration will be processed, subjected to clean-up procedures, screened by identification procedures, and quantitatively measured by a variety of instrumental techniques.
(Robert Booth, FTS: 684-7364; COML: 513-569-7364)

Environmental Monitoring Systems Laboratory – Cincinnati

Reorganization

On August 21, 1988, the Environmental Monitoring and Support Laboratory – Cincinnati was reorganized and became the Environmental Monitoring Systems Laboratory (EMSL-Cincinnati), with the same acronym as before. The new EMSL-Cincinnati has three divisions, eight branches, and a new Program Operations Staff. Approximately 18 persons were transferred from the Bacteriology/Virology and Parasitology/Immunology Section of the Toxicology and Microbiology Division, Health Effects Research Laboratory, to EMSL-Cincinnati, creating a strong Microbiology Division to complement our Chemistry and Quality Assurance Divisions. EMSL-Cincinnati senior staff includes:

Title	Name	Telephone
OFFICE OF THE DIRECTOR		
Director	Mr. Thomas Clark	FTS:684-7301; COML: 513-569-7301
Deputy Director	Mr. Gerald McKee	FTS:684-7303; COML: 513-569-7303
Program Operations Staff		
Chief	Ms. Ann Alford-Stevens	FTS:684-7330; COML: 513-569-7330
Senior Science Advisors	Mr. Robert Booth	FTS:684-7364; COML: 513-569-7364
	Mr. James Lichtenberg	FTS:684-7306; COML: 513-569-7306
MICROBIOLOGY RESEARCH DIVISION		
Director	Dr. Alfred Dufour	FTS:684-7218; COML: 513-569-7218
Virology Branch		
Chief	Dr. Robert Safferman	FTS:684-7334; COML: 513-569-7334
Bacteriology Branch		
Chief	Dr. Gerard Stelma	FTS:684-7384; COML: 513-569-7384
Parasitology and Immunology Branch		
Chief	Mr. Walter Jakubowski	FTS:684-7385; COML: 513-569-7385
CHEMISTRY RESEARCH DIVISION		
Director	Dr. William Budde	FTS:684-7309; COML: 513-569-7309
Organic Chemistry Branch		
Chief	Mr. James Eichelberger	FTS:684-7278; COML: 513-569-7278
Inorganic Chemistry Branch		
Chief	Mr. Larry Lobring	FTS:684-7372; COML: 513-569-7372

Title	Name	Telephone
QUALITY ASSURANCE RESEARCH DIVISION		
Director	Mr. John Winter	FTS:684-7325; COML: 513-569-7325
Development and Evaluation Branch Chief	Mr. Harold Clements	FTS:684-7325; COML: 513-569-7325
Aquatic Biology Branch Acting Chief	Dr. Cornelius Weber	FTS:684-8114; COML: 513-533-8114
Project Management Branch Chief	Mr. Raymond Wesselman	FTS:684-7325; COML: 513-569-7325

(Gerald McKee, FTS:684-7303; COML: 513-569-7303)

Program Operations Staff (POS)

Best wishes from EMSL-Cincinnati staff to Ann Alford-Stevens, Chief, Program Operations, (POS).

The reorganization has resulted in many changes at EMSL-Cincinnati. One result is that Betty Thomas is assuming some new duties and responsibilities. Betty is part of the new Program Operations Staff and will be devoting her time to preparing technical information products rather than distributing them. Future request for publications should be directed to the Publications Unit, Center for Environmental Research Information (CERI), 26 W. Martin L. King Drive, Cincinnati, OH 45268, FTS: 684-7562; COML: 513-569-7555. Request should include the complete publication title and the EPA report number. Allow about four weeks for delivery.

For information about methods or studies, contact the author of the specific method or research or call the relevant office listed here:

Chemistry (organic and inorganic) methods and research projects – Chemistry Research Division, FTS: 684-7586; COML: 513-569-7586.

Microbiology methods and research, virology, bacteriology, parasitology and immunology – Microbiology Research Division, FTS: 684-7218; COML: 513-569-7218.

QA/QC programs, Water Supply Studies, and Water Pollution Studies – Quality Assurance Research Division, FTS: 684-7325; COML: 513-569-7325.

Aquatic biology methods and research – Aquatic Biology Branch, FTS: 684-8114; COML: 513-533-8114.

Noteworthy Items

Mailing List Verification Update

Thank you for your cooperation in returning the mailing list sheets to the ORD Publications Unit. Your card should have been returned to CERI by September 23, 1988. If you did not return the form by now, your name has been deleted from the list. If you wish to be added to the mailing list, complete and return the mailing list sheet (last page of this issue) to CERI.

