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EPA NEWSLETTER

Quality Assurance

CONTENTS

Scientific/Technical Highlight

Office of Ground-Water Protection, USEPA, Washington, DC

Ground-Water Monitoring Strategy

Ground-water monitoring in the United States is in the early stages of development and is hampered by many problems, as has been pointed out in the Office of Technology Assessment (OTA) report "Protecting the Nation's Ground-Water from Contamination" and other technical reports. At present, usable ground-water data are limited and often not readily accessible; what does exist is fragmented among the various Federal, state, and local agencies directly or peripherally involved in ground-water decision making. Other than the work conducted by the U.S. Geological Survey (USGS) on the quantity of natural ground-water contaminants, there has been no concentrated effort at the Federal level to assess the need for ground-water data or to plan for its collection, analysis, and use. Such an effort needs to focus on determining who needs the data, for what purposes they are needed, and how accessible they are. The Ground-Water Monitoring Strategy is the Agency's first attempt to do this on any comprehensive scale for an environmental issue.

This strategy which has just been issued by the U.S. Environmental Protection Agency (USEPA) provides a cross-Agency analysis of the need for and use of ground-water monitoring data. Within this approach, individual programs focus on their program's specific needs while the Ground-Water Monitoring Strategy focuses on the interrelationships between programs and the overall direction of the Agency's ground-water monitoring effort.

Ground-water monitoring is viewed as a continuum of activities ranging from defining background conditions, to performance of waste treatment and storage facilities, to defining the success of USEPA programs on protecting the ground-water resources. These range of activities are addressed through seven monitoring objectives.

1. Characterize the Nation's Ground-Water Resources;
2. Identify New Contamination Problems;
3. Assess Known Problems to Support Regulatory Development and Standard Setting and Respond to Site-Specific Problems;
4. Assure Compliance with Regulations;
5. Evaluate Program Effectiveness;
6. Improve Data Quality; and
7 Develop Ground-Water Data Management System.

The last two objectives play special cross cutting roles. Without the appropriate level of data quality and access to the data, the satisfactory implementation of the other five objectives is difficult if not impossible. The key word is "appropriate," because not all data needs the same level of quality assurance (QA) and accessibility, it depends on the intended use and user of the data.

At the present time several activities are underway to address the first five objectives. A Memorandum of Understanding has been developed and is being implemented between USEPA and the USGS related to ground-water; several surveys and studies are underway or have been completed by USEPA to assess ground-water problems such as leaking underground storage tanks, nonhazardous waste landfills, pesticides, inorganics and radionuclides in drinking water; and a Hazardous Waste Ground-Water Task Force is reviewing the Resource Conservation and Recovery Act (RCRA) permit process in both commercial and on-site RCRA facilities.

Two key activities are underway in the Agency to address ground-water data quality and accessibility. The Office of Research and Development (ORD) is implementing Data Quality Objectives to specifically tie data quality to its intended usage. The Office of Ground-Water Protection and Office of Information Management are conducting a Ground-Water Requirements analysis to determine who needs the data, for what purpose are the data needed, and how accessible are the data?

The Ground-Water Monitoring Strategy is broad in scope and is focused on a five-year horizon. As these specific activities are completed in FY86 and FY87, other issues will be addressed in a systematic manner.
(Norbert Dee, FTS: 382-7077; COML: 202-382-7077)

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

Some Observations

The objective of publishing the QA Newsletter continues to fulfill its original mission: to serve as a forum for sharing timely information for the QA program in order to assure reliable laboratory data and to provide interlaboratory communication. We want to thank Norbert Dee, Office of Ground-Water Protection, headquarters, for providing the article on ground-water monitoring appearing under our new feature: *Scientific/Technical Highlight*. Our next issue will feature monitoring methodology and QA practices on sludges and related sample types.

The technical staff of the USEPA is encouraged to consider submission of a capsule summary on the above subject. Continue to send information by electronic mail, through use of magnafax (FTS: 684-7274 and 684-7276), or mail articles to: Betty Thomas, Publications Assistant, EMSL-Cincinnati, 26 West St. Clair Street, Cincinnati, Ohio 45268.
(Betty Thomas, FTS 684-7302; COML: 513-569-7302)

New Manual for the Analyses of Inorganic Constituents in Precipitation

A contract with Illinois State Water Survey (ISWS) of Champaign, Illinois, has resulted in a chemical methods manual, "Development of Standard Methods for the Collection and Analysis of Precipitation," EPA/600/4-86/024. The manual was prepared under the direction of Mark Peden (ISWS) with John Pfaff as the project officer. This manual includes procedures for conductance, pH, acidity, calcium, magnesium, potassium,

sodium, chloride, fluoride, ammonium, nitrate, nitrate/nitrite, orthophosphate, and sulfate. Precision and bias data, sample handling information, preservation techniques, and QA practice are included in each method.

