

Core Lab LIMS

Quick Reference Guide

May 2005

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Introduction

The VBI Core Lab Facility's (CLF) laboratory information management system (LIMS) was developed by GraphLogic, Inc. of Branford, CT. The LIMS is a workflow system intended to simplify sample submission and data retrieval for improved customer service and to increase accountability by the CLF. Workflow systems operate from the premise that objects (samples in this case) move from process to process, based on pre-established criteria and/or results. The LIMS tracks and records all decision points, criteria and costs associated with each submitted sample.

Supported browsers for the VBI LIMS are Firefox and Mozilla. Opera is largely functional; though you will lose auto-fill features on sample submission pages.

Improved customer service

The LIMS provides automated sample submission screens with input validation to significantly decrease the questions we may have to ask before we can begin processing your samples. Additionally, the LIMS provides automated email notification to the submitter when lab processing has been completed, a repository for retrieval of data from the current submission and a central, project based, repository for retrieval of all data assigned to each project.

Additionally, when members of our customer community are diligent to enter descriptive information about their projects/experiments, we might, over time, be able to suggest research efforts, previously performed, that might be related and provide contact information for that effort.

Improved accountability

The samples you entrust to us and the quality of the test results we return to you are important. With that in mind, the LIMS not only enforces control procedures for each protocol but also audits all processing that is performed; the steps a sample passed through, any control parameters and associated cost. All audit data is available through various reports within the LIMS.

Each step in the LIMS has, stored in the database, an associated cost. Sample processing fees are automatically calculated by accumulation of only those fees associated with steps through which the sample moved. Over time, we plan to automate the submission of ISR information and billing through Banner for our Virginia Tech customers.

We need your feedback

We hope you find the LIMS to be helpful in communicating with the CLF. The system is a continually evolving product. To be successful, we need your feedback – we welcome your comments ...

Request a VBI Core Lab LIMS Account

1. Enter the URL for the VBI Core Lab LIMS into the address bar of your internet browser: <http://lims.vbi.vt.edu>.
2. Login using the account setup user ID: *PIregistration* with password *register* as shown in the following figure.