Semiannual Newsletter Distribution

The QA Newsletter will continue to be distributed semiannually (January and July) until further notice. Continue to send information by electronic mail whenever possible, through magnafax (FTS: 684-7274 and 7276 or mail articles to: Betty Thomas, EMSL-Cincinnati, 26 West Martin L. King Drive, Cincinnati, OH 45268.
(Betty Thomas, FTS: 684-7393; COML: 513-569-7393)

MEMORIAL TO RUBY JERALDINE "JERRY" BIVENS

Ruby Jeraldine "Jerry" Bivens, affectionately known to us all as Jerry, deceased in January. Jerry was a very kind, faithful, devoted employee for the Federal Government for 40 years. Most recently she held the position of Publications Clerk. She handled requests for EMSL-Cincinnati reports with a great degree of concern for all recipients. We will miss her.

Chemistry Research Division

New Instruments Installed for Research on Methods for Non-Volatile and Non-Gas Chromatographable Compounds

Two new, recently developed, major laboratory instruments were installed and will be used during FY89 for research and development of broad spectrum analytical methods for non-volatile and non-gas chromatographable toxic organic pollutants in drinking water, wastewater, ambient water, and hazardous waste. The instruments are an Extrel Thermabeam (trademark) high performance liquid chromatography (HPLC)/mass spectrometry (MS) system and a Hewlett-Packard particle beam HPLC/MS system. The two instruments, which will be used in the in-house research program by experienced EPA personnel, will allow the simultaneous development and testing of several methods and the implementation of these methods on the commercial instrument system that shows the best overall performance. Test methods for non-volatile and non-gas chromatographable compounds are needed for many compounds planned for regulation, or currently regulated, under the Safe Drinking Water Act, the Clean Water Act, the Toxic Substances Control Act, the Resource Conservation and Recovery Act, or the Comprehensive Environmental Response, Compensation, and Liability Act.
(William Budde, FTS: 684-7309; COML: 513-569-7309)

Inorganic Chemistry Analyses

Problems with Test Supplies and Equipment, Drinking Water Certification Program

EMSL-Cincinnati is assigned the responsibility to maintain a program for identifying and reporting problems with supplies and equipment to users and manufacturers. Orion Research Incorporated has voluntarily announced that one of their fluoride standards exceeded specifications. Use of this standard may result in unacceptable performance on performance evaluation or drinking water samples.

The specific product identification is:

Product:	1 ppm Fluoride Standard
Orion catalog number:	040906
Lot number:	SX-1
Actual analysis:	0.86 ppm

This product can be replaced by contacting Orion Customer Service at Toll Free number 1-800-225-1480 or COML: 617-242-3900.
(Larry Lobring, FTS: 684-7372; COML: 617-569-7372)

Clarification

The article that appeared in the QA Newsletter, Volume 10, Number 2, July 1988, concerning Sample Collection and Preservation should read – "Composite samples that are being collected for the measurement of parameters that require refrigeration (Cool to 4°C) should be refrigerated during the composite period." The required preservation techniques are listed in Table II or 40 CFR 136.3.
(Larry Lobring, FTS: 684-7372; COML: 617-569-7372)

Microbiology Research Division

Suspended Cell Culture Technique for Enterovirus Monitoring of Water and Wastewater

The EMSL-Cincinnati Virology Branch has evaluated the suspended cell culture procedure and recommends the use of this method where low numbers of indigenous viruses are anticipated in a test sample. When the virus densities in a sample are low, the suspended cell culture procedure detects more viruses than the currently used monolayer procedure. The suspended cell technique also requires less time because it involves no prior planting of the cells or medium changes.

For further information about the suspended cell culture procedure contact Daniel R. Dahling, FTS: 684-7333; COML: 513-569-7333.
(Robert S. Safferman, FTS: 684-7334; COML: 513-569-7334)

Concentrating Viruses from Municipal Wastewater Sludge Solids

The accuracy of virus monitoring data from environmental samples depends greatly on the efficiency of concentration procedures used to reduce the sample volumes to a quantity which can be economically assayed on cell cultures. One step in the concentration procedure involves the use of beef extract to desorb viruses from solid particulates. A modification in the commercial manufacture of powdered beef extract greatly reduces the virus recovery efficiency during the organic flocculation procedure. To overcome this problem, this beef extract has been supplemented with a floc prepared from paste beef. This has resulted in virus recoveries comparable to those obtained with powdered beef extract produced prior to the change in the manufacturing process. Copies of a report on the subject are available from Mrs. Cherry Jenkins, FTS: 684-7356; COML: 513-569-7356.
(Robert S. Safferman, FTS: 684-7334; COML: 513-569-7334)

