

**Improving Public Communication through Environmental Data Transparency  
at Los Alamos National Laboratory – 15306**

Nita Patel\*, Karen Paige\*, J. Christopher Echohawk\*

\*Los Alamos National Laboratory

**ABSTRACT**

The Los Alamos National Laboratory (LANL) environmental data span a wide range of media, including air, soil, sediment, water, foodstuff, and biota as well as over 1000 analytes and time periods extending over 4 decades, resulting in over 14 million records to manage and analyze. At a time of budget cuts and rapid social and technological change, the public, regulatory and compliance agencies, and stakeholders demand accelerated data delivery and efficiency, information sharing, and transparency in the dissemination and handling of samples collected in and around LANL. Meeting these requirements, while constraining the associated costs can be challenging; however, LANL has achieved this by adopting a cloud-based database called the Environmental Information Management (EIM) system and its public database counterpart, IntellusNM (Intellus) ([www.intellusnm.com](http://www.intellusnm.com)). To be consistent with federal initiatives to move government computing into cloud-based services, LANL chose to partner with an existing cloud-based vendor, Locus Technologies, to implement a software-as-a-service model. As an additional cost-saving measure, local regulatory and compliance agencies collaborated with LANL to incorporate their data into EIM and Intellus database. By adopting a single platform cloud-based solution to replace 12 different pre-existing environmental data systems, LANL has streamlined environmental data processes, resulting in over \$15 million cost savings through 2015.

EIM, LANL's internal cloud database, provides a cradle-to-grave process for data handling. EIM supports LANL's entire data process from detailed sample planning, mobile data collection using iOS mobile devices, to automated bottle labeling, generation of chain of custody, analytical lab electronic data deliverable upload, auto data validation, sample tracking, and custom regulatory and compliance reports. EIM has functionality to assess data in various ways such as the ability to design new formatted reports, a free-form structured query language tool of the entire database, exceedance reports, calculation engine, charting, trends, and statistics. EIM also has interactive geographic information system layers and analyte concentration color contour mapping capabilities. Additionally, and of greater importance to LANL, EIM supports the ability for third-party landowners to review data before release to the public, thus ensuring transparency and confidence in LANL's stewardship of human health and the environment.

Intellus, the database counterpart of EIM, is the publicly available view of the entire LANL database and requires no data feeds or transformations. Intellus allows user-friendly access to LANL's environmental data as it is collected, providing the public, scientists, remediation teams, regulators, and stakeholders within hours of receipt. Full transparency in giving the public access to environmental data information provides LANL's overall solution to environmental data management for the public. By making the data easy to obtain, search, and query for interested stakeholders, the system enables confidence in LANL's stewardship of the environment. Working together identifies key topics of improvements, develop strategies and help support innovation and substantial advances within LANL's environmental data management system.

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## **INTRODUCTION**

Los Alamos National Laboratory (LANL) has a long, rich history in supporting the nation's nuclear weapons development. As part of that legacy, LANL has created operational byproducts that require a long-term monitoring and assessment to ensure the health and safety of its neighbors. LANL has been addressing the monitoring and cleanup of the site and surrounding lands for several decades and will continue doing so in the future. Like many U.S. Department of Energy (DOE) sites, LANL developed a range of custom software tools to manage, track, and report data for its own use. Often this process was not efficient, was subject to budget constraints, and was not well thought out in terms of long-term maintainability. LANL believed its needs were "unique" and developed and managed the tools to support its mission.

However, over the years, LANL has recognized that insular systems and overall lack of transparency in environmental information management led to more questions and concerns from stakeholders than were warranted. LANL realized it needed to close this communication gap to build and strengthen public trust in the LANL environmental monitoring and cleanup process. To address these issues, LANL set out on a better course to fix a range of problems with a single solution. In the process, LANL learned it was not necessarily unique, that it could economically partner with experts in environmental data management, it could use commercial systems, and it could share in near-real time all its environmental data with stakeholders. As an added bonus, stakeholders and third-party landowners could also use the same transparent system as LANL.

