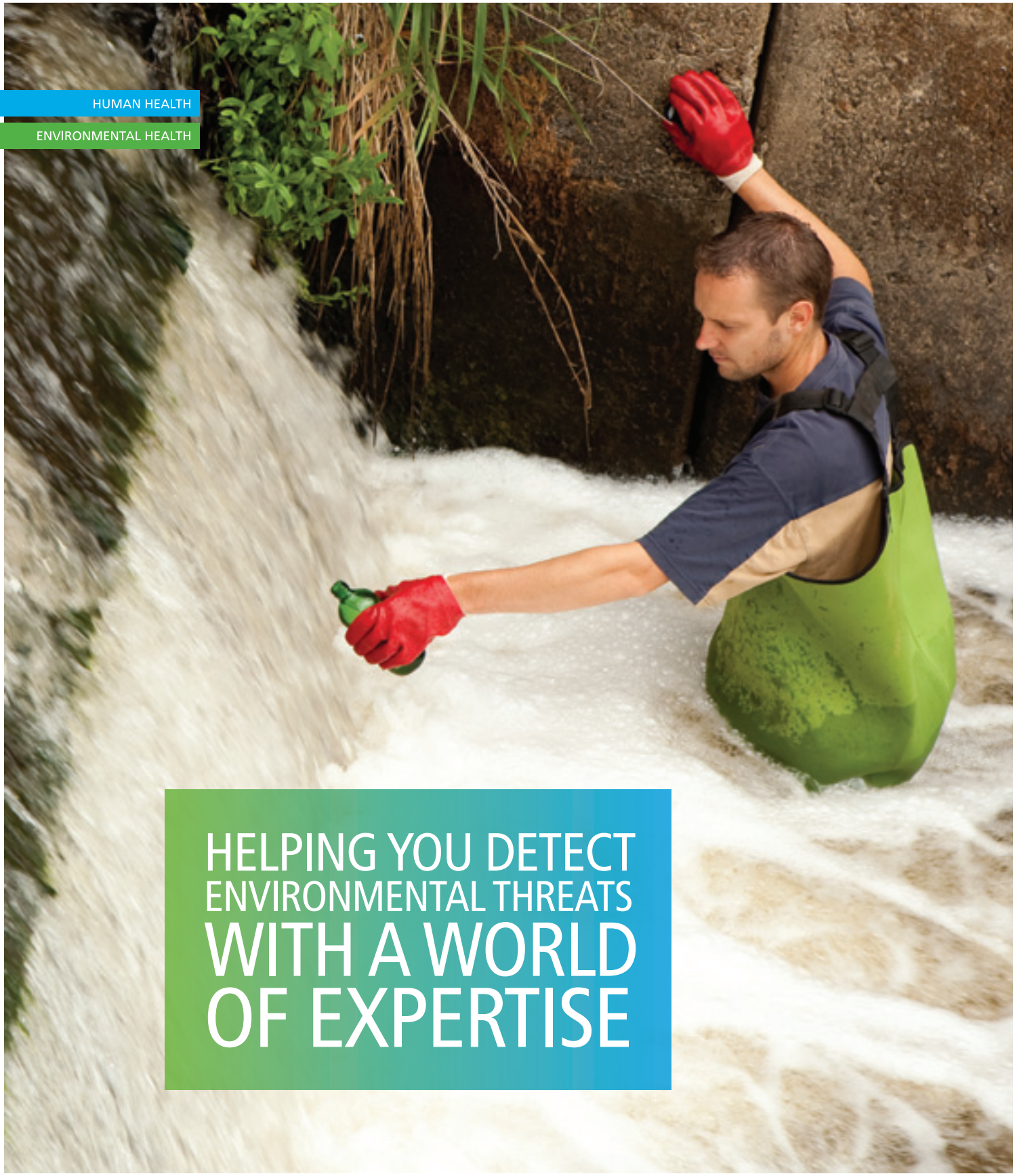
HUMAN HEALTH

ENVIRONMENTAL HEALTH



# HELPING YOU DETECT ENVIRONMENTAL THREATS WITH A WORLD OF EXPERTISE

Environmental Solutions

PerkinElmer®
*For the Better*

**READ HOW WE'VE HELPED CUSTOMERS AROUND THE GLOBE MONITOR WATER, AIR AND SOIL.**

# GLOBAL SOLUTIONS FOR A CHANGING WORLD

When regulations keep changing and new environmental threats emerge every day, one company offers the tools and expertise you need to respond quickly and effectively: PerkinElmer.

All around the world, we make it easier to determine organic and radioactive contaminants, trace and toxic metals, chemicals and other impurities. And our global team of experts has the critical knowledge you require to keep up with new and updated regulations.

