The AquaSafe Management System (ASMS)

User Manual

Contents

Introduction

The AquaSafe Management System (ASMS) is our customised, intelligent and structured representation of Water Quality Data distributed across multiple platforms including Tabular, Graphical & Summary Records, incorporating an automatic alert generation system.

The ever increasing global population is directly proportional to the rampant exhaustion, depletion and degradation of natural resources, of which Water perhaps being the most pertinent.

Supply and access to clean water is considered a luxury in different parts of the world thus continuous monitoring of existing supplies (of water) is the need of the hour to ensure public health in general.

Wagtech Projects & Trace2o Limited has been taking the endeavour to create streamlined solutions to the monitoring of Environmental Sustainability Aspects and the ASMS is one such prospect in the domain of Water Quality Monitoring.

The success of any monitoring falls flat without proper recording and representation of results, the ASMS is an effort to make sense and draw patterns in large volumes of Water Quality Data which may be used by governments, organisations or individuals to arrive at important decisions and conclusions.

The following Manual is a User Introduction Guide on the operation and Navigation of the ASMS – Water Quality Dashboard.

How does the App & Dashboard Work?

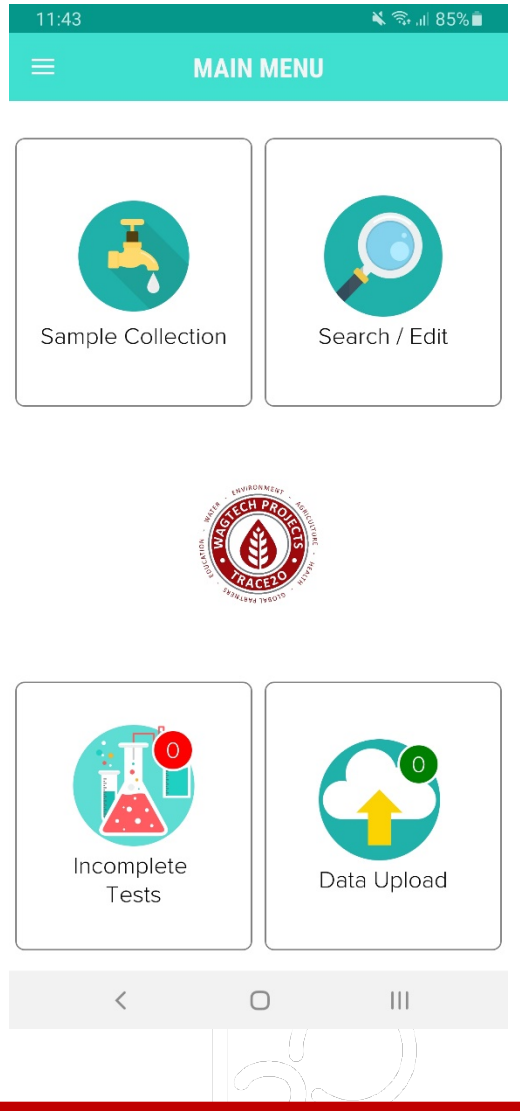
The ASMS is an exclusive added feature to the Wagtech Trace2o range for water quality monitoring. A license is the gateway to use the tailor made ASMS Android based application for recording Water Quality data on site. It should be noted that the ASMS App has an inbuilt IMEI tracker and therefor a single license cannot be used in multiple devices simultaneously. The client can either opt for the BASIC or the ADVANCED version of the Dashboard.

So how does this actually work?

Lets say that you are an organisation/individual who needs to run a Water Quality Monitoring & Surveillance program in any part of the world, and you are concerned about the contamination in your water systems such as Arsenic, Lead, Cadmium, pH & Coli formic Bacteria. The area over which you need to run the surveillance program is vast is constituted of a very large number of sources. River basins, dug wells, hand pumps & taps connected to a central distribution system.

You have a team of 5 engineers who are tasked to regularly visit the field and test the water sources for Arsenic, Lead, Cadmium, pH & Coli formic Pathogens. So this team of 5 is supposed to physically visit the sources, test the water on-site and record the observations on a note book/paper- the standard protocol. A few years down the line you have a handfuls amount of data, scattered all over note books and you are finding it hard to make any sense out of it let alone a pattern, trend, report or data analysis.