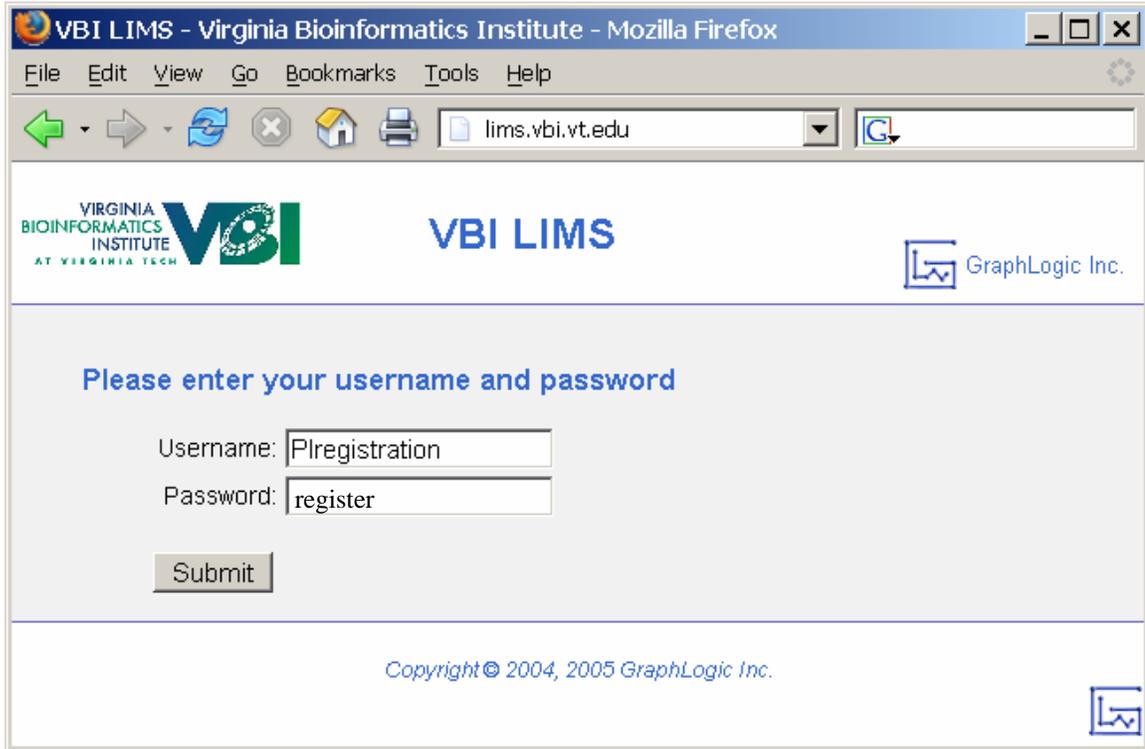


Figure 1 - Core Lab LIMS Login Page

3. Click on the menu item *Management Systems*, select the *Project Management* option and then *New PI Registration*.

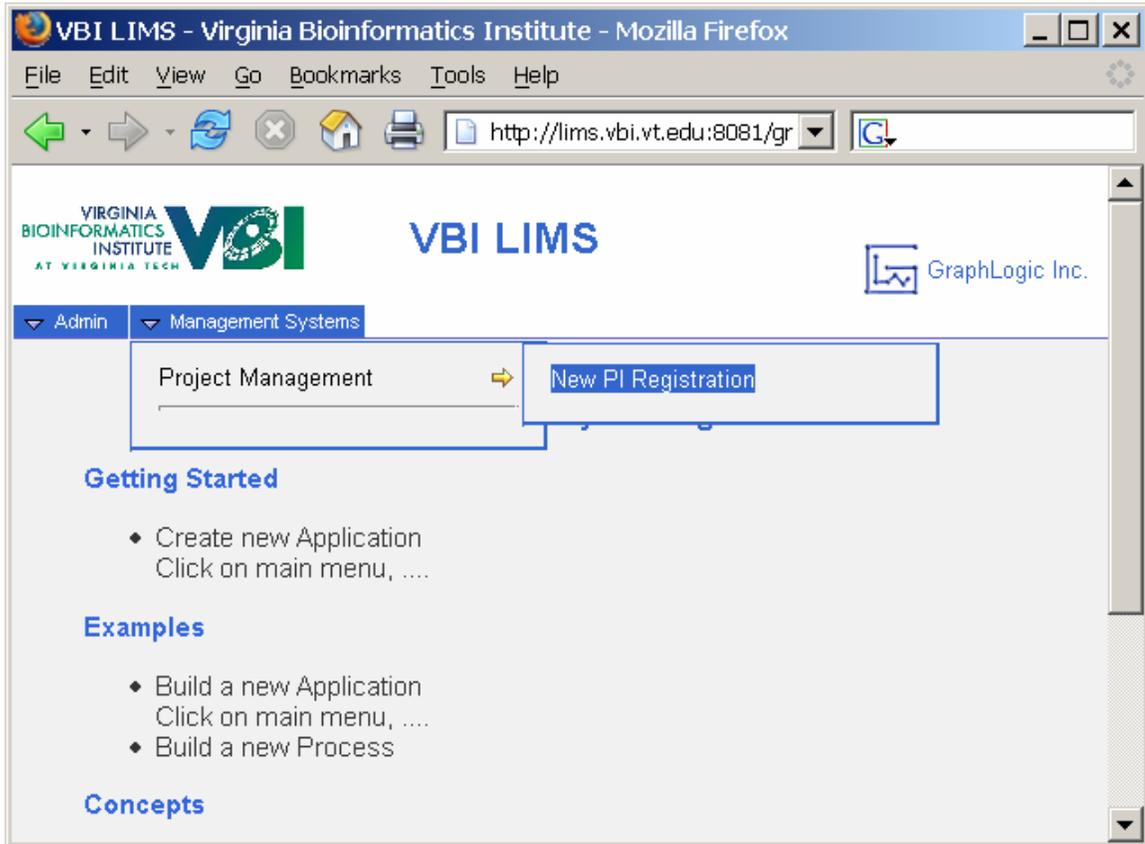


Figure 2 - Core Lab LIMS Registration Option

4. The *New PI Registration* screen is displayed as shown in the following figure.

The screenshot shows a web browser window titled "New PI Registration - Mozilla Firefox". The address bar contains the URL "http://lms.vbi.vt.edu:8081/graphlogic/editTransaction.do?action=view&transactionO". The page header features the Virginia Bioinformatics Institute logo and the text "Project Management New PI Registration" along with the GraphLogic Inc. logo. Below the header, there is a navigation bar with "Admin" and "Management Systems" tabs. The main content area displays "Request Id 520792" and a "Submit" button. A red dashed box highlights a warning message: "Fields marked with a red asterick must be entered. The user id you select must be unique in our system. Phone, Email and Fax fields must be properly formatted." The form includes several input fields: "User Id", "Password", "First Name", "Organization", "Department", "Phone", "Email", "Last Name", "Middle Initial", "Title", and "Fax". Below these are two large text areas for "Mailing Address" and "Billing Address". The footer contains the copyright notice "Copyright © 2004, 2005 GraphLogic Inc." and the GraphLogic logo.

Figure 3 - Core Lab LIMS ID Request Page

5. Complete the user ID request form as follows:

- User Id → Enter your choice for your new LIMS user ID. Must be at least 6 characters in length.
- Password → Enter your choice for your new LIMS password. Must be at least 8 characters in length.
- First Name → Contact first name.
- Last Name → Contact last name.
- Middle Initial → (Optional) Contact middle initial.
- Organization → Organization for which the contact performs duties that require core lab services.
- Title → Job title of contact at the organization named previously.
- Department → (Optional) Department in which the contact performs duties that require core lab services.

- Phone → Contact phone number in the format xxx-xxxx.
- Fax → Contact FAX number in the format xxx-xxxx.
- Email → Contact email address.
- Mailing Address → Contact mailing address.
- Billing Address → Contact billing address.

Click the “Submit” button to validate data entered into the form. Correct errors and click on the “Submit” button as necessary to complete form submission. The ID request form will be forwarded to core lab personnel for approval and activation as shown in the following figure.