In fact we have been helping the U.S. EPA with testing thousands of compounds and chemicals each year since 2007 with their ToxCast screening program, initiated to speed up the identification of potentially toxic compounds and the impact of chemical exposure on the human body. Our technology and expertise is helping enable faster identification of harmful chemicals at a lower cost and with higher accuracy.

So at a time of growing threat, crisis and constantly changing compliance standards, PerkinElmer is the partner you can count on to help you ensure a safer, healthier environment.

# CLEANER WATER

PerkinElmer offers the most reliable technologies to detect very low concentrations of contaminants in drinking water. We bring you the systems with the stability to handle the diversity of water testing to help you overcome interferences of dirty matrices and detection limits required for drinking water, while still responding quickly to time-sensitive samples. No matter how diverse or difficult your matrices, we're the vital resource more labs count on.

As a leader in atomic spectroscopy for over 50 years, we collaborate with academia and work with global regulatory bodies to pioneer the best new ways to test for emerging concerns. One thing is clear: nobody does more to help you ensure the purity of water than PerkinElmer.

## KEY APPLICATIONS

- Toxic and trace metals
- Mercury
- Mineral content
- Volatile organic compounds (VOCs)
- Semi-volatiles
- Grease and oil
- Carbamates
- Speciation

## KEY TECHNOLOGIES

- Sample preparation
- Automated Liquid Handling
- AA
- GC
- GC/MS
- Headspace sampling
- Hyphenated techniques
- ICP-MS
- ICP-OES
- Infrared
- LC
- LC/MS
- LIMS
- Liquid scintillation
- Purge and trap
- UV/Vis
- Informatics

# Critical Collaboration for Leading Laboratories

Severn Trent Laboratories (STL) is a leading supplier of water and wastewater treatment solutions. In the past, it used ICP-MS technology to perform all its potable water metals analyses. But in 2008, STL wanted to improve productivity by adding an ICP-OES suite for higher concentration elements. But which system was best?

## Designing a solution

STL has a long history of success using PerkinElmer ICP-OES instruments. But it wanted to know if its new potable water metals suite could be analyzed using our Optima™ ICP-OES, one of the fastest ICP systems available today. Working in close collaboration with STL, we developed a method designed to increase analytical capacity while complying with a variety of accreditation requirements.

## High-capacity results

The new method, combined with PerkinElmer's fast Optima ICP-OES, enabled STL to analyze as many as three times more samples than other instruments in the same amount of time. Through collaboration with PerkinElmer, STL was able to increase capacity significantly while using fewer chemicals, expending less energy and producing less waste.

### Trace metals determination using NexION® 300X ICP-MS

- Meet regulations more easily and cost-effectively
- Choose from three modes of interference removal with patented Universal Cell Technology™
- Test routine, unknown or difficult samples

### VOCs detection with Clarus® SQ 8 GC/MS

- Achieve higher throughput with the fastest heat-up and cool-down rates available on the Clarus 680 GC
- Surpass existing detection capabilities with the sensitivity of the Clarifi™ detector
- Improve resolution of light volatiles with the near-ambient performance of the Clarus 680 GC oven

See our full suite of solutions
at www.perkinelmer.com/envirosolutions

NexION 300X ICP-MS

# FRESHER AIR

PerkinElmer has helped people everywhere breathe a little easier. Do you want to measure ozone precursors with greater confidence? Identify a wider array of unknown air toxins? Or test in emerging areas such as soil vapor intrusion? With the world's most sophisticated air monitoring methods and systems, you'll find solutions for even your most complex applications.

When it comes to challenging compliance issues, only PerkinElmer offers so much expertise. In fact, we helped develop many of the regulations and methods used by the U.S. Environmental Protection Agency (EPA) today. And in the future, we'll continue working with global regulators as new approaches are required, so you can do more to ensure the quality of air.

## KEY APPLICATIONS

- Air toxics
- Air particulate monitoring
- Ozone precursors
- Soil vapor intrusion (SVI)
- Industrial hygiene
- Benzene
- Incident monitoring

## KEY TECHNOLOGIES

- Sample preparation
- ATD-GC
- Gamma counters
- GC
- GC/MS
- ICP-MS
- ICP-OES
- Liquid scintillation
- Soil vapor intrusion (SVI) tubes
- Informatics

# The World's Most Reliable Testing Methodology

The Texas Commission on Environmental Quality (TCEQ) is the lead environmental agency for the state. When challenged by the U.S. EPA to show improvements in ozone levels, TCEQ needed a robust and reliable way to collect more data – and track pollutants back to the source. But who had the expertise to handle an application this complex?

## First-of-a-kind solution

PerkinElmer was working with the U.S. EPA to develop methods for testing ozone precursor hydrocarbons. We helped TCEQ set up the first Photochemical Assessment Monitoring Stations (PAMS), which collect data hourly from numerous sites. These stations used our TurboMatrix™ Thermal Desorption and Clarus GC systems, which can perform unmanned dual-column analysis all day, every day, even under adverse conditions.

