

The Standard

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Solution*

US Geological Survey:

Target Compounds for National Reconnaissance of Emerging Contaminants in U.S. Streams

Research on Emerging Water Quality Issues

By Dana Kolpin, U.S. Geological Survey, 400 S. Clinton Street, Box 1230, Iowa City, Iowa 52244

Recent decades have brought increasing concerns for potential contamination of water resources. This contamination could result, inadvertently, from production, use, and disposal of the numerous chemicals used in industry, agriculture, medical treatment, and even common household conveniences. As knowledge of the environmental occurrence or toxicological behavior of contaminants has increased, so has concern as to the potential adverse environmental and human health effects. For many contaminants, the toxicological significance is not fully understood by public health experts (particularly effects of long-term exposures at low-levels). The need to understand the processes controlling contaminant transport and fate in the environment, and the lack of knowledge of the significance of long-term exposures has increased the need to study environmental occurrence down to trace levels.

The objective of this U.S. Geological Survey (USGS) investigation is to develop information and tools on emerging water-quality issues. These tools will be used to design and improve water-quality monitoring and assessment programs of the USGS and others, and for proactive decision-making by industry, regulators, the research community, and the public. (<http://toxics.usgs.gov/regional/emc.html>)

Contaminants are grouped into four main categories: antibiotics, human drugs, hormones, and wastewater products:

Veterinary and Human Antibiotics

Tetracyclines
Fluoroquinolones
Macrolides
Sulfonamides

Human Drugs

Prescription
Over-the-counter medications

Sex and Steroidal Hormones

Biogenics (human hormones)
Pharmaceuticals (hormone replacement
therapy)
Sterols

Industrial and Household Wastewater Products

Insecticides
Plasticizers
Detergent metabolites
Flame retardants
PAHs
Antioxidants
Others such as disinfectants and fumigants

A list of compounds with examples of each group can be found on the USGS Web site at <http://toxics.usgs.gov/regional/contaminants.html>. For more information on the National Reconnaissance of Emerging Contaminants please contact Dana Kolpin at dwkolpin@usgs.gov.

CIL offers many standards to assist in the analysis of these compounds. Please contact us for a complete listing of available compounds in any or all of the four major categories.

New Polybrominated Dioxin and Furan (PBDD/PBDF) Standards:

In recent months there has been significant interest in the formation of polybrominated dioxins and furans as byproducts of combustion of brominated diphenyl ethers and other brominated compounds. In response to customer demand for more PBDD/PBDF Standards, CIL has been increasing this product line. CIL has recently added octabromodibenzo-p-dioxin to its PBDD and PBDF offerings. CIL's full line of individual ¹³C-labeled and unlabeled polybrominated dioxin and furan standards, as well as PBDD/PBDF mixtures, can be found in our new Environmental Contaminants Standards catalog or at our Web site (www.isotope.com).

The standards listed below are currently under development at CIL. Please contact us for pricing and delivery information.

Catalog #	Description	Amount	\$ Price
ED-5089	OctaBDD (¹³ C ₁₂ ,99%)	4 x 1.2 mL	\$1,850
EF-5075	2-MonoBDF (unlabeled) 5 µg/mL in nonane	8 x 1.2 mL	Request Price
EF-5076	2-MonoBDF (¹³ C ₁₂ ,99%) 5 µg/mL in nonane	4 x 1.2 mL	Request Price
EF-5077	2,8-DiBDF (unlabeled) 5 µg/mL in nonane	8 x 1.2 mL	Request Price
EF-5078	2,8-DiBDF (¹³ C ₁₂ ,99%) 5 µg/mL in nonane	4 x 1.2 mL	Request Price
EF-5079	2,4,8-TriBDF (unlabeled) 5 µg/mL in nonane	8 x 1.2 mL	Request Price
EF-5080	2,4,8-TriBDF (¹³ C ₁₂ ,99%) 5 µg/mL in nonane	4 x 1.2 mL	Request Price
EF-5081	2,4,6,8-TetraBDF (unlabeled) 5 µg/mL in nonane	8 x 1.2 mL	\$440
EF-5082	2,4,6,8-TetraBDF (¹³ C ₁₂ ,99%) 5 µg/mL in nonane	4 x 1.2 mL	\$1,850
EF-5083	1,2,4,7,8-PentaBDF (¹³ C ₁₂ ,99%) 5 µg/mL in nonane	4 x 1.2 mL	Request Price
EF-5182	1,2,4,7,8-PentaBDF (unlabeled) 5 µg/mL in nonane	8 x 1.2 mL	\$550

In order to offer researchers access to a broad range of PBDD/PBDF standards, CIL has produced the following mixtures. These mixtures are in use in laboratories all over the world, enabling improved comparability of PBDD/PBDF data by reducing formulation variability among laboratories. Please contact CIL or your local International representative for product specifications or to place an order.