This is where ASMS comes into play, using ASMS you can streamline your surveillance through an application on your engineers phone, sending the data back to your headquarters so that the recorded data is stored instantly. The data can then be used to generate patterns, trends, report or general data analysis.

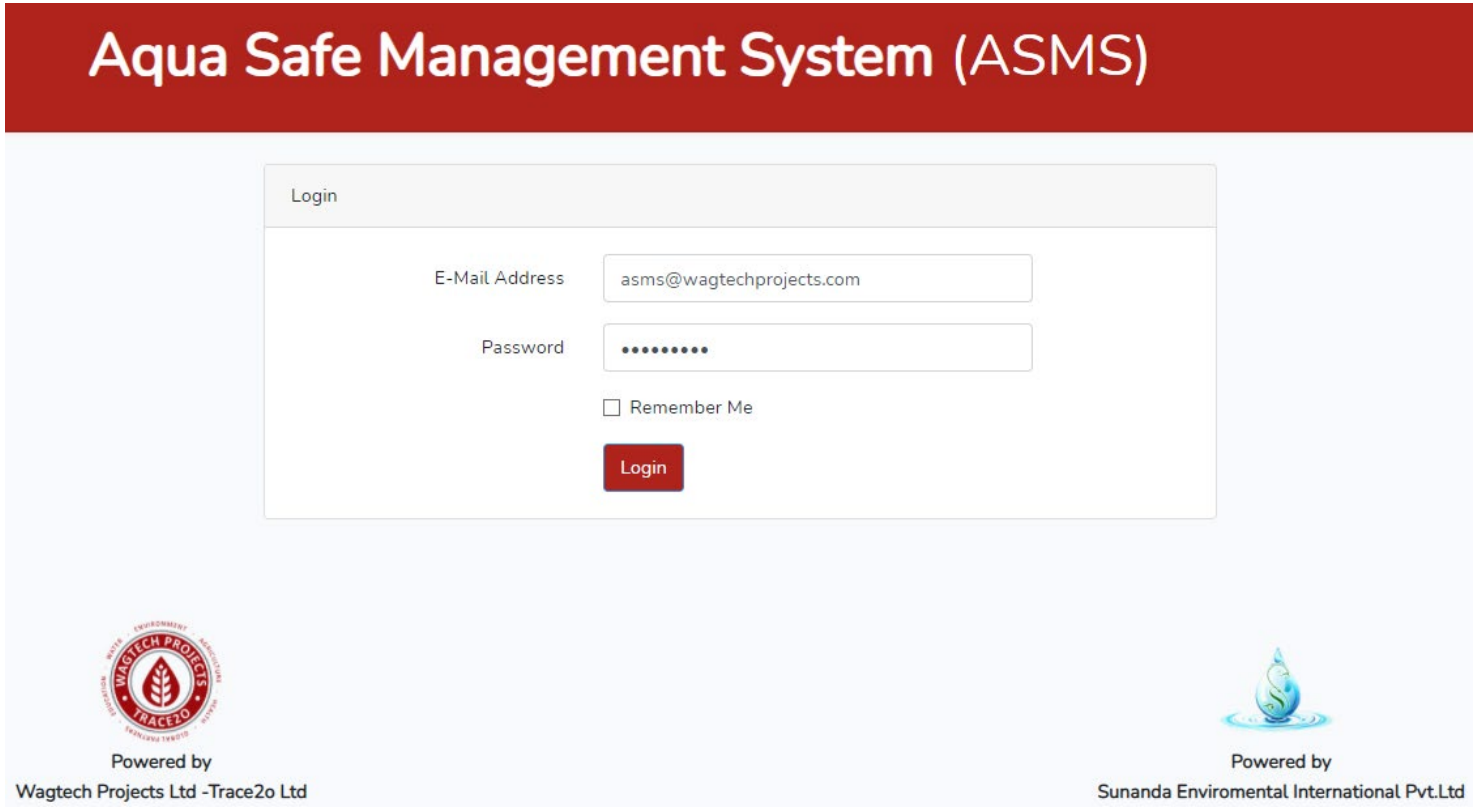


Logging in

The ASMS Dashboard is a secured site which can be reached going to: www.asmsonline.net

The link will take you to the login page which is depicted in the Image.