## Time-tested results

For over 10 years, this PerkinElmer application has delivered data reliable enough to be posted directly on the TCEQ website. Now TCEQ has an effective tool to identify increases in air contamination, track pollutants back to the source and help industries do a better job of complying with regulations.

### Air toxics analysis using Clarus SQ 8 GC/MS with TurboMatrix Automated Thermal Desorber

- Analyze trace levels with the high-sensitivity Clarifi™ detector
- Reduce maintenance time with our unique SMARTsource™
- Run more samples with the fastest GC oven

### Ozone precursor analysis using Clarus 580 GC with TurboMatrix Thermal Desorber

- Perform both specialized and routine air analyses for volatiles and semi-volatiles
- Increase confidence with robust, proven technology

See our full suite of solutions
at www.perkinelmer.com/envirosolutions

Clarus SQ 8 GC/MS and TurboMatrix Automated Thermal Desorber

# SAFER SOIL

Today, the world is facing rising levels of contamination. PerkinElmer's instruments are designed to help you detect even the smallest concentrations of toxic metals in soil, solids and hazardous wastes. We also offer unrivaled expertise in collecting, preparing and analyzing samples. And nobody knows more about radiometric detection than we do.

Are you challenged by interferences? A complex contamination site or farmland pesticides? Or emerging concerns such as hydrofracking? In every state, region and country, we offer solutions for your specific areas of focus. It's a dirty world, and only PerkinElmer has what it takes to clean it up.

**KEY APPLICATIONS**

- Toxic and trace metals
- Hexavalent chromium
- Mercury
- Pesticides and PCBs
- DROs and GROs
- VOCs
- Semi-volatile compounds
- Grease and oils
- Carbamates
- Radiation detection

**KEY TECHNOLOGIES**

- Sample preparation
- Automated liquid handling
- AA
- GC
- GC/MS
- Hyphenated techniques
- ICP-MS
- ICP-OES
- Infrared
- LC
- LC/MS
- Liquid scintillation
- Thermal analysis
- UV/Vis
- Informatics

# Making a Critical Difference in Japan

After the devastating earthquake and tsunami, Japan is facing a number of environmental threats. These include radiation leaked from the Fukushima Daiichi nuclear power plant, air toxins, and trace and toxic metal contamination in food, water and soil.

## A timely solution

PerkinElmer's systems and support teams are helping to develop new testing methods to detect contamination in rice and beef very quickly. Both Fukushima and Tokyo Universities use our instrumentation, which can handle a higher number of samples per fixed time duration than other instruments.

## Fast results

While tremendous challenges still lie ahead, we deliver reliable results sooner so scientists make better decisions faster. Our vital field infrastructure, invaluable insights and superior detection capabilities are helping keep the people of Japan and their environment safer.

### Toxic metal analysis for soil remediation testing using Optima 8300 ICP-OES

- Enhance productivity with true simultaneous analysis through patented dual viewing
- Reduce argon consumption by 50% with patented Flat Plate™ plasma technology
- Meet regulations more easily and cost-effectively

### Radiation monitoring using Tri-Carb® Liquid Scintillation Analyzers

- Detect even the smallest amounts of alpha, beta and gamma radioactivity
- Perform demanding applications with greater ease

See our full suite of solutions
at www.perkinelmer.com/envirosolutions

Tri-Carb Liquid
Scintillation Analyzer

Optima 8300 ICP-OES

## What are you trying to accomplish, and what are your challenges? With the widest selection of proven technology and most knowledgeable consultants to guide you, we're the company that's with you from start to finish.

### SAMPLE PREPARATION

At PerkinElmer, we know how important it is to start your measurement correctly. We offer a full line of sample preparation tools to simplify your process and reduce errors. From solid phase extraction columns to sample preparation block systems, we can make this critical, time-consuming step in your analytical procedure easier.

### AUTOMATED LIQUID HANDLING

With the support of a JANUS® Automated Workstation you can deploy your sample testing strategies as a semi-automated or fully automated system. With integrated detection instruments, you gain greater flexibility for fluorescence-, luminescence-, and absorbance-based analysis of environmental samples.

### ATOMIC SPECTROSCOPY

The accurate measurement of toxic and trace metal contamination is essential for maintaining the quality of air, water and soil. As the recognized world leader in inorganic environmental solutions, we offer a full suite of proven systems, including PinAAcle™ AA, Optima ICP-OES and NexION ICP-MS spectrometers.