Information on the availability of this manual, publication number EPA/600/4-86/024, may be obtained by contacting ORD Publications, Center for Environmental Research Information (CERI), USEPA, Cincinnati, Ohio 45268.
(John Pfaff, FTS: 684-7312; COML: 513-569-7312)

Biological Computer Programs

As a follow-up to the February, 1986, QA Newsletter, 32 individuals have downloaded programs from the Bulletin Board and 30 requests were received for disk copies of our various programs. Programs written by some individuals/companies have also been received by EMSL-Cincinnati. When evaluated, these will be passed along to the user community via the EMSL-Cincinnati Bulletin Board.

Presently, 37 statistical programs are available in BASIC for immediate use. Ten other Fortran programs dealing with toxicology are now being translated into BASIC and should be completed about the first of July, 1986. This Bulletin Board is for the user community. Please use it and pass along information.
(James Dryer, FTS: 778-8350; COML: 513-527-8350)

Update of Chapter 8 of the USEPA Manual of Methods for Virology

Chapter 8, entitled "Method for Reduction of Cytotoxicity of Sample Concentrates," is the first replacement chapter for the "USEPA Manual of Methods for Virology." It consists of an improved procedure for reducing sample-associated cytotoxicity in the recovery of viruses from water environments found toxic to mammalian cells used for virus assays.

This chapter has been typeset using a three-column format which greatly reduces the number of pages required; all re-issuances will reflect this form.
(Robert Safferman, FTS: 684-7334; COML: 513-569-7334)

Drinking Water Laboratory Certification Courses

In support of the Agency's QA program, EMSL-Cincinnati held Drinking Water Laboratory Certification courses for microbiology and chemistry during the weeks of June 9 and June 16, respectively, at the Andrew W. Breidenbach Environmental Research Center (AWBERC) in Cincinnati. Offered for Laboratory Certification Officers from USEPA regions and the states, both courses were filled to capacity. The topics covered included the legislative mandate and development of the certification program, 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)

Automated Method for Measurement of Polychlorinated Biphenyls (PCBs) by Level of Chlorination

EMSL-Cincinnati is assisting the Office of Emergency and Remedial Response (OERR) with a six-laboratory test of a new method (method 680) for determinations of PCBs and chlorinated hydrocarbon pesticides. Method 680 uses a mass spectrometer (MS) to detect sample components as they elute from a fused silica capillary column in a gas chromatograph (GC). For the six-laboratory test, the MS is being operated in the standard full-range mass spectrum mode, but method 680 also provides an optional selected ion monitoring mode for added sensitivity. Method 680 is designed for real-world, highly-contaminated water and soil samples and procedures are included for extraction and extract preparation prior to separation, identification, and measurement with GC/MS.

Method 680 incorporates a new approach to PCB measurements. In most standard analytical methods, PCBs are identified in terms of commercial Aroclor mixtures which may contain as many as 100 individual compounds. These methods are acceptable when standard Aroclor patterns can be observed in environmental samples. Unfortunately, standard Aroclor mixtures often become modified and mixed with other electron capture-sensitive substances in the environ-

ment. Aroclors are subject to modification by selective degradation, dissolution, and irreversible adsorption of some components. Mixing of different Aroclors leads to unrecognizable patterns.

To obviate these problems, method 680 uses a special calibration technique which allows the identification and measurement of PCB components by level of chlorination. Groups of components at each level of chlorination are called isomer groups, and total PCBs are measured by summing the quantities of isomer groups. This method represents a reasonable compromise between the Aroclor mixture identification approach, which is often impossible in real-world samples, and identification and measurement of each individual compound.

In the six-laboratory test of method 680, an optional automated procedure is being used to identify PCBs by level of chlorination, identify pesticides, and carry-out all the calculations required to produce final results. The automated procedure is contained in a set of computer programs (software) developed by EMSL-Cincinnati. These programs execute on the same computer used for the GC/MS data acquisition and their use substantially reduces the time and effort required to obtain the final results. Accuracy and precision of the identifications and measurements are improved by the elimination of the need to inspect numerous mass spectra and carry-out extensive calculations. Results of the six-laboratory test will be presented at the annual conference of the OERR's contract laboratory program in August.
(William Budde, FTS: 684-7309; COML: 513-569-7309)

Water Engineering Research Laboratory—Cincinnati (WERL-Cincinnati)

Cold Vapor Mercury Method

Analysts are advised that some batches of commercially available stannous sulfate may be contaminated with up to 5 ppm mercury. Stannous chloride, commercially checked and prepared for use in mercury determination, is therefore preferred and recommended.
(Nancy Ulmer, FTS: 684-7583; COML: 513-569-7583)

Environmental Monitoring Systems Laboratory—Research Triangle Park (EMSL-Research Triangle Park)

Reference and Equivalent Methods for Ambient Air Monitoring

Two additional equivalent methods, one for monitoring lead and one for monitoring SO_2, have been designated under the Reference and Equivalent Method program administered by the QA Division of EMSL-Research Triangle Park. They are:

EQL-0785-059, "Determination of Lead Concentration in Ambient Particulate Matter by Flameless Atomic Absorption Spectrometry" (Omaha-Douglas County Health Department, 1819 Farnam Street, Omaha, Nebraska 68183). The notice of designation was published in the *Federal Register* on September 18, 1985 (50 FR 37909).