Catalog #	Description	Amount	\$ Price
EDF-2046-A	Polybrominated Dioxin and Furan mixture (unlabeled)	1.2 mL	\$1,175
EDF-5058	Tetra-Hexa Brominated Dioxin & Furan Standard Solution (¹³ C ₁₂ ,99%) 1 µg/mL in nonane	1.2 mL	\$3,750
EDF-5059	Polybrominated Dioxin & Furan mixture (unlabeled) 1 µg/mL in nonane	1.2 mL	\$795
EDF-5070	Brominated Dioxin/Furan Calibration Solution BCS1-BCS5 (unlabeled/ ¹³ C ₁₂ ,99%)	5 x 0.2 mL	\$2,175
EDF-5071	Brominated Dioxin/Furan Labeled Compounds (¹³ C ₁₂ ,99%)	1.2 mL	\$400
EDF-5074	Brominated Dioxin/Furan PAR Solution (unlabeled)	1.2 mL	\$600
ED-5072	Brominated Dioxin/Furan Clean-Up Standard (¹³ C ₁₂ ,99%)	1.2 mL	\$155
ED-5073	Brominated Dioxin/Furan Internal Standard (¹³ C ₁₂ ,99%)	1.2 mL	\$440



New Polybrominated Biphenyl (PBB) Standards:

In addition to polybrominated dioxin and furan standards, CIL has a wide variety of polybrominated diphenyl ether standards, as well as the following polybrominated biphenyl standards:

Catalog #	Description	Amount	\$ Price
EB-5055	3,3',4,4'-TetraBB (¹³ C ₁₂ ,99%) 40+/-2 µg/mL in nonane (PBB-77)	3 mL	\$1,750
EB-5056	3,3',4,4',5-PentaBB (¹³ C ₁₂ ,99%) 40+/-2 µg/mL in nonane (PBB-126)	3 mL	\$1,750
EB-5106	2,3,3',4,4',5'-HexaBB (¹³ C ₁₂ ,99%) 40+/-2 µg/mL in nonane (PBB-157)	3 mL	\$1,750
PBB-77-CS	3,3',4,4'-TetraBB (100 µg/mL in isooctane) unlabeled Certified Standard	1.2 mL	\$150
PBB-126-CS	3,3',4,4',5-PentaBB (100 µg/mL in isooctane) unlabeled Certified Standard	1.2 mL	\$150
PBB-157-CS	2,3,3',4,4',5'-HexaBB (100 µg/mL in isooctane) unlabeled Certified Standard	1.2 mL	Request Price

Non-2,3,7,8-Containing Polychlorinated Dioxins and Furans

CIL has recently formulated many standards, both individuals and mixtures, containing dioxins and furans that are not fully chlorinated at the 2,3,7,8 positions. The following is representative of CIL's inventory of these materials.



Individual non-2,3,7,8-containing dioxin and furan standards:

Catalog #	Description	Amount	\$ Price
ED-4198	1,3,6,8-TetraCDD (¹³ C ₁₂ ,99%) 50 ± 2.5 µg/mL in nonane	1.2 mL	\$1,150
ED-4076	1,2,3,4,7-PentaCDD (¹³ C ₁₂ ,99%) 50 ± 2.5 µg/mL in nonane	1.2 mL	\$1,250
ED-4077	1,2,3,4,6,7-HexaCDD (¹³ C ₁₂ ,99%) 50 ± 2.5 µg/mL in nonane	1.2 mL	\$1,250
EF-5009	1,3,6,8-TetraCDF (¹³ C ₁₂ ,99%) 50 ± 2.5 µg/mL in nonane	1.2 mL	\$1,600
EF-5050	1,2,3,4,6-PentaCDF (¹³ C ₁₂ ,99%) 50 ± 2.5 µg/mL in nonane	1.2 mL	\$1,950
EF-5052	1,2,3,4,6,9-HexaCDF (¹³ C ₁₂ ,99%) 50 ± 2.5 µg/mL in nonane	1.2 mL	\$2,250
EF-5054	1,2,3,4,6,8,9-HeptaCDF (¹³ C ₁₂ ,99%) 50 ± 2.5 µg/mL in nonane	1.2 mL	\$2,250