## **BACKGROUND**

Before a new data system was selected, LANL had 12 different pre-existing environmental data systems. A Lean Six Sigma study in 2011 identified where efficiencies and cost savings could be achieved. Based on the results of the study, LANL was able to consolidate the number of systems and establish control processes. It developed a schedule to transition the remaining systems to the new database by the end of fiscal year (FY) 2015. The reduction in the number of systems were key cost saving and efficiency metrics. Establishing an overall centralized management approach with built-in regular reviews also significantly contributed to realizing efficiencies.

As with many fractured business processes operating within separate business units, the ability to consolidate and achieve cost savings can sometimes be limited. By addressing the key structural business process elements of the overall process, LANL was able to install a far superior system, significantly reduce overall costs, and gain control over its environmental data. The delivery of data to the public was also significantly enhanced by installing a system that completely automated the delivery process. This automation provided a double benefit by both increasing the speed at which the public could access the data and eliminating the costs associated with manual data transfer.

## **CLOUD SOLUTIONS: Re-Envisioning Environmental Data Management**

Just as the Internet changed the world forever, the use of Internet-based (or cloud) solutions changed forever how LANL managed and shared its environmental data. Internal analyses documented the cost of maintaining 12 single-purpose systems and the amount of money that could be saved by replacing them with a modern, flexible, multipurpose system. However, system replacement was only one aspect of the re-envisioning of LANL environmental data system. LANL also wanted to enhance relationships with various stakeholders and gain the trust of its neighbors. To achieve this goal, LANL decided to re-envision all aspects related to environmental data management and emerge with an elegant, reusable,

efficient, and transparent process that could be shared with others.

## System Design

In 2009, LANL started to define the system requirements. Although many were technical in nature, some requirements were decidedly conceptual to facilitate the type of future LANL envisioned. Key requirements included the following.

- **Cloud-based solution provided by a commercial vendor.** LANL decided early on it no longer wanted to be in the business of design and redesign of software solutions when a solution could be purchased and maintained via contract services. Cloud-based systems could also more easily support additional users (third parties) that would facilitate data transparency.
- **Multiple sample media supported.** The system LANL sought would capture and include air, water, soil, biota, sediment, precipitation, and waste data.
- **Full automated data validation.** – Sharing of data was hugely important to LANL but more important was sharing correct data. For LANL and the stakeholders to be confident about the quality of the data, the system needed to validate the data quickly, accurately, and efficiently. This would enable LANL and stakeholders to view data with confidence with the added benefit of significant cost reductions and no delays associated with manual data validation.
- **Strong visualization components.** LANL recognized that many people could better understand the volumes of data available if they could “see” the data in context. Millions of tabular data records are meaningless to most people, but data presented on maps with query capability are much more relevant and accessible. With the advent of Google mapping and a public expectation of easy data access similar to Google maps, a key requirement was to present the data quickly and easily in a visual manner.
- **Full public access to 100% of the validated data.** Another key requirement was full and complete access to all LANL validated environmental data. If LANL collected the data, then it wanted to share the data and thus allow public viewing without the burden of access accounts, thus making the data freely accessible. The only restriction placed on the system was a download limit per query of 1 million records.
- **Multiparty system.** LANL wanted other organizations with environmental data to use the system to foster better understanding of the process and provide tools to access data collected from other stakeholders. The first external party to take advantage of this feature was New Mexico Environment Department (NMED) DOE Oversight Bureau.
- **Ad hoc structured query language (SQL) query capability.** LANL needed powerful tools well beyond those typically found in off-the-shelf systems. LANL had demanding power users who were proficient in understanding database tables and no system would be successful without such tools.
- **Third-party data review.** LANL’s neighbors have always played an active role in monitoring site activities, and LANL routinely collects data on third party sites. A key requirement for the system was a method to enable third-party data review before release to the public so affected landowners could review the data and take action if deemed appropriate.
- **Document sharing.** LANL produces a large amount of documentation associated with each sampling event. One way to foster data transparency is to provide not only the analytical results but also the actual laboratory data packages and the validation reports. This allows stakeholders

to review all data collected at the most basic level and demonstrates a commitment to open information exchange.

