SAMPLE MASTER®

LABORATORY INFORMATION MANAGEMENT SYSTEM

Technical Proposal for Iowa Department of Agriculture & Land Stewardship

Prepared for Ken Discher

7/19/2016

Accelerated Technology LABORATORIES INC.

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Microsoft GOLD CERTIFIED Partner

SGS

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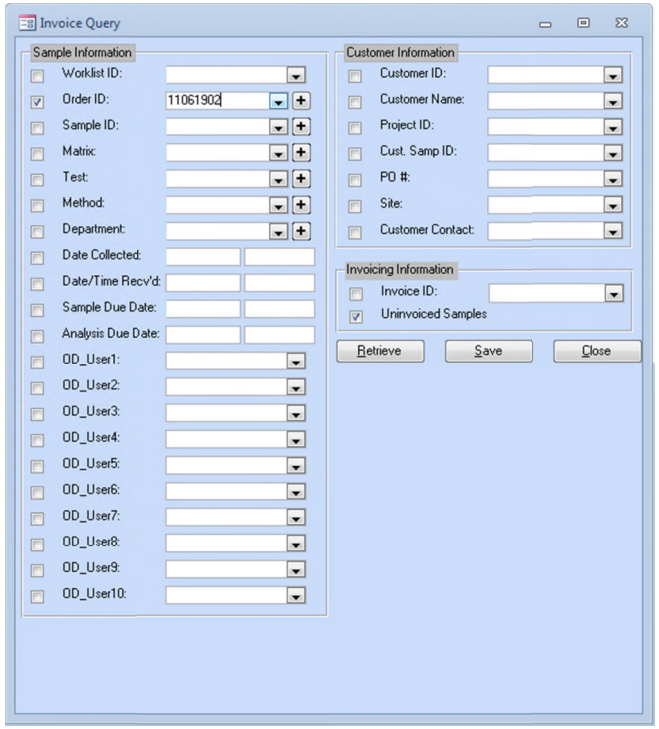
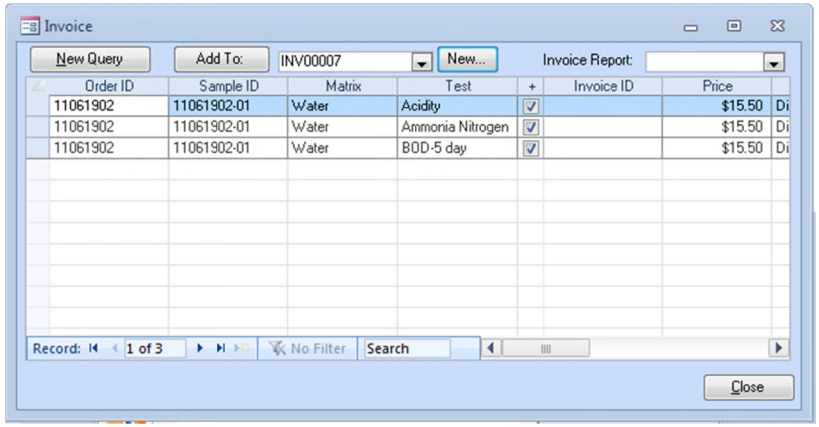
INVOICING/BILLING The LIMS application software shall generate reports for invoicing purposes. The tasks may include, but are not limited to, the following list.		**20-INVOICING/BILLING** In addition to a narrative description of INVOICING/BILLING, for any line items that Contractor either cannot provide or provides a deviation from the line item please explain why and explain what the Contractor does provide that may meet the ability listed.
Ability to generate invoices based on sample type and test performed.	3	Sample Master® has integrated invoicing capabilities in the Sample Tracking module. Users can track analyses by customer, assign costs to particular tests and apply discounts and generate invoice reports directly from the LIMS. These reports can be placed on the Task Manager and automatically printed when the results are completed and reported out. Samples can be retrieved by a variety of selection criteria using the Invoice Query. To retrieve samples, enter selection criteria and click the Retrieve button. Samples retrieved will match all of the search criteria. Clearing the check box to the left of the search criteria will delete the criteria from the search without having to delete what is in the box. 
Ability to use customer information stored in LIMS to generate invoices.	3	
Ability to add, edit, and remove cost factors to tests and samples.	3	
Ability to create unique customer price lists.	3	
Ability to associate prices with applicable date ranges and to retain previous pricing to allow re-invoicing past work.	3	
Ability to flag customers not in good financial standing in order for lab operations to modify their interaction with those customers (e.g. not accepting work, not releasing results).	3	
Ability to support different invoice workflows based on lab section.	3	
Ability to invoice all services and samples including sub-contracted work.	3	
Ability to format invoices to comply with state accounting system requirements.	3	
Ability to interface with existing accounting system software (AMS Advantage).	1	

After the samples are retrieved, users can add them to an invoice. To add samples to an invoice, mark each sample you want to add by checking its "+" checkbox. Pull-down or enter the name of the invoice where the samples will be added. Then click the Add To: button.



When a test is assigned to a sample, Sample Master® will check to see if the customer and project have a price configured for that test-matrix-priority. If there is a customer price, Sample Master® will insert the customer price. Both the default test price and customer prices are configured in the Maintenance module. If Sample Master® does not find a price for the customer; the default price will be selected for the test.

ATL Engineers will work with IDALS to develop a Requirements Document (RD) to create an interface with their AMS Advantage accounting system. This ensures that data is properly mapped and all necessary fields are included.

LIMS DESIGN/ARCHITECTURE The tasks may include, but are not limited to, the following list.		**21-LIMS DESIGN/ARCHITECTURE** In addition to a narrative description of LIMS DESIGN/ARCHITECTURE, for any line items that Contractor either cannot provide or provides a deviation from the line item please explain why and explain what the Contractor does provide that may meet the ability listed.
Ability to design a Lab section module where the workflow and project, sample, test, parameter, and result associations can serve as a template to "copy and paste" and create a new Lab section module (that is also modifiable).	3	Workflow, including the test process, is defined in Sample Master® via user-defined Departments. Departments are defined to mirror the workflow through a laboratory such that routing of individual samples can be defined through the various Departments from sample login through to sample disposition. In Sample Master® there is a Matrix that defines all of the tests that can be run under that Matrix (and then there are methods with parameters). Matrix->test->method->parameter (analytes) the parameter are the result holders and based on workflows, other options can be configured and copied. Users can create the project including Project ID at the time of sample receipt and login. Sample Master® is designed to support multiple users simultaneously accessing the LIMS, under the recommended technical specifications. Users may enter data, run queries or generate reports with negatively impacting the responsiveness of the LIMS. ATL has designed Sample Master® so users can define over 70% of the fields in the LIMS. Users can alter form captions to their terminology for easy and fast deployment, and have the ability to add new tables, forms (screens) reports. These updates are pulled into the LIMS when a new version is released, thus future-proofing and protecting our clients LIMS investments. Sample Master® has a very unique feature that is called the Master Query function that allows users to EASILY archive data by date range, project, test, site, and over 20 other fields or combinations of fields. This flexibility makes it extremely easy for users to archive data. ATL engineers can work with IDALS to develop a process for archiving based on a defined retention schedule. Archived data may be accessed by attaching the Master Query to the archived database. Sample Master® has the Master Query function that allows users to retrieve or mine data in the LIMS with over 8 trillion combinations. This
Ability for multiple users to access data simultaneously for data entry and functions that require data retrieval (queries).	3	
Ability to run multiple processes concurrently.	3	
Ability to interface and enter data (e.g., consistent use of screen layouts, keyboard/mouse functions, navigation, etc.).	3	
Ability to natively support menu customization.	3	
Ability to archive data using user defined retention schedules.	3	
Ability to restore archived data.	3	
Ability to insure data integrity (information is not corrupted during communication, transfer, manipulation, storage, and recall functions) and recovery after fault.	3	
Ability to provide maintenance tools to change domain data.	3	
Ability for user to define tables without recourse to the vendor.	3	
Ability for user to define fields and field without recourse to the vendor.	3	
Ability for user to change the order of the records being viewed.	3	
Ability for user to define field expressions without recourse to the vendor.	3	
Ability to perform ad-hoc queries via customer configuration.	3	
Ability to link/attach objects to a project, sample, test, or parameter.	3	
Ability to provide version control on applications and objects.	3	
Ability for the LIMS and the backend database to be upgraded and maintained without major disruption to the system.	3	
Ability to provide all secured users access to data via the internet or LAN.	3	

Ability to have user-level security based on the user's login into LIMS system as an integral part of the LIMS.	3	feature is a query builder that can be exported to Access or Excel and that can be saved. This is a significant function as reporting is the most important feature of any LIMS. ATL's Sample Master® also has a one-step function that allows users to save queries and call them up with one click, and they can make the query only available to them or they can share the query with others in the laboratory. Sample Master® allows for the attachment of documents or referencing a path name to documents in a variety of locations in Sample Master®. Documents attached or referenced in Sample Master® can be viewed by the user directly from Sample Master®. Sample Master® allows users to attach documents, such as SOPs, photos, PDFs, and others. The link is stored to a separate location. Users can use Microsoft Word or Excel and lock those SOP files so that only users with permissions can make any changes. Complete history/version control is documented. ATL has also entered into a partnership with LabCore that offers a document management solution that ATL has integrated into the LIMS as an option. ATL engineers can review the various options for on-line SOPs and document management with the LIMS Team. Many of ATL's clients are ISO 17025 certified and NELAC certified and these requirements are very important. Sample Master® can be deployed via browser on Citrix to allow remote users to securely access the LIMS. Sample Master® Result Point® is designed for laboratories that require tight security and want external users to receive sample update status, sample results, and XML reports, EDDs, and pdf final analysis reports. Result Point® utilizes the latest web technology and does not require that the end-user has any application software installed. This can be accessed anywhere there is Internet access. Sample Master® has tight security to ensure that only authorized individuals can login to the system. Users are required to provide a user name and password and the LIMS is CFR 21 part 11 compliant. Access level is restricted to users that require specific functions, such as data entry, data approval, data retrieval, data modification (auditing), and data customization. In addition to the LIMS access, users can be assigned various levels of permissions, such as None, View only, Enter, Validate and
Ability to support at least 50 concurrent users and allow an unlimited number of named users.	3	
Ability to add, edit, or remove users via customer configuration.	3	
Ability to configure permissions for each user based on roles. Roles must be able to control authority to delegate and assign work; to add, edit, or remove data from lists and templates; to enter or view data; to print documents and reports; and to add, edit, or remove report forms and templates.	3	
Ability to override role-based permissions to add or restrict certain permissions for specific users.	3	
Ability to support the State of Iowa Lab's compliance with 21 CFR Part 11.	3	
Ability to support the State of Iowa Lab's compliance with ISO 17025:2005.	3	
All system software is designed to allow growth.	3	

		Approve. LIMS administrators can configure the LIMS to utilize Windows authentication for added security. The web portal Result Point® also has tight security and utilizes SSL (Secure Socket Layer) and electronic server certificates with 128 bit data encryption. As a Microsoft Certified Partner, ATL follows Microsoft standards for clean uncluttered screens that hold very sophisticated functionality. ATL was one of the first 100 Microsoft Certified Partners; and ATL's premier LIMS Sample Master® is tightly integrated with the Microsoft Office suite. What this means to clients is that there is less of a learning curve as the Sample Master® is very similar to other Microsoft Applications, and has the built-in capability to directly export data to Excel, Word, Access, and several other standard formats, there is integration with Outlook for e-mail. This integration with the Microsoft platform ensures that ATL's clients will have a future-proof system.

LIMS DOCUMENTATION/SUPPORT The LIMS product shall have supporting materials. The tasks may include, but are not limited to, the following list.		**22-LIMS DOCUMENTATION/SUPPORT** In addition to a narrative description of LIMS DOCUMENTATION/SUPPORT, for any line items that Contractor either cannot provide or provides a deviation from the line item please explain why and explain what the Contractor does provide that may meet the ability listed.
System documentation available including design, setup, and maintenance information.	3	In addition to the Sample Master® User Manual, ATL provides End-User Training Manuals, LIMS Administrator Manuals and laminated Quick Start Guides. All documentation is provided in hard copy and electronic (PDF) format. The LIMS features comprehensive on-line help, and documentation and full search capabilities as well as context sensitive help that follows Windows convention. Sample Master® utilizes the F1 key to provide context sensitive functionality. When the user presses the F1 key, documentation is displayed that is relevant to the location of the cursor on the Sample Master® screen. Entry fields adhere to a "Hot-Lookup" capability. Pull down menus are used extensively throughout Sample Master®. The Sample Master® Help Menu item includes an index lookup, contents table and full documentation of Sample Master® is easily accessible to the user. Where practical, functions will display appropriate default or previous entries related to that function. ATL prides itself on working with its customers to create a detailed multi-tiered support plan, which matches our clients' laboratory, data management, and support requirements, today and into the future. ATL customer support options recognizes this cycle by providing a range of services within The ATL metals Support Program that meets customers' changing needs through LIMS evolution. The ATL Metals Support Program currently provides four levels that mirror customer business requirements. ATL BRONZE being the most basic level of support through PLATINUM, which is the most comprehensive. ATL'S GOLD support is the most popular and best value support option. All service packs, patches and upgrades include release notes, which are cumulative.
User documentation available.	3	
User and training documentation describes how to use each component in non-technical terms (e.g., functional description).	3	
Documentation available in electronic format (e.g., CD-ROM).	3	
Documentation regularly updated and distributed to customers.	3	
On-line help provided including: features to assist in locating a function or feature, descriptions of how each function works, and descriptions of fields, their contents, and acceptable formats.	3	
Multiple support package options available depending on the changing needs of the laboratory.	3	
Multiple training options available (on-site, training site, online, etc.)	3	

		ATL offers multiple training options, including onsite training during implementation, web-based training, including ATL's new Virtual, Instructor-Led Training (vILT), and ATL's Boot Camp, which allows LIMS users to interact with others across the industry spectrum and provides an immersive, hands-on experience.

BARCODES The LIMS application software shall have the ability to generate, print, and read barcodes. The tasks may include, but are not limited to, the following list.		**23-BARCODES** In addition to a narrative description of BARCODES, for any line items that Contractor either cannot provide or provides a deviation from the line item please explain why and explain what the Contractor does provide that may meet the ability listed.
Ability to generate labels with barcodes.	3	Bar coding is integrated into the Sample Master® Sample Tracking module. Sample Master® is compatible with most standard bar-code fonts and can import complex associated sample information. Labels can be configured by the user and printed automatically upon sample login or ad-hoc. Label printing can be associated with sample schedules by the user utilizing the User Function Setup and the Task Manager. For usability reasons, ATL recommends bar code fonts 3 of 9 or 128, which also contain human readable information below the barcode. **Positive ID (Bar-coding, Label Printing, etc.)** ATL offers a barcode starter package that is a complete positive ID solution. The package includes a Zebra Label printer, scanners, ribbons, all cables, software, and 1,000 waterproof, tearproof labels to get started. There is a standard barcode label in the LIMS, and these can be modified if desired. ATL supports both 1D and 2D solutions. **Sample Labels with 2D barcode** Clients leverage barcodes on bottles, tubes, sampling bags, folders, etc. to facilitate positive ID. The LIMS can print as many labels as are needed and users can have custom designed labels to ensure that their data is captured. **Benefits of Barcoding include:** • Increased throughput • Positive ID (eliminate transcription errors) • The reduced cost over manual options • Improved sample management and tracking • Higher accuracy –eliminate human error
Ability to select from common barcode formats (including Code 39 and Code 128).	3	
Ability to generate a unique barcode for each sample (to the container level), reagent, and working solution/standard.	3	
Ability to set a default number of labels to print with the ability to manually change the number of copies.	3	
Ability to use bar code labels and scanners for sample tracking from receipt to disposal/return.	3	
Ability to use bar code labels and scanners for entering sample ID and other information.	3	

ATTACHMENTS

Certificate US13/82816

The management system of

Accelerated Technology Laboratories, Inc.

496 Holly Grove School Road,
West End, NC, 27376, United States

has been assessed and certified as meeting the requirements of

ISO 9001:2008

For the following activities

The design, development, training, servicing and support of Laboratory Information Management Systems (LIMS).

Further clarifications regarding the scope of this certificate and the applicability of ISO 9001:2008 requirements may be obtained by consulting the organization

This certificate is valid from 22 April 2016 until 15 September 2018 and remains valid subject to satisfactory surveillance audits.
Recertification audit due a minimum of 60 days before the expiration date.
Issue 2: 7 April 2016.
Certified since 22 April 2013.

Authorized by

John Woodman
Senior Vice President SSC, North America
SGS Systems & Services Certification, a Division of SGS North America, Inc.
201 Route 17 North, Rutherford, NJ 07070, USA
t (201) 508-3000 f (201) 935-4555 www.us.sgs.com

This certificate remains the property of SGS and shall be returned upon request

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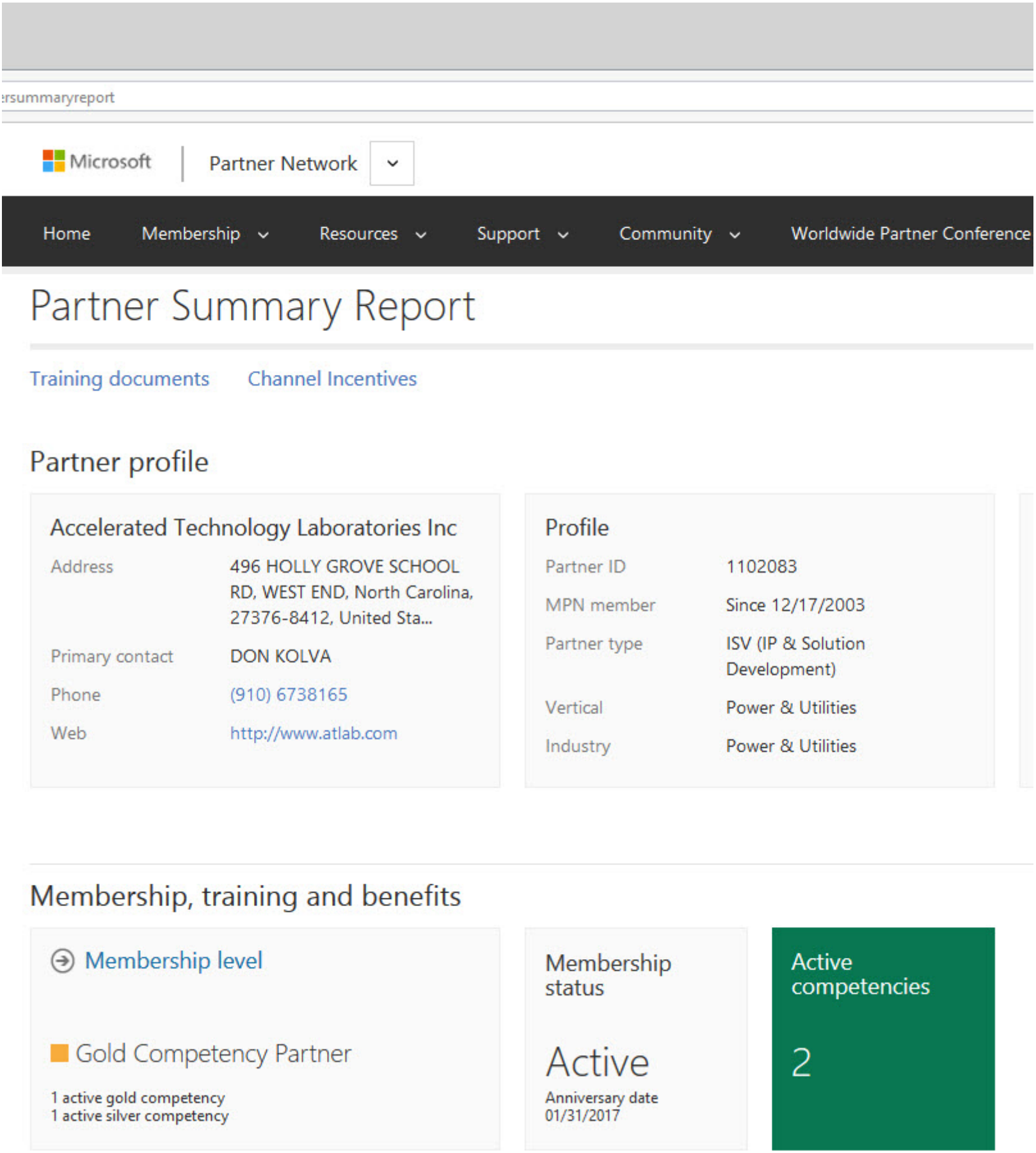
Attachment B



Attachment # 1
Certification Letter

Alterations to this document are prohibited, see section 2.12.14.

7/19/16

Issuing Officer Name: **Ken Discher**
Agency: Dept. of Administrative Services
Agency Address: Dept. of Administrative Services
Central Procurement and Fleet Services Enterprise
1305 E. Walnut St.
Hoover Bldg. – Level 3
Des Moines, IA 50319

Re: **RFP1216009012** - PROPOSAL CERTIFICATIONS

Dear Ken Discher:

I certify that the contents of the Proposal submitted on behalf of **Accelerated Technology Laboratories, Inc.** (Contractor) in response to **Agency** for **RFP1216009012** for an Online LIMS System are true and accurate. I also certify that Contractor has not knowingly made any false statements in its Proposal.

Certification of Independence

I certify that I am a representative of Contractor expressly authorized to make the following certifications in behalf of Contractor. By submitting a Proposal in response to the RFP, I certify in behalf of the Contractor the following:

1. The Proposal has been developed independently, without consultation, communication or agreement with any employee or consultant to the Agency or with any person serving as a member of the evaluation committee.

2. The Proposal has been developed independently, without consultation, communication or agreement with any other contractor or parties for the purpose of restricting competition.

3. Unless otherwise required by law, the information found in the Proposal has not been and will not be knowingly disclosed, directly or indirectly prior to Agency's issuance of the Notice of Intent to Award the contract.

4. No attempt has been made or will be made by Contractor to induce any other contractor to submit or not to submit a Proposal for the purpose of restricting competition.

5. No relationship exists or will exist during the contract period between Contractor and the Agency or any other State agency that interferes with fair competition or constitutes a conflict of interest.

Certification Regarding Debarment

6. I certify that, to the best of my knowledge, neither Contractor nor any of its principals: (a) are presently or have been debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by a Federal Agency or State Agency; (b) have within a three year period preceding this Proposal been convicted of, or had a civil judgment rendered against them for commission of fraud, a criminal offense in connection with obtaining, attempting to obtain, or performing a public (federal, state, or local) transaction or contract under a public transaction, violation of antitrust statutes; commission of embezzlement, theft, forgery, falsification or destruction of records, making false statements, or receiving stolen property; (c) are presently indicted for or criminally or civilly charged by a government entity (federal, state, or local) with the commission of any of the offenses enumerated in (b) of this certification; and (d) have not within a three year period preceding this Proposal had one or more public transactions (federal, state, or local) terminated for cause.