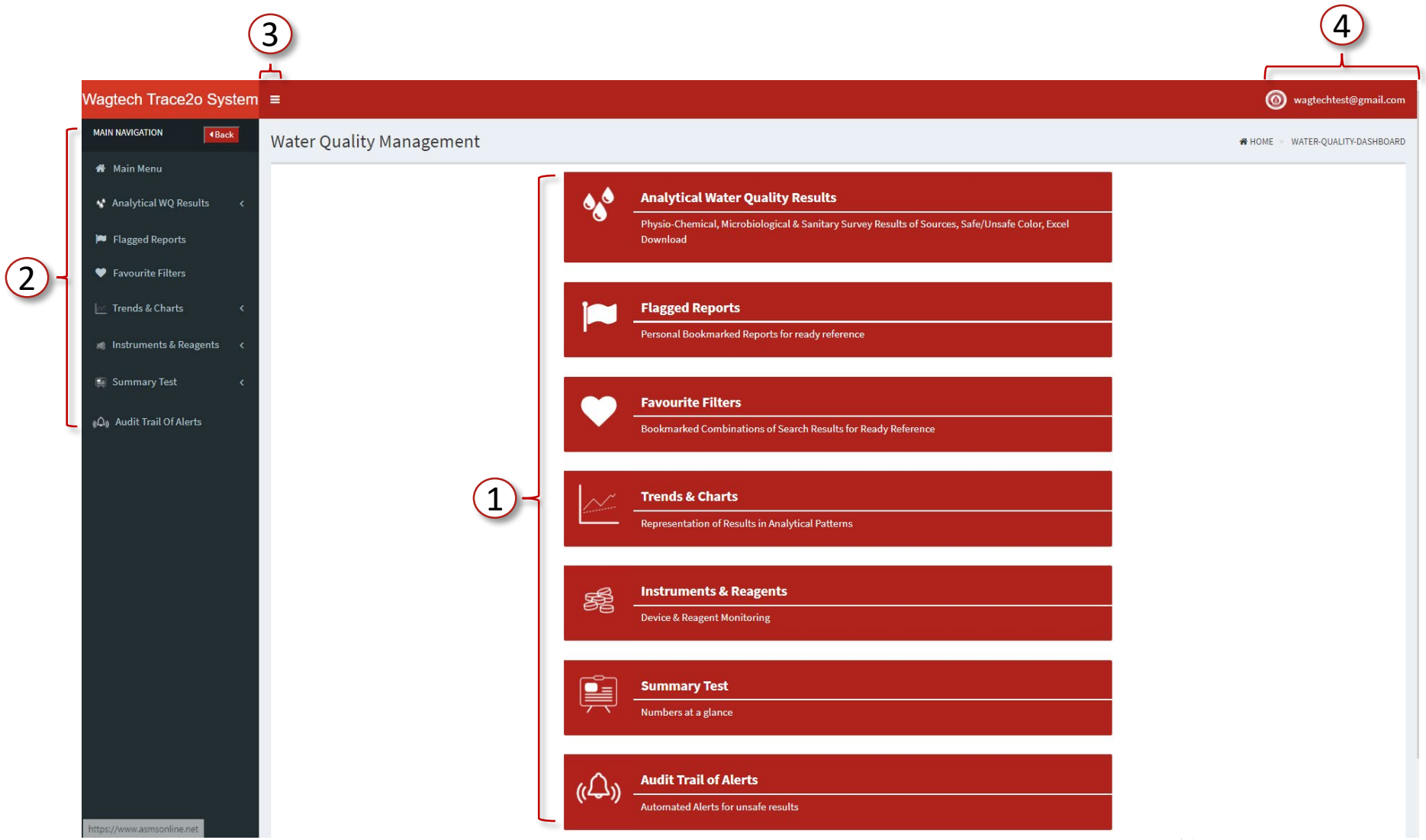
Upon reaching the login Page, you needs to type in the email and Password provided by Wagtech Projects Trace2o.



