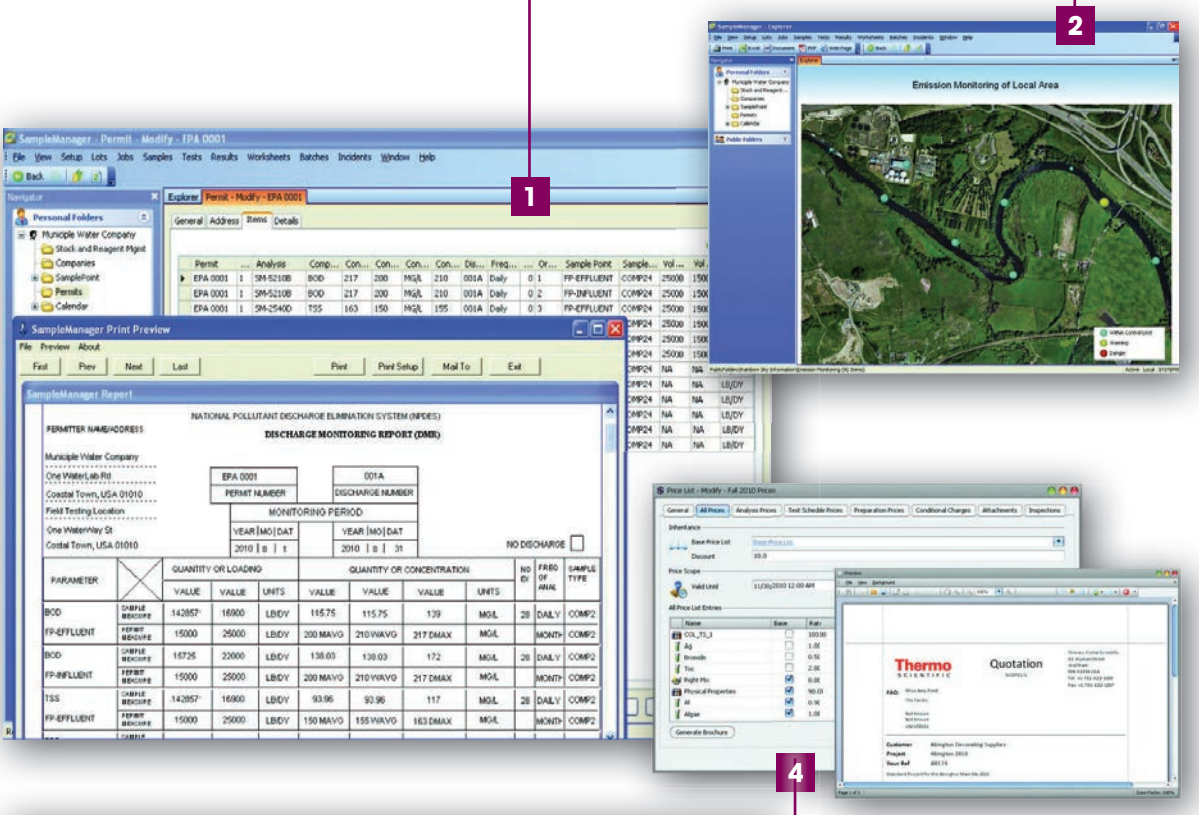

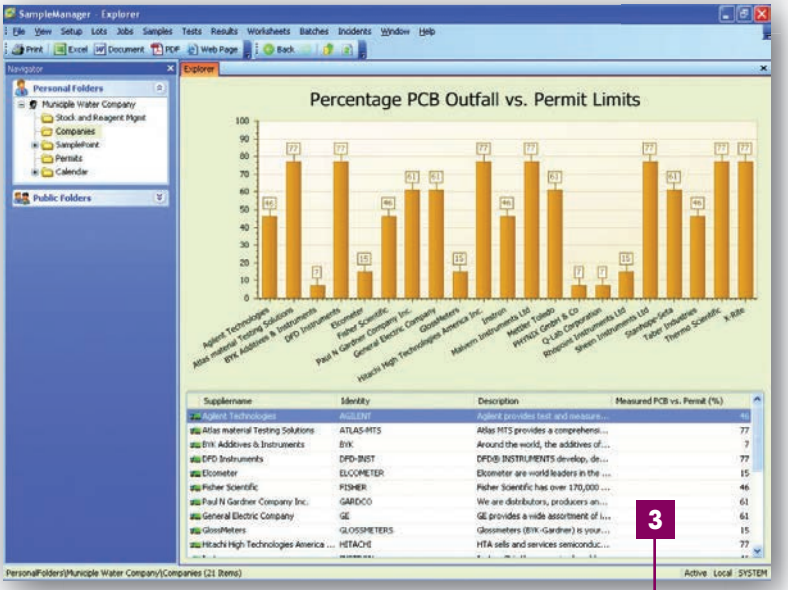

PHOTOS COURTESY OF THERMO FISHER SCIENTIFIC

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1) Pre-defined report templates allow customers to automatically generate regulatory required reports in a short time.

2) Data Visualization allows users outside the laboratory to monitor field collection sites quickly and easily within the laboratory information management system.

3) Dashboards provide graphical representations of information to allow laboratory management and analysts to visualize critical information in various forms.

4) Pricing, quoting and invoicing can be managed from within SampleManager LIMS, reducing the need for other software applications and reducing implementation and integration costs.

Testing Made Simpler

A laboratory informatics solution from Thermo Fisher Scientific aims to help water system labs reduce tedious labor, prevent errors, and simplify compliance

BY TED J. RULSEH

Laboratory information management systems (LIMS) have been around for about 25 years, and many water systems use them. The challenge often is to configure the LIMS for the specific needs of a drinking water operation.

Now Thermo Fisher Scientific offers a LIMS preconfigured to help users comply with water and environmental regulatory guidelines and requirements. It is built on the functionality provided by the company's widely used SampleManager LIMS.

The Water and Environmental LIMS is designed to help laboratory professionals make fast and informed decisions, deliver information needed to manage laboratory processes, and respond to the latest regulatory and business demands.

It helps labs establish protocols and documentation methods that meet NELAC compliance requirements and ISO 17025 guidelines, automate reports and records to ensure full traceability, and improve lab and workflow efficiency. Colin Thurston, the company's chief strategist for process industries, talked about the system in an interview with *Water System Operator.*