EQSA-0486-060, "Thermo Electron Instruments, Inc., Model 43A Pulsed Fluorescent Ambient SO_2 Analyzer" (Thermo Electron Instruments, Inc., 108 South Street, Hopkinton, Massachusetts 01748). The notice of designation was published in the *Federal Register* on April 10, 1986 (51 FR 12390).

The latest complete list of all currently designated reference and equivalent methods may be obtained from the QA Division (MD-77), EMSL-Research Triangle Park, USEPA, Research Triangle Park, North Carolina 27711, or from the appropriate QA Coordinator (listed at the end of this Newsletter).
(Frank McElroy, FTS: 629-2622; COML: 919-541-2622)

Headquarters

Office of Water Enforcement and Permits (OWEP)—Washington, DC

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

Through EMSL-Cincinnati, the OWEP has been conducting a QA program to assure the quality of National Pollutant Discharge Elimination System (NPDES) self-monitoring data of the 7500 major permittees. Since 1980, five national studies have been completed.

Major permittees are sent performance evaluation (PE) samples containing constituents normally found in industrial and municipal wastewaters. The samples are to be analyzed with the method normally used to report NPDES self-monitoring data. Responding permittees subsequently receive an evaluation of their data, and are given guidance for checking error sources.

The program has provided valuable data in assessing the quality of DMRs. Improvements have been significant. It also enables the tracking of improvements by individual industries, identifying the sources of error, and improving the efficiency of NPDES compliance monitoring.

Since there have been changes on the study population from study to study, a group of permittees that has participated from the beginning has been identified as a control to monitor how permittees can improve. The control group (about 3000 permittees have participated in all five studies) shows slightly higher improvement rates. The improvements are illustrated in Figures 1 and 2.

New initiatives in 1986 (Study 6) include:

1. Three analytes are added: total cyanide, total phenolics, and total residual chlorine.

2. Permit files are being compared with DMR QA report files to track discrepancies in reporting.

(Samuel To, FTS: 202-475-8319; COML: 202-475-8322)

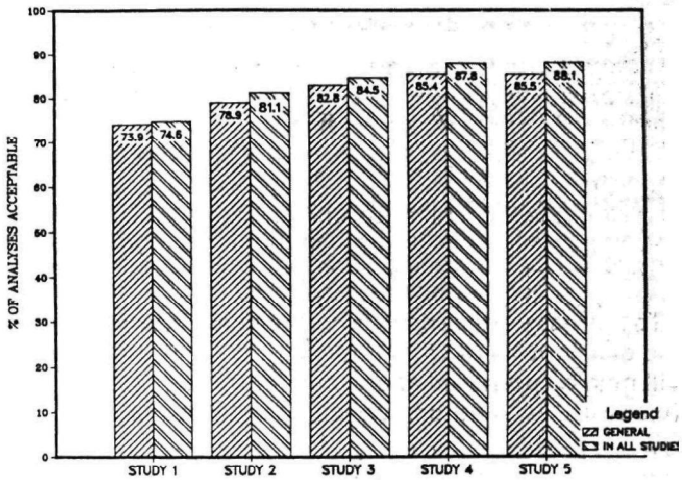

Figure 1--Percent of DMR QA Analyses Acceptable

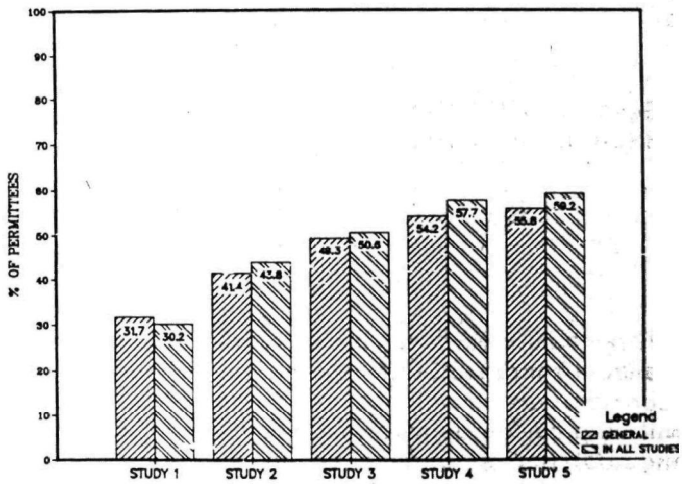

FIGURE 2--PERCENT OF PERMITTEES WITH ALL DATA ACCEPTABLE

QA SUPPORT FOR WATER AND WASTEWATER ANALYSES EMSL-CINCINNATI

Quality Control (QC) Sample Program

Single Level QC Sample Series

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

NEW QC SAMPLES

Volatile Organic Contaminants (VOC)

Seven new VOC sample series are now available from EMSL-Cincinnati. These samples contain 56 analytes at one level each and can be used with USEPA Methods 502, 503, 524, 601, 602, and 624.