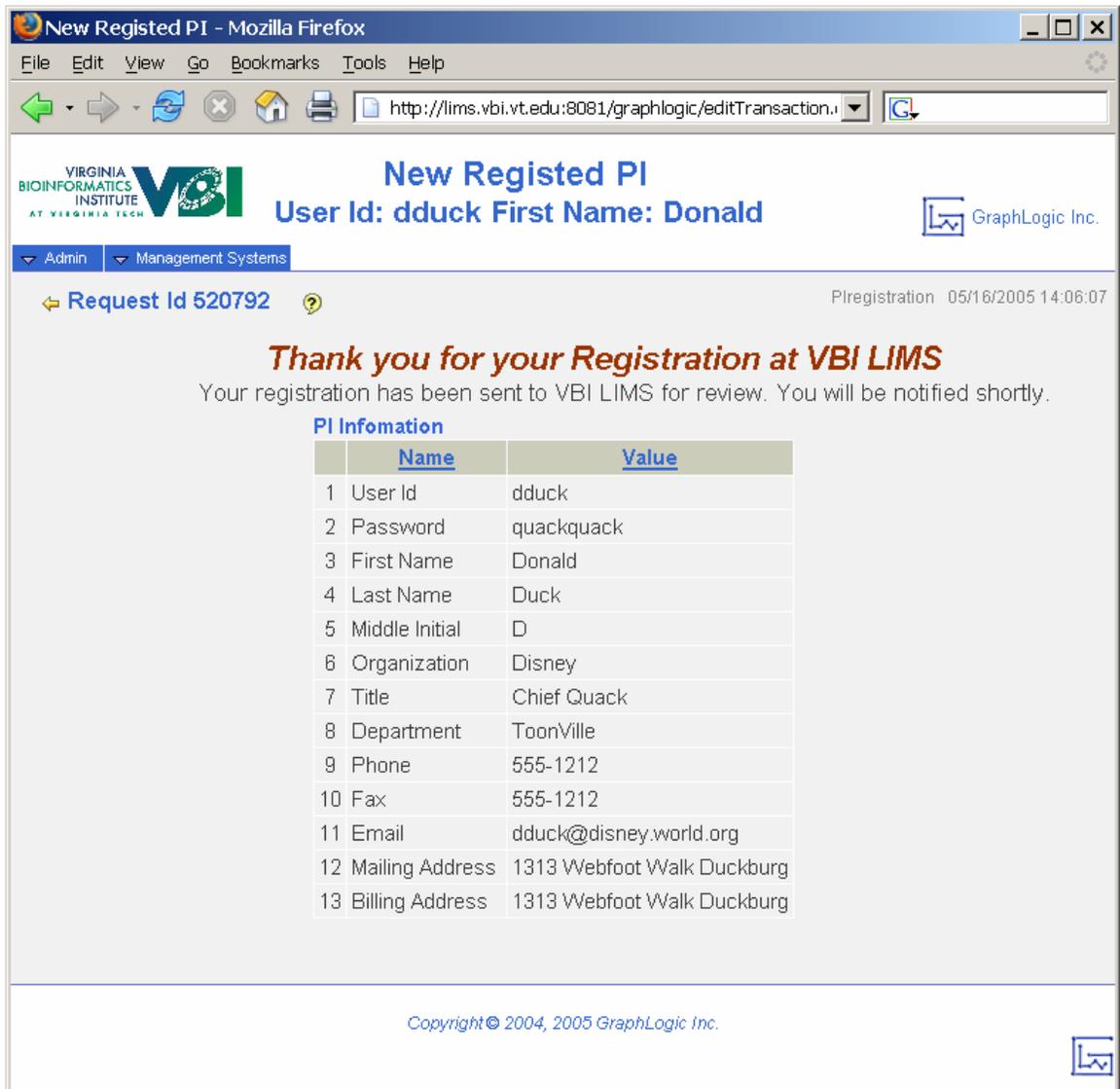


Figure 4 - Core Lab LIMS Submission

6. Click on the menu item *Admin* and select the *Logoff* option.

7. The LIMS user ID application will be reviewed as soon as practical. When approved, you will receive an email containing your activated user ID and password.
8. Proceed to login at the VBI core lab LIMS at <http://lims.vbi.vt.edu:8080/graphlogic> using your approved ID and password.

Create and Maintain Projects

Upon successful login to the CLF LIMS with your new account, you may proceed to the appropriate sample submission form within the application. The access level for each LIMS user determines which navigational menus are available to the user. CLF client accounts will typically have access to 5 menus as follows:

- Admin – Contains administrative functions for the LIMS
 - My Profile: {your user ID} – Allows the user to update account information including password, name, phone number and email address.
 - Help – Provides access to the contents of the LIMS help subsystem.
 - Logoff – Allows the user to cleanly log out of the LIMS.
- Genomics – Provides access to processes within the Genomics laboratory such as DNA Sequencing, DNA Fragment Analysis and Gene Expression Analysis. The sample submission form for each specific process is available on the “Genomics” menu by selecting one of the following menu items:
 - Affymetrix Workflow
 - BioAnalyzer
 - Custom MicroArray
 - Library Picking
 - MicroArray Printing
 - Plasmid Prep
 - Sequencing
 - Real-Time PCR
- Proteomics – Provides access to processes within the Proteomics laboratory. The sample submission form for each specific process is available on the “Proteomics” menu by selecting one of the following menu items:
 - 2D Gel
 - Mass Spectrometry
- Management Systems
 - Project Management – Provides access to project setup and data retrieval functions. Available functions include “Add Project”, “Edit Project” and “View Project Data”. Each is described in more detail in the following sections.

Add Project

Before submitting sample data to the CLF for processing, a “Project” will be created to contain, or group, sample and result data. Subsequent sample submissions may reference the same project, or individual projects may be set up to encompass each submission.

The CLF recommends that clients logically group sample submissions in similar fashion to the scientific experiments that are being performed.

To add a project, click on the “Management Systems” menu, followed by the “Project Management” option and then the “Add Project” option as represented by the following figure.