   This certification is a material representation of fact upon which the Agency has relied upon when this transaction was entered into. If it is later determined that Contractor knowingly rendered an erroneous certification, in addition

to other remedies available, the Agency may pursue available remedies including suspension, debarment, or termination of the contract.

Certification Regarding Registration, Collection, and Remission of Sales and Use Tax

7. Pursuant to *Iowa Code sections 423.2(10) and 423.5(8) (2011)* a retailer in Iowa or a retailer maintaining a business in Iowa that enters into a contract with a state agency must register, collect, and remit Iowa sales tax and Iowa use tax levied under *Iowa Code chapter 423* on all sales of tangible personal property and enumerated services. The Act also requires Contractors to certify their compliance with sales tax registration, collection, and remission requirements and provides potential consequences if the certification is false or fraudulent.

   By submitting a Proposal in response to the (RFP), the Contractor certifies the following: (check the applicable box)

   ☐ Contractor is registered with the Iowa Department of Revenue, collects, and remits Iowa sales and use taxes as required by *Iowa Code Chapter 432*; or

   ☒ Contractor is not a "retailer" or a "retailer maintaining a place of business in this state" as those terms are defined in *Iowa Code subsections 423.1(42) and (43)*.

   Contractor also acknowledges that the Agency may declare the Contractor's Proposal or resulting contract void if the above certification is false. The Contractor also understands that fraudulent certification may result in the Agency or its representative filing for damages for breach of contract in additional to other remedies available to Agency.

Sincerely,

Stacey Brewer

Stacey Brewer, Sr. Product Specialist

Attachment #2
Authorization to Release Information Letter

Alterations to this document are prohibited, see section 2.12.14.

7/19/16

Issuing Officer Name: **Ken Discher**
Agency: Dept. of Administrative Services
Agency Address: Dept. of Administrative Services
Central Procurement and Fleet Services Enterprise
1305 E. Walnut St.
Hoover Bldg. – Level 3
Des Moines, IA 50319

Re: **RFP1216009012 -** AUTHORIZATION TO RELEASE INFORMATION

Dear Ken Discher:

Accelerated Technology Laboratories, Inc. (Contractor) hereby authorizes the **Agency** ("Agency") or a member of the Evaluation Committee to obtain information regarding its performance on other contracts, agreements or other business arrangements, its business reputation, and any other matter pertinent to evaluation and the selection of a successful Contractor in response to **RFP1216009012.**

The Contractor acknowledges that it may not agree with the information and opinions given by such person or entity in response to a reference request. The Contractor acknowledges that the information and opinions given by such person or entity may hurt its chances to receive contract awards from the State or may otherwise hurt its reputation or operations. The Contractor is willing to take that risk.

The Contractor hereby releases, acquits and forever discharges the State of Iowa, the Agency, their officers, directors, employees and agents from any and all liability whatsoever, including all claims, demands and causes of action of every nature and kind affecting the undersigned that it may have or ever claim to have relating to information, data, opinions, and references obtained by the Agency or the Evaluation Committee in the evaluation and selection of a successful Contractor in response to the RFP.

The Contractor authorizes representatives of the Agency or the Evaluation Committee to contact any and all of the persons, entities, and references which are, directly or indirectly, listed, submitted, or referenced in the Contractor's Proposal submitted in response to RFP.

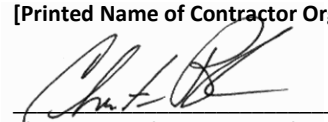
The Contractor further authorizes any and all persons and entities to provide information, data, and opinions with regard to its performance under any contract, agreement, or other business arrangement, its ability to perform, business reputation, and any other matter pertinent to the evaluation of the Contractor's Proposal. The Contractor hereby releases, acquits and forever discharges any such person or entity and their officers, directors, employees and agents from any and all liability whatsoever, including all claims, demands and causes of action of every nature and kind affecting the Contractor that it may have or ever claim to have relating to information, data, opinions, and references supplied to the Agency or the Evaluation Committee in the evaluation and selection of a successful Contractor in response to RFP.

A photocopy or facsimile of this signed Authorization is as valid as an original.

Sincerely,

Accelerated Technology Laboratories, Inc.

_____
[Printed Name of Contractor Organization]



_____ 7/19/16
Christine Paszko, Vice President, Sales & Marketing Date

About Sample Master®

The Sample Master® LIMS product line is a complete and total data management solution. It is comprised of feature rich modules to assist with data management and laboratory operations. Modules include Sample Tracking, Data Entry, Sample Scheduling, QA/QC, Electronic Data Transfer, Chemical Inventory, Resource Management, Customer Relationship Management and LIMS Maintenance. The modularity allows our customers to purchase only the modules that are required. Modules can be added, allowing for expansion as the laboratory grows. ATL's LIMS software products are designed to grow with your laboratory and promote Good Laboratory Practices (GLP). No matter what size laboratory you have, Sample Master® can increase efficiency and productivity, provide data security and quality and increase reporting times.

ATL's Sample Master® LIMS will provide your laboratory the necessary components to automate processes to compete in a constantly evolving environment. ATL has nearly two decades experience in implementing Sample Master®, with ISO 9001 certification of our Quality Management System and a team of professionals with a solid laboratory background. LIMS implementation is a partnership, in which both parties work as a team, together to achieve a common goal - implementation of a state-of-the-art LIMS package and automation solution to enhance data quality, decrease turnaround times and increase productivity.

Sample Master® LIMS Overview

Sample Master® is designed to be used without manuals, although a complete, user-friendly manual is included. On-line help is available everywhere in Sample Master® and there is a tutorial for first time users. There is also seamless integration with QuickBooks Pro Accounting package to help laboratories manage their valuable financial information.

Sample Master® is comprised of modules to help manage the operations in the laboratory; these modules can be purchased separately. While a brief explanation of each module is outlined below, ATL's response details only those modules specific to the organization's proposal requirements.

Sample Tracking lets you enter samples into the LIMS and follow their progress through the laboratory. Sample Tracking includes integrated bar coding, sample login, chain of custody, quoting and invoicing.

Data Entry is for entering and reporting sample results. Permissions can be granted to each user to view, enter, validate or approve results. Data Entry allows the laboratory to enter, approve and report results with peer review. There are dozens of standard reports included.

Sample Scheduling is used to log automatically samples that are routinely collected. Samples can be automatically scheduled as daily, weekly, monthly, quarterly, semi-annual or annual events. Sample bottle labels and worklists can automatically be generated in advance of a sampling event.

QA/QC lets you graph results and create control charts for data that has been entered into Sample Master®. You can easily select the data to plot using criteria such as test, sample number, analyst, etc. It is just as easy to select the samples used to generate the control limits.

Electronic Data Transfer allows direct electronic transfer of data from the instrument to Sample Master® via a variety of formats including .XLS, .CSV, text (ASII) and others. Sample Master® can be configured to scan directories to import multiple files or import data for multiple runs by file or directory. When multiple runs are imported, users can select the data that is entered into Sample Master®. ATL has a library of over 450 instruments that have been interfaced with its LIMS.

Chemical Inventory lets you track supplies and vendors. You can receive and make supplies, reconcile them and update the supplies used in sample analysis. Users are warned when running low on supplies. Users can also track lot numbers, vendor information and expiration dates.

Resource Management is for managing instrument calibrations and repairs as well as personnel certificates. Users can view this information by employee, by certification or by test. Expiration dates are also recorded. If an instrument is out of calibration, the LIMS can be set to disallow data input from the instrument that is out of calibration.

Customer Relationship Management (CRM) is for managing customer enquiries and complaints. This module will track how each contact was made, by phone, fax or e-mail and the severity of the issue and actions taken toward the resolution. There are also several reports including customer history, open issues by severity and a summary report.

LIMS Maintenance is a central location to enter and edit information that is used throughout the LIMS, such as sites, collectors, client contacts, employees, permissions, sampling numbering format, tests, methods, limits, QC information, departments and numerous defaults.

Figure 1 - Sample Master® Main Menu

Customization, computer networking, on-site training and filling of the database are all available to provide a total solution for your organization. We provide a convenient toll-free phone number for phone support and always have knowledgeable staff ready to answer your questions.

Parameters, Tests and Test Groups

Sample Master® utilizes parameters, tests and test groups. Parameters are constituents that are measured as part of a test, and a test may have one or more parameters. A test is an analysis that is performed on a sample to provide results; a pH is example of a test with one parameter (pH) and Volatile Organic Compounds (VOCs) is an example of a test with more than one parameter. Finally, tests can be grouped together in test groups. If the laboratory offers a package deal on VOCs with pH called "VOC Special", then a test group of VOCs and pH could be created. Samples could then be logged in as a VOC Special with the price for the test group, and the necessary tests will automatically be entered.

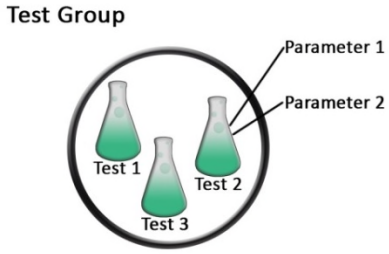


Figure 2 - Parameter, Test & Test Group Relationship

Department and Department Order

Samples flow through a typical laboratory by moving from one department to another. Department names are created in the Maintenance Module. A sample to be tested for pH might be flow through the laboratory like this:

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Action	Department	Department Order
Sample is received	Sample Receiving	0
pH is measured	Wet Chemistry	1
pH is reviewed	Review	2
Final Report is sent	Reporting	3

Figure 3 - Department Test Order

The Department order for the pH test is then Sample Receiving, Wet Chemistry, Review and Invoicing. This order is created for the pH test by clicking the "Department Order" button in the Tests function in the Maintenance Module.

Permissions

Access to each function of Sample Master® can be assigned to employees. For example, only employees that have access to the "Result Entry" function can enter results. In addition to assigning access to functions, Sample Master® provides departmental levels of permission for sample retrieval. This is accomplished by assigning permissions to an employee for a department. With this arrangement, Sample Master® can be configured to allow two employees to use the "Result Entry" function, and allow only one employee to enter results for the Organics Department. There are five permissions that an employee may have for a department:

Permission	Level	Meaning
none	0	Employee cannot view results
view	1	Employee can only view results
enter	2	Employee can only enter results that have not previously been entered
validate	3	Employee can enter new results or validate previous results for results that have not been approved
approve	4	Employee can enter new results, modify previous results and approve results. If a result has previously been approved, all changes are recorded with an audit trail.

Samples are logged into Sample Master® through Sample Tracking and their status is changed by each department as they move through the laboratory. If results are entered for the samples with the Data Entry Module, the status of the sample is automatically changed.

Sample Master® LIMS has multiple levels of security. In addition to the established network security, users must log into Sample Master® LIMS with a user name and password. There are multiple levels of permissions in the LIMS from view only, where users that are logged in with this permission level are only allowed to view data, but have no ability to enter or alter any data in the system. Full permission allows users to view, enter, validate, and approve data in the system. This level is reserved for high-level managers and the LIMS database administrator. There are many levels of permissions: none, view only, view and enter only, view, enter and validate, and view, enter, validate and approve.

In addition to the multiple levels of permission, there is also permission based on LIMS function, for example the LIMS consists of several modules, a user may have access to the Sample Tracking module and all the functions in that module and no other access. There is also the ability to provide end-users with access to certain functions within a module. This module access combined with the multiple levels of permissions, allows the administrators the flexibility to view and enter permissions for sample login and view only permissions for data entry. There is also a complete internal chain of custody that tracks the sample status throughout the laboratory and its storage location at which stage of the processing.

Sample Master® LIMS also contains a full audit trail, once sample data has been approved and any changes to the result are requested, an audit trail must be spawned. The audit trail tracks all changes to approved results, the date and time of the change, the person that entered the original result, the person that entered the corrected result, along with the date and time stamp and the reason for the change. There is also functionality only available to the database administrator to view all changes to each table of the database in a full audit mode. The system is CFR 21 chapter 11 compliant and electronic signatures are utilized throughout the LIMS.

Exporting Data and Reports

Throughout Sample Master®, data can be directly exported to spreadsheets and word processors by selecting export from the file menu. All reports can be output to (ASCII) text, spreadsheets or Rich Text Format (RTF) for manipulation with word processors. ATL engineers also provide on-site database administrator training and will demonstrate this functionally during the training sessions.

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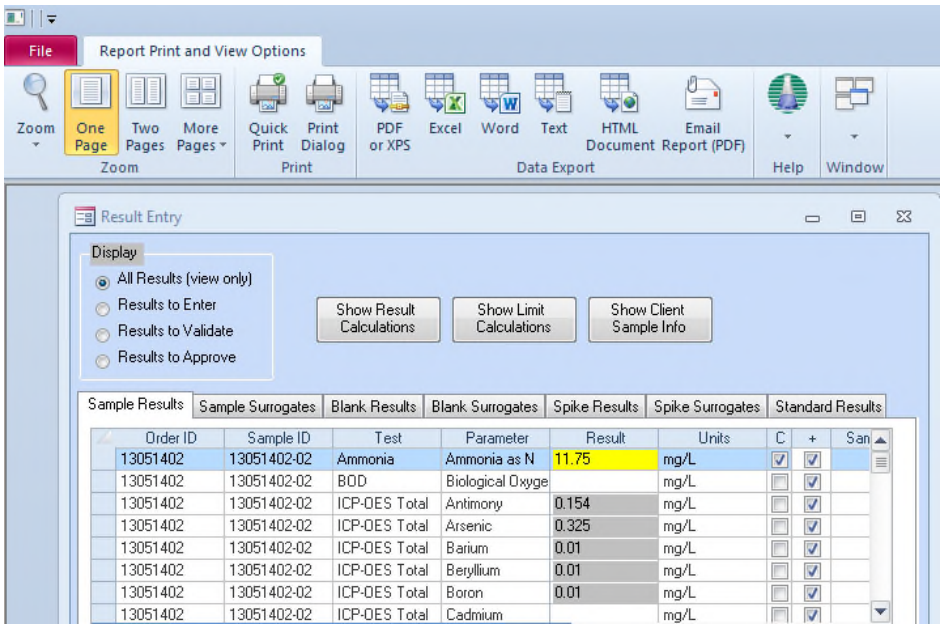

Figure 4 - Exporting Reports

On-line Help and Tutorial

On-line help is also available by selecting from the help menu or by pressing the F1 key at any time. There is also a tutorial selectable from the help menu for first time users. The ESC key will clear cancel actions and acts as a “safety net”.

Instrument Integration

Instrument integration is a key feature of any LIMS; Sample Master® offers a full suite of integration tools. ATL has worked with more than 450 different instruments importing data into LIMS. After the initial configuration, importing results from instruments or sub contract laboratories is as easy as dropping the data file in a defined folder. Sample Master® monitors these file drop locations and when a new file is present it will parse, import and store the data so that analysis and other users can have access to the data from the LIMS. Data can be imported from an assortment of files: TXT, CSV, XLS, PRN, and XML for example.

Sample Master® supports both uni and bi-directional instrument integration (Figure 6) and can create worklists that aid the analyst in loading instrument data. These worklists can also be barcoded for increased speed and accuracy, especially important for high throughput laboratories. Figure 5 is an example of a sample-tracking sheet.

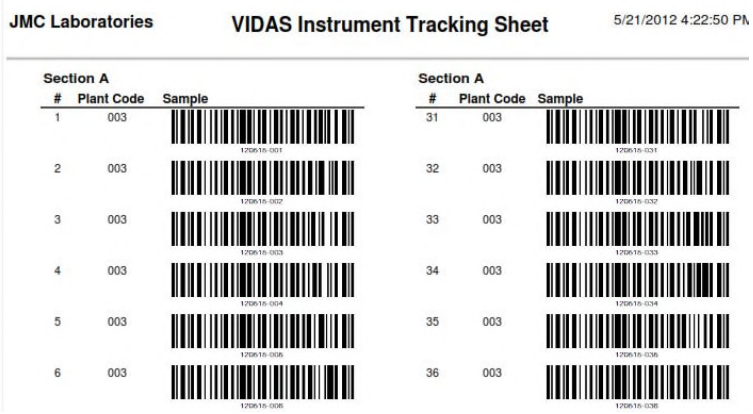

Figure 5 - Sample Tracking Sheet

Instruments often provide a method to automatically save the data files to the specified import folder, adding another aspect of automation. If needed, Sample Master® provides support for setting up an automatic email system that can accept email from your subcontractors or even from remote instruments. Clients can save both raw and final result instrument data in Sample Master®.

Additionally, Sample Master® supports 'wedge'-style software interfaces. If your instruments provide a text export option that can read directly from the machine to an Excel sheet or similar file, your wedge software can often read directly into Sample Master® as well. In the event that these integration tools aren't right for your situation, ATL can provide custom solutions for your specific integration objectives

Figure 6 - Transfer of Data from Instrument to LIMS

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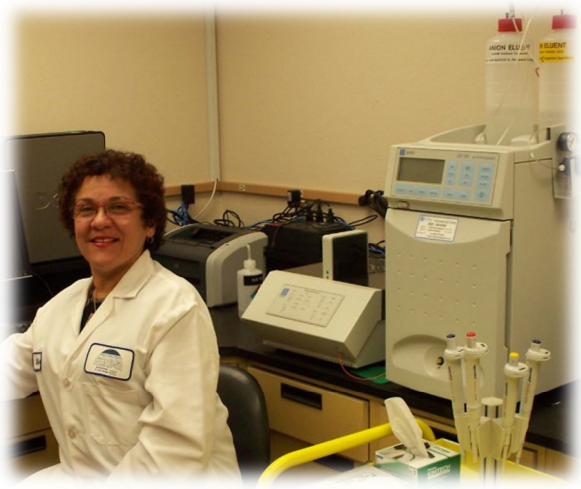

The Sample Tracking Module

The Sample Tracking module is used to login samples and track them around the laboratory. It includes quote, login, track, invoice and dispose of samples. It also includes functions to provide backlog and production reports.

Quotes

Quotes can be created for each client with applied discounts to the customer price. Samples can be automatically logged into Sample Master® with the click of a button. Bottle orders and collection sheets can also be printed directly from the quote. The status of each quote is identified as pending, won or lost.

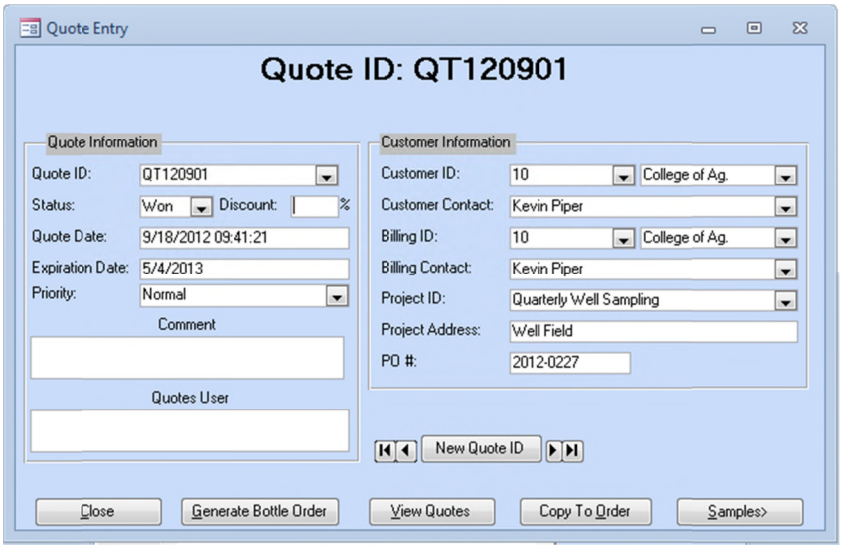

Figure 7 - Creating Quotes

Sample Login

When a customer requests samples to be analyzed, they need to be logged into Sample Master®. This is accomplished by selecting the Sample Login option. Samples are logged in as groups for a customer and this group is assigned an Order ID. Order IDs and Sample IDs can be configured with many different formats including text, dates, numbers, etc. If a new customer requests samples, the person logging the samples in can select “New Customer” from the Edit menu and enter customer information at that time. New projects can also be created by selecting “New Project” from the Edit menu.

As each sample is entered, default information is copied down from a default information area. Samples can also be copied from a previous sample, or multiple samples requiring the same tests can be logged in from one screen, so logging in a large number of samples is conveniently accomplished.

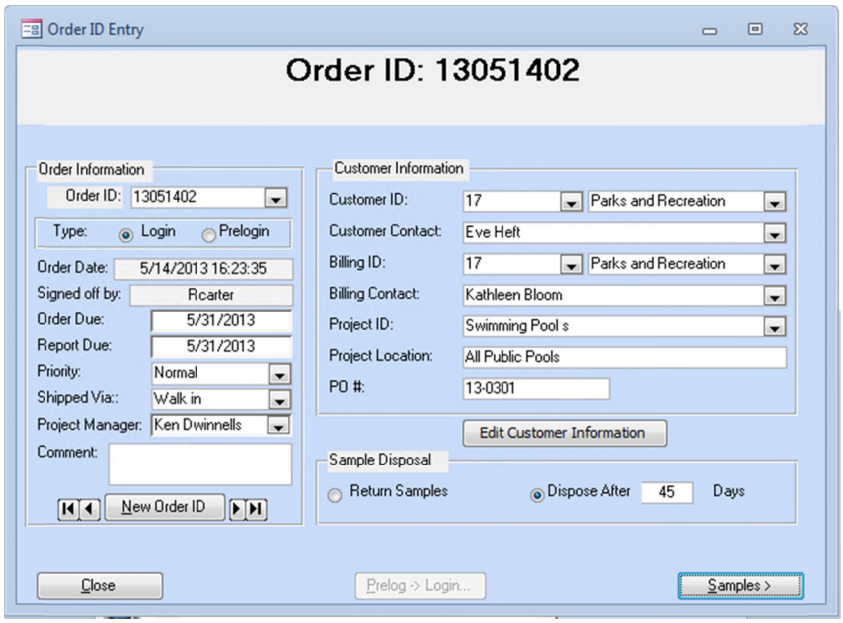

Figure 8 - Sample Login

Multiple samples can be logged in for various tests at the click of one button. Sample Master® automatically generates the sample numbers for each sample.

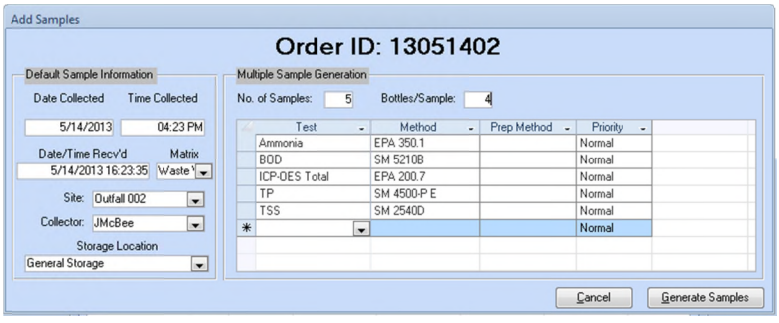

Figure 9 - Tests for Multiple Samples

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Tests can always be added to samples and new samples can be added for a customer. Each Order ID must also be signed off before the samples are available for analysis. Sign off can be accomplished by the employee that logged the samples in, or it can be a different employee.