Bacterial Indicator Strains

Three additional bacterial reference cultures are now available from EMSL-Cincinnati. *Klebsiella pneumoniae, Pseudomonas aeruginosa,* and *Streptococcus faecalis* will be provided by lyophilized cultures for qualitative and quantitative characterization. Sterile microbiological blanks are also available now for use as negative controls or as simulated lyophilized cultures.

These samples are shipped in dry ice with instructions for rehydration and dilution, a profile of biochemical reactions of the organisms, and the cell count/vial. When stored below 0°C, the cultures' viable counts and biochemical reactions are stable and replicable.

Depleted QC Series

Aromatic Purgeables (Method 602), Halogenated Purgeables—I and II and GC/MS Purgeables I through IV have been depleted and are replaced by the new VOC samples. Series I through III can be used in place of the Aromatic Purgeables and Series IV and VII for the Halogenated Purgeables VOC I through VII will replace all of the GC/MS Purgeables. Samples for Benzidines (Method 605) and Nitrosamines (Method 607) are not available because of instability of the compounds. PCBs in Sediments and PCBs in Fish have been depleted. PCBs in Sediment are being re-made but the latter series will not be replaced in FY 86 because of higher priority needs.

Notice of Changes

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 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 sample, blind samples, or replicates incorporated into each analytical run as part of the laboratory's QC program.

To encourage proper usage of QC samples and reduce costs of program operations in times of budget restric-

tions, the QA Branch is limiting the number of sets of each QC sample type to six.

If you have special needs beyond these numbers, please contact the appropriate regional QA Coordinator/ QA Officer, describing your needs for extra samples. The QA representatives are asked to pass these requests to QA Branch if they feel the need is fully justified.

There is no certification or other formal evaluative function resulting from the use of QC samples and data return is not expected. The QC Sample Program covers the ambient water quality, drinking water, water pollution, priority pollutant, hazardous, and toxic waste programs for chemical, biological, and microbiological parameters. Most samples are prepared as concentrates in water or organic solvent (where noted) and sealed in glass ampuls. Instructions are provided for dilution of samples to volume with water or wastewater prior to analysis. A maximum of six sets per series per year will be distributed. Waivers to this policy will be made only if written requests are received which fully explain the need for more QC samples and their impact on USEPA activities. The following samples are available now:

QC Samples for Water Quality Analyses

DEMAND ANALYSES	*BOD, COD, and TOC*
USEPA/API STANDARD REFERENCE 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*
MERCURY	*mercury, two levels*
MINERAL/PHYSICAL ANALYSES	*sodium, potassium, calcium, magnesium, pH, sulfate, chloride, fluoride, alkalinity/acidity, total hardness, total dissolved solids, and specific conductance.*
MUNICIPAL DIGESTED SLUDGE	*26 parameters (metals, nutrients, demands, residues, and phenols)*
NONIONIC SURFACTANT (CTAS TEST) STANDARD	*Reference Nonionic Surfactant, $C_{12\text{-}18}E_{11}$ Standard Methods Method 512 C*
NUTRIENTS	*nitrate-N, ammonia-N, Kjeldahl-N, orthophosphate, and total P*
OIL AND GREASE	*analyzable by IR and gravimetrically*
PESTICIDES IN FISH	*toxaphene, DDD, DDE, and DDT*
PHENOLS, TOTAL (4AAP Method)	*total phenols in water*
POLYCHLORINATED BIPHENYLS (PCBs) IN OILS	*Aroclor 1016, 1242, 1254, and 1260 in transformer, hydraulic, and capacitor oils, (specify Aroclor and oil)*
SUSPENDED SOLIDS	*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*
TRACE METALS IN FISH	*arsenic, cadmium, chromium, copper, lead, mercury, nickel, selenium, and zinc*
VOLATILE ORGANICS (Method 601)	*chloroform, 1,2-dichloroethane, 1,1,1-trichloroethane, 1,1,2-trichloroethylene, carbon tetrachloride, 1,1,2,2-tetrachloroethylene, bromodichloromethane, dibromochloromethane, and bromoform in methanol*

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	
DICHLOROBENZENES (Methods 601, 602, and 612)	*3 Sets: meta and para isomers, meta and ortho isomers, and meta, ortho and para isomers in methanol*
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*

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, 1260 and 1262 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.