### **System Selection**

After a proposal process and a review of requirements vs system capabilities, LANL selected Locus Technologies' Environmental Information Management (EIM) system. Work on implementing this system began in 2011 and included mapping of historical data from several internal systems. EIM went live with the first sampling plan in February 2012, and the first data were processed in March 2012. The system was configured for the priority work process items first and an ancillary program data was added over the next 2 years based on individual program schedules and available budgets.

### **System As-Built**

EIM provides a cradle-to-grave process for data handling. EIM supports LANL's entire data process from detailed sample planning, mobile data collection using iOS mobile devices, to automated bottle labeling, generation of chain of custody, analytical laboratory electronic data deliverable (EDD) upload, automated data validation, sample tracking, and custom regulatory and compliance reports. EIM has functionality to assess data in various ways such as the ability to design new formatted reports, a free-form SQL tool of the entire database, exceedance reports, calculation engine, charting, trends, and statistics. EIM also has interactive geographic information system (GIS) layers, and analyte concentration color contour mapping capabilities. Additionally, and of great importance to LANL, EIM supports the ability for third-party landowners to review data before it is released to the public to maintain shareholder transparency and confidence in LANL's stewardship of the surrounding environment.

Since "going live" LANL has processed over 4,300 EDDS from multiple contract labs. One of the third-party users of EIM, the New Mexico Environment Department (NMED), has processed over 550 laboratory deliverables. The automated features built into EIM's EDD Loader and validation module have allowed LANL to fully process the data in an EDD upload (which can sometimes be thousands of analytical records) in an average of less than 2 days. The end result is that analytical results from laboratories become available to all users, including the public, soon after they are received.

System operations, updates and maintenance are handled by the vendor under a line item contract, so LANL knows and controls the costs associated with the system. The system is managed by a change control board to eliminate unnecessary "nice to have" modifications and control operating cost.

### **The Public Face of LANL Environmental Data: Intellus**

One critical element of the LANL EIM system is its ability to easily and transparently share environmental data with stakeholders. As with any robust domain specific technical software system, EIM is complex and requires training and domain expertise to fully utilize the system and features. Allowing general public access to EIM was deemed untenable because of its depth of domain features and the necessity to vet the data before release through established U.S. Environmental Protection Agency (EPA) data validation protocols. It is of no benefit to report inaccurate data. However, LANL wanted to release all data as soon as it was validated and/or approved by any third-party landowner with data from his or her land. To address these dual concerns, the vendor implemented a simplified front end to the system and established an automated daily database replication and formed a public website called IntellusNM.com.



IntellusNM is integrated with EIM, is the publicly available view of the entire LANL database, and requires no feeds or transformations of the data. Data uploaded in EIM undergoes an automated nightly replication to Intellus. Intellus is a single, cloud-based, web-accessible system, combining transparency and supporting documentation to the public, scientists, remediation teams, regulators, and stakeholders, at a mouse-click within hours of receipt.