Workshop on Drinking Water Quality

An American Society for Microbiology (ASM) Workshop entitled "Drinking Water Quality: Recent Concerns and new Developments" sponsored by the Committee on Continuing Education will be offered at the ASM Annual Meeting, New Orleans, Louisiana, May 14, 1989. The one-day program will include discussions on requirements for compliance with the revised drinking water regulations with the following participants:

- Overview of Monitoring Requirements for Compliance with the revised drinking water regulations. Robert Bordner, EMSL-Cincinnati, USEPA;
- Use of the Autoanalysis Colilert System for the identification of *Escherichia coli*, Stephen C. Edberg, University School of Medicine, Yale University, New Haven, Connecticut;
- Microbial bioassay for determining nutrients (assimilable organic carbon) in drinking water, Eugene W. Rice, Risk Reduction Engineering Laboratory - Cincinnati (RREL-Cincinnati), USEPA;
- Concentration contact time (C-t) disinfection values for determining in activation of waterborne pathogens, Vincent P. Oliveri, Department of Geography and Environmental Engineering Johns Hopkins University, Baltimore, Maryland
- *Giardia*, *Cryptosporidium*, and viruses in drinking water, Joan B. Rose, Department of Microbiology, University of Arizona; and
- Health significance associated with opportunistic pathogens in drinking water, Alfred P. Dufour, EMSL-Cincinnati, USEPA.

For additional information and registration contact the Office of Education and Professional Recognition, ASM, 1913 I Street N.W., Washington, DC 20006, Toll Free 800-424-9872.
(Robert Bordner, FTS: 684-7319; COML: 513-569-7319

Quality Assurance Research Division

Delays in Shipment of QC Samples and Repository Standards

Discussions are underway between Occupational Safety and Health Administration (OSHA) and USEPA to establish the labeling, packaging, and information requirements which must be followed for QC samples and calibration standards under the proposed Hazardous Communication Standard. Interruptions in the distribution of some samples are being experienced, and further modifications in sample labeling, packaging and shipping procedures are anticipated through 1989. Your patience is requested. (James Longbottom, FTS: 684-7308; COML: 513-569-7308)

Headquarters

Office of Water Enforcement and Permits (OWEP) – Washington DC

Progress Report on the Discharge Monitoring Report (DMR) QA Program

Under the Clean Water Act, the National Pollutant Discharge Elimination System (NPDES) regulates municipal and industrial wastewater treatment facilities. To these facilities, EPA or delegated states issue unique permits that specify limits on pollutants in their discharges and set self-monitoring requirements. Each permittee submits the results of self-monitoring on a Discharge Monitoring Report (DMR). As EPA and states make compliance decisions based on the NPDES self-monitoring data, assurance of the data quality is crucial.

Through EMSL-Cincinnati, the Office of Enforcement and Permits conducts the DMR QA Program, which serves us a primary tool to assure the quality of the NPDES self monitoring data. It evaluates the permittees' ability to analyze and report accurate data. Major permittees are required to participate by Section 308(a) of the Clean Water Act. Major permittees receive performance evaluation samples with constituents and concentrations like those found in their industrial or municipal wastewaters. They are required to analyze these samples with constituentsand concentrations like those found in their industrial or municipal wastewaters. They are required to analyze these samples using the same personnel andmethods normally used for reporting NPDES data. Later, EPA sends each permittee an evaluation of their reported data and a checklist for locating sources sources of errors.

Besides providing insight on DMR data quality, this program maintains direct and regular technical contact with permittees. Annual national results since the inception of the DMR QA Program in 1980 are illustrated in Figures 1 and 2. Other accomplishments of the program include: (1) tracking of improvements by states, industries, and types of ownership, (2) checking truthfulness in reporting, (3) checking sources of errors, and (4) evaluating performance for each analyte by the analytical method used.
(Samuel To, FTS: 475-8322; COML: 202-475-8322)