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*
TEMIK	*aldicarb, aldicarb sulfoxide, aldicarb sulfone in acetonitrile*
TRACE METALS - WS	*arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver*
TRIHALOMETHANES	*chloroform, bromoform, dichlorobromomethane, and chlorodibromo methane in methanol*
TURBIDITY	
VOLATILE ORGANIC CONTAMINANTS - I (Methods 503, 524, 602 and 624)	*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)	*trichloroethane, p-xylene, o-xylene, t-butylbenzene, p-cymene and n-dichlorobenzene*
VOLATILE ORGANIC CONTAMINANTS - III (Methods 503, 524, 602 and 624)	*toluene, chlorobenzene, isopropylbenzene, sec-butylbenzene, 1,2,4-trimethylbenzene, n-butylbenzene, and o-dichlorobenzene*
VOLATILE ORGANIC CONTAMINANTS - IV (Methods 502, 524, 601 and 624)	*1,1-dichloroethylene, cis-1,2-dichloroethylene, 1,1,1-trichloroethane, 1,1-dichloropropene, 1,1,2-trichloroethane, 1,1,2,2-tetrachloroethylene, and bis(2-chloroethyl)ether*
VOLATILE ORGANIC CONTAMINANTS - V (Methods 502, 524, 601 and 624)	*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*
VOLATILE ORGANIC CONTAMINANTS - VI (Methods 502, 524, 601 and 624)	*dichloromethane, 1,1-dichloroethane, 1,2-dichloroethane, bromodichloromethane, 1,3-dichloropropane, 2-chloroethyl ethyl ether, 1,2,3-trichloropropane, chlorobenzene, bromobenzene and o-dichlorobenzene*
VOLATILE ORGANIC CONTAMINANTS - VII (Methods 502, 524, 601 and 624)	*trichlorofluoromethane, trans 1,2-dichloroethane, dibromomethane, 1,2-dichloropropane, chlorodibromomethane, 1,1,2,2-tetrachloroethane, chlorohexane, o-chlorotoluene, and p-dichlorobenzene*

QC Samples for Biology/Microbiology

ADENOSINE TRIPHOSPHATE (ATP)	*three concentrations for use with luciferin-luciferase firefly bioluminescence assays; three ATP ampuls/set in tris buffer*
ALGAE FOR IDENTIFICATION	*Sample 1 contains two taxa and Sample 2 contains three taxa of preserved algae for microscopic identification. Instructions include the identifications of the algae. (Laboratory must specify sample needed.)*
BACTERIA INDICATOR STRAINS	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	*fluorometric analyses, three levels, in acetone*
CHLOROPHYLL	*spectrophotometric analyses, one level, in acetone*
REFERENCE TOXICANTS	*sodium lauryl sulfate, one level, aqueous solution, and cadmium chloride, one level, aqueous solution (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 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 (1000 µg/mL)**
E009 1,2-Dichloroethane (10,000 µg/mL)
E010 1,1,1-Trichloroethane (10,000 µg/mL) (QAR)
E011 Hexachloroethane
E012 1,1-Dichloroethane (10,000 µg/mL)
E013 1,1,2-Trichloroethane (10,000 µg/mL) (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 (10,000 µg/mL)
E022 2-Chlorophenol
E023 1,2-Dichlorobenzene
E025 1,4-Dichlorobenzene
E026 3,3'-Dichlorobenzidine
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 (4500 µg/mL)****
*E044 Methyl bromide (9940 µg/mL)****
E046 Dichlorobromomethane (10,000 µg/mL)
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 (1000 µg/mL)
*E071 Benzo(a)pyrene (1000 µg/mL) (QAR)**
*E072 Benzo(b)fluoranthene (2500 µg/mL)**
*E073 Benzo(k)fluoranthene (1000 µg/mL)**
*E074 Chrysene (1000 µg/mL)**
E075 Acenaphthylene (QAR)
*E076 Anthracene (1000 µg/mL)**
*E077 Benzo(g,h,i)perylene (1000 µg/mL)***
E078 Fluorene (QAR)
E079 Phenanthrene
*E081 Indeno(1,2,3-c,d)pyrene (500 µg/mL)**
E082 Pyrene (1000 µg/mL)
E083 Tetrachloroethylene (10,000 µg/mL)
E084 Toluene (10,000 µg/mL)
E085 Trichloroethylene (10,000 µg/mL)
E088 Dieldrin
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
E098 Heptachlor
E099 Heptachlor epoxide
E100 alpha-BHC (2500 µg/mL)
*E101 beta-BHC (2500 µg/mL)**
E102 gamma-BHC (Lindane)
E103 delta-BHC (1000 µg/mL)
E104 PCB-Aroclor 1242 (QAT)
E105 PCB-Aroclor 1254 (QAT)
E107 PCB-Aroclor 1232 (QAT)
E108 PCB-Aroclor 1248 (QAT)
E109 PCB-Aroclor 1260 (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) (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 (2500 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 (1000 µg/mL)*
E220 Aldrin
E222 2,3,5-Trichlorophenol (QAR)
E224 2,4-Dimethylphenol (QAR)
E225 1,2,3,4-Tetrachlorobenzene (2500 µg/mL)
E231 Dibenzo(a,h)anthracene (1000 µg/mL)**
E236 n-Decane
E237 n-Undecane
E238 n-Dodecane
E239 n-Tridecane
E240 n-Tetradecane
E241 n-Pentadecane
E242 n-Heptadecane (2500 µg/mL)
E244 n-Nonadecane (1000 µg/mL)
E246 n-Tetracosane (500 µg/mL)
E250 ortho-Cresol (QAR)
E251 meta-Cresol (QAR)
E252 para-Cresol
E255 Dibutyl ether
E257 Styrene
E258 Epichlorohydrin****
E260 Pentachlorobenzene (2500 µg/mL)
E261 Dibenzofuran
E262 Diphenyl ether
E263 Diphenylamine
E270 Acrylamide (10,000 µg/mL)
E271 Pyridine (10,000 µg/mL)
E282 Diisodecyl phthalate
E284 Acetone
E285 Diethyl ether (4500 µg/mL)
E286 1,2-Epoxybutane****
E295 Phenacetin
E299 2-Fluoroacetamide
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)
E342 4-Nitroaniline
E360 Carbon tetrachloride (10,000 µg/mL)
E368 1,2,3-Trichloropropane
E455 Dinoseb****
E470 PCN Halowax 1099 (QAT)
E471 PCN Halowax 1001 (QAT)
E472 PCN Halowax 1000 (QAT)
E473 Acetonitrile***
E480 para-Dioxane (10,000 µg/mL)
E536 Vinyl chloride (4500 µg/mL)***
E542 Aniline
E548 N,N-Dimethylformamide
E552 2,4,5-TP (Silvex) (QAR)****
E662 3-Nitrophenol
E713 Picloram (1000 µg/mL)****
E715 Carbofuran
E952 p,p'-Methoxychlor
E954 Aldicarb (1000 µg/mL)****
E993 1,2-Dibromo-3-chloropropane (QAT)
E995 Aldicarb sulfone (1000 µg/mL)****
E996 Aldicarb sulfoxide (1000 µg/mL)****
E1089 Alachlor (1,000 µg/mL)