WSO: What specific need was your company aiming to fill with this LIMS?

Thurston: One challenge for labs in water and environmental testing is the breadth of analyses required by regulatory authorities and the amount of data the instrumentation is producing. In the past, labs have tried to make do with spreadsheets or paper notebooks. But today, being able to

prepare the kind of reporting required by organizations like the EPA means you need to have your data in a structured format.

Also, labs found their scientists and technicians were spending more time doing paperwork and transcribing data than doing the scientific operations they were actually being paid for. Our LIMS is configured to allow labs to be much more efficient by taking data directly from instrumentation and comparing it with the regulatory limits for various contaminants.

And once the data is actually in the LIMS, it provides a set of predefined templates for reporting. In essence, it allows labs to automate as far as possible the kinds of processes that don't really need human intervention, and so allow the operators to get on with the job of testing and processing samples.

> **"We looked at the specific needs of a water testing lab and configured those requirements into the system, so that instead of having a long and involved configuration process, users receive a major template straight out of the box."**
> COLIN THURSTON

WSO: What makes this offering different from other LIMS?

Thurston: Typically, LIMS have been general-purpose systems designed to meet the needs of multiple types of labs. We looked at the specific needs of a water testing lab and configured those requirements into the system, so that instead of having a long and involved configuration process, users receive a major template straight out of the box.

So for example, if you're undergoing NELAC compliance audits, you can meet the requirements much more easily because we've configured the system with the kinds of features you need to be up and running, and do it faster than you could with a generic LIMS.