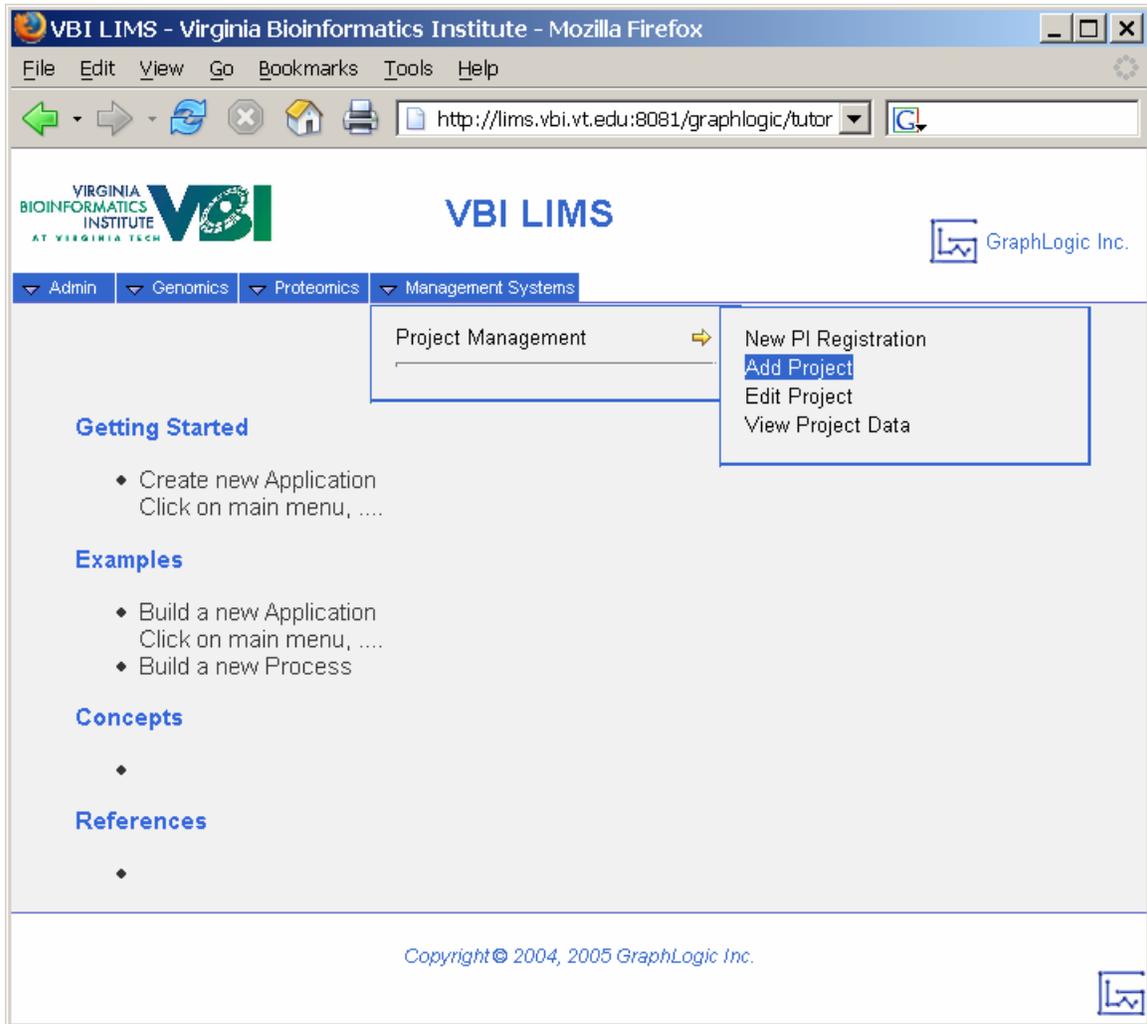


Figure 5 - Add New Project

The LIMS will next collect some high-level information about the new project as shown in the following figure.

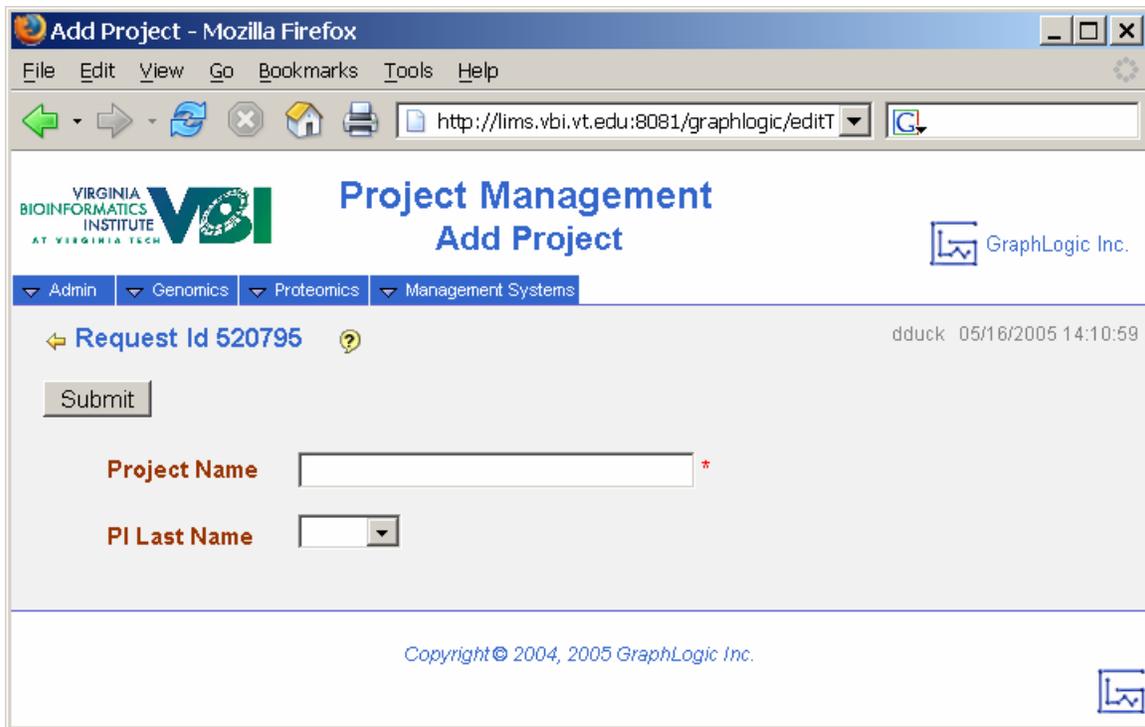


Figure 6 - Create New Project Name

The fields that must be completed to continue are the “Project Name” and “PI Last Name”. Provide a meaningful name for the project space to be created in the LIMS database and select the primary investigator name from the list-of-values. After completion of all data fields, click on the “Submit” button to continue to the next step.