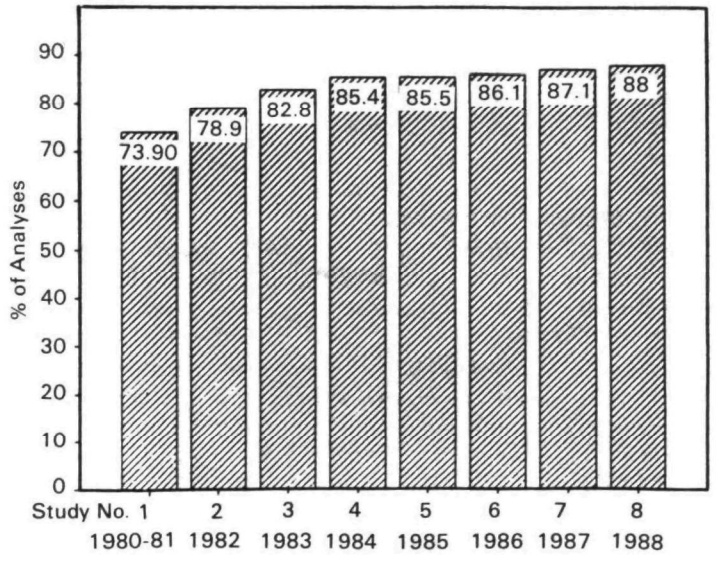


Figure 1. Percent of DMR QA analyses acceptable.

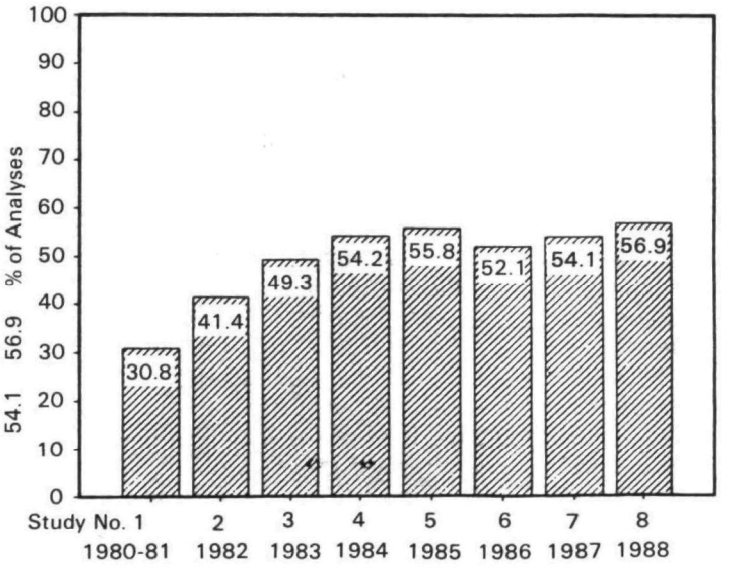


Figure 2. Percent of permittees with all data acceptable.

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 isooctane solution containing 20 PCB congeners for use as an instrumental check has been prepared for EMSL-Cincinnati by the National Institute of Standards and Technology (NIST). The PCB congeners are in ampules containing approximately 300 ng of each congener in 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	*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, hexachlorobutadiene, 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-tetrachlorobenzene, 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-chloroethyl)ether, 4-chlorophenyl phenyl ether, 4-bromophenyl phenyl ether in acetone*
METALS BY ICP	*As, Be, Ca, Cd, Co, Cr, Cu, Fe, Mg, Mn, Mo, Ni, Pb, Sb, Se, Ti, Tl, V and Zn in dilute nitric acid, and 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)	*acenaphthylene, 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 Institute of Standards and Technology, 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, boromform, 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 methanolnaphthalene, and pyrene in acetone*

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 pneumoniae, 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 onpurity 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-Tetrac hloroethane (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)
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 g/mL)
E083 Tetrachloroethylenbe (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 g/mL)**
E560 Ethuyl parathionb (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 compounds. 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
_____Other_____
_____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

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
_____Nitroaro. & Isophorone
PCBs (specific Aroclors)
_____Aroclor 1016
_____Aroclor 1221
_____Aroclor 1232
_____Aroclor 1242
_____Aroclor 1248
_____Aroclor 1254
_____Aroclor 1260
_____Phthalate Esters
_____Polynuclear Aromatics I
_____Polynuclear Aromatics II
_____Other_____

Biological Samples

_____Algae for Ident. #1
_____Algae for Ident. #2
_____Algae for Ident. #3
_____Algae for Ident. #4
Bacteria Indicator Strains
_____Enter aerogenes
_____E coli
_____Klebsiella pneumoniae
_____Pseudomonas aeruginos
_____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)