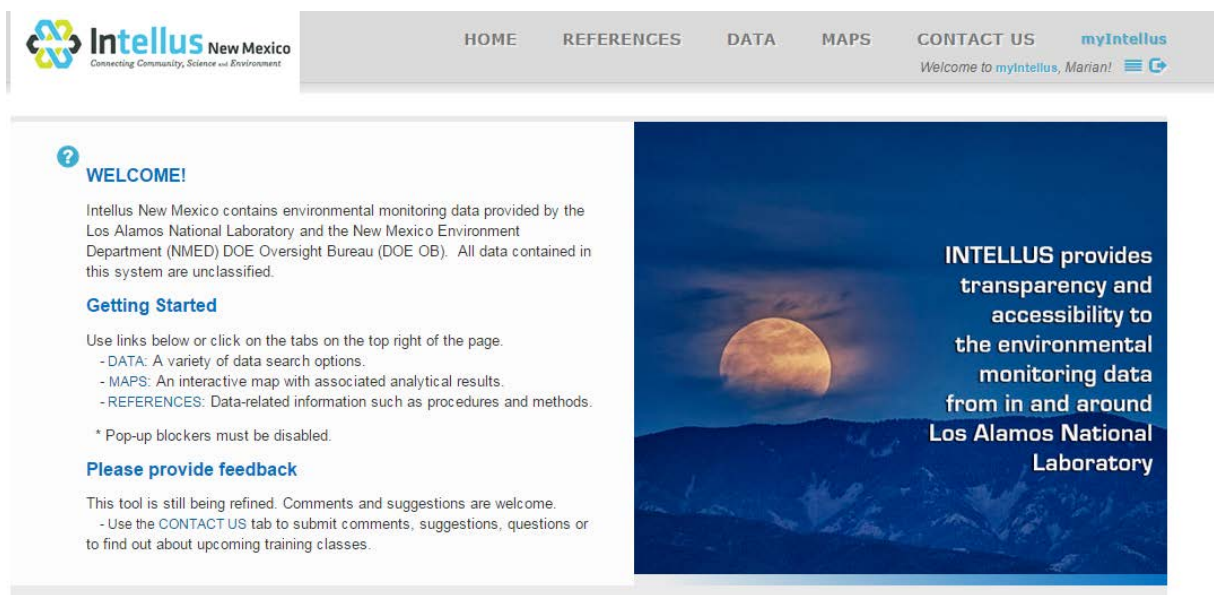


Fig. 1. Screen shot of the IntellusNM home page.

The Intellus website has a variety of automated reports as well as customized reports to satisfy customer needs to evaluate the most current data available. Queries were designed to allow users to run inquiries with more specific information for an improved user experience. Advanced queries to view analytical information, analytical laboratory data quality information and data quality evaluations for results are available to the users as well as location, sample, and field information. The user is able to incorporate the integrated geographical information system mapping tool to locate sampling sites, their associated analytical data, and regulatory limit exceedances. The user is also able to plot and trend all environmental data available in the system.

Using the systems direct link to EIM, LANL can quickly and easily add newly formatted custom reports to address emerging issues and provide quick data responses. This feature is one of the most innovative tools in Intellus. The system is configured to allow LANL to create in EIM a custom SQL query for any data in the database. Thus, if a new emerging contaminant of concern is identified, within hours LANL can create a custom “push button” query and post the query to Intellus. LANL does all this directly without the need for vendor support.

Intellus also allows LANL to share a rich variety of environmental documents with the public via a self-service link to EIM’s companion product, ePortal. Through an integrated document library, LANL is able to select documents for public delivery with instant posting to the Intellus website. LANL has shared

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over 400 GB of documents with the public including laboratory data packages, data validation reports, standard operating procedures (SOP) for environmental work, technical white papers, and various reports of interest. The sharing of these documents allows the public to verify that the reported result value is correct by reviewing the raw data in the data packages. Users can derive the same reported result in Intellus by working backward from reviewing analytical laboratory's instrumentation raw data within the Level 4 data packages. All document posting is self-managed by LANL without vendor intervention, making the feature easy to use and extremely timely.

The screenshot shows the Intellus web application interface. At the top left is the Intellus New Mexico logo with the tagline "Connecting Community, Science and Environment". To the right is a navigation bar with links for HOME, REFERENCES, DATA, MAPS, CONTACT US, and myIntellus. Below the navigation bar is a status bar indicating "Current Data Provider: All Data Providers". The main content area is titled "Intellus References" and shows a tree view of document categories on the left and a details table on the right. The tree view includes categories like Intellus Document and Files, Intellus Files, LANL Files (with sub-categories like Data Packages, NEWNET, Reports, Standard Operating Procedures, White Papers, and NMED-OB Files), and Intellus Updates Archive. The details table for a selected document (3345S.pdf) shows the following information:

Name	3345S.pdf
Description	
Size	75.31 MB
Created By	Admin
Created Date	03/28/2013 7:27 AM
Modified By	Admin
Modified Date	04/13/2013 7:19 PM

**Fig. 2. Intellus contains over 27,000 reference documents accessible the public, including LANL reports, white papers, and SOPs.**

In 2014, LANL added the additional concept of “saved reports” to Intellus to support frequent users. This feature depends on users creating user accounts and performing initial queries they wish to save. With a single click, they are able to save reports and rerun them easily with current data as the system is refreshed.