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

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

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 Programs 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*
___ *Mercury*
___ *Mineral*
___ *Mun. Digested Sludge*
___ *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*
___ *Volatile Organics*
___ *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 Temik*
___ *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*
___ *Dichlorobenzenes*
___ *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*
___ *Aroclor 1262*
___ *Phenols (GC)*
___ *Phthalate Esters*
___ *Polynuclear Aromatics I*
___ *Polynuclear Aromatics II*
___ *Other* _____

Biological Samples

___ *Algae for Ident. #1*
___ *Algae for Ident. #2*
___ *ATP*
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)

Fold Here

Place Stamp
Here

Quality Assurance Branch, Room 525
Environmental Monitoring and Support Laboratory
U.S. Environmental Protection Agency
Cincinnati, Ohio 45268

Fold Here

PLEASE COMPLETE THE FORM AND MAIL TO:
QUALITY ASSURANCE BRANCH, Room 525
EMSL-CINCINNATI
U.S. ENVIRONMENTAL PROTECTION AGENCY
CINCINNATI, OH 45268

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

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.

___ *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 (1000 µg/mL)**
___ *E009 1,2-Dichloroethane (10,000 µg/mL)*
___ *E010 1,1,1-Trichloroethane (10,000 µg/mL) (QAR)*
___ *E011 Hexachloroethane*
___ *E012 1,1-Dichloroethane (10,000 µg/mL)*
___ *E013 1,1,2-Trichloroethane (10,000 µg/mL) (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 (QAR)*
___ *E020 p-Chloro-m-cresol*
___ *E021 Chloroform (10,000 µg/mL)*
___ *E022 2-Chlorophenol*
___ *E023 1,2-Dichlorobenzene*
___ *E025 1,4-Dichlorobenzene*
___ *E026 3,3'-Dichlorobenzidine (QAR)*
___ *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)*
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___ *E043 Methyl chloride (4500 µg/mL)****
___ *E044 Methyl bromide (9940 µg/mL)****
___ *E046 Dichlorobromomethane (10,000 µg/mL)*
___ *E050 Hexachlorobutadiene (QAR)*
___ *E051 Hexachlorocyclopentadiene*
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___ *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*

**In Acetone* ***In para-Dioxane* ****In 2-Propanol* *****In Acetonitrile* *(compounds continued on reverse)*

Date Requested: _____ Date Shipped: _____
EPA-360 (Cin) (Rev. 6/83, Pt. 3)

