



Customer Story

Shanghai EPA Enhances Environmental Monitoring Capability to Build a World- Class Testing & Monitoring Platform for China

Shanghai, the largest city in China, is the leader in Chinese economy, science and technology, industry, finance and trade. Currently, the Shanghai government is faced with the burden of increasing productivity while still protecting and improving the health of the environment. To improve environmental quality, there are still many challenges in Shanghai, such as population expansion, industry decentralization, and pollution discharge of existing and new emerging pollutants.

The Shanghai EPA is a government agency, with the primary role of monitoring and protecting the Shanghai environment. The agency also provides great support and leadership to EPA agencies in other provinces through their first-class environmental monitoring capabilities with advanced instruments and experienced engineers. The agency mainly includes three departments: Shanghai Environmental Monitoring Center (SEMC), Shanghai Academy of Environmental Science (SAES), and 17 district/county level environmental monitoring stations. SEMC is a province level environmental monitoring station in China. Their main responsibilities are developing and performing:

- Environmental monitoring plans
- Pollutant source monitoring
- Environmental monitoring technology R&D
- Developing or updating environmental standard and technological practices
- Guiding and coordinating Shanghai environmental monitoring business for all the district/county level environmental monitoring stations

The responsibilities of SAES are the R&D work of environmental projects needed to support environmental management, performing environmental assessment and standard validation and service for environmental engineering design for correlated industries. The district and county level environmental monitoring stations are mainly responsible for monitoring local environmental quality and monitoring for pollutants.

Challenge

Currently, the Shanghai EPA requires strict routine monitoring of pollutants from surface water, ground water, waste water, sea water, air, soil, solid waste and other environmental samples according to the requirements of China GB/industry standards and Shanghai regional practices. There are hundreds of environmental samples with different matrices to be tested every day, and most of them include multiple elements, which are difficult and impact efficiency. In addition, some elements with sub-ppb to ppt concentration level cannot be detected by traditional AAS or ICP-OES and the district /county level test technicians, require an easy to operate instrument so they can be assured reliable results.

Solution

Over the last seven years, the Shanghai EPA has consulted with PerkinElmer to select the most suitable and advanced analytical instruments to enhance their environmental monitoring capabilities and to meet their monitoring requirements. To help them meet these increasing requirements, they have selected new PerkinElmer systems such as nine AA systems, six ICP-OES systems, three ICP-MS systems, two GC systems and other instruments from PerkinElmer.

As an example, SEMC purchased a PerkinElmer AAnalyst™ 700 in 2006 to routinely test heavy metals according to China GB standards. Throughout the following 3 years, the instrument was very reliable and had no malfunctions. SEMC was also very satisfied with the immediate application and maintenance service from their local PerkinElmer Shanghai team. So, when the SEMC's test workload increased they decided to purchase both the Optima™ 7300DV ICP-OES and the NexION™ 300X ICP-MS in 2010 to replace their older models.

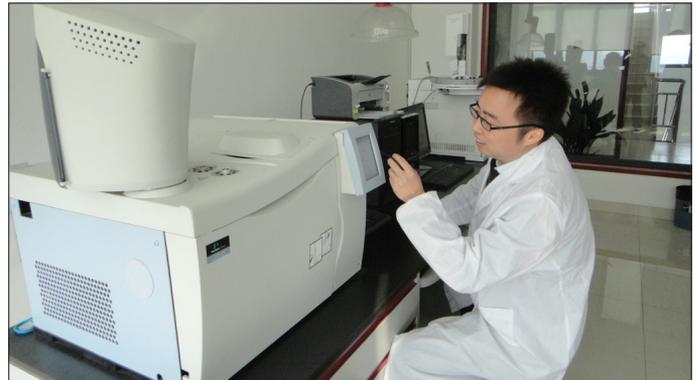


Figure 1. A Shanghai Songjiang District EPA engineer sets analytical methods to measure organic phosphorus/nitrogenous pollutants in water samples.

Outcome

The director of the SEMC heavy metal testing lab said, "The Optima 7300DV ICP-OES with dual viewing function has improved sample throughput by 30~40% compared to our older model of ICP-OES. We have also been able to transfer some of our tests conducted on the AAS which increased our efficiency by 50 – 100%. The NexION 300 ICP-MS can measure heavy metals with a sub-ppb to ppt concentration level to widely extend our environmental monitoring range, especially if it is used very frequently to measure some ultra-low concentration level elements, e.g. Tl, Pb, Se etc. in surface water and underground water samples. The AAnalyst 700 can also help routinely monitor environmental samples to meet the requirements of GB standards. Now, we have the full capability to test heavy metals required in existing standards and can, even meet new future regulatory requirements."

The Shanghai EPA is also using the PerkinElmer ICP-MS to investigate the first GB standards for measuring heavy metals in air particulates. During the development of this new regulation, PerkinElmer application engineers worked with the SEMC engineers to develop and optimize the analytical method to help the project run more smoothly. The draft of the GB standards is finished and will be submitted to the National EPA for comments and publication. The Shanghai EPA is also seeing great efficiencies using the PerkinElmer Clarus™ GC, HS and ATD, for organic pollutant testing mainly in the Shanghai district/county level environmental stations.

As the Shanghai Songjiang district EPA organic lab manager said, "I have used quite a few GC instruments from other manufacturers, but I'm deeply impressed by the PerkinElmer Clarus GC and service I have received. The instrument is designed very precisely, the touch screen installed makes the instrument easy to operate, and the column oven temperature can be declined very sharply, which can improve our sample throughput and even improve the separation ability when analyzing low carbon VOCs. Also, PerkinElmer service is always quick to respond by telephone or on-site."

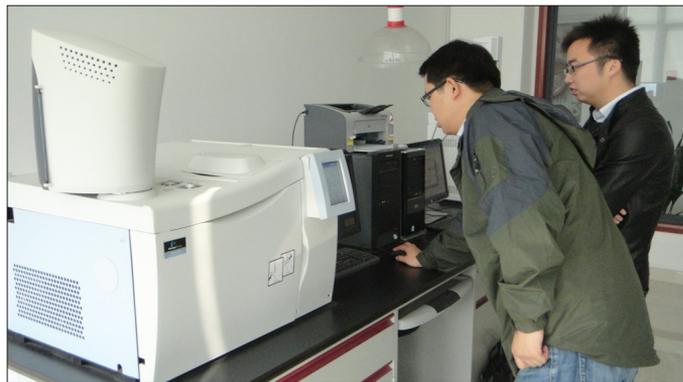


Figure 2. A PerkinElmer application engineer is demonstrating the operation of the Clarus GC for a Shongjiang District EPA engineer.

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