Non-2,3,7,8-containing dioxin and furan mixtures:

Catalog #	Description*	Amount	\$ Price
EDF-5040	Non-2,3,7,8-Containing PCDF Cal. Solutions CS1-CS5 (unlabeled/ ¹³ C ₁₂ ,99%)	5 x 0.2 mL	\$2,750
EDF-5041	Non-2,3,7,8-Containing PCDF Clean-Up Standard (¹³ C ₁₂ ,99%)	1.2 mL	\$7,200
EDF-5043	Non-2,3,7,8-Containing PCDF Sampling Standard (¹³ C ₁₂ ,99%)	1.2 mL	\$1,950
EF-5042	Non-2,3,7,8-Containing PCDF Syringe Standard (¹³ C ₁₂ ,99%)	1.2 mL	\$1,250

**Please contact CIL for complete descriptions of the above mixtures including congeners and concentrations.*

Other new products from CIL



CIL is constantly introducing new products and expanding our existing product lines in response to customer requests and in anticipation of new areas of interest.

The following listing represents new items which were recently produced by CIL or are currently in production. Please inquire about other new items of interest, as we are constantly adding to our existing product line.

Catalog #	Description*	Amount	\$ Price
CLM-6680-1.2	Octachlorostyrene (¹³ C ₈ ,99%) 100 µg/mL in isooctane	1.2 mL	\$295
EO-5156	2,2',3,4,4',5,5',6-OctaBDE (BDE-203) (unlabeled) 50 µg/mL in nonane	1.2 mL	\$250
EO-5161	2,2',4,4',5,6'-HexaBDE (BDE-154) (¹³ C ₁₂ ,99%) 50 µg/mL in nonane	1.2 mL	Request Price
ECN-5102	Tetra-Octa Polychlorinated Naphthalene Mix (¹³ C ₁₀ ,99%) 1 µg/mL in isooctane	1.2 mL	\$875
ECN-5178	Tetra-Octa Polychlorinated Naphthalene Mix (unlabeled) 1 µg/mL in isooctane	1.2 mL	\$325
DLM-4633-1.2	3-Chloro-1,2-propanediol (propane-D ₅ ,98%) 1 mg/mL in methanol	1.2 mL	\$175
DLM-2080-1.2	1,2,3-Trichloropropane (D ₃ ,98%) 1 mg/mL in methanol	1.2 mL	\$175
ULM-6891-0.01	Cyclopenta[<i>c,d</i>]pyrene (unlabeled)	0.01 g	\$495

**Please contact CIL for complete descriptions of the above mixtures including congeners and concentrations.*

Call for



Participants

Call for laboratories to participate in the Cambridge Isotope Laboratories/Cerilliant Corporation 2003 International Interlaboratory Study on Sediment, Soil, and Fish Tissue Standards

CIL and Cerilliant are preparing to formulate new Performance Evaluation Standards. All laboratories are invited to participate in an International Interlaboratory study on new clean soil and contaminated sediment Performance Evaluation standards. We are also expanding the analyte list and obtaining new consensus values for our existing fish Performance Evaluation standards (EDF-2524, EDF-2525, and EDF-2526). Please contact Jay Grazio at 978-749-8000, extension 284, or at jayg@isotope.com if you are interested in participating in this Interlaboratory study.

What's New on the CIL Web Site

There is always something new and exciting happening at CIL. Whether we have developed a new product, created a new piece of product literature or introduced a special product promotion, you can find out the latest happenings at CIL by visiting our Web site. At www.isotope.com, our "New Products" link will take you to a list of our newest product offerings with just one click. You can also browse our Special Promotions page to find out which products are available at a discounted price. And, if you want to find out where CIL will be exhibiting in the near future, you can check our News and Events page 24 hours a day.

Visit www.isotope.com today and you'll find:

- New [Brominated Flame Retardant brochure](#) that lists all BFR standards currently available from CIL.
- New [Environmental Contaminant Standards](#) catalog in .PDF format is now available for download.



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One of our international distributors will be happy to assist you. Please visit the CIL Web site to find your local CIL distributor:

<http://www.isotope.com/cil/about/dist.cfm>

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