The "Master Query"

Throughout Sample Master® samples can be retrieved by Worklists, Order ID, Sample Number, Test, Method, Collect Date range, Due Date range, Expiration Date range, Department, Status, Customer Name, Customer Project, Customer Purchase Order, Collection Site, customer supplied Sample Number, etc. Any combination of the above can be used to narrow the number of retrieved samples. This "Master Query" provides the retrieval of samples with only knowing one piece of information about the samples. Check boxes by each piece of information indicate which information is used when retrieving samples. Instead of having to clear the field, the checkbox to the left can be unchecked.

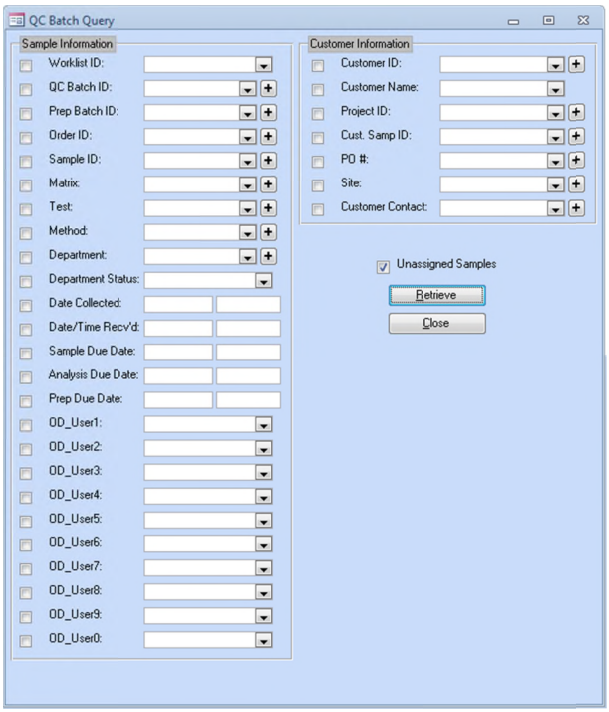

Figure 10 - Master Query Function

Chain of Custody

Chain of Custody can be used to track physically the storage location of each sample in addition to when each sample has moved from one department to another. This allows samples to be moved from one person to another or from one storage location to another within a department.

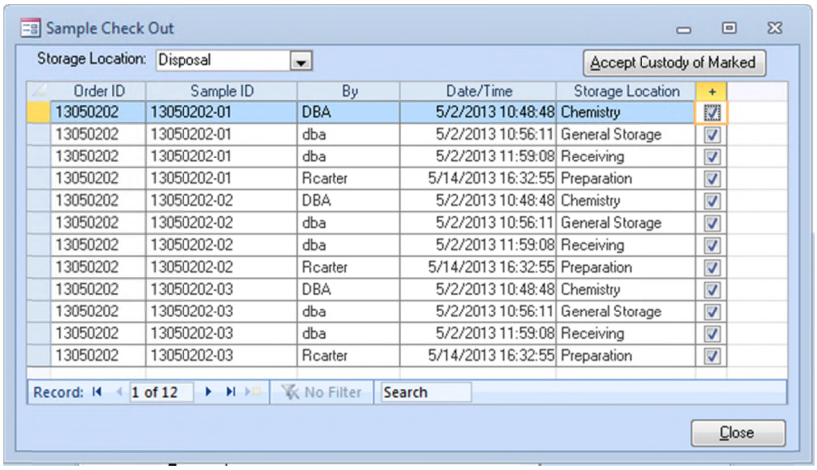

Figure 11 - Chain of Custody

Create a Worklist

Worklists can be created by one employee for another employee. This provides the ability for a supervisor to create worklist assignments for other employees. By using the "Master Query", end users can retrieve samples by their worklist, tests, due dates, etc. Since worklists can also be printed onto a report that can be modified by the end user, this is a good method to provide bench sheets.

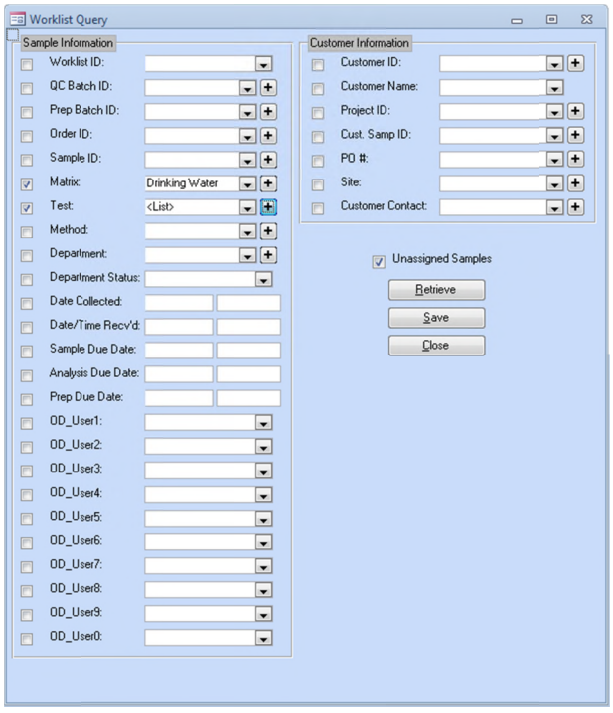

Figure 12 - Worklist Query

Sample Preparation

Samples can be grouped together for preparation stages such as digestion or extraction. Sample Master® will generate a unique preparation ID that can be overwritten by the end user. This ID can

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be used to retrieve samples when QC samples need to be assigned or when results need to be entered.

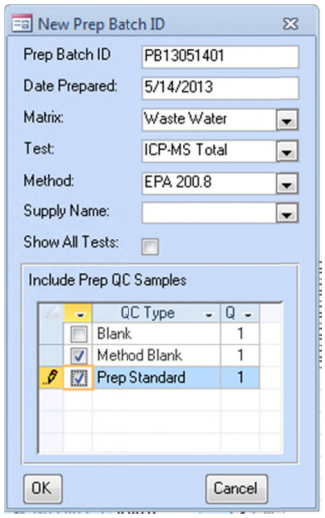

Figure 13 - Preparation Batch Creation

Update Sample Status

As samples move from one department to another, their status can be updated. A single button updates the status of all of the samples that are retrieved. This provides the benefit of quickly updating the status of a large number of samples. If the Data Entry Module is purchased, the sample status is automatically updated when results are entered for a sample.

View Sample Status

When a customer calls to determine the status of their samples, the status of every sample for that customer can be retrieved with the “Master Query”. Each sample is displayed with every department that it has been in and which departments that it still needs to go through. Details of the sample, such as when it was updated from each department, can be listed by clicking the “Details” button. If the sample has results, they can be viewed by clicking the “Results” button.

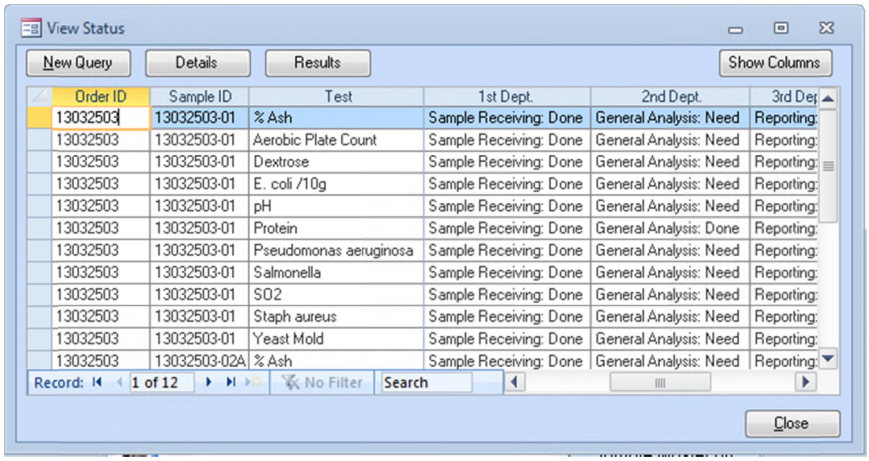

Figure 14 - Sample Status

Backlog Report

The Backlog Report is used to determine the number of samples that need to be analyzed. This could be by department, customer, test, date range, etc. using the “Master Query”.

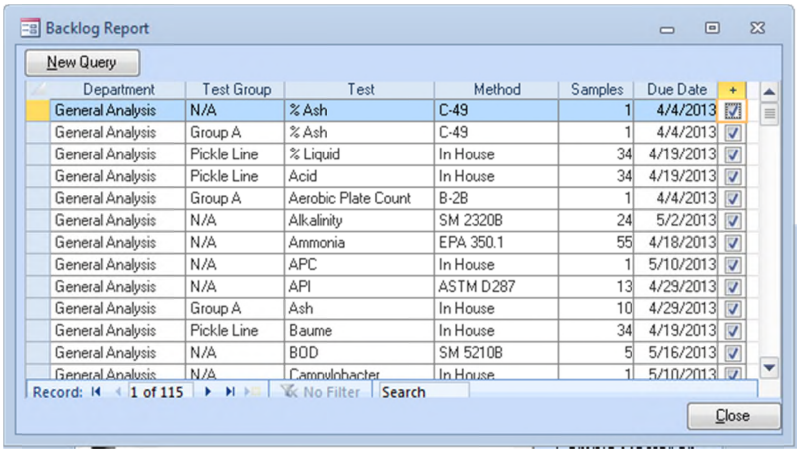

Figure 15 - Backlog Report

Production Report

The Production Report is used to determine how many samples have been analyzed. This could be by department, customer, test, date range, etc.

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Invoice

Sample Master® provides full invoicing capabilities. The client, project and priority determine pricing for each test. This means that a client can have multiple projects with different price schedules. If the client does not have prices assigned, Sample Master® will automatically insert the list price for the test and priority. Invoices can be exported to spreadsheet or ASCII file format for direct import into most popular accounting packages.

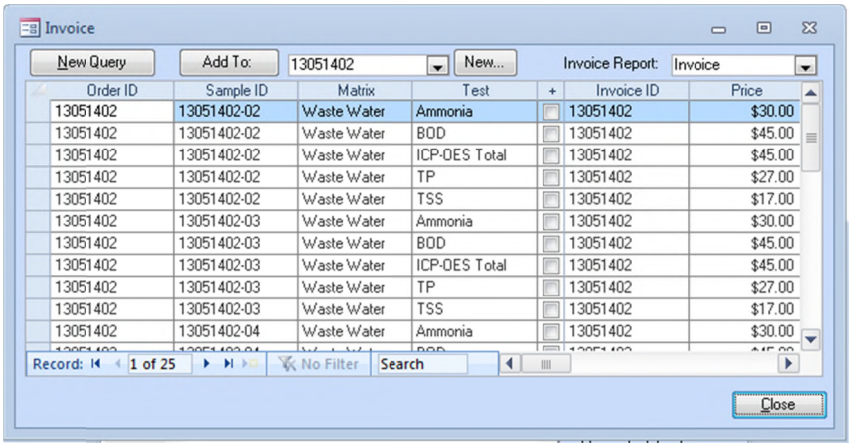

Figure 16 - Invoicing

Cooler Maintenance

Coolers that are sent to clients can be tracked with Sample Master®. The status of each cooler can be displayed as well as the record of each cooler. This enables the laboratory to determine quickly, the location of missing coolers.

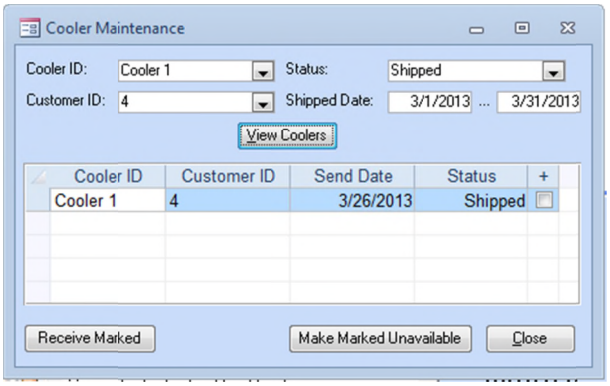

Figure 17 - Cooler Maintenance

Positive ID (Bar-coding, Label Printing, etc.)

ATL offers a barcode starter package that is a complete positive ID solution. The package includes a Zebra Label printer, scanners, ribbons, all cables, software, and 1,000 waterproof, tearproof labels to get started. There is a standard barcode label in the LIMS, and these can be modified if desired. ATL supports both 1D and 2D solutions.

Figure 18 - Scanning Bar Code Labels

Sample Labels with 2D barcode

Clients leverage barcodes on bottles, tubes, sampling bags, folders, etc. to facilitate positive ID. The LIMS can print as many labels as are needed and users can have custom designed labels to ensure that their data is captured.

When a bar-code scanner is passed over the bar code, the light source from the scanner is absorbed by the dark bars and not reflected, but it is reflected by the light spaces. A photocell detector in the scanner receives the reflected light and converts the light into an electrical signal. As the wand is passed over the bar code, the scanner creates a low electrical signal for the spaces (reflected light) and a high electrical signal for the bars (nothing is reflected); the duration of the electrical signal determines wide vs. narrow elements. This signal can be "decoded" by the bar code reader's decoder into the characters that the bar code represents. The decoded data is then passed to the computer in a traditional data format.

Benefits of Barcoding include:

- Increased throughput
- Positive ID (eliminate transcription errors)
- The reduced cost over manual options
- Improved sample management and tracking
- Higher accuracy –eliminate human error

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More and more laboratories are taking advantage of the benefits of bar coding from sample login through final disposal. ATL engineers will be happy to discuss the bar-coding options and to provide assistance in the selection of any specialty needs, such as waterproof labels or labels that will survive autoclaving. In addition to discussing the different labeling options, ATL engineers can also make recommendations as to the best printers for specialty labels, handheld scanners, and label software.

The Data Entry Module

This module is used to create QC batches, enter and report results. It also provides functionality to plot result trends, configure test parameters and have customers examine their results.

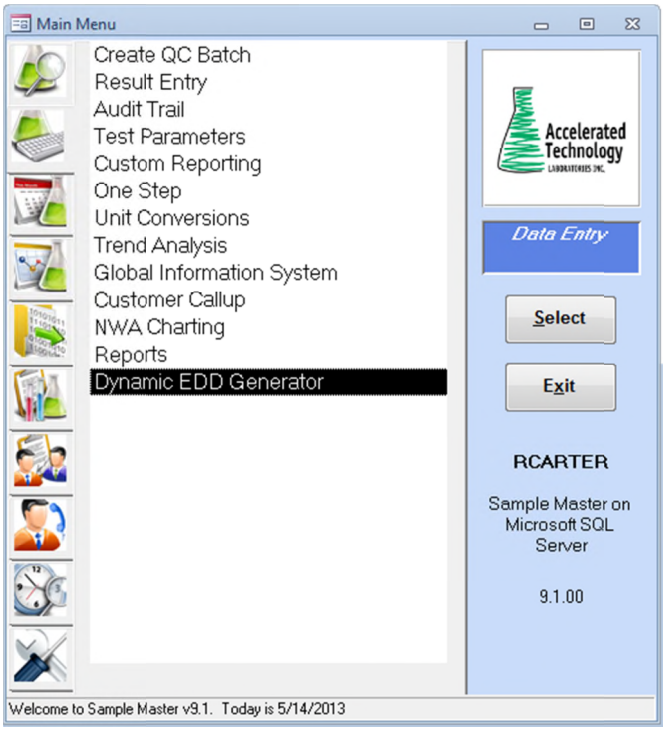

Figure 19 - Data Entry Module

Create QC Batch

QC batches are used to assign QC samples to groups of samples. Sample Master® automatically generates a QC Batch ID that can be overwritten by the end user. The end user can select from a variety of QC types for the samples. These results will then be associated with every sample in the batch.

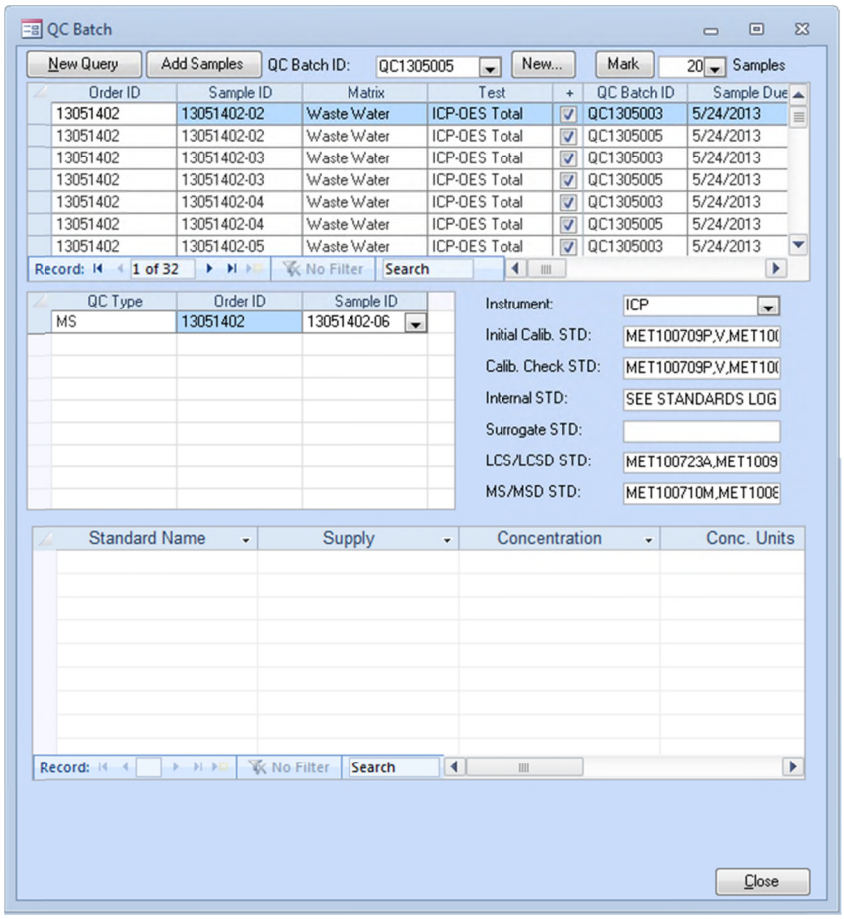

Figure 20 - Add Samples to QC Batches

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Result Entry

Results are entered manually for each parameter by selecting the samples with the “Master Query”. The entered results can be checked against the limits set for each parameter. The detection and range limits are hard limits (results must be between these values), but the lower and upper limit will allow the result but issues a warning. If the QA/QC Module is used, the QA/QC samples can be checked against the control limits.

Results to enter, validate or approve can be viewed by clicking the appropriate radio button. After results are validated, all changes must be made by clicking the audit button. For QC samples, recoveries and RPDs are automatically calculated at entry.

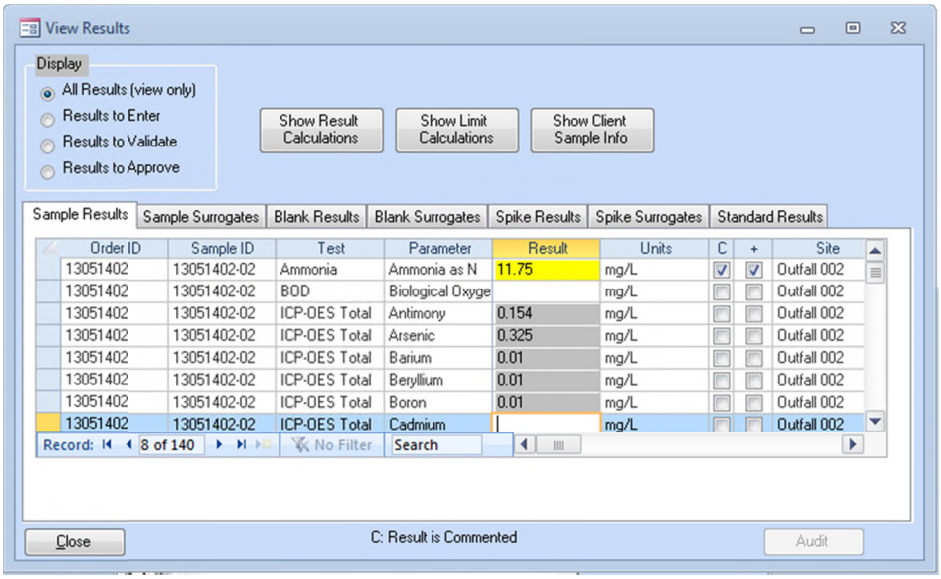

Figure 21 - Results Entry for Samples

Audit Trail and GALP (Good Automated Laboratory Practices)

Changes to samples that have been approved can only be made by clicking the audit button during result entry. All information about the change is recorded including the new and previous result, who, when and why the change was made. All samples with an audit trail can be retrieved with the “Master Query”.

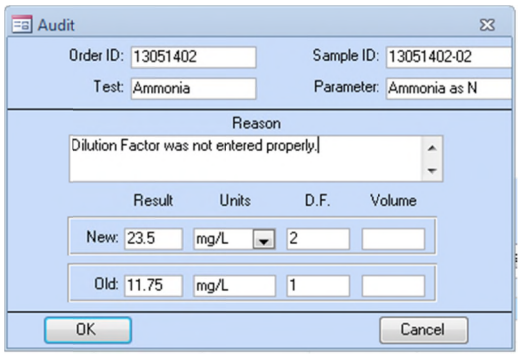

Figure 22 - Audit Trail

Parameters

Results are stored for each parameter of a test. Additional parameters, surrogates and spike parameters can be added for each test. Each parameter can have a different entry and reporting units, limits and significant figures or decimals. Parameters can also be calculated from other parameters in the test.

Figure 23 - Test Parameters

Custom Reporting

Custom Reporting is used to select samples to print on a custom report. An unlimited number of custom reports can be created and placed on the list for use in the Maintenance Module (See “Add Custom Report”). You can retrieve samples for a client and print a report in the format that the client requests.