The project will be created in the LIMS database and the user will be offered the opportunity to enter additional details about the project including the responsible department, project description, experimental design and objectives. A sample screen is shown in the following figure.

You may click on the yellow arrow (👈), near the top-left side of the screen, at any time to return to the previous screen.

To reference “help” content for the “Add Project” screen, click on the help icon (🔍).

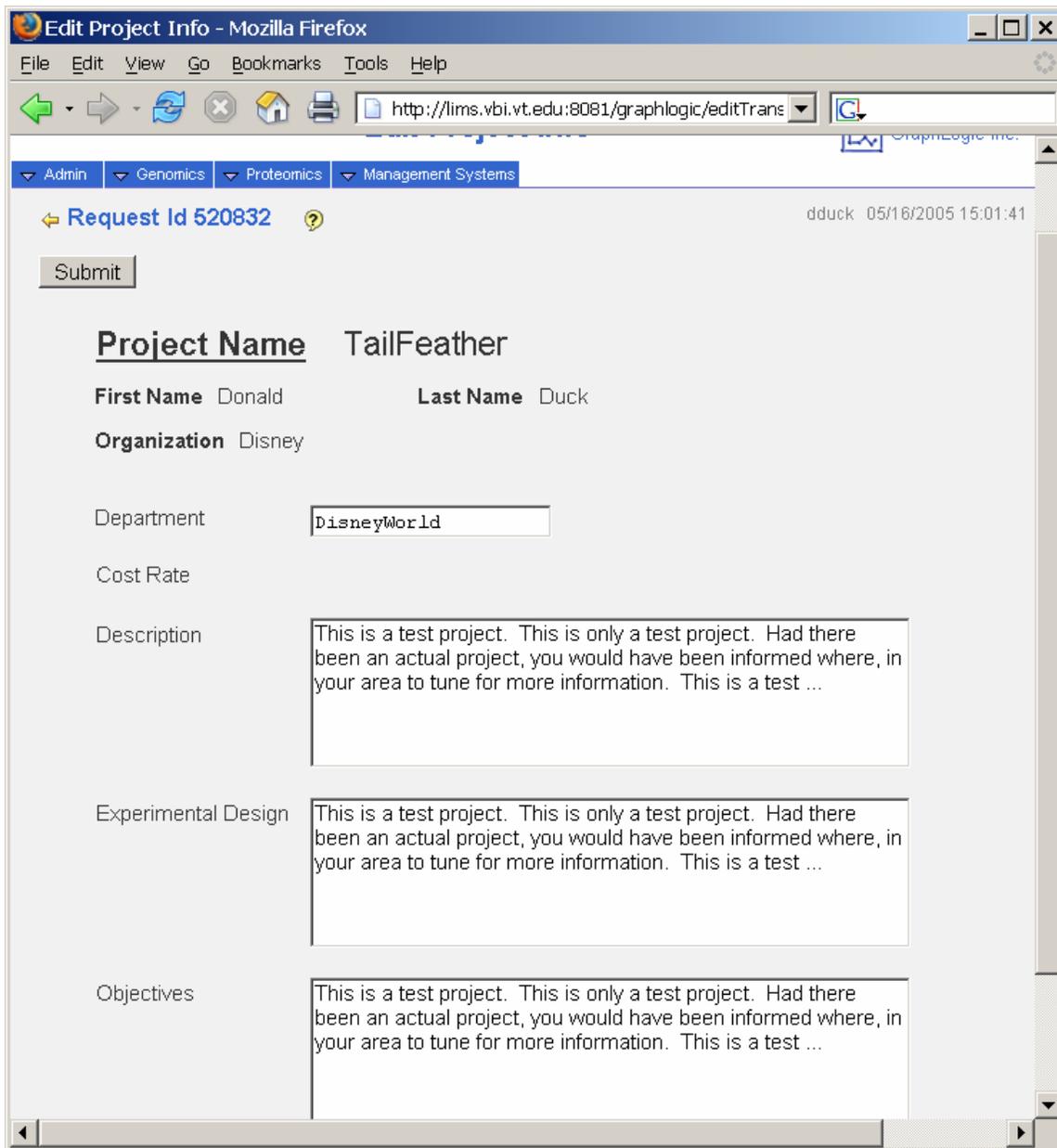


Figure 7 - Create New Project Details

The CLF encourages clientele to enter as much information as possible to facilitate future organization, retrieval and appropriate cross-discipline collaboration with additional members of the research community. It is important to note that the CLF only shares sample results with the originator. However, there will be future opportunity for each client to share data with additional or future collaborators.

When all appropriate data has been recorded for the project, click on the “Submit” button to complete the new project initialization process.

You may click on the yellow arrow (👈), near the top-left side of the screen, at any time to return to the previous screen.

To reference “help” content for the “Add Project Info” screen, click on the help icon (🔍).

Edit Project

Similar to “Add Project,” the “Edit Project” function allows the user to update details about an existing project.

Select the “Edit Project” option from the “Management Systems” → “Project Management” to display the “Edit Project” screen as shown in the following figure.