Intellus allows user-friendly access to LANL's environmental data as it is collected. Full transparency in giving the public access to environmental data information provides LANL's overall solution to environmental data management for the public. By making the data easy to obtain, search, and query for interested stakeholders, the system enables confidence in LANL's stewardship of the environment. This trust helps citizens and leaders to improve transparency and accountability by fostering collaboration between organizations and groups. Working together allows stakeholders to identify key topics of improvements, develop strategies and help support innovation and substantial advances within LANL's environmental data management system.

## Analyzing Data in Intellus

Beyond simple data downloads and map viewing, Intellus contains tools for more sophisticated analyses. These tools have led to more robust use of the system by LANL and NMED technical users. One of the key analytical tools provided is exceedance reporting. Exceedance reporting lets the public or other users analyze LANL data against a wide range of regulatory standards or limits. LANL provides lists of all applicable regulatory limits for the public to use in this analysis. Intellus provides tools to analyze data against single or multiple regulatory limits with a single query. Single-limit queries can be saved by the user and rerun at any time.

Additional regulatory limit lists can be added anytime in EIM, and they are automatically populated in Intellus. The public is welcome to request additional limit lists through the Intellus email contact address provided in Intellus.

Current Data Provider: Los Alamos National Laboratory

Selected Analytical Exceedance Results:

Action Limit	Location ID	Field Sample ID	Date Sampled	Parameter Name	Upper Limit	Limit Units	Report Result	Lab Out
EPA MCL	R-28	CAMO-10-16764	2010-05-13	Chromium	100	ug/L	340	
EPA MCL	R-28	CAMO-10-16765	2010-05-13	Chromium	100	ug/L	342	
EPA MCL	R-42	CAMO-10-16821	2010-05-13	Chromium	100	ug/L	850	
EPA MCL	R-42	CAMO-10-16822	2010-05-13	Chromium	100	ug/L	960	
EPA MCL	MCO-0.6	CAMO-10-22780	2010-07-02	Chromium	100	ug/L	662	
EPA MCL	R-28	CAMO-10-22859	2010-07-14	Chromium	100	ug/L	472	
EPA MCL	R-28	CAMO-10-22859	2010-07-14	Chromium	100	ug/L	558	
EPA MCL	R-28	CAMO-10-22860	2010-07-14	Chromium	100	ug/L	539	
EPA MCL	R-42	CAMO-10-22891	2010-07-13	Chromium	100	ug/L	1210	
EPA MCL	R-42	CAMO-10-22893	2010-07-13	Chromium	100	ug/L	1240	

Maps open in a new window. Make sure any pop-up blockers are turned off if you send results to the map.

Close Save query to myIntellus ?

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**Fig. 3. The above illustrates total transparency via data audit tracking.**

To foster total transparency, LANL also provides a full audit trail of data updates on the environmental data in EIM and makes those updates visible in Intellus for the public to review. Environmental data updates occur on every environmental project at every site and can stem from a location being reported incorrectly or a laboratory reporting an incorrect result. LANL opted not to be selective about the type of data updates shared as they are a normal part of routine data review and common for all data systems and sites. All changes to the data in specific tables are reported, and reasons for the changes are provided.

The following data tables are tracked:

- **FIELD\_SAMPLE\_RESULT:** This data table contains data reported by laboratories for samples they have analyzed.
- **LOCATION:** This data table contains information about sampling locations.
- **PARAMETER:** This data table contains information to identify analytical parameters associated with laboratory data.



Intellus tracks and provides additional details to changes that are defined as significant. Significant changes were agreed upon with community-based groups that monitor activities at LANL. Specific reasons for each of the changes are provided. This approach has created a more trust with the community and a defensible audit trail for all parties including LANL.

The screenshot shows the 'Track Changes' section of the Intellus web application. At the top, there is a navigation bar with links for HOME, REFERENCES, DATA, MAPS, CONTACT US, and myIntellus. Below this, a status bar indicates 'Current Data Provider: Los Alamos National Laboratory'. The main content area is titled 'Track Changes' and features a table with the following columns: Date, Data Provider, Table, Field Sample ID, Parameter, Column Updated, Old Value, New Value, and Reason. Two rows of data are visible, both dated 2014-10-20, from Los Alamos National Laboratory, showing updates to the DETECT\_FLAG column for Acetone samples.