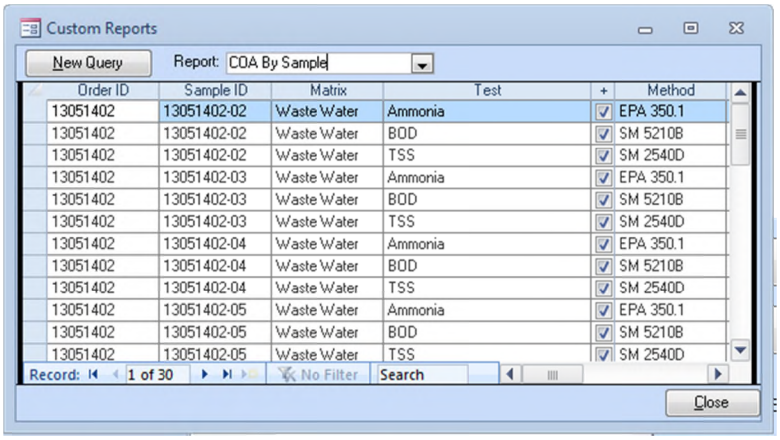

Figure 24 - Selecting Samples for Custom Reports

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Trend Analysis

Trend Analysis provides a convenient method to view the trend of results for a particular test, date range, project, etc.

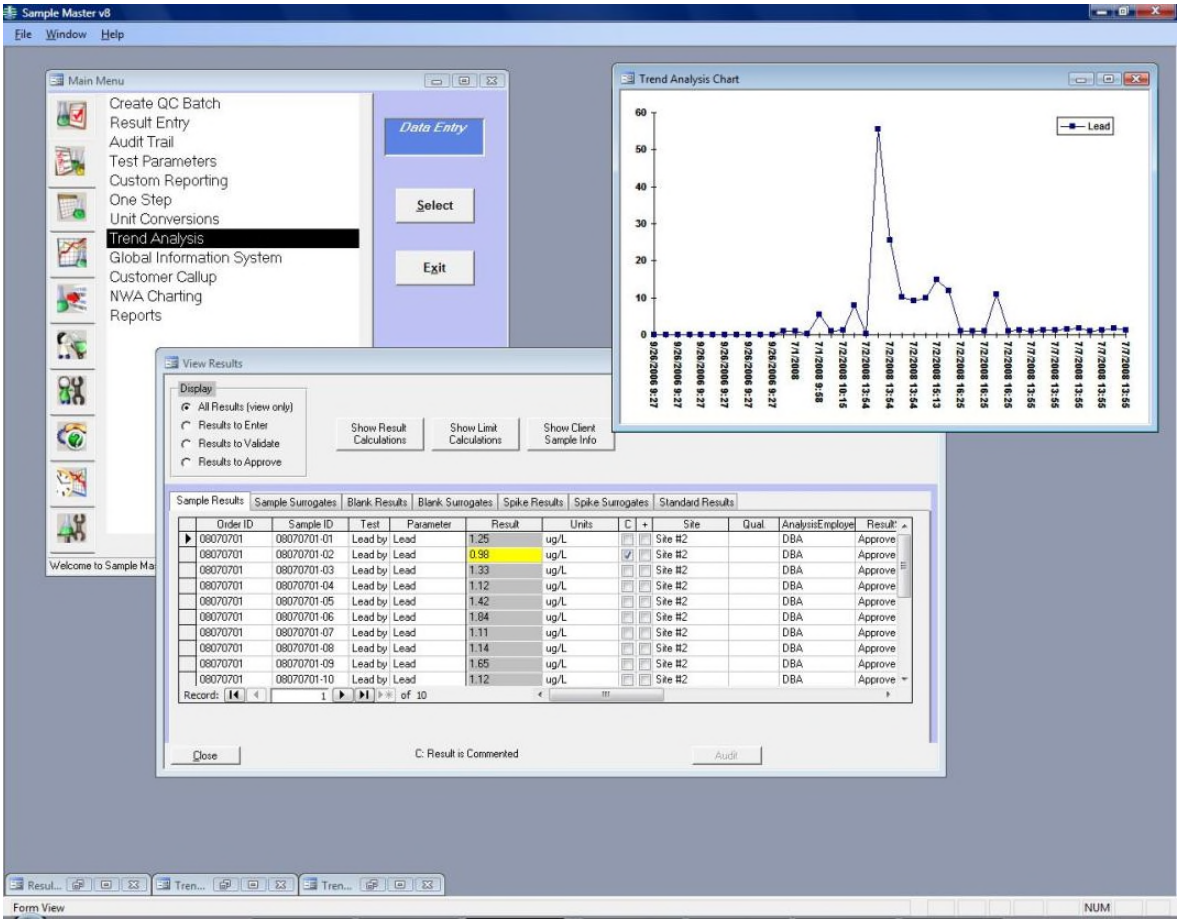

Figure 25 - Trend Analysis

Statistical Analysis

Links to NWA or SAS JMP allow users to perform a range of statistical analysis and generate charts for sample data. Charts can be easily created from result data. The two charts shown were made from the data at the bottom.

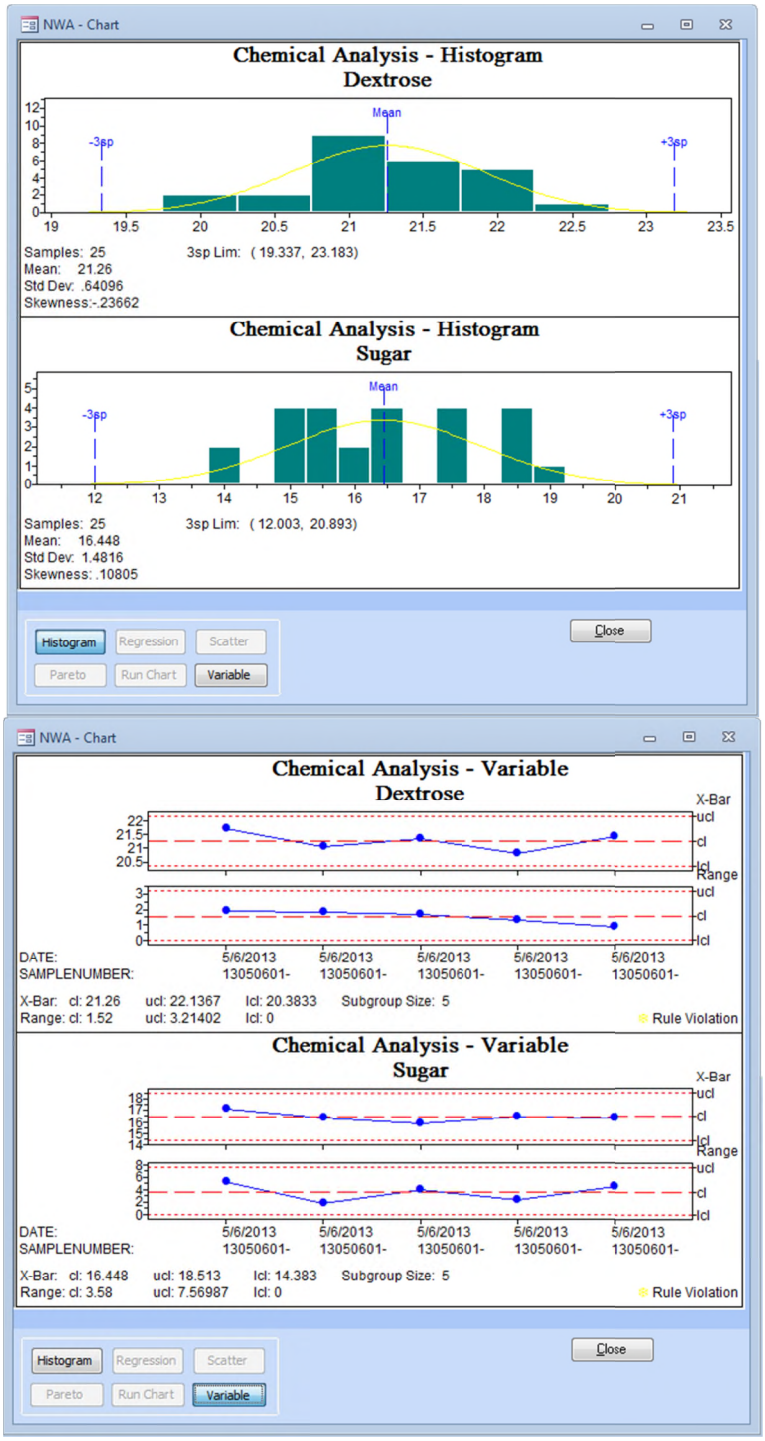

Figure 26 - NWA Charting

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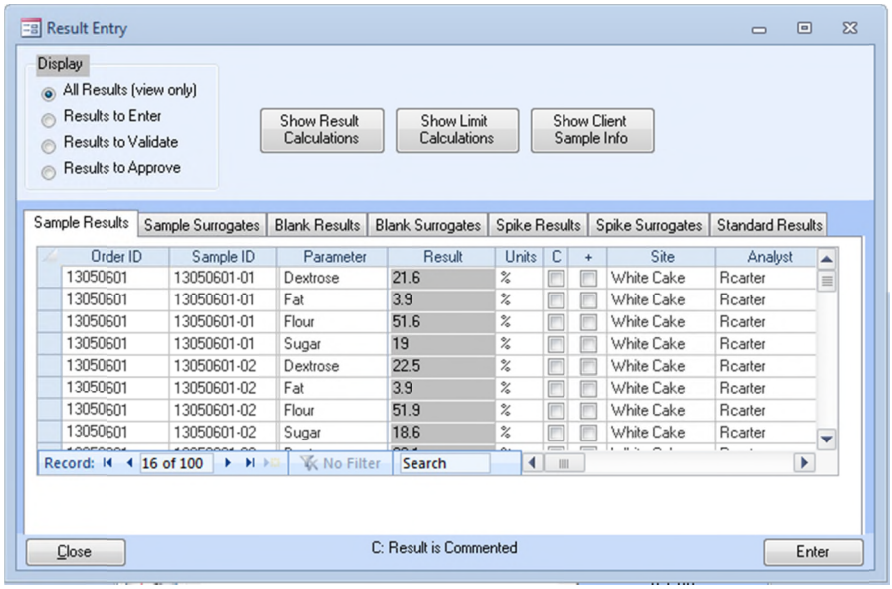

Figure 27 - NWA Charting Data

The Sample Scheduling Module

This module is used to schedule routine samples for automatic login into Sample Master®. Project Definition and Scheduling Tests and sites are scheduled for collection by projects. The frequency for each project can be:

Frequency	Description
Annually	Once a year
Semi-annually	Once every six months
Quarterly	Once every three months
Monthly	Once a month (by day of month or by day in week)
Bi-weekly	Once every two weeks
Weekly	Once a week (including multiple days)
Daily	Once a day
Hourly	Once every hour
Minutely	Once every minute

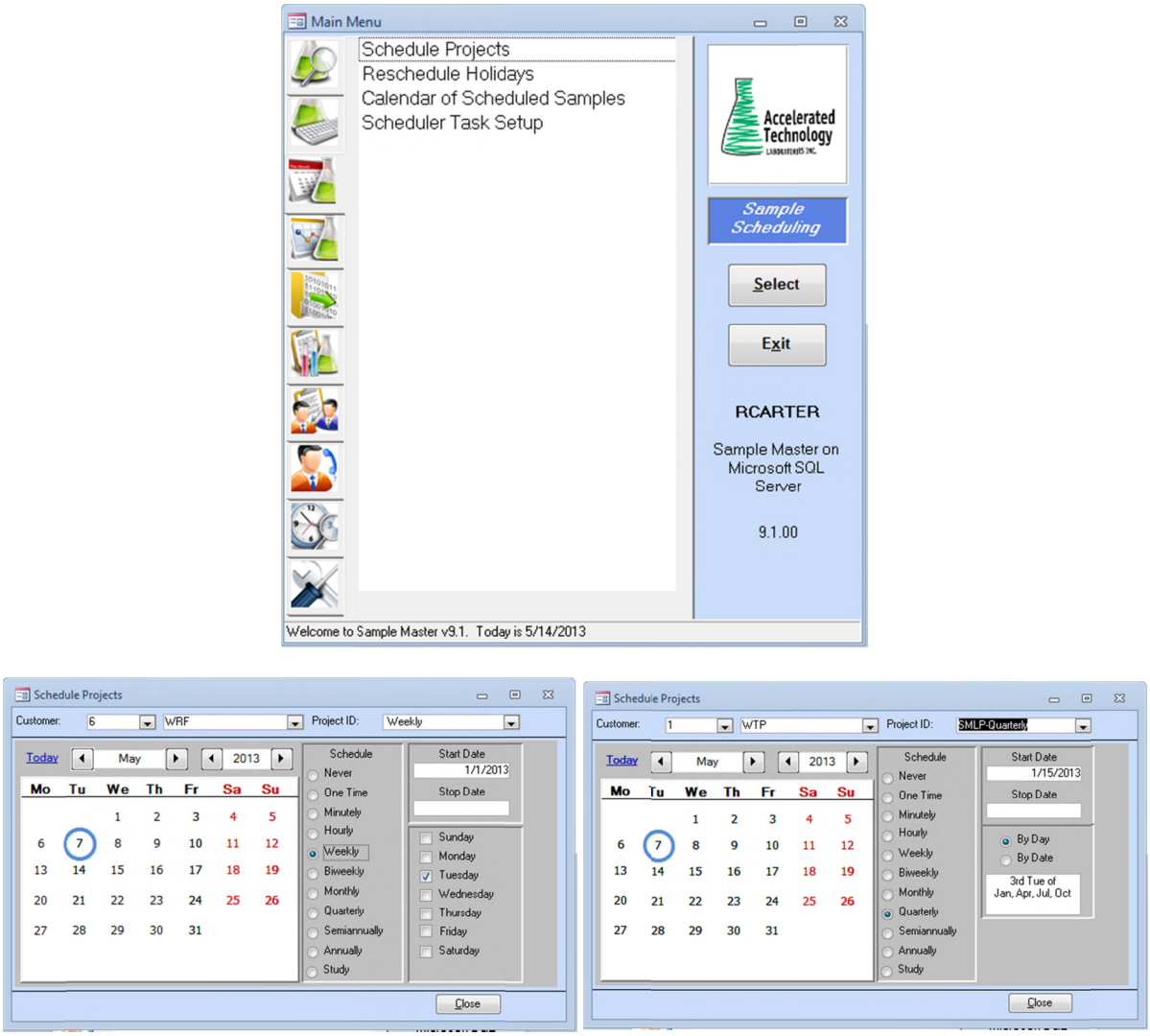

Figure 28 - Project Scheduling

Holiday Assignments

Projects that are scheduled for collection on holidays can be automatically canceled or rescheduled for a different day.

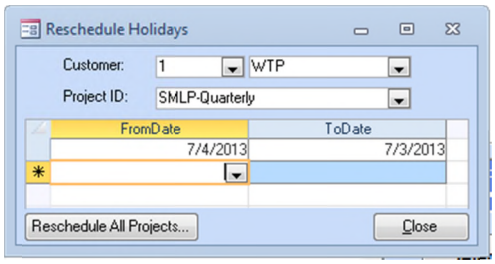

Figure 29 - Rescheduling Holiday Projects

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Calendar

The calendar function provides a monthly calendar showing all of the projects that are scheduled to be collected. By selecting a day on the calendar, the tests and sites for each project are displayed.

Scheduler Task Setup

The Scheduler can be configured to start on a particular day and run on a daily or weekly basis. Samples can be logged in one or more days in advance.

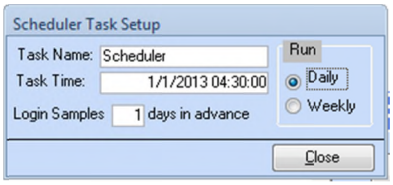

Figure 30 - Task Setup

The QA/QC Module

The QA/QC module allows users to graph results and create control charts for data that has been entered into Sample Master®. Users can configure tests to include QC, matrix spikes, blanks, duplicates, surrogates, matrix spike duplicator and many others. Control limits may be entered manually or calculated from historical limits. You can easily select the data to plot using criteria such as test, sample number, analyst, etc.

Figure 31 - QA/QC Main Screen

Control Charts

Control charts can be generated for a parameter by test, method, instrument, employee ID or test date. The results that are used to calculate the control limits and the results that are plotted on the control chart can be selected. The control charts can be printed and saved for future use.

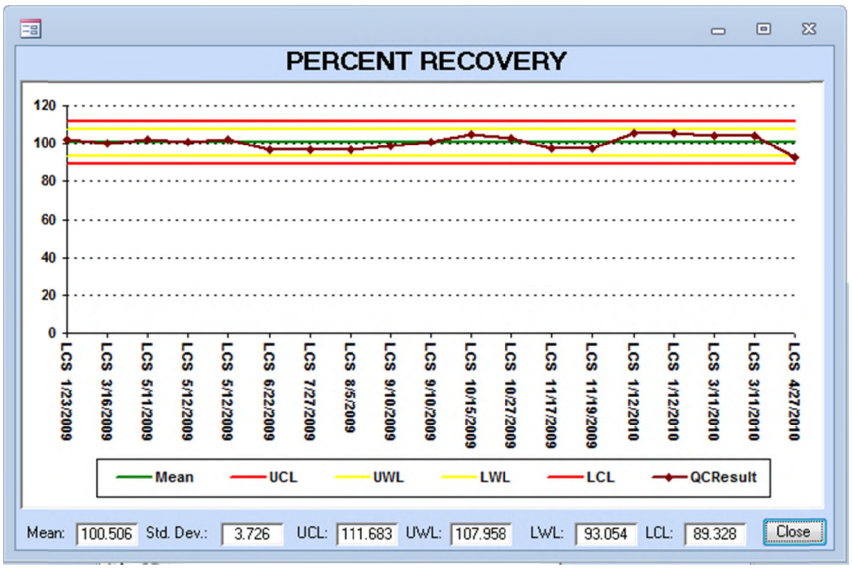

Figure 32 - Recovery Control Chart with Control & Warning Limits

Control Limits

In addition to calculating the control limits, Sample Master® provides the means to enter manually, control limits that are calculated by other means. These limits can also be electronically imported from popular statistical packages.

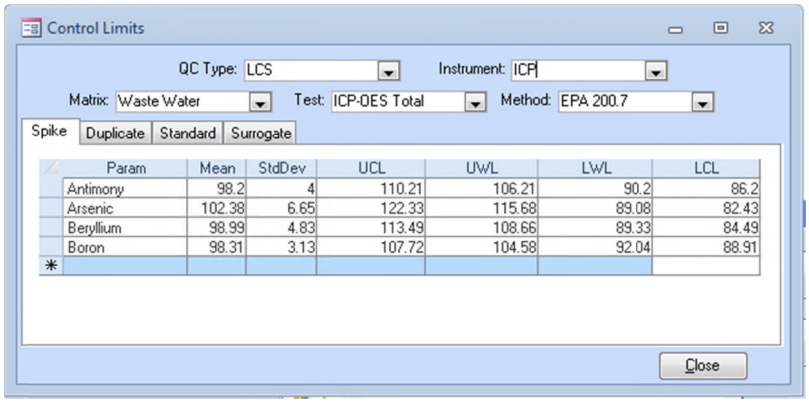

Figure 33 - Manual Entry of Control Limits

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QC Types

This function allows the end user to create an unlimited number of QC types that can be added to QC batches. This might include triplicates, field blanks, trip blanks, etc. This function also allows the user to change the names of QC Types to match the laboratory terminology.

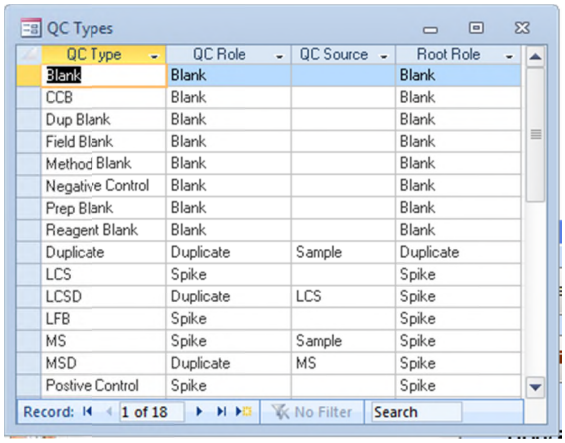

Figure 34 - Entering/Modifying QC Types

The Electronic Data Transfer Module

This module is used to upload data from instruments automatically. A single file or an entire directory can be scanned. Users can also import multiple instrument runs and select which data is placed into Sample Master®.

Import Data from a File

Results can be automatically entered electronically from spreadsheet or text files. Either the spreadsheet file can have the columns of data in a defined order such as sample number, concentration, units, etc. or the first row of the spreadsheet can label the columns.

All importing is accomplished by creating a task and selecting the files to import. Specific files can be selected to import at a certain time. Any error that may occur during importing will be displayed for the task. The user can choose whether tasks that complete without error are displayed or removed.

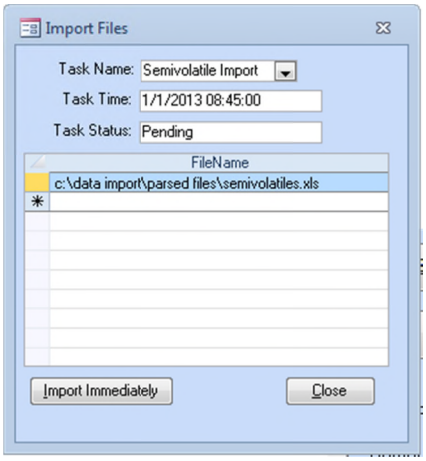

Figure 35 - Data Import

Import All Files in One Directory

Sample Master® can continually check a directory to import any file that is in the directory. After a file is imported, it is moved to a subdirectory called “imported”.

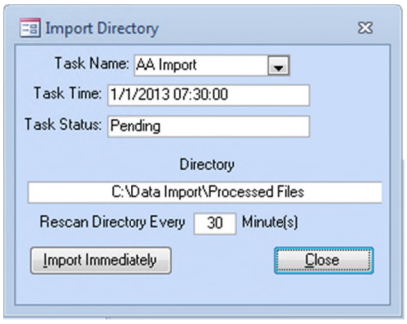

Figure 36 - File Directory for Imports

Select Imported Runs to Enter

This function allows the end user to select which runs are entered into the database as the result. For example, multiple runs with different dilutions can be imported into Sample Master® and the end user can select which run is used for each parameter.

The Chemical Inventory Module

This module tracks the purchasing, usage and disposal of chemicals, reagents and supplies in the laboratory. This module can be customized to contain a list of current vendors that can be customized to individual laboratory needs.

Supplies and Vendors

This function allows the end user to enter which supplies will be tracked and which vendors are used by the laboratory.