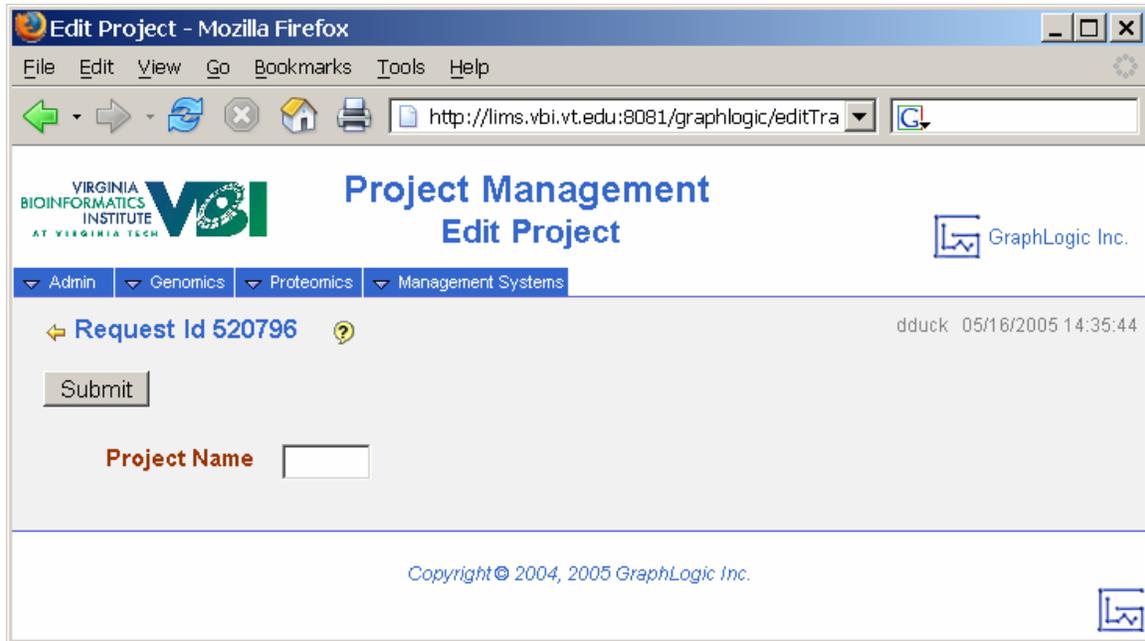


Figure 8 - Edit Project

Only projects that the logged in user has permission to access will be available from the list-of-values. Select the appropriate project name from the list and click on the “Submit” button to display currently stored project details (as shown in Figure 7). Edit details as desired and click on the “Submit” button to save the updated project information.

You may click on the yellow arrow (↩), near the top-left side of the screen, at any time to return to the previous screen.

To reference “help” content for the “Edit Project” screen, click on the help icon (?).

Sample Submission

Each protocol available within the LIMS contains a unique sample submission screen. However, the essential functionality of all sample submission pages is identical. This section will describe those essential functions that may be exercised on the sample submission screen for any process.

Each sample submission screen will contain fields for user entry of data. The screen will be separated into two primary sections as follows:

- Common information – generally at the top of the page. This is information that is common to all samples that will be submitted in any given group.

- Detailed sample information – follows the common information. This is information that will be unique for each sample, or that will describe a unique procedure that is to be performed for each sample.

Key controls for the form are circled in the following figure and described in the following paragraphs.

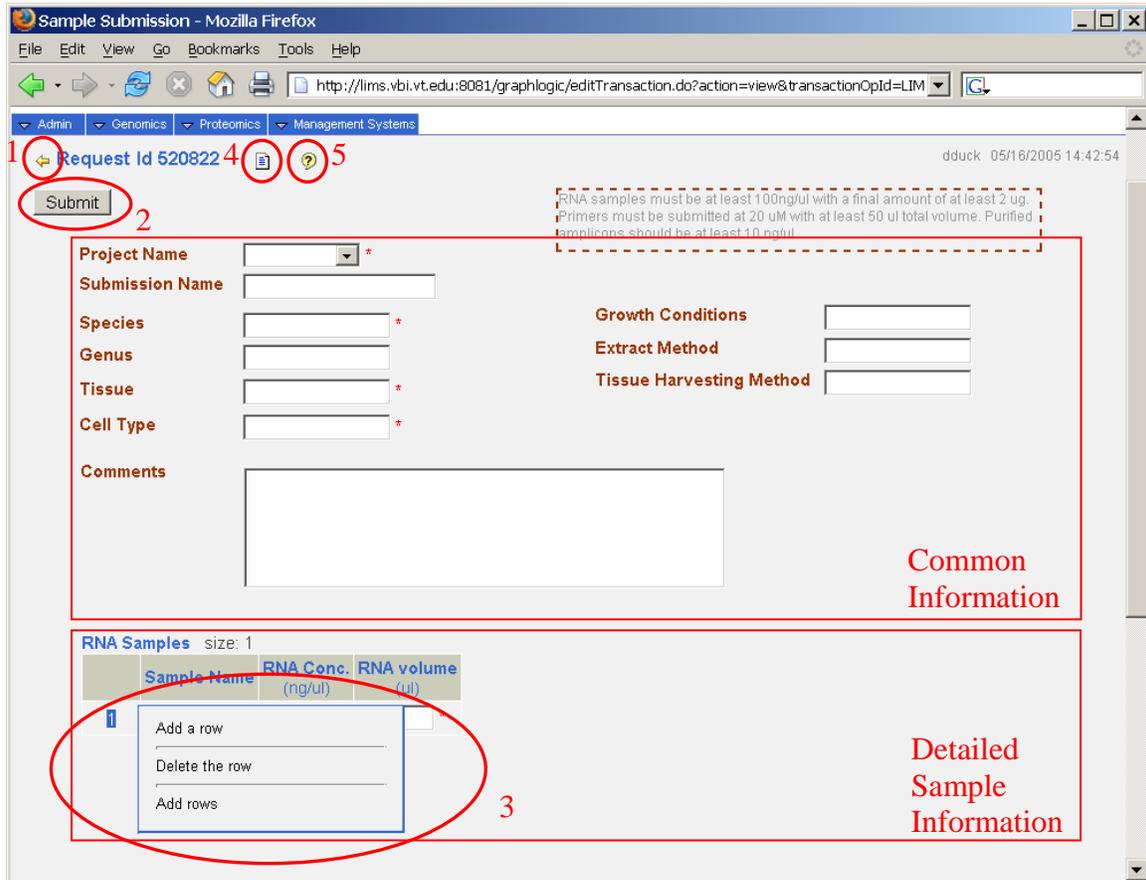


Figure 9 - Sample Submission

The user may click on the yellow arrow (1 in the figure) at any time to return to the previous screen.

