Bika Water LIMS

Sampling Rounds

Functional specification and use cases

version 1.0, lemoene Smit, 16 March 2014

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1 Purpose of this document

This document is used to establish a common understanding of how Bika LIMS must meet the water quality lab's Sampling Round requirements. It focuses on the gap between current Bika functionality and lab requirements.

The document serves as a functional specification for programmers working on the project, and as quality management tool during acceptance testing by lab representatives. The specification is also used to accurately quote on the customisations required.

It is not uncommon that overlooked or additional functions are identified mid-project. These deviations are managed in a change control procedure after full technical analysis. It takes cost and time implications into account, and adjustments to the specification, budget, delivery and payment schedule.

1.1 Document History

V 1.0 Final. Updated with comment from the lab

V 0.9 Rewritten Sampling Round Templates to be a collection of AR Templates

V 0.8 Added Lab San Martin requirements, excluding Sampling Scheduling.

V 0.1 First version extracted form greater Bika Water specification

2 Overview

The aim of the design here is to automate as much as possible of the sampling process, including automatic creation of Sample records and Analysis Requests, and the use of barcodes.

By offering Sampling Round creation as a web-based form, it opens up the possibility for it to be completed on-site using a mobile device (laptop, smart phone) directly in the LIMS.

Since Sampling Rounds are recurring events, e.g. weekly sampling of the same rivers and lakes, their creation can be automated by maintaining 'Sampling Round Templates' that will allow for 'one click' and error free individual Sampling Round creation.

The Sampling Round is created with a number of default values collected from its Template but they can be over-written should they differ from the default values. Sample Points can be deleted from the Round, or new ones added.

NB. Sampling Rounds are constructed per Client, i.o.w. It will always ever contain samples from one client. If more than one Client is included on the same physical trip, the lab will handle their Samples in separate Rounds.

3 Not in the Scope

Scheduling Sampling Rounds

Sampling Rounds for multiple Clients

4 Notes to Programmers

…. a lot like Batching ARs in the current system, but batching Samples in stead and capturing Sample data only. Even the field analyses are Sample attributes. Furthermore, for ease of use, the Samples in a sampling Round are listed per Partition everywhere.

Which is different, but hopefully still some useful code to be mined (and improved;-)

5 Additions to Setup items

5.1 Samples. Partitions

For composite samples, the Sampling duration time must also be captured, thus in addition **Date/Time Sampled,** Samples also get a **Sampling Duration** field that is displayed on all Sample views, listed as a column on Sample lists, and captured here via Sampling Rounds.

A field '**Security seal intact Y/N**' for each partition container, captured to the container record on Sample reception.

5.2 Sample Points

Sample Points get a '**File attachment**' attribute on their set-up pages where user may upload photos or other documents related to the Sample Point.

5.3 AR Templates

AR Templates get a **Composite Y/N** checkbox and it is applied when ARs are created using the AR Template

5.4 Environmental conditions

To be used for Sampling Rounds, e.g. sunny, rainy, etc.

6 Sampling Round Templates. SRTs

A Sampling Round Templates (SRTs) are created as a collection of AR Templates, each set up earlier for the Sample Points to be included in the Template and from where the eventual Round's ARs and Sample records will be constructed.

The use case assumes that AR Templates have been created for all the Sample Points to be included in the SRT. The AR Templates will typically include values for:

Sample Point

Sample Type

Partitions and their containers and pre-preservations

Composite Y/N

Field Analyses

Lab Analyses

6.1 Creating a SR Template

Use case. **Creating a Sampling Round Template**

Role players. Lab manager, Client Contact, Lab Clerk

1. The lab manager logs in and navigates to 'Sampling Round Templates' in the LIMS setup area, or...
2. … if the SRT is applicable to a certain Client only, the SRT is create in the Client's folder, like their own Sample Points and Profiles at the moment. Client Contacts are allowed to create these too
3. He/she clicks [add] to create a new template, or on an existing one to edit it
4. The user edits the general Sampling Round Template fields:
5. **Title** – a short name that describes the Round for it to be easily identified on forms and drop-down menus
6. **Description** – a 'long name' with more information. This texts is also displayed upon a mouse-over of the Title field
7. **Sampler** – the default Sampler for these Rounds, selected from a drop-down menu of all Samplers in the system
8. The lab **Department** responsible for the Sampling Round
9. The user indicates the **Sampling Frequency**, the number of days between recurring field trips. At this stage public holiday and other non-working days are not considered. Sampling Scheduling will be the subject of future development.
10. If there are Sampling Instructions that'll always apply to this Round, the user enters that text in a **Sampling Instructions** field for the Template
11. These can still be overwritten when the eventual Sample Rounds will be created from the SRT
12. The user sequentially selects the AR Templates to be included in the SRT
13. **NB**. If a SRT is required that do not fully correspond to the AR templates selected, only 2 options exist:

    Edit the AR Templates (create new ones if necessary), or

    Edit the eventual AR Rounds created from the SRT

14. When done, the user [Saves] the SRT

6.2 Viewing and editing SRTs

1. The Sampling Round has 2 Tabs, **Edit/View** and **AR Templates**

2. The Edit/View tab displays the Template's 'header attributes' and authorised users, may edit them:
   - Title
   - Description
   - Sampling Frequency
   - Sampler
   - Lab Department
   - Sampling Instructions

3. The LIMS calculates the total number of Sample Points as well as total number of Containers included in the Round and displays these totals too

4. The AR Templates tab tables all the AR Templates included in the SRT

5. The table has columns for:
   - AR template title
   - Sample Point
   - Sample Type
   - Composite Y/N
   - Container Title
   - Container volume
   - Preservations
   - Sampler
   - ` Preparation method

6. **NB. The table is listed 1 row per Sample Partition/Container -** It is required for the Sampler to see which (pre-preserved) containers they have to pack for the field trip

7. As per standard Bika table, users can select which columns they want to see, and sort table data per column header

8. Authorised users may delete or add AR Templates to the list

7 Creating Sampling Rounds

Sampling Rounds are fully fledged LIMS objects which adhere to workflow. They are created with initial status open and when all data are captured they are *closed*.

Programmers: Sampling Rounds groups Samples very much like 'Batches' do for ARs

The ARs and Samples created per Sampling Round, enter the standard Bika workflow. There is one exception: Samples belonging to a Sampling Round that was closed earlier can be disposed of in bulk from the Sampling Round screen, and the date and 'disposer' details capture there

Like other LIMS objects, Sampling Rounds can be cancelled at any given time. Programmers: Cancelling is a secondary workflow, like that for cancelling and the Round's original status is maintained, e.g. an open Round can have a cancelled status as well as closed Rounds.

All status changes are logged in the Round's audit log.

Use case. **Creating and completing a Sampling Round**

Role players. Sampler, lab manager, lab clerk

1. The user navigates to the Client's Sampling Rounds in the LIMS navigation tree and clicks [+add]

2. The user may create a Sampling Round manually or create it from a SRT previously configured in the system, by selecting one from a drop-down combining the Client's own and general lab SRTs (Programmers - this is already implemented fro Profiles etc.)

3. To create a Round manually, the user follows a procedure similar to that described above in creating a Sampling Round Template, He/she completes or edits the header fields , which are the same as for SRTs, with the addition of
   Sampling date

4. … and creates the SR's AR/Samples directly as per standard AR create form. AR templates can still be used for these

5. If an SRT is used, the LIMS fills all these fields and creates the ARs automatically as configured in the SRT

6. Any of the fields created from the template may be edited - the system enforces data integrity by only allowing only valid entries from lookup widgets

7. ARs may be cancelled from the list created by the template, or new ones may be added

8. The LIMS calculates the total number of Sample Points as well as total number of Containers included in the Round and displays these totals on the Sample Round view

9. Once the user is happy with the Sample Round, he/she presses a [save] button

7.1 Labelling a Sampling Round

At any given time, authorised users may print all the Container labels, inclusive of barcodes, from a **[labels]** button on Samples/ARs tab of a Sampling Round, where containers are listed.

