

## Arkansas DEQ Implements TITAN® LIMS to Help Laboratory Achieve Long-Term Goals

Mission to increase lab productivity, reduce paper, and achieve NELAP compliance

### Organization Profile

The Arkansas Division of Environmental Quality (ADEQ) includes the Laboratory and Monitoring Services (LMS) section. LMS is comprised of an Air Chemistry Laboratory, Environmental Multimedia Laboratory and a Laboratory Accreditation Program. Each year, LMS analyzes thousands of air/soil/water samples to ensure the safety of its citizens, visitors and the environment in Arkansas.

LMS maintains a state-of-the-art environmental laboratory in North Little Rock, AR that serves both the Air Chemistry and Environmental Multimedia Laboratories. The Air Chemistry staff includes three chemists and a laboratory supervisor. Air Chemistry monitors the existence of pollutants including lead, ozone, carbon monoxide, sulfur dioxide and Particulate Matter around the state to ensure air quality is within guidelines set by the U.S. Environmental Protection Agency (EPA).

The Environmental Multimedia Laboratory employs a staff of four chemists and a laboratory supervisor. The laboratory is responsible for analyzing water samples collected each month from over 200 sites around the state, for the purpose of monitoring water quality standards that affect the environment. This data also is reported to the EPA. In addition, the laboratory analyzes samples from wastewater treatment plants to ensure they are meeting federal and state permit levels. Samples are also analyzed from ground water for aquifer protection and soil samples are also analyzed for the existence of hazardous materials in cleanup sites.

### Their Challenge

ADEQ implemented a commercial LIMS in 2002 and then migrated to another LIMS in 2010 to manage the large amount of data generated throughout their laboratory operations. Over time, the laboratory staff determined that there were capabilities missing in the LIMS. These included the following:

- The LIMS was not able to track the results of standard quality control (QC) metrics needed to generate QC reports and control charts.
- The process of changing control limits was difficult.
- The review and approval process was very cumbersome and did not provide for a three phase review/approve/validation process.

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[www.adeq.state.ar.us](http://www.adeq.state.ar.us)

“*ATL TITAN® LIMS has opened up many areas of tracking, auditing and reporting for the laboratory. Performance metrics are produced easily and efficiently, and electronic files keep everything related to a sample in one place.*”

Lessie Redican, Senior Manager,  
Laboratory and Monitoring Services



- Instruments were not interfaced with the LIMS so getting result data to the LIMS was manual, time consuming, and prone to transcription errors.
- The LIMS was not very flexible when the lab needed to generate a report. In many cases a report ended up being over 100 pages and it was difficult to create reports in a manageable format. The labs required more robust QA/QC capabilities in the LIMS that was easy to use. They ended up exporting data to Excel and creating graphs and control charts.
- When new users were introduced to the LIMS, there was a longer than desired learning curve – the LIMS was not very user friendly. In addition, the users needed to leverage other tools for data that normally would be found in a LIMS.
- Because one of the long-term goals was to become a NELAP compliant laboratory, the need for comprehensive traceability was really something ADEQ wanted from their LIMS. Unfortunately, the ability of the LIMS to provide audit-ready traceability of samples from login to disposal was lacking and the lab knew it would be an obstacle to NELAP compliance.
- There were times when a chemist wanted to access a SOP (Standard Operating Procedure) document while working in the LIMS. Unfortunately, the LIMS was not designed to store and easily access external documents like SOPs.

Because the LIMS was not viewed as user-friendly, the lab had only one LIMS user who really knew the LIMS well. The other users would go to that one user and, as a result, overall productivity was impacted. ADEQ knew that their current LIMS was lacking certain capabilities that would keep them from achieving many of their current and future objectives.



**Arkansas DEQ Laboratory**

## Our Solution

Due to the limitations of their existing LIMS, ADEQ began evaluating alternative LIMS solutions. In addition to being able to address the list of shortcomings in their LIMS, the laboratory spent time defining a list of additional requirements that would enable them to achieve future goals including becoming a NELAP compliant laboratory. ADEQ began research on potential LIMS systems that were known to be strong solutions for the environmental market. Additional team members were brought in for a more formal evaluation process. Following guidelines required by the State of Arkansas, a comprehensive Request for Proposal (RFP) was developed and posted through their normal procurement process.