Navigating

The Diagram shows the page that you will be guided to once logged in:

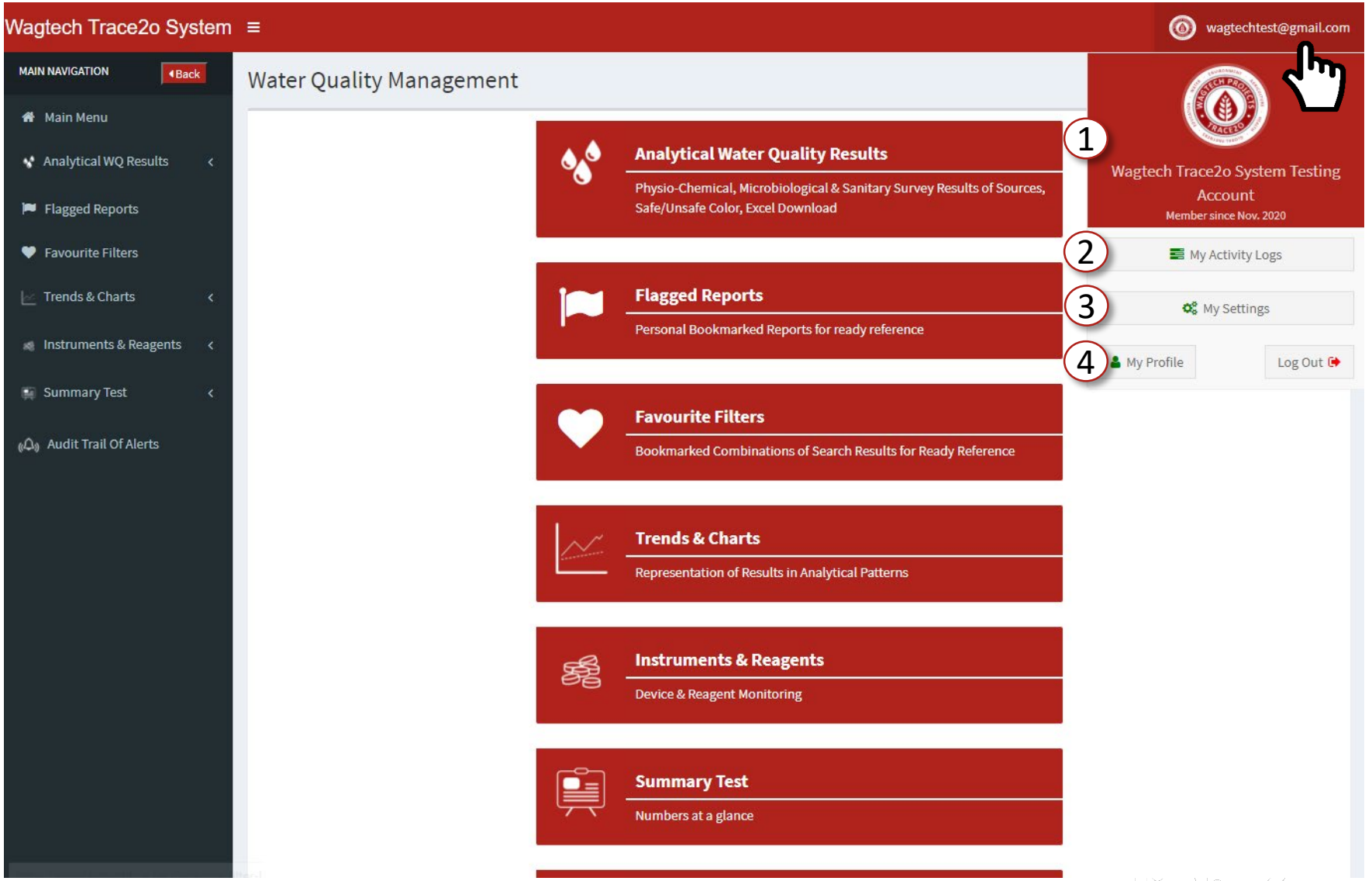
1. The main menu where you find the features of the ASMS
2. The side menu, same as the main menu (figure 1) , however this will always be present as you go into the different modules
3. If clicked will collapse the side menu allowing the window to widen
4. The profile which contains settings, activity logs and the log out button.