The system prints barcode labels for each prepared container with with a unique ID per Sample Partition and other attributes:

Partition ID barcode
Partition ID alphanumeric
Sampling Round Title & ID

Container Title
Container Size

Composite Y/N
Preservation
Sampling Date
Sampler
Hazardous Y/N

8 Editing a Sampling Round

At any time a authorised users may navigate to *open* Sampling Rounds and edit them. *Closed* Sampling Rounds can only be viewed

1. The Sampling Round has 2 Tabs, Edit/View and ARs/Samples

2. The Edit/View tab displays the 'header' fields identified above, hyperlinked where applicable

3. The AR/Samples table has columns identified for SRTs, with the addition of
   - AR ID
   - Sample ID
   - Date/Time Sampled

4. NB. The table rows are listed per Sample Partition/Container - It is required for the Sampler to see which (pre-preserved) containers they have to pack for the field trip

5. As per standard Bika table, users can select which columns they want to see, and sort table data per column header

9 Using a Sample Round

The Samplers may the Sampling Round form to take with on the field trip. Some labs may enter data directly into the system on mobile computers should connectivity at the Sample Points exists.

1. The form includes the **Sampling Instructions** for the round

2. All the data displayed are printed as well as a number of fields that have to be manually completed on the field trip: e.g. to capture
   - Field Analyses results
   - Sampling time
   - Sampling duration
   - Environmental conditions
   - Additional Remarks

3. A **Sample disposed** column is also available on the form for later use

4. The print includes Sample barcodes, per Sample Partition/Container

5. Apart from a **Remarks** field for the Round, **Remarks** can also be captured for each Sampling Point/AR in the Round

6. The print includes space for the Signatures
   - Sampler
   - Client Contact that agrees with the sampling carried out. space for both handwritten name and signature. This is necessary for when sampling is done on Client premises
   - The user disposing the Samples

7. The Samplers take the printed form with on their field trip and capture the above data on them. Once back from the field trip, they transcribe the data from paper to the on-line form

   Additional functionality on-line:

8. A **File attachment** widget is available on the Sampling Round where users may upload any documents, scans or photos related to the Round

9. A '**Container prepared by**' field is available per Container row and can be completed from a drop-down menu of all Samplers and Preservers in the system.

10. A numeric field transportation **Temperature at arrival**

11. A field 'Security seal intact Y/N', for each partition container, captured to the container record

12. If a Sample is checked off as **Not Sampled**, say because a borehole at the sampling point was dry, the the user cancels Sample record created earlier, the LIMS automatically cancels its associated AR

13. When done the user presses [**save**]

14. When the user is happy that the Round is complete, he/she changes its status manually to *closed*

10 Cancelling a Sampling Round

Sampling Rounds can never be deleted, only cancelled. The user does so in the same way any other object is cancelled in the system, by checking it in a list of Sampling Rounds and pressing a [cancel] button.

NB. When the round is cancelled, all its associated Samples and ARs are cancelled by the system.

Cancelled Rounds, like other Bika objects, can be listed separately and are displayed against the system's default background.

11 Disposing Samples using the Sampling Round

Users may use the Sampling Round form to dispose of all the Samples that are included on it, even after the Round was closed.

Samples expire when their Retention periods elapse. The retention Periods are configurable per Sample Type and starts at the Sample's sampling time. Samples can also be manually expired by authorised users.

After expiry, the Samples are not offered for results capture any more, but they have not been physically disposed of. Users can navigate to the lists of expired Samples and [Dispose] of them there.

In Sampling Rounds it is possible to [Dispose] of all the Samples in the Round together, whether they expired or not.

Use case. **Disposing the Samples included on a Sampling Round**

Role players. Sampler, lab clerk, lab manager

1. The user navigates to the Sampling Rounds in the LIMS navigation tree and opens the Round which contains the Samples he/she needs to dispose of
2. He/she navigates to the Round's Sample list
3. … and pushes a [Dispose All] button
4. The System changes all the selected Samples' statuses to disposed regardless whether they have been expired yet
5. The user doing the disposal in the system's name gets captured on the Round in the **Disposed by** column for each Sample selected. This data is actually updated and kept on the Sample records themselves
6. The user navigates away
7. Currently the lab procedure expects the user to also signs the printed COC form that went with on the field trip.
8. All labs will not need that the printed form get signed, because the system has already captured the name at the moment of the disposal
9. If the Samples included on the Round are disposed elsewhere in the system, e.g. on the Sample record itself, the user doing so and captured on in the log of the Sample, is surfaced and listed on the Round too

12 Sampling Round lists

Like most other LIMS objects, Sampling Rounds are listed and the lists can be reached from the navigation column. Lists can be selected for All, Open, Closed or Cancelled statuses.