Date	Data Provider	Table	Field Sample ID	Parameter	Column Updated	Old Value	New Value	Reason
2014-10-20	Los Alamos National Laboratory	FIELD_SAMPLE_RESULT	MD21-14-86036	Acetone	DETECT_FLAG	Y	N	UPDT DFLG
2014-10-20	Los Alamos National Laboratory	FIELD_SAMPLE_RESULT	MD21-14-86038	Acetone	DETECT_FLAG	Y	N	UPDT DFLG

Fig. 4. An example of a significant update presented in Intellus.

### Sharing Sampling Calendars: Everyone’s Informed on What’s Happening Today

LANL publishes its daily, weekly, monthly and annual sampling calendars in Intellus, including detailed information on sampling events and locations. The public can check on any day and find out what is planned, where these activities are to occur, what types of samples will be collected, and what analyses will be run on the samples. Because LANL does 100% of its sample planning in EIM, the information in Intellus is always accurate and up to date with any changes that occur as a result of weather or access restrictions. The sampling calendars are available for each third-party data provider if they use Sample Planning in EIM.

The screenshot displays the 'Sampling Calendar' for December 2014. It includes navigation controls for the month and year, and a list of planned sampling activities for each day of the week. The activities include various types of studies, filters, and sample collection events.

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	<b>1</b> 2013 AL Study 2014 AI Filter 2014 ESR 2014 IP 2014 LAP 2014 PCB Sieve 2014 Rio at BDD 2014 Runon-off 2014 Urban AIRNET CrEX-Cr Remove R-43 Cr Remove Spring Filter White Rock Q1	<b>2</b> 2013 AL Study 2014 AI Filter 2014 ESR 2014 IP 2014 LAP 2014 PCB Sieve 2014 Rio at BDD 2014 Runon-off 2014 Urban AIRNET CrEX-Cr Remove R-43 Cr Remove Spring Filter White Rock Q1	<b>3</b> 2013 AL Study 2014 AI Filter 2014 ESR 2014 IP 2014 LAP 2014 PCB Sieve 2014 Rio at BDD 2014 Runon-off 2014 Urban AIRNET CrEX-Cr Remove R-43 Cr Remove Spring Filter White Rock Q1	<b>4</b> 2013 AL Study 2014 AI Filter 2014 ESR 2014 IP 2014 LAP 2014 PCB Sieve 2014 Rio at BDD 2014 Runon-off 2014 Urban AIRNET CrEX-Cr Remove R-43 Cr Remove Spring Filter White Rock Q1	<b>5</b> 2013 AL Study 2014 AI Filter 2014 ESR 2014 IP 2014 LAP 2014 PCB Sieve 2014 Rio at BDD 2014 Runon-off 2014 Urban AIRNET CrEX-Cr Remove R-43 Cr Remove Spring Filter White Rock Q1	<b>6</b> 2013 AL Study 2014 AI Filter 2014 ESR 2014 IP 2014 LAP 2014 PCB Sieve 2014 Rio at BDD 2014 Runon-off 2014 Urban AIRNET CrEX-Cr Remove R-43 Cr Remove Spring Filter White Rock Q1

Fig. 5. By clicking on the day, the user can review details in Intellus on each sample planned in sampling calendar.

## Visualizing Data in a Simple to Use GIS

Intellus includes a robust GIS mapping application that is easy to use and allows sophisticated data presentation with an ability to print out maps. The GIS function is accessed either directly from a query by clicking the “send data to a map” button or via a separate menu item for free-form data exploring. LANL has provided to Intellus its facility boundaries and various overlays of LANL technical areas so users can easily orient themselves on the maps. Users pick the locations (or groups of locations) of interest and post them to the map. Once posted, users simply click on the data point and drill into the data behind the location and can see all analytical data results, any regulatory exceedances, field measurements and groundwater levels. From each data grid, users can review all the location’s data, download the data in popular formats (such as Excel), or print out the map.