The team was very pleased when ATL TITAN was included in responses that made the final cut, as TITAN was seen as the best choice for ADEQ. The team discussed and graded the RFP responses and presentations and selected ATL TITAN LIMS. The team clearly was impressed with TITAN's ability to address the laboratory's functional LIMS requirements and would also be central to helping ADEQ achieve many of their current and future goals. They see a number of key benefits in selecting TITAN and they include:

- A major goal for ADEQ was to reduce the amount of paper being generated in the lab. Paper is costly to maintain and also means that much of the data is being captured and used with manual processes that are inefficient and prone to human error. Implementing TITAN is the first step towards realizing this goal.
- ADEQ was impressed with TITAN's interface design from an ease of use standpoint – this is very important in order to ensure that all appropriate laboratory staff can fully leverage TITAN's powerful capabilities.
- Implementing TITAN was critical to having the ability to have the lab staff adopt a standard review/approve/validate process that helps boost lab productivity, standardize on accepted lab procedures and improve data quality.
- TITAN provides ADEQ with a level of powerful traceability and auditing that gives ADEQ management the confidence that if any questions are raised about a specific test performed in the past, TITAN will be used to quickly provide a complete history of that test. Traceability in TITAN will also play a key role in helping the laboratory achieve and maintain requirements for NELAP compliance.
- Using TITAN will provide inventory tracking of the lab's chemical and reagent supplies and alert staff when inventory falls below pre-defined reorder levels and will enhance lab efficiency. Inventory reporting will also provide a level of cost control that management has never experienced before.
- Implementing TITAN also included the interfacing of ADEQ's scientific instruments (over 20 instruments including GC/MSs, ICPs, mercury analyzers, etc.) and installing bar code printer and hand scanner technology. This provides a complete lab automation solution that eliminates paper while increasing the productivity of the lab staff.

## INSTRUMENTS INTERFACED WITH TITAN® LIMS

Agilent GC/MS Model 7890A/2400 with Teledyne  
Atomx Autosampler  
Agilent ICP-OES 5100SVDV  
GE Analytical, Sievers TOC 5310 C  
GE Analytical, Sievers TOC M5310 C  
HACH Orion Conductivity Meter HQ 40d Multi  
HACH Lachat Quik Chem 8500 Series 2  
HF Scientific Turbidimeter Micro 100  
Sartorius Analytical Balance MSA 124S-100DI  
Shimadzu GC-2010 Plus AE - DRO  
Hydra AF Mercury Analyzer  
Hydra C Mercury Analyzer  
Shimadzu GC -2010 Plus AE – PCB  
Thermo Dionex IC-2100  
Thermo ICP-MS X-Series 2  
Thermo Orion VersaStar pH meter  
Varian GC/MS Model 3890/4000  
Westco Discrete Analyzer Smart Chem

GE Analytical, Sievers TOC 5310 C  
Agilent GC/MS Model 7890A/2400  
Agilent ICP-OES 5100SVDV  
Varian GC/MS Model 3890/4000  
GE Analytical, Sievers TOC M5310 C  
HACH Orion Conductivity Meter HQ 40d Multi  
HACH Lachat Quik Chem 8500 Series 2  
Shimadzu GC-2010 Plus AE - DRO  
Hydra AF Mercury Analyzer  
Hydra C Mercury Analyzer  
Shimadzu GC -2010 Plus AE – PCB  
Thermo Dionex IC-2100  
Thermo ICP-MS X-Series 2  
TSS and TDS Import  
Agilent ICP-OES 5100  
Sievers TOC  
COC Import

- ATL's Professional Services group contributed some key deliverables as part of the final TITAN LIMS solution. First, ATL developed a Chain of Custody (CofC) import that allowed field inspectors to download all the information from their CofC records seamlessly into TITAN. This was a manual procedure previously, and was a source of errors in transcription and interpretation of handwriting. The CofC is now saved with the work order and easily retrieved in TITAN.
- Second, the ATL team converted the data from previous in-house databases and the LIMS by writing stored procedures to move all of the data into TITAN, for easy accessibility, security, and easier maintenance. Having all of the environmental data (over 30 years of data) in one secure database format allowed for access by different program users within ADEQ.
- ADEQ also looked at the strength of the LIMS vendors from a training and support standpoint and they were clearly impressed with ATL's capabilities in these areas. ATL's most popular support plan includes unlimited technical support and it recently celebrated twenty years of offering LIMS Training Boot Camps. These types of options are very important to ADEQ to insure their investment in TITAN is optimized.



### **Arkansas Division of Environmental Quality (ADEQ)**

*Accelerated Technology Laboratories (ATL), headquartered in West End, NC, provides laboratory automation solutions to a variety of industries from analytical, environmental, food & beverage, water and wastewater, chemical, government, public health, clinical testing and manufacturing. ATL's LIMS products are installed in over 575 laboratories around the world and supported by a steadfast commitment to excellence in product quality, support and training. ATL is one of the few LIMS providers that is ISO 9001:2015 certified. For additional information, visit: [www.atlab.com](http://www.atlab.com).*