Fold Here

Fold Here

Place Stamp
Here

Quality Assurance Research Division, Room 525
Environmental Monitoring Systems Laboratory
U.S. Environmental Protection Agency
Cincinnati, Ohio 45268

PLEASE COMPLETE THE FORM AND MAIL TO:
QUALITY ASSURANCE RESEARCH DIVISION, Room 525
EMSL-CINCINNATI
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 samples 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*

(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)

_____ 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
_____ 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-Dioxan ***In 2-Propanol ****In Acetonitrile + + +In Cyclohexanone

Date Requested:_____ Date Shipped:_____

PLEASE COMPLETE THE FORM AND MAIL TO:
QUALITY ASSURANCE RESEARCH DIVISION, Room 525
EMSL-CINCINNATI
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 samples 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_5 (100 g/mL)**
_____ *E190 2,4-Dimethylphenol-3,5,6-d3 (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 µ g/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 4)

How to Order USEPA Publications

For Project Summaries (denoted by EPA/600/S number) of full reports, direct your request to CERI, USEPA, Cincinnati, Ohio 45268. Be sure to include the EPA/600/S number and the title for each Summary requested. There is no charge for these publications, but availability is on a limited basis.

For full reports (denoted by the National Technical Information Service [NTIS] PB number), direct your request to NTIS, 5285 Port Royal Road, Springfield, Virginia 22161. Be sure to include the NTIS PB number, the report title and a check for the publication(s) ordered.

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Include with your request the NTIS PB number, the report title, and a check for the publication(s) ordered.

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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

Heated Purge and Trap Method Development and Testing
EPA/600/4-88/029
NTIS: PB 88-242607/AS
Cost: $15.95 per copy
EPA/600/S4-88/029 (Project Summary)
Samuel Lucas, Hazel Burkholder, and *Robert O'Herron*

Quality Assurance

USEPA Method Study #39 – Method 504
1,2-Dibromethane (EDB) & 1,2-Dibromo-3-Chloropropane (DBCP) in Water by Microextraction & Gas Chromatography
EPA/600/4-88/034
NTIS: PB 89-119580/AS
Cost: $15.95 per copy
EPA/600/S4-88/034 (Project Summary)
Kenneth Edgell and *Raymond Wesselman*

WHERE TO WRITE

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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

U S Environmental Protection Agency
Environmental Monitoring Systems Laboratory – Las Vegas
Las Vegas, Nevada 89193-3478

U S Environmental Protection Agency
Environmental Monitoring Systems Laboratory – Cincinnati
Cincinnati, Ohio 45268

U S Environmental Protection Agency (RD-682)
Quality Assurance Management Staff
Office of Modeling, Monitoring Systems and Quality Assurance
Washington, DC 20460

U S Environmental Protection Agency
Atmospheric Rresearch and Exposure Assessment Laboratory – ResearchTriangle Park (MD-59)
ResearchTriangle Park, North Carolina 27711

RESPONSE SHEET*

Subject Matter: _____Water _____Air _____Solid Waste

Author:_____

Comments:_____

_____

_____

_____

(Use additional sheets if needed.)

_____

Reader's Name

_____

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 Systems Laboratory – Cincinnati
U.S. Environmental Protection Agency
Cincinnati, OH 45268

(Betty Thomas, FTS: 684-7393; COML: 513-569-7393

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

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San Francisco, CA 94105
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Arizona, California, Hawaii, Nevada,
American Samoa, Guam, Trust Territories of
Pacific Islands, Wake Island

Barry Towns
Quality Assurance Office/Chief (Water and Air)
Environmental Services Division
U S Environmental Protection Agency, Region 10
1200 Sixth Avenue, Mail Stop 337
Seattle, WA 98101
FTS 399-1675, COML: 206-442-1675
Alaska, Idaho, Oregon, Washington

QA Officer Changes

Telephone Number Change

Region 1
Carol Wood – FTS. 860-4316, COML 617-860-4314

Region 5
Maxine Long – FTS 353-3114, COML. 312-353-3114

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Quality Assurance Newsletter

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

If you are already on the mailing list and wish to change your address, delete your name, or change previously specified Areas of Interest, you must submit your request along with the mailing label found on the back of this Newsletter. Sending this information greatly speeds our processing your request.

- Cut Here -

Name_____

Address:_____

_____

City/State/Zip Code:_____

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) USEPA
- (b) Other Federal Government
- (c) State or Regional Government
- (d) Local Government
- (e) Industry
- (f) Academia
- (g) Consultant
- (h) Individual
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- (j) Citizen or Conservation Group
- (k) Foreign