The user will click on the “Submit” button (2 in the figure) to indicate that data entry is complete. This action will cause the LIMS to validate all data entered on the submission form. The user will be notified if any required fields have been left blank or if any of the data does not meet established core lab criteria. In general, core lab criteria will be described in help text contained near the upper-right corner of the screen and will generally consist of things such as volume for a given concentration.

When all sample data passes validation criteria for the submission screen, the LIMS will store the sample data and initiate processing within the LIMS workflow.

The user may add any required number of rows to contain detailed sample information. The control to add a row(s) is labeled 3 in the figure. Move the mouse pointer over the last available number in the list and wait for the popup box as shown in the preceding

figure. To add one blank row, click on the “Add a row” options. To add multiple blank rows, click on the “Add rows” option. Choosing the option to add multiple rows will result in an additional popup box to collect the number of rows that should be added to the list.

To delete an erroneous detail data row, hold the mouse pointer over the item number at the beginning of the row until the popup box is displayed. Then select the option to “Delete the row”.

The LIMS also provides “hot keys” to help with some redundant tasks such as appending a sequential number to a series of sample names or copying identical data down any column.

To append a sequential number to a column of data, perform the following actions:

- Click on the data entry box for the first entry in the column that will contain serialized names.
- Type the static part of the name – the part of the name that remains constant for each row of the column.
- Hold down the “Ctrl” key and press the “down arrow” of the computer keyboard to populate all remaining rows in the column.

For example: Type a sample name such as “ARB-05092005-” and then press <CTRL><Down Arrow>. The “Sample Name” column will be populated with strings such as ARB-05092005-1, ARB-05092005-2, ARB-05092005-3, ... until all rows in the selected column have been populated.

To simply copy static data in all remaining rows of a column, perform the following actions:

- Click on the data entry box for the first entry in the column that will contain copied information.
- Type the data that is to be copied to all rows of the column.
- Press the “down arrow” of the computer keyboard to populate all remaining rows in the column with exact copies of the data typed into the data entry block.

Typing a volume of “1000” and then pressing <Down Arrow> will populate all entries in the volume column below the current row with the value 1000.

To add notes or comments to the sample submission, click on the “notes” icon (labeled 4 in the figure).

Click on the “help” icon (labeled 5 in the figure) on any sample submission screen to access more specific data/sample requirements.

Data Retrieval

When all requested protocols have been executed for a set of samples submitted on a single submission form, the requesting user will be notified that the results files are ready for retrieval. In the LIMS, there are two ways to view/retrieve result files: from the relevant workflow and from the “View Project Data” function of the LIMS.

Workflow Data Retrieval

To retrieve sample results data from the workflow, log into the LIMS using your user ID and password and select the relevant lab/process from either the “Genomics” or “Proteomics” menus. If necessary, click on the + icon to the left of the “Data Retrieval” step to expand and display the list of samples that have completed processing and have results files that are available for download by the user.

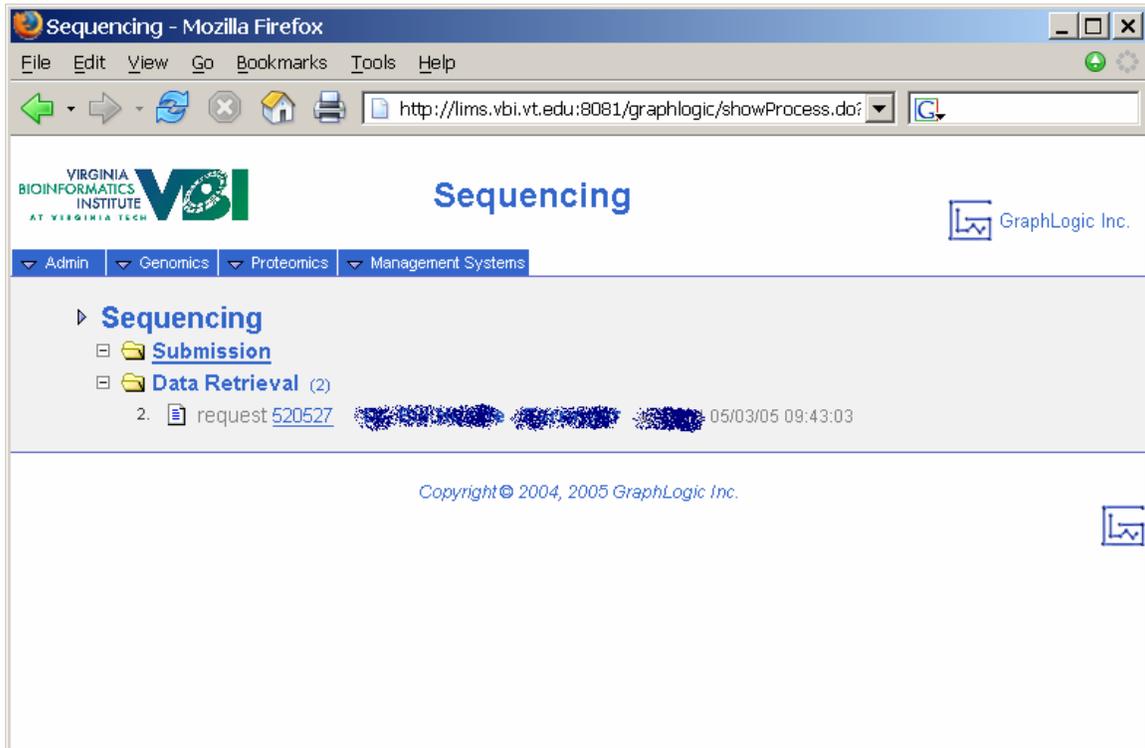


Figure 10 - Process Workflow Data Retrieval

Click on the link for any row to display more detailed sample information as shown in the following figure.