The options provided by the map tools include the following:

- Review data around an address
- Review data within a free form shape (spatial query)
- Review data within a circumference
- Find a location
- Display results on the map
- Measure on the map
- Change map base layer to various options
- View overlays such as buildings or technical areas

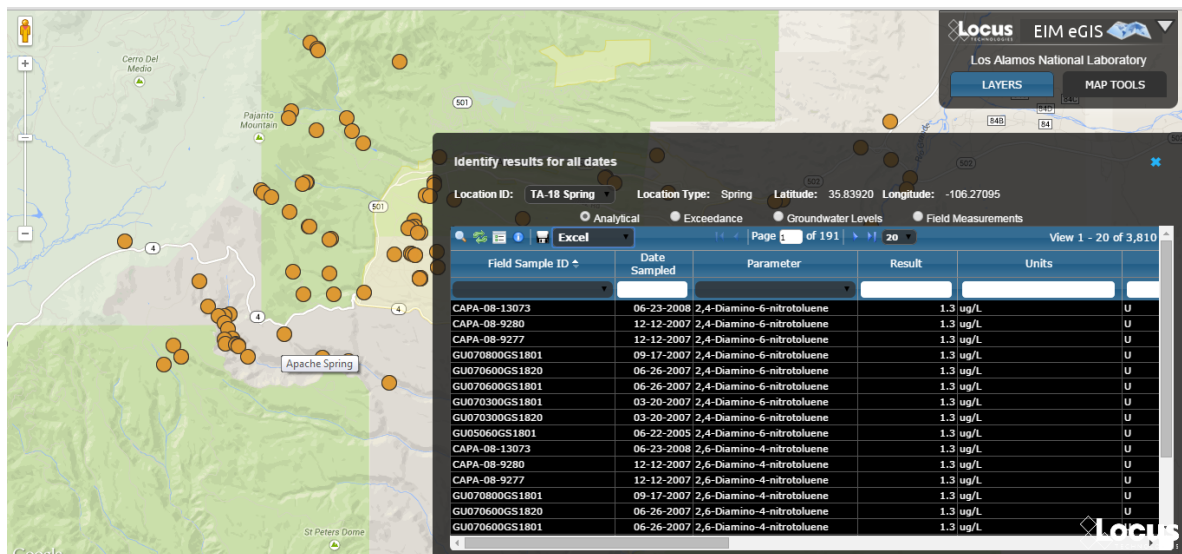
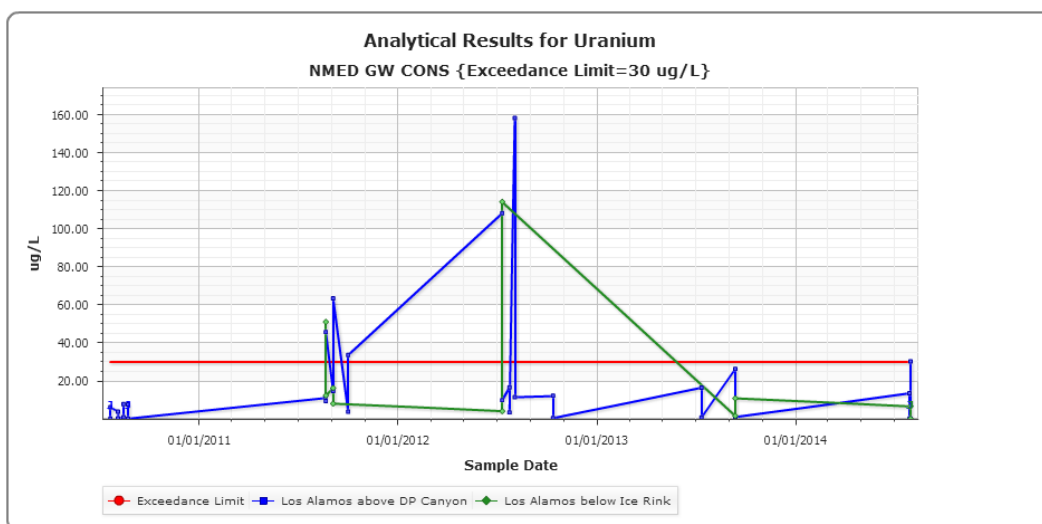


Fig. 6. A user can view locations of springs on LANL property and surrounding area as well as specific results for a single sampling location.

