

What “Going Green” means to this US Environmental Testing Laboratory!



ESC Lab Sciences is one of the largest environmental labs in the US. It is located in Mt. Juliet, TN just a short ride from the Nashville airport. The staff owners are committed to environmental stewardship. Instead of just talking about saving the planet they have created a Green Choice Initiative that has resulted in a win-win for the employees and the environment.

Like most US environmental contract laboratories, ESC Lab Sciences is focused on testing water, wastewater, soils, and air for target contaminants based on established US EPA methods. They purchase from Agilent; gas chromatographs, liquid chromatographs, gas chromatography/mass spectrometers, and Open Lab informatics systems. They receive sample containers from across the US on a daily basis and generally perform the analysis and report results in less than 5 days. Their volatiles’ analysis lab contains over 30 Agilent GC/MSD systems performing EPA Methods 524, 624 and 8260.



But the management and staff decided to look at the various processes in their company and to make a commitment to reduction, reuse, and recycling.

Let's look at how this commitment is reflected in three areas: laboratory analysis, building operations, and employees.

This lab was typical in the fact that they utilize large amounts of solvents (especially methylene chloride) for sample extractions and prep before analysis. Most labs make a minimal effort at collecting waste solvent then pay a waste hauler to take away the waste solvent containers.

But ESC has re-engineered their processes to reduce the amount of solvent usage and they use an innovative technique for solvent recovery. They worked with the EPA and state regulatory agencies to validate new sample prep methods for semi-volatile organic compounds (SVOC). In one method they reduced sample volumes from 1000 ml to 40 ml which resulted in a 98% reduction in methylene chloride. They revamped an old technique (EPA Method 3510C) to a new micro version that reduces sample volumes and solvent by 90%. They have also replaced some traditional liquid/liquid extraction methods with solid phase extraction (SPE) which results in further solvent savings.



They won a national award from the Environmental Business Journal for trapping solvent emissions and reclaiming 85% of evaporated solvent released during the sample extract concentration process. They reduce solvent emission, reduce staff solvent exposure and they make money by selling the reclaimed solvent.

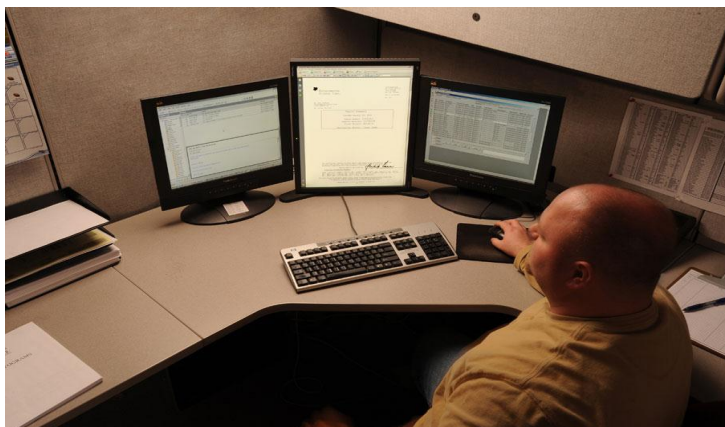
Along with the micro extractions this laboratory utilizes Agilent Multi-mode Inlets (MMI) on many of their GC/MS systems in order to meet regulatory

detection limit. These inlets allow much larger injection volumes than the normal split/splitless inlets.

They also save time and money by decreasing GC/MS run times and increasing sample throughput by enabling faster oven heating cycles to accomplish “fast GC”.



The lab has introduced “paperless reporting”. Data reviewers are given multiple screens to make it easier to check data and review reports. Data analysis for GC and GC/MS methods is facilitated with Agilent EnviroQuant SW. Agilent Open Lab software is integrated with the LIMS system.



To conserve energy and water, management has made the following changes to company operations:

- Programmable thermostats
- Motion activated lights/fans/sinks

- **Waterless urinals**
- **Converting fluorescent light fixtures from T-8 to T-5 and transitioning to LED**
- **Purchasing carpets and insulation that are made from recycled materials**
- **Installed rain gardens to capture and redirect storm water run-off.**

The lab realized that they were paying to have a large volume of glass water containers removed as waste. They contacted a company which now pays ESC for the glass bottles. This manufacturer then produces home décor and drinkware from the bottles.



Some of the most innovative practices involve the employees. All the employees are encouraged to help improve lab processes to reduce waste. The staff is incentivized to drive fuel efficient vehicles. Plastics are recycled, which resulted in a total of 34,000 pounds for 2011. Household hazardous waste days are held where employees can dispose of old paint, pesticides/herbicides, solvents and other miscellaneous chemicals, aerosol cans and used motor oil from their homes. ESC has contracted with a local oil recycler who collects all the used motor oil and recycles it to an “Eco Friendly Oil” that is resold.

ESC also added an electric vehicle and charging station to its fleet and was one of the first in the nation to purchase the Nissan Leaf.



ESC Lab Sciences is leading the way among testing laboratories in the practice of green initiatives. They proudly use this “commitment to environmental stewardship” in marketing services to their customers.