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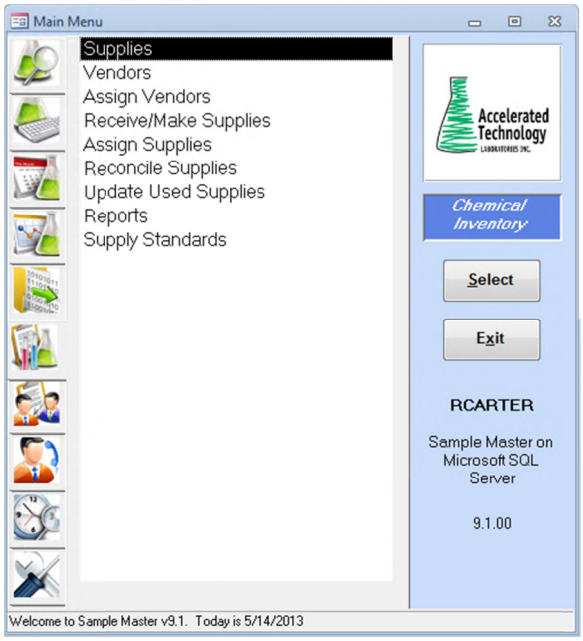
Receive/Make Supplies

This function is used to add to the amount of supplies available in the laboratory.



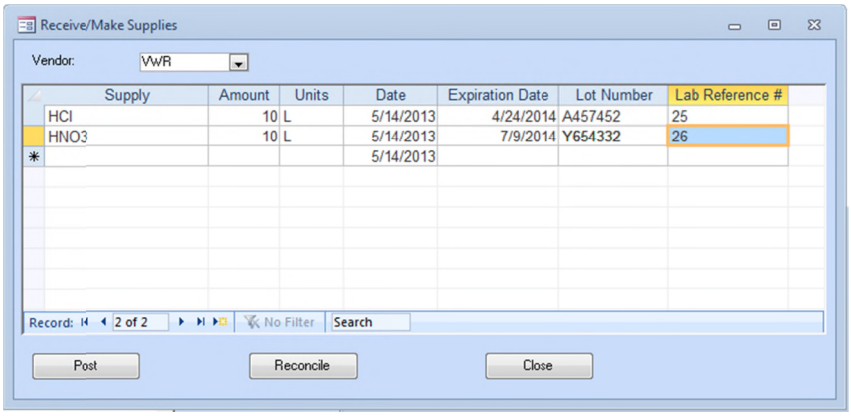


Figure 37 - Receiving Supplies

Reconcile Supplies

This function is used to reconcile supplies between the amount stored in Sample Master® and the actual amount in the laboratory.

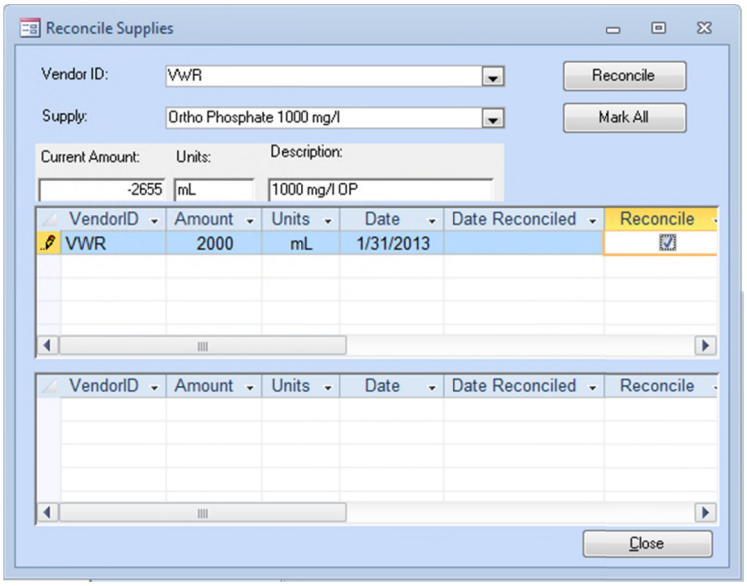


Figure 38 - Reconciling Supplies

Update Supplies Used in Samples

This function is used to calculate the supplies used during analysis of samples. It deducts the supplies used from the available inventory.

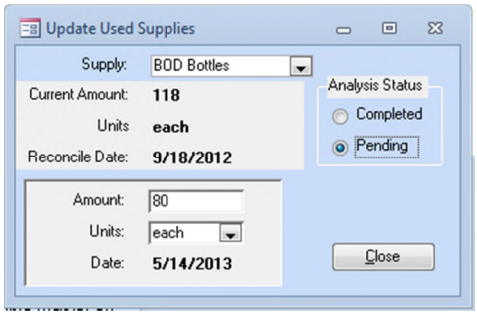


Figure 39 - Updating Used Supplies

The Resource Management Module

This module allows users to track employee training certificates and records training classes taken. This ensures that training records are up to date. The instrument management portion allows users to track instrument maintenance, including calibration, costs, and repairs. This module provides integrated functions that allow users to monitor each instrument and follow trends so that preventative maintenance can be scheduled if needed.

Define Instrument Calibrations

This function is used to list the available types of instrument calibrations.

Instrument Calibrations

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This function is used to list the calibrations for each instrument including when the next calibration is due.

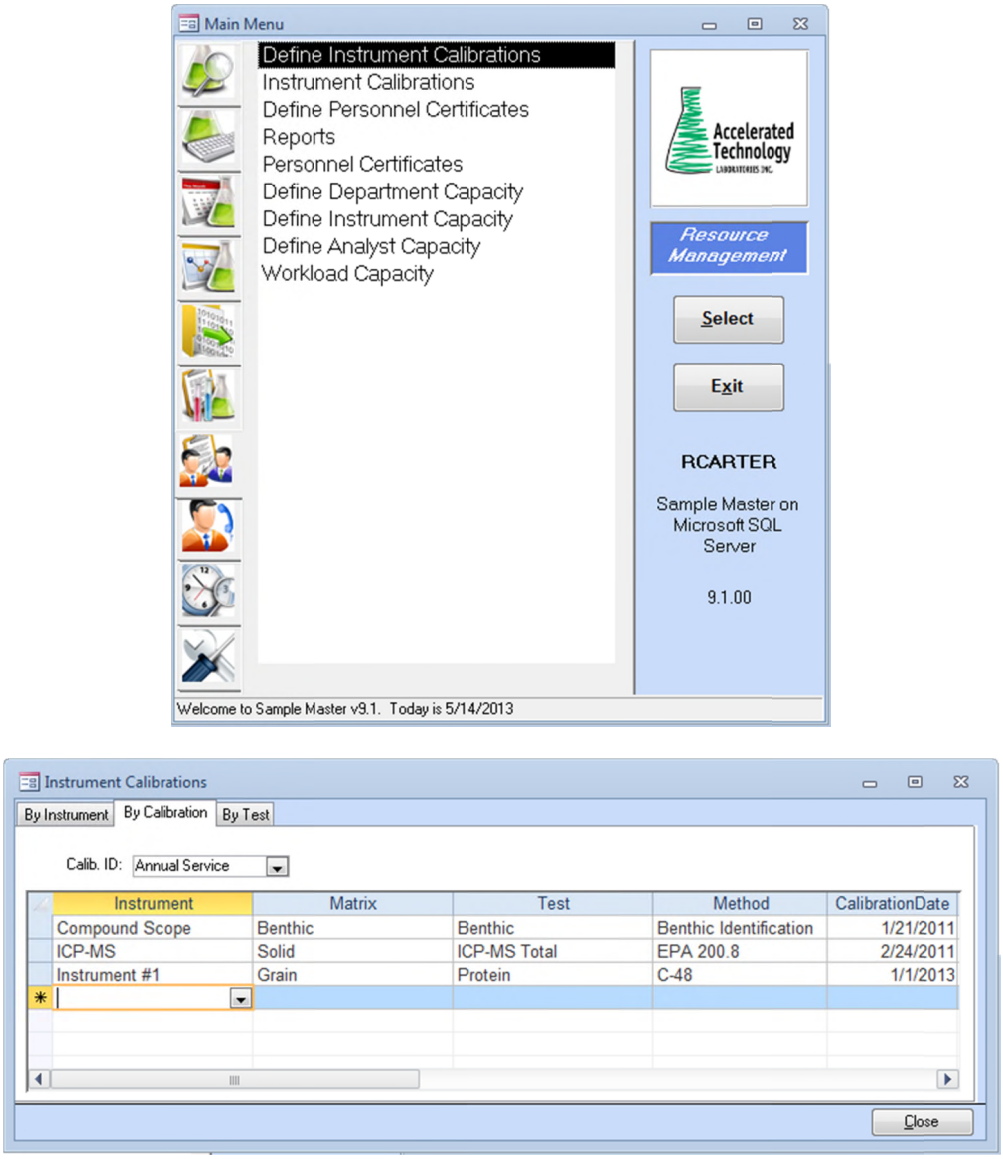

Figure 40 - Tracking Instrument Calibration

Define Personnel Certificates

This function is used to list all of the active certificates.

Personnel Certificates

This function is used to list the certificates for each employee.

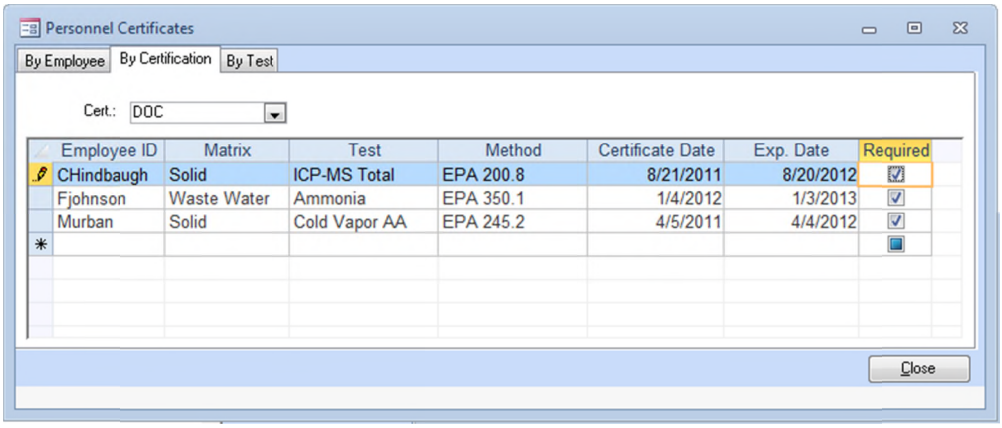

Figure 41 - Managing Employee Certifications

The Customer Relationship Management (CRM) Module

For any laboratory, complaints and special requests are routine. Misreported results, lost samples, missed turnarounds, billing disputes, and requests for custom reports or data packages can be a daily occurrence. Without an organized method of tracking and monitoring problems, customer satisfaction can quickly suffer.

The Sample Master® Complaint Manager can assist the lab by keeping track of all unresolved issues. Complaints can be reported by priority, status, and elapsed time. This prevents problems from being lost or buried on someone's desk. Complaints can be dealt with based on the length of time they have been open or the urgency of the request. The status of the complaint can be retrieved at a moment's notice.

For laboratory management, the information thus gathered can be used to monitor trends in complaint frequency, types, and turnaround. The types of complaints or the length of time it takes to resolve them may help identify areas of weakness in the laboratory's operations. There are several reports aimed at tracking this type of information. These reports can also be used to monitor complaints from specific critical customers, which may allow the lab manager to find out about emerging problems *before* the customer starts sending samples to another laboratory.

Creating a New Complaint

Each new complaint is assigned a unique Complaint ID. The format of the Complaint ID depends on the defaults that are set in the Maintenance Module. Once a complaint has been created, events may be added to it as steps are taken to resolve the complaint.

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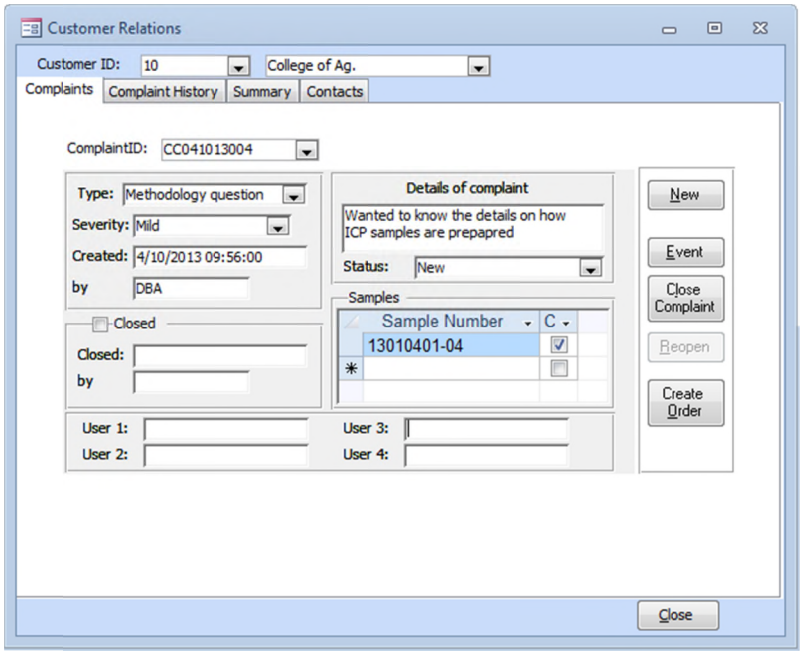

Figure 42 - Creating New Complaints

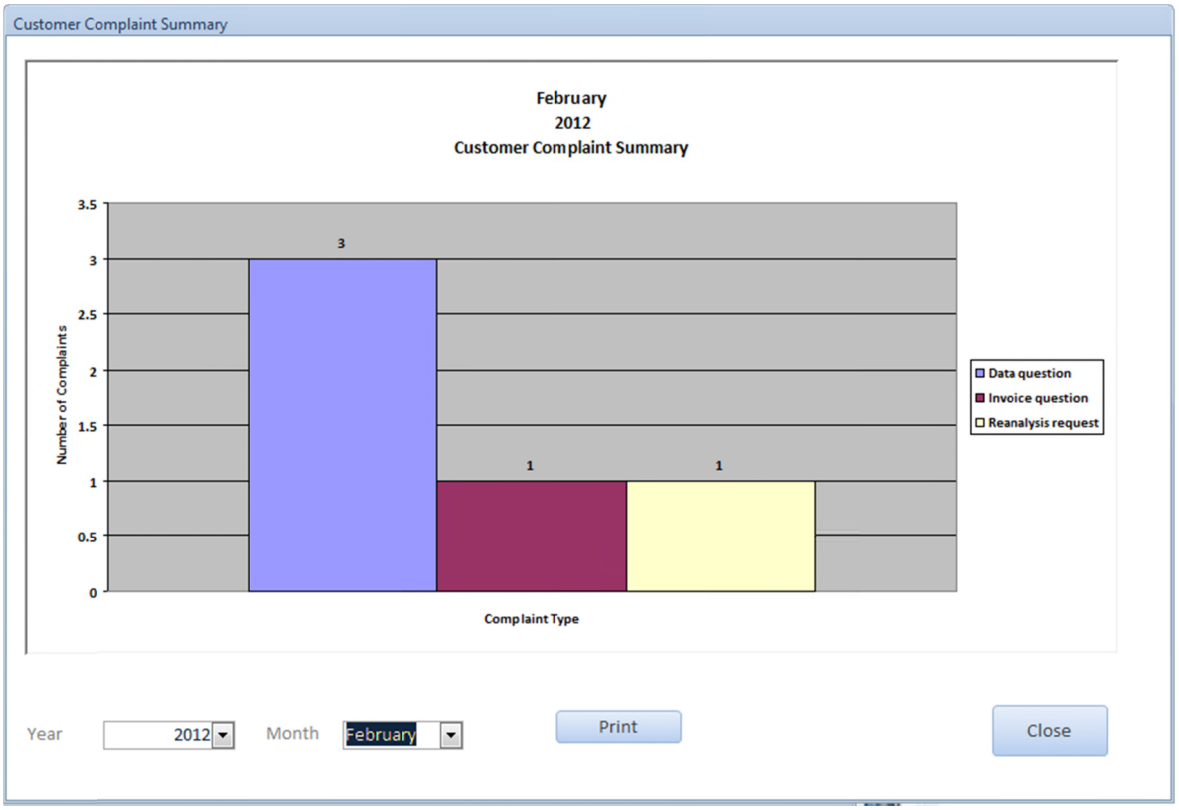

Figure 43 - Complaint Summary Screen

The Summary screen shows a snapshot of activity, both for the current customer and for the entire lab. It is a quick way to spot trends and see the volume of complaints over the last month. Included

on the screen is the *average TAT*, which is the average number of days complaints remained open. The average includes all complaints closed in the last 30 days.

The Complaint Severity Function is used to enter and maintain the list of Complaint Severities that are available to select on the Customer Relations form. It is accessed from the main CRM menu. The user can edit the Sort order or add new Severities.

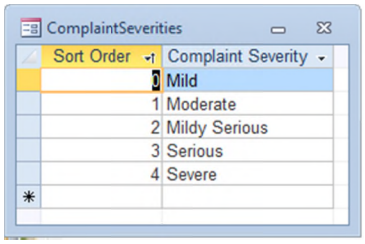

Figure 44 - Complaint Severities Function

Open Complaints by Severity

This report lists all complaints that have not been closed yet. The complaints are sorted by priority, with the highest priority complaints appearing at the beginning of the report. It includes customer information, the date the complaint was opened, and the last activity for each complaint.

Customer History

This report lists detailed information about each complaint. The complaints are listed for each customer in the order they were received. It includes the status of the complaint and a chronological listing of all events for the complaint.

Summary by Type

For any selected period, this report lists counts of complaints open at the start of the period, received, resolved, and open at the end of the period. It also shows the average turnaround time for complaints closed during the selected period. These statistics are provided for each Complaint Type.

Executive Summary

This report consists of several graphs, which summarize complaint activity and turnaround time over the last 24 months. Some of the charts compare activity for corresponding months in the two years. There is also a stacked line chart, which can be used to show trends in the types of complaints being received.

The Maintenance Module

The Maintenance Module is used to enter information that is used by all other portions of Sample Master® and to provide a central location for the database administrator to maintain Sample Master®.

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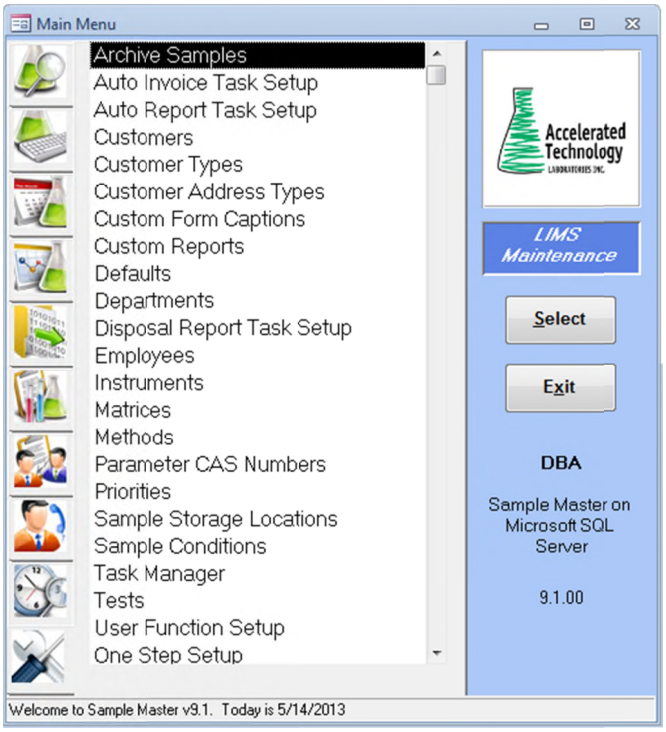

Figure 45 - The Maintenance Module

Some of the functionality includes:

Archive Samples

Using the "Master Query", samples can be removed from the active database and placed in an archive database. This keeps the database size manageable and will vary based on each laboratory's in-house hardware.

Auto Invoice and Auto Report Task Setup

When the last sample result is approved for entire Order ID, Sample Master® Pro can be configured to automatically print the report and an invoice. Each test can be printed to a different report.

Customers

Adding, modifying or deleting the name, address, phone numbers and contact names for each customer is accomplished with the Customers option. Separate information for invoicing is included here.

Customer Prices

Prices for each customer can be set on a project-by-project basis or for all projects. When a test is assigned to a sample, Sample Master® Pro uses the price that is set for that customer and project for the priority. If no price is found, Sample Master® Pro uses the list price for the test and priority.

Customer Projects

Multiple projects can be created for each customer. These projects can have separate names, locations, etc.

Customer RDLs

Detection limits for each customer can be set on a project-by-project basis or for all projects. When a result is reported if no RDL is found Sample Master® uses the default RDL for the test.

Custom Form Captions

Almost every screen caption can be modified to mirror the terminology of your laboratory. This means that you can change items such as Sample Number to Sample ID or any other name that your laboratory uses.

Custom Reports

An unlimited number of custom reports can be created (*users can use Crystal, Word or Excel for reporting, if desired.)* The samples to be placed on the report are retrieved with the "Master Query".

Defaults

This is used to modify defaults that are used throughout Sample Master®. These defaults include Order ID, Sample Number, QC Batch ID and Preparation Batch ID formats, the number of days before samples are disposed, etc.

Departments

The name and description for each department are entered here.

Disposal Report Task Setup

In addition to invoices and reports, Sample Master® can automatically print reports that show which samples are ready for disposal.

Employees

The name, title and phone number of each employee are stored here.

Instruments

A list of instruments and support information is entered here.

Matrices

Tests can be separated by matrix. This means that different limits, department order, etc. can be assigned to a matrix/test combination.

Methods

The name, activation date, retirement date and description of each method are modified here. Once a method is added, it can only be retired. This ensures that all results have a traceable method associated with it.

Parameter CAS Numbers

Each parameter can have a CAS number associated with it. These values are entered here.

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Permissions

The permissions for each employee are modified here. By default, an employee does not have permission for any departments until the department is added for that employee.

Priorities

Five priorities can be used with the ranking from low priority (0) to high priority (5). When samples are displayed for adding to worklists, they are ranked by priority.

Sample Storage Locations

Samples can be stored at various locations in the laboratory such as refrigerators. These locations are entered here.

Scheduler Task Setup

This is where the time of the day that the scheduler will run is set and whether it will run daily or weekly. The number of days in advance that it will login samples is also set here.

Task Manager

The Task Manager is a process that is started on one computer and “looks” for files to import or samples to log in from the sample scheduler. It can be set to look for tasks at a defined number of minutes.

Tests

Information about each test including bottle type, preservative, method, department order, instrument, price, cost, due days, expiration days and a description is modified here.

Auto Faxing and E-Mailing in Sample Master®

In Sample Master® our Auto Reporting function will automatically email, fax or print a report by test on a customized schedule. For instance, a user could set Sample Master® to send these reports out when information is available weekly, daily, hourly or up to the minute. This will allow laboratories customers to keep their customers informed automatically.

Sample Master® Pro GIS (Geographic Information System)

Sample Master®'s GIS functionality will pinpoint customer sites or sample collection locations to their exact geographic location. Many locations do not have a mailing address so Sample Master®'s GIS functionality also maps by latitude and longitude.