## Plotting and Trending in Intellus

All Intellus users can take advantage of the plotting and trending capabilities in the system. If people are curious about the tritium concentrations in a specific area over time, for example, it is quick and easy to generate charts in Intellus and all of the output can be saved and printed. Users can plot the following types of charts:

- Plots of laboratory parameters
- Plots showing data that exceed established lists of regulatory standards or references values
- Plots including data from measurements made in the field and analytical data (laboratory parameters)



**Fig. 7. The above graph is an example of how Intellus reaches beyond LANL.**

One feature LANL envisioned early in the process was the ability for others to share data on Intellus. In the system as configured as of November 2014, LANL and the NMED DOE Oversight Bureau both present data publically in Intellus. Data from each entity are kept separate and site permissions within EIM keep each tenant in separate site databases. This means the public or other stakeholders can visit one website and obtain all environmental data collected by either LANL or the NMED DOE Oversight Bureau in one location. This ease of access facilitates data sharing from both the regulated and the regulator and makes the public's involvement role much easier.

Intellus/EIM is configured such that other non-LANL entities can use the system as well. As other facilities make the transition to more data transparency, other tenants may be added. As LANL has learned, the basics of environmental data management are fairly universal, and although DOE sites present some challenges in terms of complex reporting, the basics of data collection, analysis, validation, review and reporting are fairly generic within the industry.

## Who Uses Intellus?

During the implementation of the Intellus system, LANL envisioned the user community to be local and regional stakeholders in the vibrant communities that surround LANL. This happened but with a twist. Many of the users are LANL and NMED staff who needed access to various environmental data for their various activities. By providing a simple user interface and enabling a “self-service” portal of information, LANL and NMED staff who previously had to put in data requests or struggle with complex systems were suddenly empowered to gather the information they needed when they needed it.

LANL has also actively fostered public outreach by providing regional “hands-on” training sessions. LANL has provided many sessions to various regional groups and fields questions from the public via a dedicated email address. Overall, the feedback has been positive. The site can be accessed using all major browsers so the public has a positive experience from its initial visit.

The screenshot displays the myIntellus Dashboard interface. At the top, there is a navigation bar with links for HOME, REFERENCES, DATA, MAPS, CONTACT US, and myIntellus. A welcome message reads "Welcome to myIntellus, Marian!". On the left, an "Instructions" sidebar provides a 6-step guide on how to create and save a report. The main content area, titled "myIntellus Dashboard", features a "Your Saved Reports" section with a "Show all" and "Hide all" toggle. Below this, a table lists three saved reports:

Report Name	Description	Data Provider
General Chem Results - NMED	General Chemistry results from 4 location groups	NMED DOE Oversight Bureau
All locations Uranium	All locations uranium	Los Alamos National Laboratory
pmr Motrandad	pmr	Los Alamos National Laboratory

On the right, a "Control Panel" sidebar includes links for "myIntellus Dashboard", "Edit your profile", and "Log out". At the bottom of the instructions sidebar, it notes that "Report names and descriptions can be" (partially cut off).

**Fig. 8.** Using the MyIntellus feature allows a user to save reports from multiple data providers.

**Fast Facts**

LANL's EIM database and Intellus system contain a wealth of information:

- Over 27,000 documents, laboratory reports and white papers
- Over 14,000,000 field and analytical and air records
- 4,739 Sample plans
- Over 4,000 analytical EDDs loaded
- Over 300 non-analytical EDDs loaded
- 5,430 chains of custody generated
- Over 29,000 logins (EIM)
- 28,679 locations
- 1,511 parameters
- 506 analytical methods
- 73 parameter analyzed over 50,000 times
- 39 locations with over 1,000 samples
- 83 locations sampled for more than 40 years
- Earliest samples date back to the 1940s