___ E068 Diethyl phthalate
___ E069 Dimethyl phthalate
___ E070 Benzo(a)anthracene (1000 µg/mL)
___ E071 Benzo(a)pyrene (1000 µg/mL) (QAR)*
___ E072 Benzo(b)fluoranthene (2500 µg/mL)*
___ E073 Benzo(k)fluoranthene (1000 µg/mL)*
___ E074 Chrysene (1000 µg/mL)*
___ E075 Acenaphthylene (QAR)
___ E076 Anthracene (1000 µg/mL)*
___ E077 Benzo(g,h,i)perylene (1000 µg/mL)**
___ E078 Fluorene (QAR)
___ E079 Phenanthrene
___ E081 Indeno(1,2,3-c,d)pyrene (500 µg/mL)*
___ E082 Pyrene (1000 µg/mL)
___ E083 Tetrachloroethylene (10,000 µg/mL)
___ E084 Toluene (10,000 µg/mL)
___ E085 Trichloroethylene (10,000 µg/mL)
___ E088 Dieldrin
___ E089 Chlordane (QAT)
___ E091 4,4'-DDE
___ E092 4,4'-DDD
___ E093 alpha-Endosulfan**
___ E094 beta-Endosulfan**
___ E095 Endosulfan sulfate (QAR)
___ E096 Endrin (QAR)
___ E097 Endrin aldehyde
___ E098 Heptachlor
___ E099 Heptachlor epoxide
___ E100 alpha-BHC (2500 µg/mL)
___ E101 beta-BHC (2500 µg/mL)*
___ E102 gamma-BHC (Lindane)
___ E103 delta-BHC (1000 µg/mL)
___ E104 PCB-Aroclor 1242 (QAT)
___ E105 PCB-Aroclor 1254 (QAT)
___ E107 PCB-Aroclor 1232 (QAT)
___ E108 PCB-Aroclor 1248 (QAT)
___ E109 PCB-Aroclor 1260 (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 (2500 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 (2500 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 (1000 µg/mL)*
___ E220 Aldrin
___ E222 2,3,5-Trichlorophenol (QAR)
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___ E225 1,2,3,4-Tetrachlorobenzene (2500 µg/mL)
___ E231 Dibenzo(a,h)anthracene (1000 µg/mL)**
___ E236 n-Decane
___ E237 n-Undecane
___ E238 n-Dodecane
___ E239 n-Tridecane
___ E240 n-Tetradecane
___ E241 n-Pentadecane
___ E242 n-Heptadecane (2500 µg/mL)
___ E244 n-Nonadecane (1000 µg/mL)
___ E246 n-Tetracosane (500 µg/mL)
___ E250 ortho-Cresol (QAR)
___ E251 meta-Cresol (QAR)
___ E252 para-Cresol
___ E255 Dibutyl ether
___ E257 Styrene
___ E258 Epichlorohydrin****
___ E260 Pentachlorobenzene (2500 µg/mL)
___ E261 Dibenzofuran
___ E262 Diphenyl ether

*In Acetone **In para-Dioxane ***In 2-Propanol ****In Acetonitrile (compounds continued on reverse)

Date Requested: _____ Date Shipped: _____

PLEASE COMPLETE THE FORM AND MAIL TO:
QUALITY ASSURANCE BRANCH, Room 525
EMSL-CINCINNATI
U.S. ENVIRONMENTAL PROTECTION AGENCY
CINCINNATI, OH 45268

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

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 (4500 µg/mL)*
___ *E286 1,2-Epoxybutane*****
___ *E295 Phenacetin*
___ *E299 2-Fluoroacetamide*
___ *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)*
___ *E342 p-Nitroaniline*
___ *E360 Carbon tetrachloride (10,000 µg/mL)*
___ *E368 1,2,3-Trichloropropane*
___ *E455 Dinoseb*****
___ *E470 PCN Halowax 1099 (QAT)*
___ *E471 PCN Halowax 1001 (QAT)*
___ *E472 PCN Halowax 1000 (QAT)*
___ *E473 Acetonitrile****
___ *E480 para-Dioxane (10,000 µg/mL)*
___ *E536 Vinyl chloride (4500 µg/mL)****
___ *E542 Aniline*
___ *E548 N,N-Dimethylformamide*
___ *E552 2,4,5-TP (Silvex) (QAR)*****
___ *E662 3-Nitrophenol*
___ *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)*****

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 ****In Acetonitrile †Methylene chloride ††In Isooctane*

Date Requested: _____ Date Shipped: _____

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

Training Information for Instrumentation, QA/QC

EMSL-Cincinnati receives many requests for information about training courses offered on the use of analytical instrumentation and the role of QA and QC in environmental measurements. Since many agencies are cutting back or eliminating their training facilities, it becomes increasingly important to personnel in need of such training to have a central source of information.

In response to this need, and in keeping with the *Newsletter's* mission to report current information on the methodology and QA/QC used in environmental measurement activities, a list of courses is provided.

It should be noted that this information does not in any way constitute an endorsement of the organization offering such training, nor will this laboratory make any sort of referral regarding the merits of individual courses. Please contact the association sponsoring the course for further information.

Please submit information on instrumentation or QA/QC courses to: Betty Thomas, Publications Assistant, QA Newsletter, EMSL-Cincinnati, USEPA, 26 West St. Clair, Cincinnati, Ohio 45268, who reserves the right to publish only that information which relates to either the use of instrumentation or QA/QC techniques or procedures in methods required by various regulatory or compliance monitoring programs.