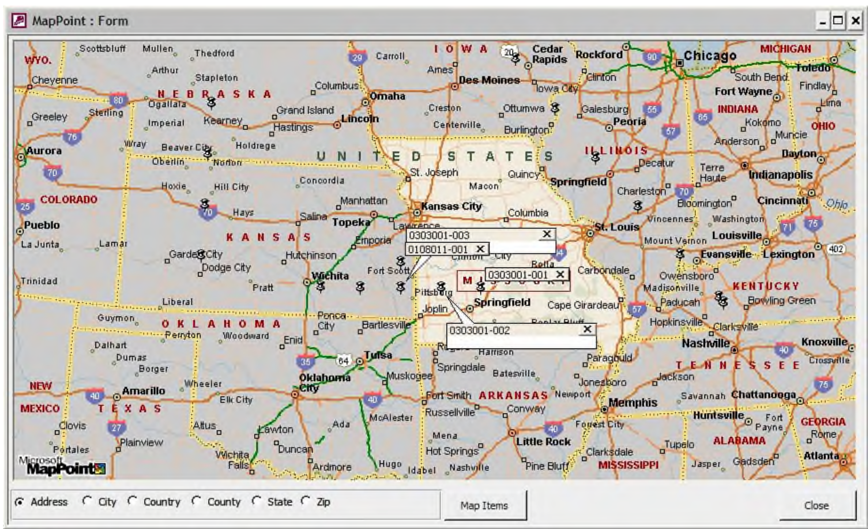

Figure 46 - Sample Master(R) GIS

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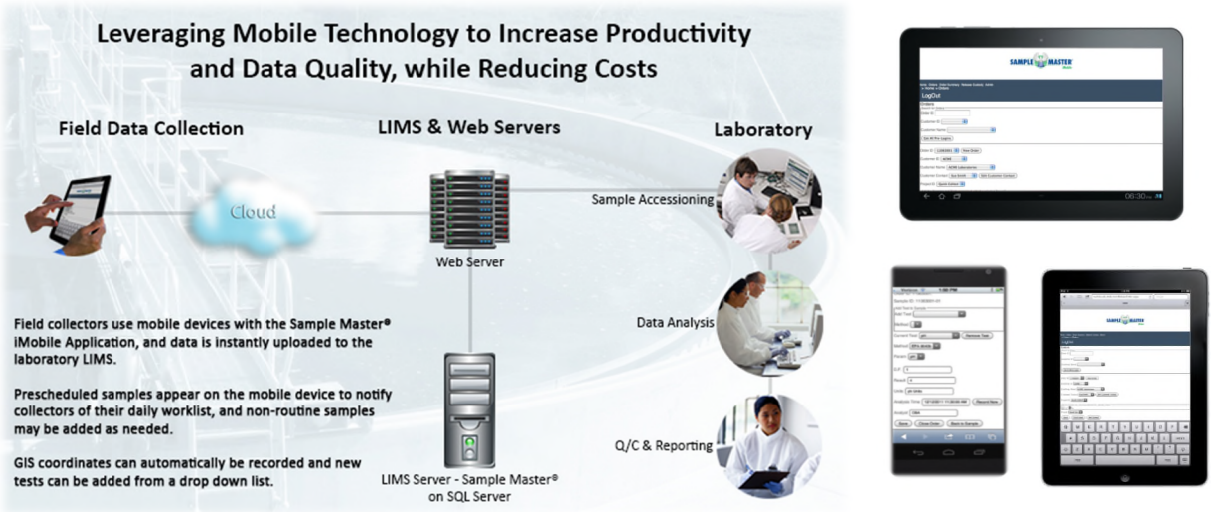
Sample Master® iMobile

Providing LIMS users in the laboratory and the field with the ability to capture data in real time and on-the-fly, Sample Master® iMobile is a cutting-edge tool that allows users to upload testing site data as it is collected, eliminating the need to manually re-enter documents and field measurements, or return hard copies to the laboratory. Sample Master® Mobile runs on any qualified mobile device with a web browser and the ability to connect to the internet, and integrates seamlessly with Sample Master® LIMS.

Data from the field or collected in the laboratory, including electronic chain of custody, collector information, date and time stamps, location information, GIS coordinates, test results, notes, and more, is encrypted and transmitted securely to the laboratory where it assimilates effortlessly into the LIMS.

All businesses continually strive to reduce costs, increase service, improve productivity and remain competitive, and Sample Master® iMobile is the perfect application to assist with this goal. By facilitating collection of data away from workstations, reducing the time for data to be returned to the laboratory, improving data quality, and eliminating the need for paper forms, Sample Master® iMobile provides a rapid return on investment.

Leveraging Wi-Fi, 3G and 4G technology, Sample Master® iMobile offers users the ability to cache data until a connection is available, and automatically synchronizes the captured data with Sample Master®. The application runs on most devices using Android 4.0+ and on Apple iPads and iPhones**.



***Sample Master® iMobile Requirements**: Outward Facing Connection on server to the website and web service will be installed; IIS 7.0; Windows Server 2008. Processor: Minimum: 1GHz (x86 processor) or 1.4GHz (x64 processor); Recommended: 2GHz or faster; Note: An Intel Itanium 2 processor is required for Windows Server 2008 for Itanium-Based Systems. **Memory**: Minimum: 2GB RAM; Recommended: 4GB RAM or greater; Max for 32-bit systems: 4GB (Standard) or 64GB (Enterprise and Datacenter); Max for 64-bit systems: 32GB (Standard) or 1TB (Enterprise, Datacenter) and 2TB (Itanium- Based Systems). **Available Disk Space**: Minimum: 10GB; Recommended: 40GB or greater; Note: Computers with more than 16GB of RAM will require more disk space for paging, hibernation, and file dumps.*

Result Point®

Result Point® is a very secure and powerful way for customers to retrieve both order statuses and results (preliminary and final) PDF reports, electronic data deliverables, news items, permits, from the World Wide Web. It allows the users to have real-time access to Sample Master® for sample information without having access to that database. The site can be branded with your organizations logo and a link to the Result Point® page can be added to the laboratories existing web site.

To begin the process, the customer clicks on the link on the laboratories home page that brings them to the Result Point® login page (Figure 47). The customer enters their Customer ID or username and password as assigned by the laboratory and clicks the login button.

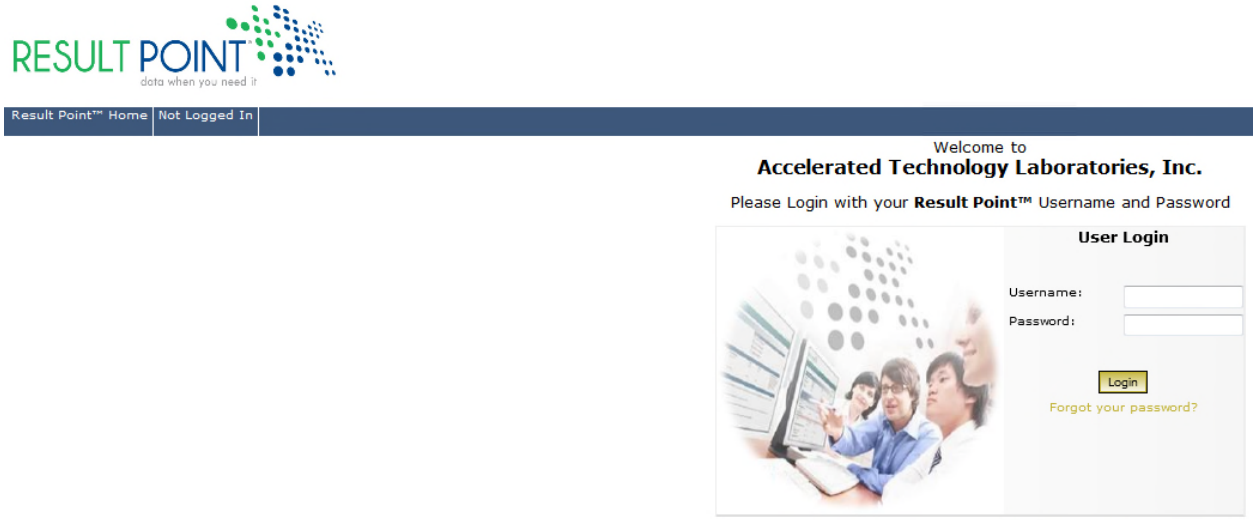


Figure 47 - Result Point Login Page

The customer either can then view an order status or can view results for a particular sample. To view the sample status, they simply select the order ID and then click it to display a detailed or summary report. There are also several reports that are created on the fly, and as the data in the LIMS is updated, these reports are updated.

The system leverage SSL (Secure Socket Layer) with electronic server certificates to ensure that all data is secure with 128-bit encryption.

The customer can then click the Samples button to display information about each of the samples in the order, broken down by year and month and order IDs. This will display the sample number, site, customer sample number, collector, collection date and received date for each of the samples. Users can also search by site if they desire.

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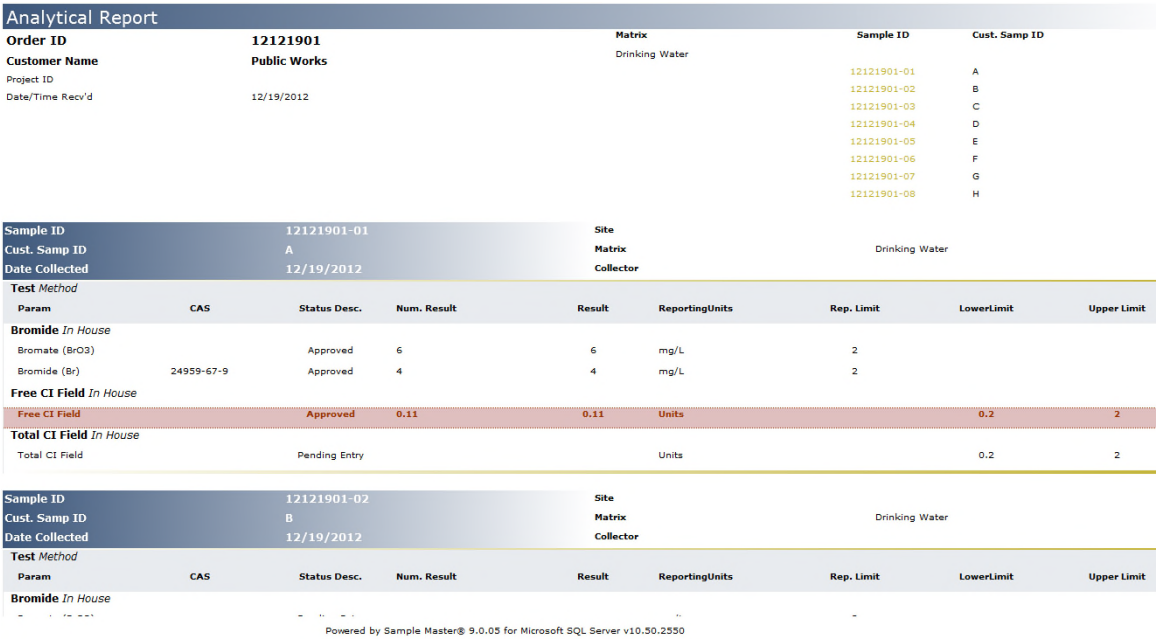


Figure 48 – Report Results

The customer can then print the results (Figure 48) in the same manner as any other web site, with printer friendly printing in which users can turn page breaks on or off.

Figure 49 - Attachments

Result Point® also allows users to link PDF final reports or CoA to each sample for 24/7 access (Figure 49). This allows users to print out final copies of only their reports with a user name and password from a secure web site.

Administrative functionality for Result Point® allows users to update banners with laboratory specific information, search for sites with a hot lookup and set permit limits for each site if desired. In addition, a color-coded bar will indicate which samples have exceeded the permit limits for easy reading. A user access function tells the administrators which users have utilized the site and how long they are on the site and from which IP they entered the site. Additional administrator tools look at page load time and usage to ensure that clients have rapid access to data.

Sample Master® Minimum & Recommended Specifications
Client Requirements
Minimum: Windows XP (with latest service pack) or higher, 1GB of RAM, 100MB of available hard disk space, 1024 x 768 display resolution
Recommended: Windows 7 or higher, 2GB of RAM, 250 MB of available hard disk space, 1280 x 1024 display resolution
Server Requirements
Minimum: Microsoft SQL Server 2005, Windows Server 2003 (with latest service pack) or higher, 2GB RAM, 1GB available hard disk space
Recommended: Microsoft SQL Server 2012 (or higher), Windows Server 2012 (or higher), 4GB RAM, 2 GB available hard disk space

Result Point® Minimum Technical Specifications	
Client Requirements	MS Internet Explorer 8 or Higher, Google Chrome 22 or higher, Firefox
Application Server Requirements	Sample Master v8.5 or Higher w/ MS SQL 2008 R2 or 2012, or Oracle Windows Server 2003 w/ IIS 6.0 or Higher (server OS Required)

Accelerated Technology Laboratories, Inc. Company Background

Accelerated Technology Laboratories, Inc. (ATL) was founded in 1994 in the Silicon Valley in response to a need for an easy to use and affordable Laboratory Information Management System (LIMS). At the time, there were over two dozen LIMS solutions on the market, yet this need existed. ATL pioneered Windows-based LIMS, called Sample Master. Sample Master could work with both Microsoft SQL Server and Oracle. These two relational data bases were chosen because they were marketplace leaders and offered advanced functions such as referential integrity and excellent integration with other Windows applications such as Excel, Word, PowerPoint and WordPerfect. ATL subsequently developed a host of additional products including a NPDES Discharge Monitoring Reporting (DMR) package and iMobile technology, which leveraged smart phones, tablets and iPads to improve productivity and realize cost-savings in the field and the laboratory.

Today, the Sample Master® LIMS product line is installed in over 530 laboratories around the world. We have worked with our customers to solve laboratory information management and automation problems in a variety of laboratories including analytical, environmental, food & beverage, water & wastewater, chemical, government, public health, clinical testing and manufacturing, and others. ATL software has provided LIMS software solutions for a number of Fortune 500 companies and many other laboratories that are ISO, CAP/CLIA, ELAP or NELAC certified. All of ATL's LIMS software products are designed to grow with your laboratory and promote Good Laboratory Practices (GLP).

ATL continues to sustain a strong commitment to quality and invests heavily in research and development to provide our customers with the best available technology and tools. We are one of the few independent LIMS firms that is ISO 9001:2008 certified, and we are one of the few LIMS vendors that is a Microsoft GOLD Certified Partner. ATL has attained Gold Certified Partner status in the Microsoft Partner Program with a competency in Data Management Solutions and Networking Infrastructure Solutions. Microsoft awarded the designation to ATL in recognizing of our expertise and impact in the technology marketplace. As a Gold Certified Partner, ATL has demonstrated expertise with Microsoft technologies and proven ability to meet customers' needs. Microsoft Gold Certified Partners receive a rich set of benefits, including early access to new features and tools, additional training and enhanced support; this improved access to Microsoft resources gives us a distinct advantage. As a Gold Partner, ATL's customers receive many additional bonuses, as ATL receives Microsoft software prior to public release along which allows us to proactively plan for upcoming changes prior to their release, rather than having to reactively scramble to adapt to them after they have been made. Sample Master® recently achieved VMware Ready™ and Citrix Ready® status, and is fully supported on VSphere 5.5 or above and Citrix XenApp® v7.6.

ATL is also an Oracle Business Alliance and Citrix Technology Partner. ATL's partnerships with firms such as Linko, HACH, AllMax (Operator 10), Northwest Analytical, SAS JMP, InfoTech, Tracking Solutions, Toshiba, Dell, IBM, HP-Compaq and others allows us to leverage the best available technology in our laboratory information management solutions. All of these alliances and certifications enable us to better serve our clients and allow us to offer our customers superior software solutions at affordable costs. ATL also maintains a competitive advantage in the LIMS industry because it holds regular user groups and focus groups to determine what new features and regulatory issues are important to users and parlays them into a specification document for future releases.

ATL is headquartered in West End, NC with additional offices in Raleigh, NC; Asheville, NC; Myrtle Beach, SC; Little Rock, AR; Denver, CO; Ft. Worth, TX; McKinney, TX; Dayton, OH; Springfield, MO; and Franklin, TN. Internationally, ATL has sales offices in Canada, Europe, South America, Mexico, Africa and the Middle East. ATL's dedicated staff of 35 has extensive experience in LIMS setup, implementation, database conversion, system validation, instrument integration, training and support. Our employees are subject matter experts in the fields of chemistry, computer science, microbiology, laboratory management, software development and water & wastewater with various degrees ranging from AS, BS MS, MSc to PhDs

A comprehensive support plan and dedicated training team back ATL's strong customer commitment and LIMS solutions. All Customers with active support agreements are guaranteed superior technical support from 8am to 5pm EST. Customers with PLATINUM Support or extended support hours have a support engineer assigned to them that can be reached beyond normal support hours on a cell phone to meet their live support requirements. Customers with GOLD and PLATINUM Support are guaranteed a dedicated Account Manager that will respond to their needs quickly and efficiently.

ATL keeps our customers informed of LIMS and industry news by publishing a quarterly newsletter and holding regular focus groups to ensure that new technology and products continually meet the needs of the laboratory. We also hold user group meetings to obtain customer feedback and provide customers with the opportunity to share ideas, business strategies, and reports, as well as build friendships with other users.

Attachment G

Planning for LIMS

Strategic and Operational Planning

A formal review of the discovery and development process and human and system interfaces is mapped in the form of flow diagrams to form the basis of a roadmap for successful LIMS utilization.

- ✓ A review of the laboratory's strategic goals and a risk assessment
- ✓ A needs assessment/gap analysis to understand the current laboratory and technology workflows
- ✓ A technology analysis of the current state of the IT environment including architecture (hardware/software) and operational processes
- ✓ The deployment of a phased implementation plan

ATL recommends a one-day site assessment to meet with the IT team to determine what components, if any, should be proposed. Technology moves so quickly – what is specified today could be replaced by something more superior for the same cost in a few months. Many times our clients have hardware in place that can be leveraged in the new system and it is important to find out what expertise the team has, and whether there is a preference for any particular hardware vendor. ATL is a partner of HP and Dell, but we have deployed several other brands as well. Additionally, ATL is a LIMS firm (not a networking firm, although we have expertise in that area) and we work with our hardware partners to conduct on-site visits to determine the best available technology and work with our clients. A LIMS is a long-term partnership and we want to ensure that we are getting the best technology.

Requirements Document (RD)

The workflow analysis process allows for definition and testing of the functional and technical requirements for potential technology solutions. This task provides the baseline for the development and configuration of a tailored solution to meet the client's unique needs. Users are able to see firsthand how the various modules that make up the LIMS can help them achieve their individual and workgroup goals.

Workflow Creation

Because no two laboratories are identical, workflow creation is the critical task to a successful LIMS deployment. The workflow creation exercise directs all stakeholders to actively participate in understanding the current operational processes. Once workflows have been created for each section of the laboratory, it is much easier to understand the entire process and look for areas of improvement. ATL's engineers have extensive expertise in migrating data from legacy systems and successfully migrating data, workflows, as well as static table data.

ISO 17025 Compliance Check

This optional service will focus on automated, computer requirements of ISO 17025, as there are also laboratory requirements. ATL also has personnel that have worked with ISO 17025 requirements for the entire laboratory in addition to LIMS requirements, offering clients a single total solution.

As an integral part in creating ISO 17025 validated applications, ATL, Inc. offers services to:

- Audit the configured software and process.
- Ensure that the ISO 17025 Requirements are being met.
- Create IQ/OQ/PQ Documentation.
- Generate test plans and validation scripts.
- Review system compliance with Functional Requirements Specification guidelines.

Configuration

With custom configuration, ATL engineers work with your team to create a LIMS solution that meets your needs while executing our ISO Certified Quality Management System software development and configuration process. We deliver what you need - on time and within budget, as your laboratory automation partner – with no surprises.

Static Table Data Population

We work with your team to populate a template of static table data from your legacy system so that you will not have to re-enter any data that is currently stored electronically. We have extensive expertise in migrating data from numerous legacy systems and importing that information into ATL's data management systems.

Static Table Data Population QC (Quality Control)

Once all of the data is populated into a template, our engineers ask our clients to review the data (Quality Control). Engineers can also import the data into the template from the legacy system, such as those based on Oracle, Microsoft SQL Server, DB2, Access, Paradox, Filemaker Pro, My SQL, AS 400 and many others.

LIMS Tailoring to Each Area

The information from the Requirements Document (RD) and workflows can be incorporated into the configuration of the workflow for each department. System configuration also includes custom form captions to mirror the terminology that is utilized in the laboratory to facilitate acceptance.

LIMS Configuration

Once the templates and checklists are completed, the team can work to create a system that will accommodate the needs of the laboratory with a few typical use case scenarios for each laboratory section. This allows the team to envision how various test cases will be handled and to know if any adjustments need to be made to the configuration. Once the team is satisfied with the use case scenarios, the system is ready to be installed.

Deployment

ATL follows a proven methodology for installing and configuring LIMS systems that are easy to maintain and have the flexibility to accommodate variations in each department. This methodology comes from over a decade of experience.

LIMS Optimization

ATL's systems team will work with you to make sure that the computing environment has been optimized for maximum performance. Your systems, networks, and database environments are designed to deliver maximum performance.

Plan for Parallel Testing

Prior to putting a new LIMS into place, it is important to perform parallel testing to ensure that both systems are providing acceptable data outputs. Our engineers can assist with developing a plan for this testing.

Training Services

Our certified trainers provide custom tailored on-site End-user and LIMS Database Administrator training as well as classroom style training and on-the-job training in smaller groups. Because not all people learn the same way, our certified trainers utilize a combination of training methods and offer video tutorials. In addition, ATL also offers the following: 3-day Intermediate LIMS Boot Camp, 2-day Advanced LIMS Boot Camp and Web Based Training (Seminar or Interactive).

Attachment H

ATL LIMS Implementation Plan

The approach taken by ATL in LIMS implementation is one of collaborating with organizations to assist in all aspects of the implementation process. ATL is an ISO 9001 certified firm and as such has a Quality Management System in place that ensures that there are QC checks throughout the entire installation process, with extensive use of checklists and QC documents that follow a project plan developed in conjunction with the client to ensure a successful installation that is on time and on budget.

As a first step, ATL sends clients a Pre-Installation checklist to be completed prior to the Pre-Installation Conference Call. This checklist is used to help engineers to create a Gantt chart for the project. During the Pre-Installation Conference Call, ATL engineers and project managers meet with the key client project personnel to establish the requirements during the installation. This time is also used to discuss setting up the static tables in the database with methods, tests, matrices, users, sites, clients, prices, etc., training schedules (who will be trained and when), instrument access for the engineers to integrate the instruments, and other items important to the organization of the project. This also provides a chance for managers to bring up any questions that they may have. Once implementation requirements have been defined, and all pre-implementation tasks have been completed, on-site installation begins with a LIMS Kick-off Meeting and ends with a Wrap-up Meeting. At this stage, the Client is ready to go live into production.