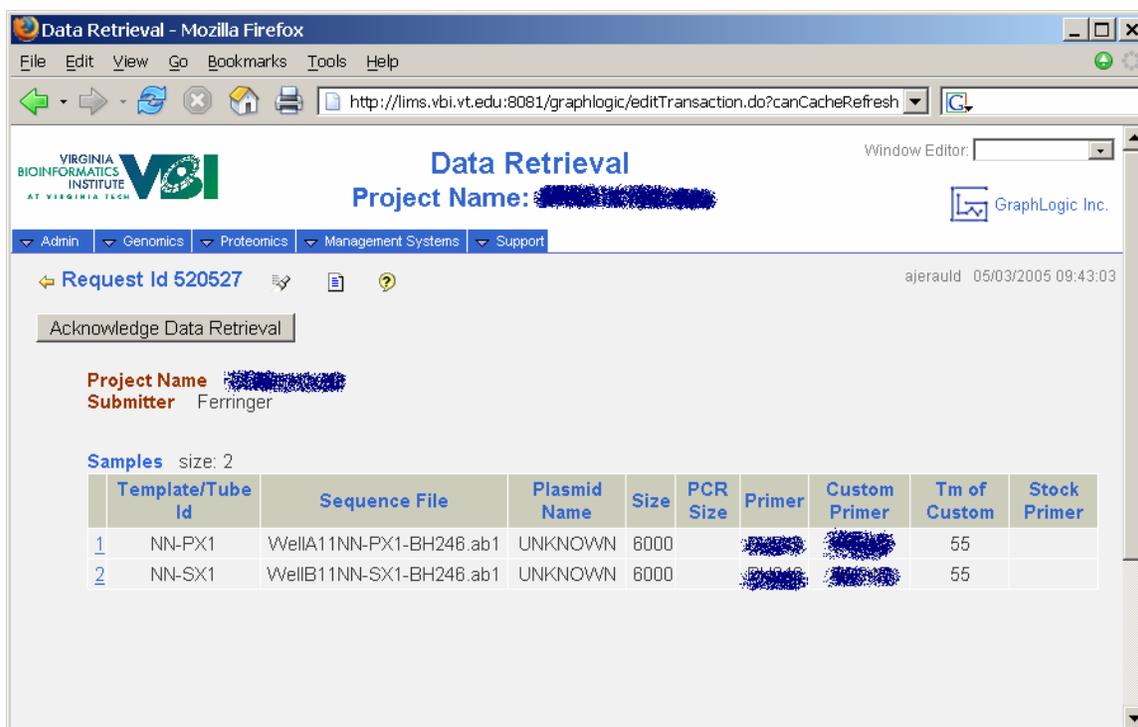


Figure 11 - Project Data Retrieval

If the user is authorized to access/download the results data files, each filename will be a link that may be clicked to initiate downloading/saving the file to the user's local computer. When data retrieval has been completed, click on the "Acknowledge Data Retrieval" to allow the samples to exit the "Data Retrieval" step.

You may click on the yellow arrow (↩), near the top-left side of the screen, at any time to return to the previous screen.

To add notes or comments to the sample submission, click on the "notes" icon (📝).

To reference "help" content for the "Data Retrieval" screen, click on the help icon (🔍).

All results data files are also available under the "Management Systems" menu by selecting "Project Management" and then "View Project Data".

View Project Data

"View Project Data" is a central repository for all sample results contained in the LIMS for a given project. Sample information is segregated by process and listed by timestamp within each process. A sample "View Project Data" screen is shown in the following figure.

View Project Data - Mozilla Firefox

File Edit View Go Bookmarks Tools Help

https://lims.vbi.vt.edu:8443/graphlogic/editTransaction.i

VIRGINIA BIOINFORMATICS INSTITUTE AT VIRGINIA TECH

Project Management View Project Data

Window Editor: [dropdown]

GraphLogic Inc.

Admin Genomics Proteomics Management Systems Support

Request Id 521016 ?

willie 05/09/2005 13:58:47

Project Name LIMS test

Process	Data Files		
	Name	Size	Last Modified
1 Affymetrix	1 test1.cab.pdf	30799	04/28/2005 11:32:53
	2 test2.cab.pdf	30799	04/28/2005 11:32:53
2 BioAnalyzer	1 5-2-05 [redacted] 2005-05-02 15-06-23.cld	66654	05/02/2005 15:28:10
	2 5-2-05 [redacted] 2005-05-02 15-06-23.cld	66654	05/02/2005 15:28:10
	3 5-2-05 [redacted] 2005-05-02 15-06-23.cld	66654	05/02/2005 15:28:10
	4 5-2-05 [redacted] 2005-05-02 15-06-23.cld	66654	05/02/2005 15:28:10
	5 5-2-05 [redacted] 2005-05-02 15-06-23.cld	66654	05/02/2005 15:28:10
Xichena			05/02/2005

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Figure 12 - View Project Data

Only projects that the logged in user has permission to access will be available from the list-of-values. Select the appropriate project name from the list and click on the “Submit” button to display all stored project results files.

You may click on the yellow arrow (←), near the top-left side of the screen, at any time to return to the previous screen.

To reference “help” content for the “View Project Data” screen, click on the help icon (?).