Instrumentation

Finnigan MAT Institute

Nancy Kranpitz, Registrar
4450 Carver Woods Drive
Cincinnati, Ohio 45242
COML: 513-891-2100

Basic MS
August 11-15, Cincinnati, Ohio

Introduction to MS
September 22-23, St. Louis, Missouri

Basic Mass Spectral Interpretation
September 24-26, Cincinnati, Ohio

QA

Association of Official Analytical Chemists

Marilyn Taub
1111 North 19th Street
Suite 210
Arlington, Virginia 22209
COML: 703-522-3032

QA for Analytical Laboratories
August 12-13, Arlington, Virginia
September 13-14, Scottsdale, Arizona

Andersen Samplers, Incorporated

Stack Sampling Seminar

Robert Ford
4215 Wendell Drive, S.W.
Atlanta, Georgia 30336
COML: 404-691-1910

October 6-10, Gainesville, Florida

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.

Some complete reports (denoted by EPA 600 numbers) are available free of charge on a limited basis from ORD Publications. Include the EPA/600 number and the report title with your request. If copies of the report are no longer available, you will be notified. These reports may also be obtained at the cost indicated from NTIS.

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

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

Development of Method for Semivolatile Organic Priority Pollutants in Fish
EPA/600/S4-85/081
NTIS: PB 86 136058/AS ($11.95 per copy)
T. Engel and *Thomas Pressley*

Evaluation of Methods for Hazardous Chemicals Listed in Appendix D to 40 CFR 122 (Table V)
EPA/600/S4-86/001
NTIS: PB 86 136520/AS ($16.95 per copy)
S. Lucas, M. Cooke, T. Cole, and *Fred Kawahara*

Validation of Soxhlet Extraction Procedure for SW 846
EPA/600/S4-85/073
NTIS: PB 86 118585/AS ($9.95 per copy)
Larry Michael, M. Arthur Moseley, John Hines, Edo Pellizzari, and *Robert Slater*

Determination of Dithiocarbamate Pesticides in Wastewaters
EPA 600/S4-85/072
NTIS: PB 86 118726/AS ($11.95 per copy)
T. Engel, J. Warner, W. Cooke, and *Thomas Pressley*

Determination of Phenols in Industrial and Municipal Wastewater
EPA/600/S4-85/068
NTIS: PB 86 119120/AS ($16.95 per copy)
J. Florance, J. Hall, M. Khare, S. Maggio, J. Mitchell, R. Solomon, J. SoloRio,
D. Strother, M. Wass, and *James Lichtenberg*

Determination of Chlorinated Hydrocarbons in Industrial and Municipal Wastewaters
EPA/600/S4-85/069
NTIS: PB 86 121357/AS ($11.95 per copy)
J. Florance, J. Hall, M. Khare, S. Maggio, J. Mitchel, R. Solomon, J. SoloRio,
D. Strother, M. Wass, and *James Lichtenberg*

QA

Improved Methods of Analysis for Chlorate, Chlorite, and Hypochlorite Ions at the Sub-mg/L Level
EPA/600/S4-85/074
NTIS: PB 86 118684/AS ($9.95 per copy)
Gilbert Gordon and *Daniel Bender*

Inorganic Analyses

USEPA Extraction Method Development Study for Trace Metals in Leachate
EPA/600/S4-85/071
NTIS: PB 86 118981/AS ($16.95 per copy)
T. Copeland, J. Maney, and *John Pfaff*

EPA Method Study 32, Method 450.1, Total Organic Halides (TOX)
EPA/600/S4-85/080
NTIS: PB 86 136538/AS ($11.95 per copy)
Carol Tate, Bruce Chow, Robert Clark, Nancy Grams, Lewis Hashimoto, and *Terence Grady*

EPA Method Study 33, Ignitability Characteristics of Solids
EPA/600/S4-86/015
NTIS: PB 86 166303/AS ($11.95 per copy)
Robert Handy, Larry Michael, Caroline McLaughlin, Edo Pellizzari, and *Terence Grady*

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:

U.S. Environmental Protection Agency
Environmental Monitoring Systems Laboratory — Las Vegas
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.)

_____
Reader's Name

_____
Address

_____
City State Zip Code

_____
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.

Mailing List
Quality Assurance Newsletter

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Betty J. Thomas
U.S. Environmental Protection Agency
Environmental Monitoring and Support Laboratory-Cincinnati
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 of your request.

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- (d) Microbiology
- (e) Viruses
- (f) Quality Assurance
- (g) Sampling and Automatic Measurements
- (h) Monitoring Systems
- (i) Radiochemical Analysis
- (j) All Subjects

(2) Air:
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- (b) Ambient Monitoring
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- (d) Monitoring Systems
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(3) Solid Waste:
- (a) Chemical Analysis
- (b) All Subjects

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