Implementation Plan

ATL does not have a cookie-cutter implementation plan for all organization; rather, they are customized for each client as their needs vary. Many tasks can occur simultaneously, and implementation typically requires 4-7 months, depending on the options included (instrument integration, system interfaces, data migration from a legacy database, etc.). However, as a guideline, on the following page are some typical tasks with approximate completion times.

Implementation Plan

Task Name	Duration	Resources
Pre-Installation Checklist	1-2 weeks to complete. The checklist includes administrative and personnel information, a description of the database engine, network and hardware platforms, instrument Inventory, laboratory description, work flow analysis – sample migration through the laboratory, examples of test request forms, instrument output files, sample labels, management and customer reports, test methods, and a variety of other items including the client's expectations regarding the installation process and timing.	Client staff
Pre-installation Conference Call	2-4 hours to review and answer any questions concerning the checklist, installation details, and any general items and to define the installation schedule.	ATL Project Manager / Account Manager ATL Engineers / Client Project Manager / Client LIMS Team
If detailed configuration or customization is required, complete the Requirements Document (RD) and produce, test and deliver customization items	5-30 days (can be greater depending on the complexity of the configuration or customization.) ATL's RD process ensures that the client's customization items are defined, understood and approved by the client prior to any development, testing or installation of customization items.	ATL Project Manager / Account Manager / ATL Engineers / Client Project Manager / Client LIMS Team
LIMS Kick Off Meeting (on-site)	~1 hour (can be greater depending on complexity of the project and amount of configuration.) Review the entire configuration with the Laboratory Manager and Database Administrator/s and review training schedule for various groups and instrument availability.	ATL Project Manager / ATL Engineers / Client Project Manager / Client LIMS Team
Verify hardware, software and network requirements and set-up	1-4 hours depending on number of client machines and amount of client assistance (often information can be obtained from Pre-Installation Checklist.)	ATL Engineers / May include assistance from Client IT
Install LIMS on Laboratory Server‡	1-2 hours	ATL Engineers
Install LIMS Client Portion‡	~10 minutes per client machine (total time is dependent on the number of client machines.)	ATL Engineers

‡ Applicable to premise deployments only

Task Name	Duration	Resources
Work with laboratory to populate the static tables of the database	1-8 hours depending on the format, amount and availability of the information provided by the laboratory. NOTE - if all the information is in electronic format (Excel), ATL Engineers can populate the tables.	Client LIMS Team / ATL Engineers
If data migration is required, migrate data from historic data source to LIMS	2-4 days, depending on the format, amount, complexity and availability of the historic information provided.	ATL Engineers
Provide training to LIMS Database Administrators and LIMS Administrators	1-4 hours to review LIMS Administrator's Guide with DBAs and Administrators	ATL Certified Trainer / Client LIMS DBAs / Client LIMS Administrators
Instrument Integration with LIMS	Engineers can typically integrate 2 instruments per day. Software for integration is created off-site to maximize utilization of on-site time.	ATL Engineers
Test instrument integration and train LIMS Database Administrators on features and functionality	1-2 hours per instrument followed by a review of functionality with LIMS Administrators.	ATL Engineers / Client LIMS DBAs
Provide End-user training with training manuals	2-4 hours per group (i.e. login, analysis, reporting, etc…) to review the LIMS from logging in a sample through result entry and reporting with the laboratory end users.	ATL Certified trainer / Client End Users
Wrap-up meeting	2-4 hours to review and sign off on tasks completed and discuss any open items or outstanding issues and plan to address those.	ATL Project Manager / ATL Engineers / ATL Certified Trainer / Client Project Manager / Client LIMS Team
Going Live	(As a client option, ATL can offer on-site assistance during go-live if needed.)	ATL Engineer / Client End Users

Implementation Project Responsibilities and Procedures

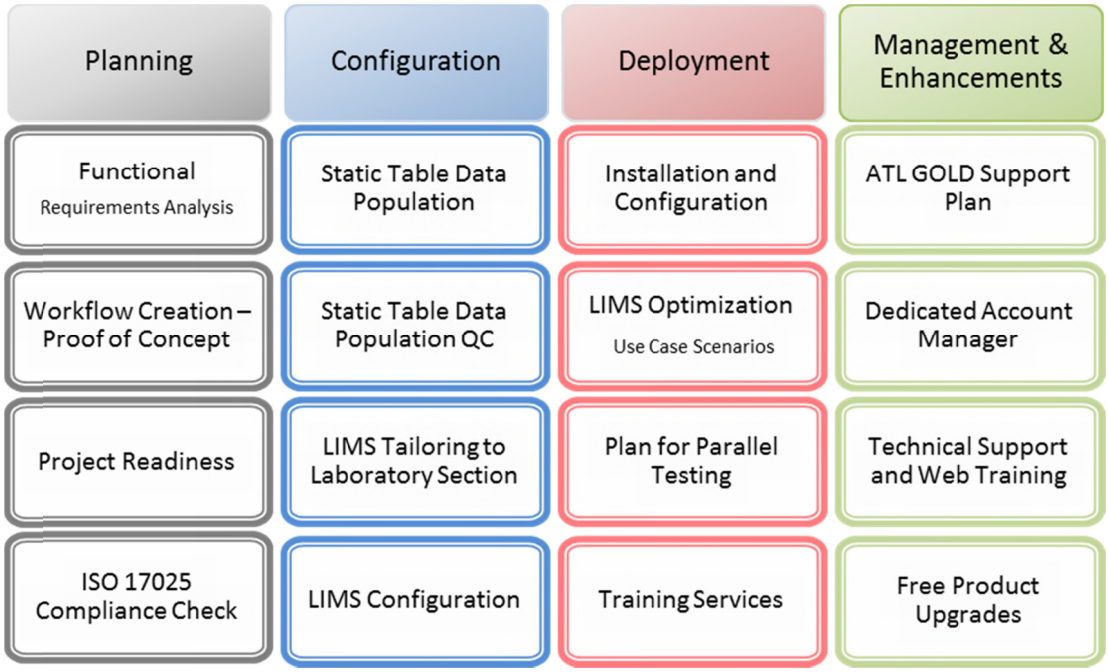
To ensure a successful LIMS implementation ATL dedicates personnel to specific roles commensurate with the implementation responsibilities.

ATL Role	Responsibility
Project Manager(s)	Manages the Risk Management Process (identify risks, evaluate risk impact and severity, and implement mitigating actions to eliminate or control these risks), all project activity, assigns resources, reports progress and status, tracks events, gathers functional and technical requirements and ensures evaluation, and signs-off on implementation deliverables.
Account Manager	Responsible for implementation delivery per the approved contract and supports Project Manager and ATL Engineers to ensure successful implementation. Also, the first step in the Escalation Procedure.
ATL Engineers	Evaluates functional and technical requirements, installs and configures LIMS. If included in the contract, performs data conversions, test instrument integration and training, and LIMS customization installations.
ATL Certified Trainer(s)	Conducts training for Client's LIMS DBAs, Administrators and End Users.
Vice President	Ultimate responsibility for implementation projects, approves implementation project changes, and second and final step in the Escalation Procedure.

ATL's expectation is that the Client will also designate personnel to specific implementation roles.

Client Role	Responsibility
Project Manager	Manages all project activity, directs client's implementation resources, reports progress and status, tracks events, functions as client's liaison to ATL, and signs-off on implementation deliverables.
LIMS Database Administratorǂ	Responsible for LIMS system maintenance and database maintenance and administration. Assists in installation and participates in LIMS DBA training.
LIMS Administrator	Responsible for LIMS administration within the lab. Assists in installation and participates in LIMS Administrator training.
End Users	Personnel who will participate in End User training.

ǂ Applicable to premise deployments only



Escalation Procedure

ATL also follows an abbreviated Escalation Procedure. When issues cannot be resolved in the normal course of project implementation, by the personnel dedicated to the project, those issues are immediately escalated to the Account Manager and then to the Vice President who acts as the final authority on resolution.

ATL Role	Negotiation, Resolution and Escalation Process	Client Role
Account Manager	◄ Negotiation & Resolution ►	Project Manager
▼	▼ Escalation ▼	▼
Project Manager	◄ Negotiation & Resolution ►	Identified Management
▼	▼ Escalation ▼	▼
Vice President	◄ Negotiation & Resolution ►	Identified Executive

Project Management and Risk Analysis

The Accelerated Technology Laboratories (ATL) comprehensive and scalable Project Management Methodology (PMM) is used on all of our engagements, and is the key factor in success for our clients. ATL adheres to a "no surprises" management policy with our clients.

Figure 1 shows our Project Management Methodology (PMM). The PMM applies ATL's industry knowledge and history of success to the five process groups of project management: 1) Initiation, 2) Planning, 3) Execution, 4) Monitoring and 5) Controlling and Closing. Project Planning, Project Execution, and Project Monitoring and Controlling are iterative processes that continue throughout the project. Project Closing is conducted to ensure full compliance with all contract terms and gain final approval. Our PMM supports our clients allowing us to focus on the partnership, tightly coupled management tools and templates, and a proven methodology to deliver quality business results.

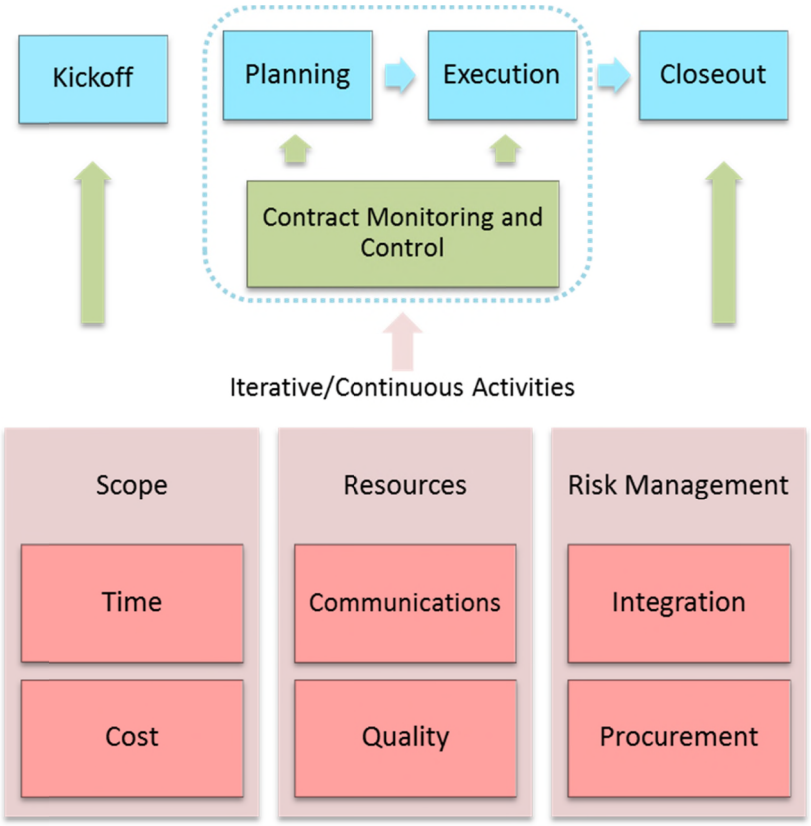


Figure 1 Project Management Methodology

Project meetings via conference call, will occur on a weekly or bi-weekly basis, dependent upon client/project needs and availability. The duration of the meetings should be one hour or less. An agenda will be distributed to the participants twenty-four (24) hours prior to the meeting along with a flash report. The flash report is a condensed version of the project schedule that provides a quick overview of the important aspects of the project with task percent complete and project status displayed. Minutes will be taken at the meetings and the minutes will be distributed within twenty-four (24) hours after the conclusion of the meeting. Items to be discussed during these meetings include but are not limited to:

- ✓ Review of previous weeks minutes and discussion of action items
- ✓ Project plan update with percent progress displayed
- ✓ Discuss tasks completed

- ✓ Obstacles and barriers to completing task
- ✓ Mitigation strategy to deal with obstacles
- ✓ Schedule for following week- tasks to be completed
- ✓ Coordination of schedules and contingencies
- ✓ List of action items

Change management is a critical component of project management and includes the processes required to control the unforeseen changes that arise, during the course of a LIMS implementation, which may affect schedule, budget or quality.

The ATL Team will adhere to a strict change management process that requires both the Iowa Department of Agriculture and Land Stewardship and ATL to approve any modifications to project scope, budget and resources or schedule. Any re-planning associated with these modifications will be accounted for by updating the applicable project management documentation as required.

The Change Management Plan acts as a reference document for the project stakeholders providing them with a description of their roles and responsibilities. The plan includes a description of the tasks and the tools with which the stakeholders will interact so the process can be properly implemented.

The goals of the Change Management Plan are to:

- ✓ Establish a standard process to initiate change requests,
- ✓ Facilitate management of changes to scope
- ✓ Ensure proper documentation of the change request process, and
- ✓ Provide guidelines to manage change related project documentation

The Change Management Plan will detail all aspects of submitting, evaluating and implementing a change to the scope. The plan will outline the entire process including:

- ✓ How a change is submitted to ATL
- ✓ Documenting the change and justification on the Change Request Form
- ✓ Impact analysis of the change by the ATL Team including technical, budgetary and schedule considerations
- ✓ Alternative approach analysis
- ✓ Documentation of Iowa Department of Agriculture and Land Stewardship impact including cost and schedule
- ✓ Communication to Iowa Department of Agriculture and Land Stewardship of final decision, and sign-off by the ATL Project Manager and the Iowa Department of Agriculture and Land Stewardship representative.

All changes are documented in a Change Request Log that is reviewed on the routine management update meetings.

Risk Identification and Mitigation

Information Technology projects, in general, are subject to many risk factors that, unfortunately, often results in the failure of the project. A LIMS selection and implementation project is not immune to these risks. It is easy to understand that a LIMS project may be at a higher risk than a generic IT project due to the nature of the laboratory environment and the markets that serve it.

Laboratories are extremely dynamic organizations with multiple, complex processes that often are modified depending on the outcome of the previous step. Adding to the complexity is the various instrument, equipment and technologies used that must integrate with the LIMS. The primary objective of risk management is to develop a timely assessment of the probability of unwanted events occurring,

their likely priority, and to aid in developing strategies to deal with problems early when the cost of mitigating actions is relatively low.

The overarching goal of ATL's approach to risk management is to prevent problems that might affect the Iowa Department of Agriculture and Land Stewardship LIMS effort.

Our approach to supporting risk management (Table 1) contains seven key elements, all with the ultimate aim of mitigating risks early in the process.

Risk Framework	
Phase	**Associated Tasks**
Plan	Determine in advance how to deal with identified risks. The ATL Team will update and keep current the Risk Management Plan, which will guide projects with documented requirements of Risk Management, including all tools and processes. We work closely with the project teams to confirm risk mitigation plans are appropriate as risk factors change over time.
Assess	Identify and analyze program areas and critical potential technical process risks to significantly increase the likelihood of meeting performance, schedule, cost, and security objectives.
Identify	Classify risks before they manifest themselves and account for them in the development and execution of mitigation plans. The ATL Team will incorporate the full life cycle of risk management, including assisting in identifying risks and inputting them into the risk management database/tool. The ATL Team personnel are trained to identify and communicate risks as they arise, including risk associated with technologies, methods and techniques of developing solutions.
Analyze	Analyze the risk by classifying its probability of occurring as High, Medium or Low. Assess the impact (priority) of the risk should it occur as High, Medium or Low. Estimate the timeframe in which the unwanted event is expected to occur as near-term, mid-term or far-term. Once classified, risks are prioritized to determine which must be dealt with first.
Develop	Assist with identifying, evaluating, selecting and implementing one or more strategies to set risk of acceptable levels. This includes the specifics on what should be done, when it should be done, when it should be accomplished and who is responsible. This information will be input in the risk management database/tool so that progress can be monitored.
Monitor	Systematically track appropriate risk and risk mitigation data, and report it to the affected parties in a manner that enables them to use the risk data in the performance of their work. Provide input to updating risk handling strategies, as appropriate.
Communicate	Identified risk will be communicated weekly at the LIMS Team meetings and status reports, and in some cases earlier, based on time-sensitivity. The ATL Team will make recommendations on risk escalations to the appropriate leadership groups.

Table 1 Risk Framework

The ATL Team uses our Risk Matrix in our Program Management Methodology to update and monitor risks on a weekly basis. This approach is essential given the dynamic nature of the Client environment. Our Project Manager will lead the risk management process. Risks will be discussed both internally and with the appropriate Iowa Department of Agriculture and Land Stewardship stakeholders. Our Team will discuss risks via standing weekly status meetings and reports. As risks are identified and communicated, risk owners will create mitigation and contingency plans. Mitigation plans will provide the strategy for how to mitigate the risk prior to it becoming realized. The contingency plan will outline what our Team will do once the risk is realized.

Our Team will track risk measures in order to ensure the effectiveness of the risk management process. We will track such measures as number of open risks, number of risks opened during the month, number of risks closed during the month, and number of risks realized during the month. Risk statistics

will also be communicated at the weekly standing status meetings where potential performance, schedule, and cost-related risks are discussed.

Project Initiation

This initial on-site meeting is fundamental in determining and confirming project direction, meeting the team members and is necessarily scheduled ahead of the work process and requirements review sessions. The objective of this task is to finalize the project scope, review roles and responsibilities, develop project schedule and milestones and finalize the project communication plan.

Participants

The Iowa Department of Agriculture and Land Stewardship Project Manager, ATL Project Manager, IT, other LIMS Stakeholders and other Project Team Members with ATL as requested.

Deliverables

- ✓ Project schedule
- ✓ Final written work breakdown plan
- ✓ Communication plan outline
- ✓ List of all project team member roles, authority and contact information
- ✓ List of tasks for each team member and dates of expected completion
- ✓ Finalized and approve hardware/software list

Business Process and Requirements Evaluation

After the Project Initiation Phase, the ATL team will meet with the LIMS stakeholders to review the lab processes and requirements in preparation for configuring the system. The Team will schedule a series of meetings each design to focus on a specific topic. For the Iowa Department of Agriculture and Land Stewardship Project, it is estimated that 3-5 meetings would be required. The meetings are iterative and designed to be short in duration (maximum 1 hour) so that information can be assessed with minimal disruption to the laboratory operations. The ATL Team will distribute an agenda prior to the meeting and only request the presence of the necessary stakeholders.

The goals of this phase are:

- ✓ Determine optimal process flow for the LIMS to meet lab goals and long-term trends.
- ✓ Determine if "As Is" process flow is truly representative
- ✓ Determine if "To Be" Design is optimal for Sample Master®
- ✓ Determine all current instruments for interpretation.
- ✓ Determine interface requirements.
- ✓ Provide stakeholder reviews of system configuration

Participants

The Iowa Department of Agriculture and Land Stewardship Project Manager, ATL Project Manager/Implementation Engineer

Deliverables

- ✓ Final user requirements documents
- ✓ Final list of instruments to be integrated

System Installation

During this phase, the ATL Team will assist the Iowa Department of Agriculture and Land Stewardship Team with the installation of the hardware and software of the system. The goals of this phase include:

- ✓ Install and operate server and (client) hardware and operating systems
- ✓ Design agreed upon custom reports, EDDs, and format for any data migration
- ✓ Determine class size, location, equipment and scheduling of user training session
- ✓ Install working database and shared folders on designated server
- ✓ Determine all electronic reporting databases for the Iowa Department of Agriculture and Land Stewardship
- ✓ Install Sample Master® client-side interface on the Iowa Department of Agriculture and Land Stewardship Computers

Participants

The Iowa Department of Agriculture and Land Stewardship Project Manager, IT Manager, ATL Project Manager/Implementation Engineers

Deliverables

Implementation package contains implementation guide, hard copy of all tutorials and manuals and licensed copy of Sample Master®.

Training

Prior to the Configuration Phase, ATL will train the Iowa Department of Agriculture and Land Stewardship LIMS Administrators and users who will be responsible for the population and configuration of the LIMS. The training is designed to be classroom style; hands on learning to assure that the Iowa Department of Agriculture and Land Stewardship users are fully versed on the operation and configuration of Sample Master®. Prior to rollout of Sample Master®, ATL will conduct end user training. ATL will train System Administrator(s), "power users" and "end users". A complete description of the training can be found in the Training Plan.

LIMS Population and Configuration

During this phase, the ATL Team will work with the Iowa Department of Agriculture and Land Stewardship Team to configure the LIMS to the specific processes and requirements of the laboratory. The ATL Team will use the information gathered the in the Business Process and Requirements Analysis Phase to develop a customized configuration plan that will identify each step of the population and configuration and the individuals that are responsible for each area. The goals of the phase include:

- ✓ Populate static table data (fields from ATL's pre-install template only)
- ✓ Import the Iowa Department of Agriculture and Land Stewardship list (should be in Excel)
- ✓ Train team to build analytical test methods and preparation methods
- ✓ Train users how to create EDDs and reports
- ✓ Train DBAs on how to create new labels or modify canned labels
- ✓ Train DBAs on how to use configuration/set-up tools
- ✓ Obtain instrument output files and work together to configure instrument data imports
- ✓ Work to complete any custom integration with other systems
- ✓ Work to complete any customizations that were ordered

Participants

LIMS Administrator, ATL Project Managers/Implementation Engineers and Developers

Deliverables

- ✓ All static tables fully populated
- ✓ Analytical and prep methods established in LIMS table fully populated
- ✓ Report and EDD formats delivered to the Lab

- ✓ Label and other print report formats completed and delivered to the Lab
- ✓ Completion of custom programming

Data Migration

The ATL Team will follow a proven methodology to migrate the data from the current data systems into Sample Master®. The Sample Master® data structure contains tables to store legacy data and was specifically designed to allow organizations to easily access current and historical data from the same interface. The Sample Master® design combined with the migration methodology, assures that data migration portion of the project is completed correctly and according to the project schedule.

The data migration methodology is a multiple phase process. Each phase will contribute to a successful data migration and allow the migrated data to be properly maintained. The phases are as follows:

- ✓ Migration Strategy
- ✓ Data Source Analysis
- ✓ Migration Design
- ✓ Building Structure
- ✓ Testing and Implementation
- ✓ Revisions
- ✓ Maintenance

Migration Strategy

The focus of the overall data migration effort is determined in the strategy phase. Since most data migration projects result from system replacement, they often represent a small portion of the overall project. For the Iowa Department of Agriculture and Land Stewardship project, data will be migrated from the current system in three major phases:

- ✓ Data Extraction
- ✓ Data Transformation
- ✓ Data Load

The core process describes how the data is obtained, transformed, and loaded into the final repository. Each step of the process will be slightly different, depending on the data source and where its data will ultimately be maintained.

Each of the three primary components of the data Extraction, Transformation, Load "ETL" process is discussed below:

Data Extraction

The data extraction step is responsible for extracting data from the source system. During extraction, data may be removed from the source system or a copy made and the original data retained in the source system. Extracted data is loaded into the data staging area (a relational database usually separate from the destination database), for manipulation by the remaining processes.