WSO: How does this system communicate with the instrumentation? Is there a direct link, or do people have to enter the test results manually?

Thurston: We have a piece of software we call Integration Manager that allows users to connect instrumentation systems, read the data they output, and send that directly to the LIMS, so there is no need for human intervention. When you ask a person to transcribe results from one place to another, you end up with error rates of one in about 30 or 35 transcriptions. We can take results directly from instruments that have an RS232 output or that can output data onto a disk.

> **"We have done ROI studies that show typical payback for this type of system is on the order of 18 months."**
> COLIN THURSTON

WSO: What are a few examples of functionality created specifically to accommodate this sector?

Thurston: In the water sector, many samples are outsourced to contract testing labs. We put in functionality around contact management for samples and turnaround time measurements.

Also, a lot of work in this sector involves constructing sequences of multiple samples and then testing them in bulk. We put in facilities to help users construct the sequences they're going to run on the samples and identify which sample has to go in which order into the instrument. We've also included barcode labeling to identify individual samples and the aliquots of samples.

On the other end of things, we put together a library of typical reports that a water lab would need to provide, either to a local authority or the EPA.

WSO: How specifically might this LIMS make life easier for a scientist or technician in a typical water lab?

Thurston: First and foremost is workload planning. The system has a scheduler that helps users construct a time-based schedule for collecting and testing samples. It's important for a manager to know where the peaks and troughs are in terms of when the samples will arrive in the lab and what they need to be tested for.

Our system manages all workload assignments and throughput for the lab and identifies for the lab manager where samples are breaching the time limits for testing. There's also functionality around compliance management. For example, NELAC standards require all operators to be trained on the analytical methods and instruments they're using. In our system we can track the training records and training requirements of the techs, so the lab manager can't assign a test to a user who isn't trained to do that test. In terms of ensuring compliance, this offers a huge benefit to the lab or QA manager.

WSO: Are there any built-in checks on the lab equipment itself?

Thurston: The system manages calibration and maintenance records for each instrument and each component of instruments in the lab. Even a simple tool like a pH meter actually consists of the meter itself and the probe. A user might want to trace those items independently – to know, for example, when the probe was last regenerated. Our system can trace all the instrument maintenance and calibration and prevent work from being assigned to an instrument that has not been calibrated or needs maintenance.

WSO: How specifically might this system help users save time?

Thurston: It saves time by automating manual processes. A good example is in sample receipt. If the samples are pre-logged in based on a schedule and the system already knows about them, sample receipt is simply a matter of barcoding in the samples, which probably takes two or three seconds per sample. Then you have to schedule what needs to happen to that sample. In a manual process, it might take up to five minutes per sample to do all that.

WSO: Is this system scalable to any size lab, or is there a size below which it is not economically feasible?

Thurston: We base our licensing model on the number of concurrent users, so there is not a massive amount of investment for a small lab to make. Because we also understand that it can be difficult for small labs to make large capital purchases, we offer LIMS On Demand — basically a subscription, so users can buy LIMS time on a month-by-month basis. This is often a good financial model for a small laboratory.

WSO: How would you quantify the benefits of this system in terms of savings on configuration?

Thurston: Our pilot testing shows that there is always an element of configuration for site-specific things because every lab works differently. But we estimate that we are delivering a savings of about 60 percent of the configuration that would typically be required with a more generic LIMS. We also offer training support, a support help desk and online training courses, so we can assist with configuration as little or as much as a user wants.

WSO: What about labor savings?

Thurston: One challenge in the water industry is that scientists are being asked to do more, but are not necessarily being given the resources to employ more staff. We allow them to expand the range of testing and the number of contaminants they test for without significantly increasing their headcount. And they may be able to bring some testing back in-house that they had been outsourcing. We have done ROI studies that show typical payback for this type of system is on the order of 18 months. WSO

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