### GAS CHROMATOGRAPHY

When it comes to flexibility, ease of use and sensitivity, one family of GC and GC/MS systems stands apart: Clarus. Whether you're looking for the highest sensitivity or widest mass range possible, only PerkinElmer delivers the performance you need, day after day. And Clarus is compatible with virtually all sample introduction systems, including our world-class TurboMatrix Headspace and Thermal Desorption.

### LIQUID CHROMATOGRAPHY

PerkinElmer's LC and LC/MS systems offer many advantages: speed, sensitivity, wide dynamic range and the ability to perform speciation analysis of trace metals. From the Flexar™ HPLC and SQ 300 MS to the AxION™ 2 TOF MS, our solutions deliver superior results across a broad range of samples.

### LIQUID SCINTILLATION

PerkinElmer is committed to bringing you the liquid scintillation solutions you depend on. As the world's only provider of Tri-Carb, QUANTULUS® and 307 Sample Oxidizer analyzers, we offer a full range of solutions and applications expertise.

### MOLECULAR SPECTROSCOPY

We brought you the first commercial IR system. Every day, our innovations in Infrared, UV/Vis and Raman spectroscopy help you learn more about the performance and structure of materials at the molecular level. When you have challenges in material characterization, we have answers.

### THERMAL ANALYSIS

PerkinElmer's high-performance thermal analysis instruments and unmatched expertise will help you push the edge of science. That means greater access to insights, a far more effective work experience and the answers you need today and tomorrow. With differential scanning calorimeters, thermogravimetric analyzers and mechanical analyzers, the future of thermal analysis has never been so full of opportunities.

### CONSUMABLES, ACCESSORIES AND SUPPLIES

Whether you're using atomic spectroscopy, chromatography or any other technology, we offer consumables to answer all your analytical needs and keep your instruments running smoothly.

### INFORMATICS

Our Ensemble® portfolio provides a range of informatics solutions for all aspects of environmental testing, including data collection from testing instruments and analyzers, an electronic laboratory notebook for controlling and documenting test procedures and LABWORKS™.

# PerkinElmer Technology: Proven for a Range of Applications

Environmental monitoring requires smarter technology and more specialized capabilities than ever before. Designed around your applications needs, PerkinElmer solutions meet your most specific measurement goals.

| Choose the right solution for your application | APPLICATIONS | | | | |
|---|---|---|---|---|---|
| | Metals | Pesticides and Residues | Volatiles and Semi-volatiles | Hydrocarbons | Radiation |
| Sample Preparation | ■ | ■ | ■ | ■ | |
| Automated Liquid Handling | ■ | ■ | ■ | ■ | ■ |
| Atomic Absorption (AA) | ■ | | | | |
| Gas Chromatography (GC) | | ■ | ■ | ■ | |
| Gas Chromatography/ Mass Spectrometry (GC/MS) | | ■ | ■ | ■ | |
| Inductively Coupled Plasma-Mass Spectrometry (ICP-MS) | ■ | | | | ■ |
| Inductively Coupled Plasma-Optical Emission Spectroscopy (ICP-OES) | ■ | | | | |
| Infrared (IR) | | | ■ | ■ | |
| Liquid Chromatography (LC) | | | ■ PAH | | |
| Liquid Chromatography/ Inductively Coupled Plasma-Mass Spectrometry (LC/ICP-MS) | Speciation | ■ | | | |
| Liquid Chromatography/ Mass Spectrometry (LC/MS) | | ■ | | | |
| Liquid Scintillation | | | | | ■ |
| Thermal Analysis | | ■ | ■ | ■ | |
| Ultraviolet (UV/Vis) | ■ | | ■ | | |
| Informatics | ■ | ■ | ■ | ■ | ■ |

**WANT TO SEE MORE OF OUR SOLUTIONS? HAVE A HIGHLY SPECIFIC APPLICATION? EXPLORE OUR FULL OFFERING AT WWW.PERKINELMER.COM/ENVIROSOLUTIONS.**

# The Perfect Partnership from Start to Finish

With PerkinElmer's OneSource® Laboratory Services, you have the world's largest and most respected global service and support network at your disposal. We go beyond just maintenance and repair of instrumentation. We incorporate laboratory asset management as part of our customer's business equation – a partner with proven results in improving efficiencies, optimizing operations and providing cost certainty across the globe.

**OneSource is the ONE You Can Count On.**

- Multivendor Repair and Maintenance
- Asset Lifecycle Management
- Laboratory IT Services
- Business Intelligence Reporting
- Laboratory Relocation
- Qualification, Validation, and Calibration
- Asset Informatics
- Education and Training

… and more

## Safer. Cleaner. Healthier.

At PerkinElmer, we share your commitment to environmental safety. Our broad portfolio of solutions enables you to monitor air, water and soil more effectively, meet changing regulations, and keep your lab running smoothly.

See our full suite of solutions at www.perkinelmer.com/envirosolutions

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