Data extraction is generally performed within the source system itself, especially if it is a relational database, to which extraction procedures can easily be added. It is also possible for the extraction logic to exist in the data staging area and query the source system for data using ODBC, OLE DB, or other AP's. For legacy systems, the most common method of data extraction is for the legacy system to produce text files, although many newer systems offer direct query AP's or accommodate access through ODBC or OLE DB.

Data Transformation

The transformation phase is responsible for data validation, data accuracy, data type conversion, and business rule application. It is the most complicated of the ETL elements. It may appear to be more efficient to perform some transformations as the data is being extracted (in line transformation); however, an ETL system that uses in line transformations during extraction is less robust and flexible than one that confines transformations to the transformation step. Tools used in the transformation ETL vary. Some data validation and data accuracy checking can be accomplished with straightforward SQL code.

Data Load

The ETL loading step is responsible for loading transformed data into the destination database. The destination databases are usually updated periodically rather than continuously, and large numbers of records are often loaded to multiple tables in a single data load. The data warehouse is often taken offline during update operations so that data can be loaded faster. The design of the loading element should focus on efficiency and performance to minimize the data warehouse offline time.

Data Source Analysis

The primary aim of the analysis phase in data migration projects is to identify the data sources that must be transported into the new system. Data sources are not limited to actual data processing systems, but can also include tools and/or formatted files created by users to accomplish their daily tasks outside the normal systems. The next important part of the analysis phase involves evaluating the actual data. The data will be examined for quality and to identify data that should be migrated.

Migration Design

Once the high value legacy data sources have been evaluated, the process of data selection is initiated. Each targeted data source will be reviewed by examining each data element individually and determining if it will be moved into a data archive or become a component of the data warehouse. The design phase is essentially the act of making a checklist of the legacy data element that must be migrated.

Once the migration design is complete, the actual mapping process can be initiated.

Testing and Implementation

Testing and implementation are often combined into one phase since they occur at the same time in most projects. Testing breaks down into two core subject areas: logical errors and physical errors. Physical errors are typically associated with the scripts developed to extract, transform, and load data. Logical errors are best identified during implementation. The first step is to execute the mapping. Even if the mapping is completed successfully, we must still ask questions such as:

- ✓ How many records did we expect this script to create?
- ✓ Were the correct number of records created? If not, why?
- ✓ Has the data been loaded into the correct fields?
- ✓ Has the data been formatted correctly?

After the data has been migrated, the goal is to verify the answers to these questions and to allow access to the data by a few designated users to assure that all high level data was included during the initial migration design phase and mapping.

Revisions

The revision phase is where any required cleanup is managed. Every data model modification, transformation rule adjustment, and script modification are essentially combined to form the revision phase. Once this phase is completed, all of the legacy data that was target for the migration will exist on the new platform either in an archive format or within the newly created data warehouse. At this point, the legacy systems will no longer be required and all data going forward will be collected in the new LIMS. If the LIMS is not fully implemented, then an additional data migration event may occur later utilizing the same tools developed for the initial event. The tools at this point will be finalized and all revisions will have been incorporated.

Maintenance

The maintenance phase is in place to assure that the scripts, mappings, and utilities developed are maintained in the event that additional migrations are required. In most cases, a second and final migration event may occur due to unanticipated delays in the actual role out of the primary system. It also includes the continued up keep to both the archived data and the data warehouse.

Testing

Testing is critical to a successful LIMS implementation. The ATL Team subscribes to a multi-tier test strategy designed to identify and fix issues during the entire configuration and implementation process. The ATL test strategy includes unit testing during the population and configuration of the LIMS in addition to a comprehensive system test prior to acceptance and rollout. The testing will consist of the development of test reports that can be reviewed by Iowa Department of Agriculture and Land Stewardship. The test strategy for Sample Master® will be detailed in the Iowa Department of Agriculture and Land Stewardship System Test Plan.

Support

After the system is put into production, ATL will offer comprehensive support of Sample Master®. This includes support during implementation and after go-live. The major aspects of the support plan include:

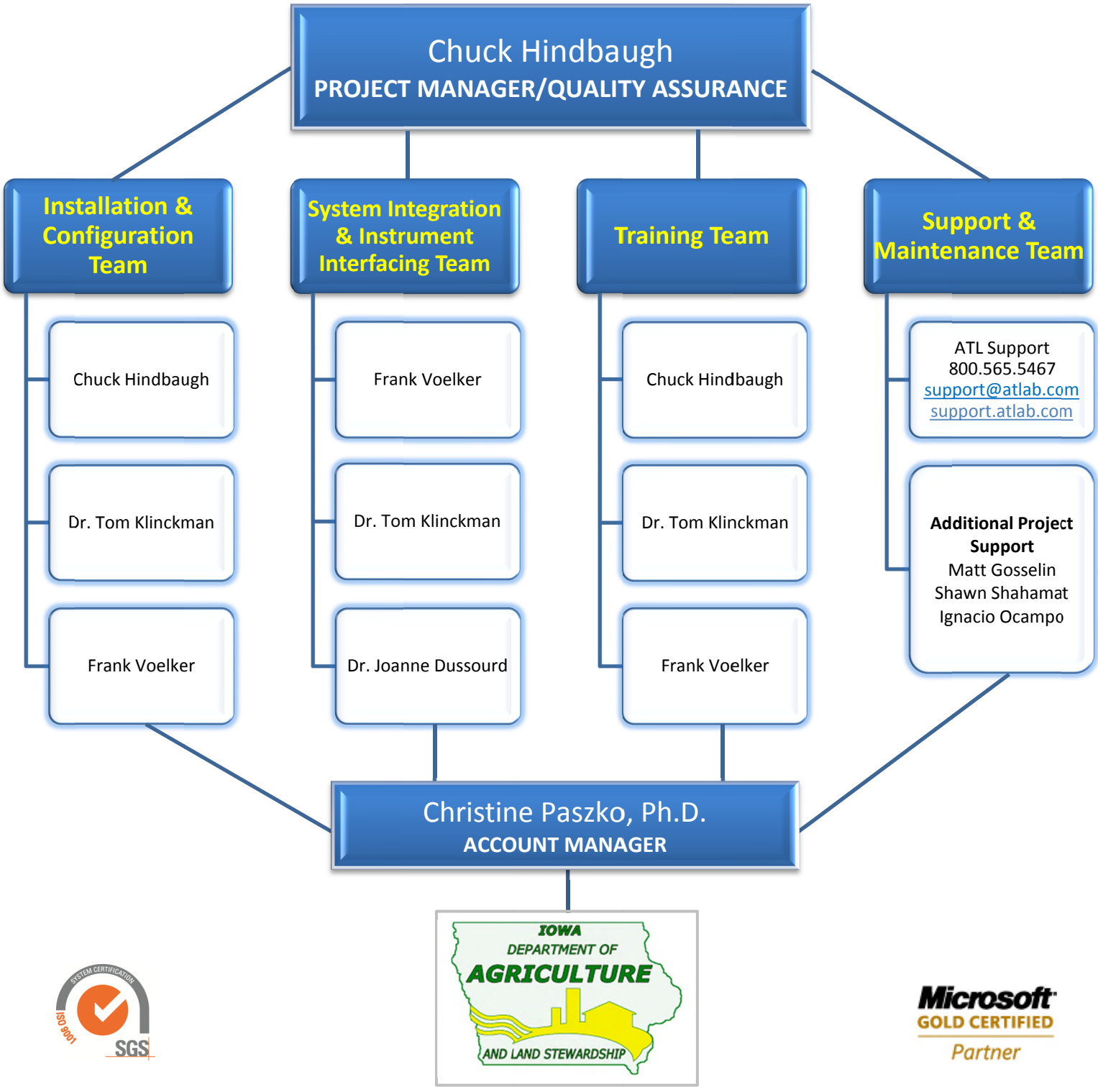
- ✓ Iowa Department of Agriculture and Land Stewardship can access an on-line knowledge forum with other users of Sample Master®, which provides peer group ideas on customizations and other technical features.
- ✓ Provide all system documentation including:
    - o Database design
    - o Entity Relation Diagrams
    - o Application Specifications
    - o User Manual
    - o Online Help
    - o Administration Manual

Schedule

Based on the information provided by Iowa Department of Agriculture and Land Stewardship in the RFP and ATL's experience implementing Sample Master® in similar environments, it is estimated that the project will take approximately **4-6** months. This is measured from contract approval to final acceptance. A final project plan will be developed as part of the Project Initiation phase.

Accelerated Technology Laboratories, Inc. Project Personnel

IOWA DEPARTMENT OF AGRICULTURE AND LAND STEWARDSHIP



Chuck Hindbaugh
Project Manager/
Implementation Services
Certified Trainer

Mr. Hindbaugh received his **B.S**. in Biochemistry and Toxicology from Eastern Michigan University.

He has worked as a Chemist, Quality Manager and Laboratory Manager with expertise in the following areas: Knowledgeable with NELAP/NELAC, and A2LA using ISO/IEC 17025, as well as scheduling work and employees. He is proficient in wet chemistry and metals analysis, qualified in organic analysis, sample collection, managing and maintaining a LIMS database. He also has experience in preparing and analyzing samples in wet chemistry and metals, using FLAA, GFAA, ICP, Cold Vapor Mercury, GC, and GC/MS.

Mr. Hindbaugh has over 15 years' experience with ATL LIMS Solutions.

As Project Manager, and Team Leader, Implementation Services, Mr. Hindbaugh is responsible for assisting in the configuration of the LIMS and working with end-users (in specification creation, training and providing overall implementation support**)**. Mr. Hindbaugh is also a Certified ATL trainer. He will be responsible for end-user training.

Christine Paszko, Ph.D.
Account Manager

Dr. Paszko has a **B.S.** in Medical Technology with a minor in Microbiology and a **Ph.D.** in Molecular Microbiology with a minor in Biochemistry from the University of Maryland. She completed 16 hours of graduate coursework at Claremont Graduate University, and Informatics and Negotiation Skills at Stanford University, Stanford, CA. She is also a graduate of the Project Management Certificate Program at NC State University

She has been working in LIMS and laboratory automation for over 20 years, has authored dozens of publications and co-authored a book and a book chapter on LIMS. She is familiar with EPA, USDA, FDA and ISO requirements for LIMS.

Dr. Paszko has over 20 years of laboratory experience and has participated in over 90 installations of the ATL LIMS product line. She worked in potable water research and R&D laboratories in MD, CA and NY.

As Account Manager, Dr. Paszko is responsible for all contractual obligations, reviewing milestones, work plans and deliverables, and providing answers to any client questions. She is also the single point of contact for any project issues and their successful resolution.

Thomas Klinckman, Ph.D.
Implementation
Engineer/
Certified Trainer

Dr. Klinckman has a **Ph.D.** in Computational Chemistry from the University of Memphis, and a **B.S.** in Chemistry from Austin Peay State University.

Dr. Klinckman has over 15 years of experience in laboratory operations and laboratory automation. He has worked as an Environmental Scientist and Laboratory Manager and has written numerous publications for the laboratory industry. As a laboratory manager his duties included: managing employees, QA/QC, backup analyst for all analyses, validating all data before leaving the laboratory, Sample Master® LIMS database administrator, basic programming, budgeting, customer relations, new business, develop methods, writing and review SOPs, analyzing meteorological data, fitness for duty testing, along with maintenance, repair and replacement of instrumentation.

Dr. Klinckman has over 11 years of experience with ATL LIMS Solutions.

As Implementation Engineer, he is responsible for assisting in the configuration of the LIMS and working with end-users (in specification creation, training and providing overall implementation support). Dr. Klinckman is also a Certified ATL trainer.

Joanne Dussourd, Ph.D.
Support Engineer/
Certified Trainer

Dr. Dussourd received a **Ph.D.** in Physiology and a **B.S.** in Biology from Cornell University. She also holds a **B.S.** in Computer Science from the University of Central Arkansas.

Dr. Dussourd's background in laboratory science combined with her computer expertise gives her special insight into laboratory client needs. She assists in support, training, instrument integration and product development and testing. She has over 10 years of programing, LIMS, instrument integration and laboratory automation expertise.

Dr. Dussourd has over 10 years of experience with ATL Sample Master® Pro LIMS solutions.

As a Support Engineer, Dr. Dussourd is responsible for providing technical support, LIMS product upgrades, enhancements, customizations and instrument integration services. She is involved in the development, validation and implementation of LIMS product upgrades and enhancements. Dr. Dussourd is also a Certified ATL trainer.

David Sloan
Implementation
Engineer/
Certified Trainer

Mr. Sloan received his **B.S.** in Food Science with a Concentration in Chemistry from Michigan State University.

Mr. Sloan has a total of 9 years of laboratory experience in three different industries. He has on site experience in food manufacturing and food safety. He also has extensive experience in research and development of adhesive and sealants, torque reduction lubricants and sound damping with in the automotive industry. Internal quality control methods, manufacturing and up scaling experience. Mr. Sloan has also worked in a commercial laboratory that performed contract testing such as water, wastewater and soil testing.

Mr. Sloan has over 9 years' experience with ATL LIMS Solutions.

As Implementation Engineer, he is responsible for assisting in the configuration of ATL LIMS Solutions and working with end-users (in specification creation, training and providing overall implementation and project support). Mr. Sloan is also a Certified ATL trainer and responsible for end-user training.

Frank Voelker
Implementation Engineer

Mr. Voelker holds an **A.A.S** in Simulation and Game Development from Sandhills Community College in Pinehurst, NC.

Mr. Voelker has education and development experience, specializing in the C# language, with training in Java, C++, and MySQL. He has worked as a B2B Educator, Software Developer and Project Manager, with expertise in IT, manufacturing and food/beverage industries. He is proficient in the tools used to design, develop and deploy ATL software, and experienced with technical writing, project management techniques and implementation strategy.

Mr. Voelker has 3 years' experience with ATL LIMS solution.

As an Implementation Engineer at ATL, Mr. Voelker is responsible for assisting in the configuration of ATL's LIMS Solutions and working with end-users (in specification creation, training and providing overall implementation support).

Matt Gosselin
Implementation Engineer

Mr. Gosselin completed his **B.S.** in Environmental Science with a Concentration in Biology at Southampton College of Long Island University.

Mr. Gosselin has extensive industrial pretreatment, asbestos, project monitoring, inspection, and laboratory experience working in both the public and private sectors. His public sector position as a Laboratory Specialist afforded him an opportunity to carry out QA/QC for the Department of Health, clerical and fiscal work, permitting, and tasks to achieve determine regulatory compliance.

Mr. Gosselin also has a wealth of sample collection, transportation, inspection, testing, and reporting experience in his position as a Project Monitor/Asbestos Inspector/Field Technician. His degree of knowledge regarding regulatory compliance, State and Federal Standards, the DEM/EPA, and the Department of Health underscores his commitment to process and procedure.

As an Implementation Engineer at ATL, Mr. Gosselin is responsible for assisting in the configuration of ATL's LIMS Solutions and working with end-users (in specification creation, training and providing overall implementation support).

Shawn Shahamat
Director of Support/
Certified Trainer

Mr. Shahamat holds a **B.S.** in Mechanical Engineering from IH University in Tehran, Iran.

Mr. Shahamat is an experienced IT Professional, with years spent in a Microsoft environment, setting up networks, building and installing software, and managing the administrative and training staff. In addition to that role, he designed and authored training manuals, built help files, and wrote test scripts.

He assists the development group in the testing of new software development plan for the company's LIMS product families, provides customer support, and assists in end-user training. Assists in maintaining a system for handling and tracking software support of current and existing product line. Assist in the timely testing of new software, enhancements and service packs. Contributes to maintaining a database of support incidents to LIMS software. Responsible for assisting support and development, providing technical support, training end-users, software installation, and assisting marketing and sales by providing technical assistance when needed. Contributes to the implementation of new software products and assists in the maintenance of current products.

As Director of Support, Mr. Shahamat is responsible for managing all technical support staff, and providing assistance with LIMS product upgrades, enhancements, customizations and instrument integration services. He is involved in the development, validation and implementation of LIMS product upgrades and enhancements. Mr. Shahamat is also a Certified ATL trainer. He is knowledgeable in both hardware and network configuration.

Ignacio Ocampo
Support Engineer

Mr. Ocampo holds an **A.A.S** in Networking Technology from Sandhills Community College in Pinehurst, NC.

Mr. Ocampo has education and development experience, specializing in Information Technology, Spanish translator/interpreter and leading the Central and South American markets. He has worked as a Support & Implementation Engineer, B2B trainer for Spanish speaking customers and ATL's Partners, and assists with translation of ATLLIMS documentation in to Spanish. Mr. Ocampo also assists with the IT Support department, helping to manage VMware environments and assist clients with support issues. Mr. Ocampo is an ATL certified trainer.

Mr. Ocampo has 1 years' experience with ATL LIMS solution.

As a Support Engineer at ATL, Mr. Ocampo is responsible for assisting in the configuration of ATL's LIMS Solutions and working with end-users and for working with our Spanish speaking customers.

Support Overview

A LIMS is a major investment, and we believe that superior support is a necessity. ATL delivers excellent support via a team of laboratory and software professionals that are experienced, responsive, and committed to providing our clients with the highest level of support and service in the industry.

ATL is an ISO certified firm and has a quality management system in place that includes a customer support database in which all support calls are logged, and typically answered immediately by a support engineer. An e-mail is sent out notifying clients that their support call has been logged and the incident number that has been assigned to it for tracking purposes. The vast majority of support issues are resolved over the phone. ATL also offers remote support services, which allow ATL software engineers to log into the customer system and perform diagnostics. The incident is not closed out until both the engineer and the client are satisfied with the solution. The dedicated account manager acts as the single point of contact and is responsible for ensuring that the client is satisfied with the proposed solution.

All calls are transferred to a support engineer immediately when calling our toll-free support line. The majority of issues are resolved over the phone (>90%). For support calls received after hours, they are responded to the next business day within 30 minutes.

Support can be accessed via a toll free number, 800-565-5437. Current version information and details on the reason for the call are needed. Standard support hours are 8:00 am to 5:00 PM ET on Monday – Friday. ATL does offer a premier level of support that provides 24/7 availability.

Online support is available through ATL's dedicated support website, allowing users to submit a support ticket online and receive a response from an ATL support engineer via phone, email or remote access, dependent upon the nature and severity of the issue.

Support escalation involves a support engineer. If there is no resolution then the issue is transferred to the Sr. Product Manager and finally to the Director of Support Services. In 20 years, support escalation has never had to go past the Sr. Product Manager for resolution to the customer's satisfaction.

Patches are released when there is an immediate need to make changes/additions. Service packs are released quarterly. Upgrades are released when there is a version change in the software, and these typically occur every 12-18 months.

ATL hosts online User Groups and Webinars on a bi-monthly basis, and hosts user dinners at major trade shows and conferences such as AWWA WQTC and Pittcon.

ATL is committed to the timely implementation of system requirements resulting from changes to the ordinances, regulations, and General Statutes.

As an ISO Certified firm, all support requests are managed in accordance with our Quality Management System. All requests for assistance by clients are recorded using our support tracking software. Once a client reports an incident, a separate, unique incident ID is created for each incident or request for information that is reported by a customer, via phone, fax, email, or the online submittal form. The customers support level is accessed, for priority, first Platinum customers, then Gold level support, then Silver and then Bronze, additionally all issues are triaged within the level of support which was purchased.

ATL provides support for all clients via our toll-free number, remote access, a dedicated support website and email. A knowledge base and FAQs are accessible through ATL's dedicated support website. All patches and services packs are available for download on ATL's customer support website.

LIMS customer support requirements are not constant over time. ATL support offerings provide our clients access to the most inclusive and flexible support options available. From early implementation to initial "go-live" and on to full operational use, this natural cycle develops as databases increase in size, user populations grow and computing environments become more sophisticated. ATL prides itself on working with its customers to create a detailed multi-tiered support plan, which matches our clients' laboratory, data management, and support requirements, today and into the future. ATL customer support options recognizes this cycle by providing a range of services within The ATL metals Support Program that meets customers' changing needs through LIMS evolution. The ATL Metals Support Program currently provides four levels that mirror customer business requirements. ATL BRONZE being the most basic level of support through PLATINUM, which is the most comprehensive. ATL'S GOLD support is the most popular and best value support option.

ATL Support Type	BRONZE	SILVER	GOLD	PLATINUM
Technical Support	5 Incidents	10 Incidents	Unlimited	Unlimited
Migration Credit	Not Included	Not Included	Included	Included
Dedicated Account Manager	Not Included	Not Included	Included	Included
Free Product Upgrades	Not Included	Not Included	Included	Included
Web Training Course Pass (ATL University)	No Included	Not Included	Included	Included
Yearly LIMS Maintenance List	Included	Included	Included (Off-Site)	Included (On-Site)
Programming Support (Off-Site)	Not Included	Not Included	Included (2 Hours Free)	Included (8 Hours Free)
ATL Web Support Site, FTP Support Area, Service Packs, User Group Meetings & LIMS Solutions Newsletter	Included	Included	Included	Included
Quarterly Web Training	Not Included	Not Included	Included	Included
Annual Maintenance Cost (based on LIMS software cost)	5%	10%	18%	35%
Training: LIMS Boot Camp	Not Included	Not Included	Not Included	Included*
Software Engineer Extended Business Hours	Not Included	Not Included	Not Included	Included

*A 5-day pass to both the Intermediate and Advanced Classes

ATL LIMS University (Now in its 18th year!)

ATL's LIMS University has been holding sold out boot camps for 18 years! We feel that training is very important and our formal training program along with our on-site, web-based, video tutorials and user-friendly training guides are a testament to that commitment.

One study found that undergraduate students learn and retain information as follows: 10 percent of what they read, 20 percent of what they hear, 30 percent of what they see, 50 percent of what they see and hear, 60 percent of what they write, 70 percent of what they discuss and 80 percent of what they experience.*

ATL UNIVERSITY BOOT CAMP

Users that attend the boot camp also have the ability to experience hands on learning with committed instructors, collaborate with other users, share ideas and discuss best practices.

On-site Training

ATL Certified Trainers also provide on-site expert installation and training for the LIMS administrator as well as end-users. On-site training has been provided in conference rooms, auditoriums, one-on-one, on-the-job as well as in small groups to allow users varied training experiences. This is initial training that is supplemented with the training manuals, tutorials, user manual and quarterly web based training as well as the curriculum that is offered through ATL University.

Web Based Training

In order to provide clients with the support that they want, when they need it, ATL Certified Trainers offer web-based training courses. The major advantage is that this training can be quickly scheduled and can be provided to a single user as well as to a group. Instructor led web courses are offered through ATL University and we offer custom training based on client's needs. Additionally all clients with ATL GOLD support receive free web training sessions quarterly which are all recorded for later viewing, if users are unable to attend.

*In the book *Handbook on Teaching Undergraduate Science Courses* (Thomson Custom Publishing, 1999), written by Gordon E. Uno