Navigating

By clicking on the profile drop down menu you will see the following options:

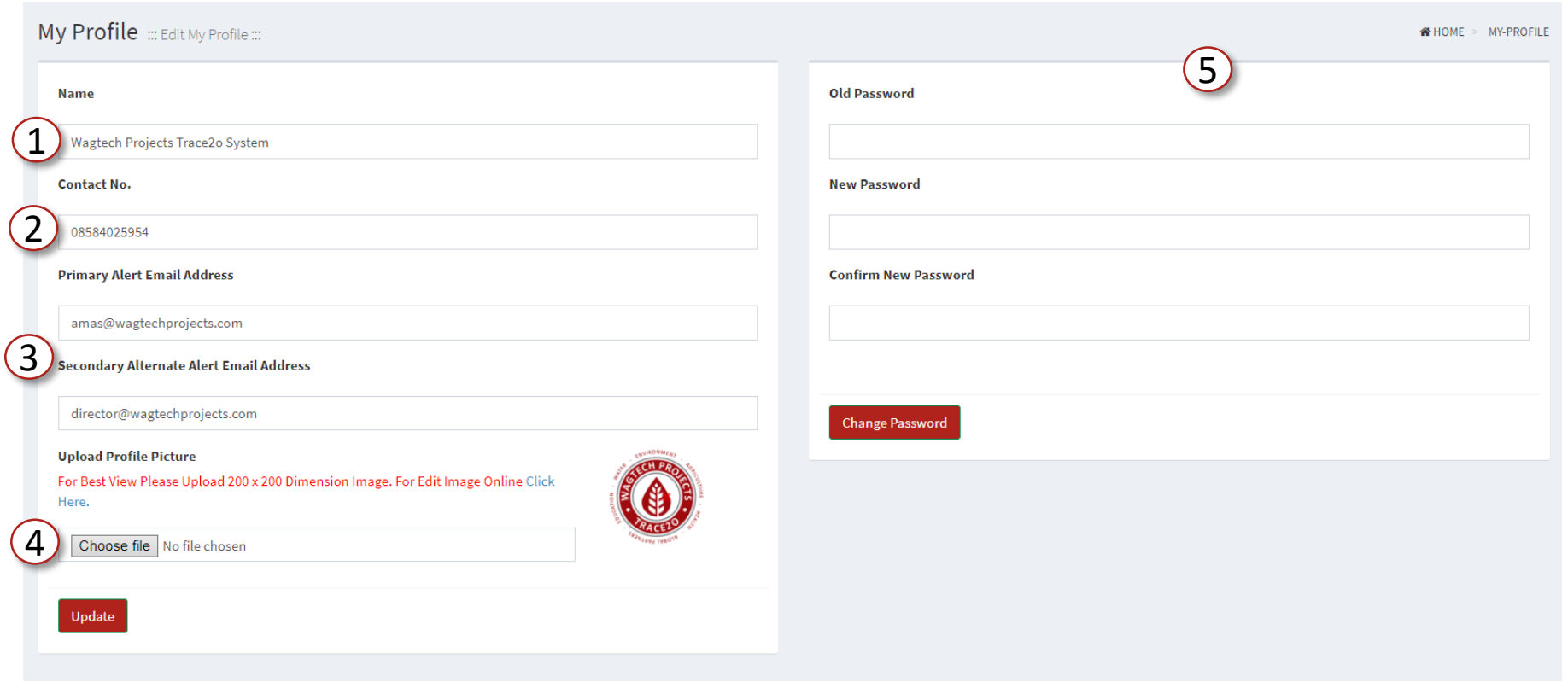
1. Your organisation logo, name and when you joined ASMS.
2. The activity log tracks all the changes that you make on the dashboard.
3. Your settings where you view and add app users to your dashboard
4. Your profile settings where you can change alert email, change your password.



My Profile

Below is the ‘My Profile’ page where you can change these settings to how you want it.

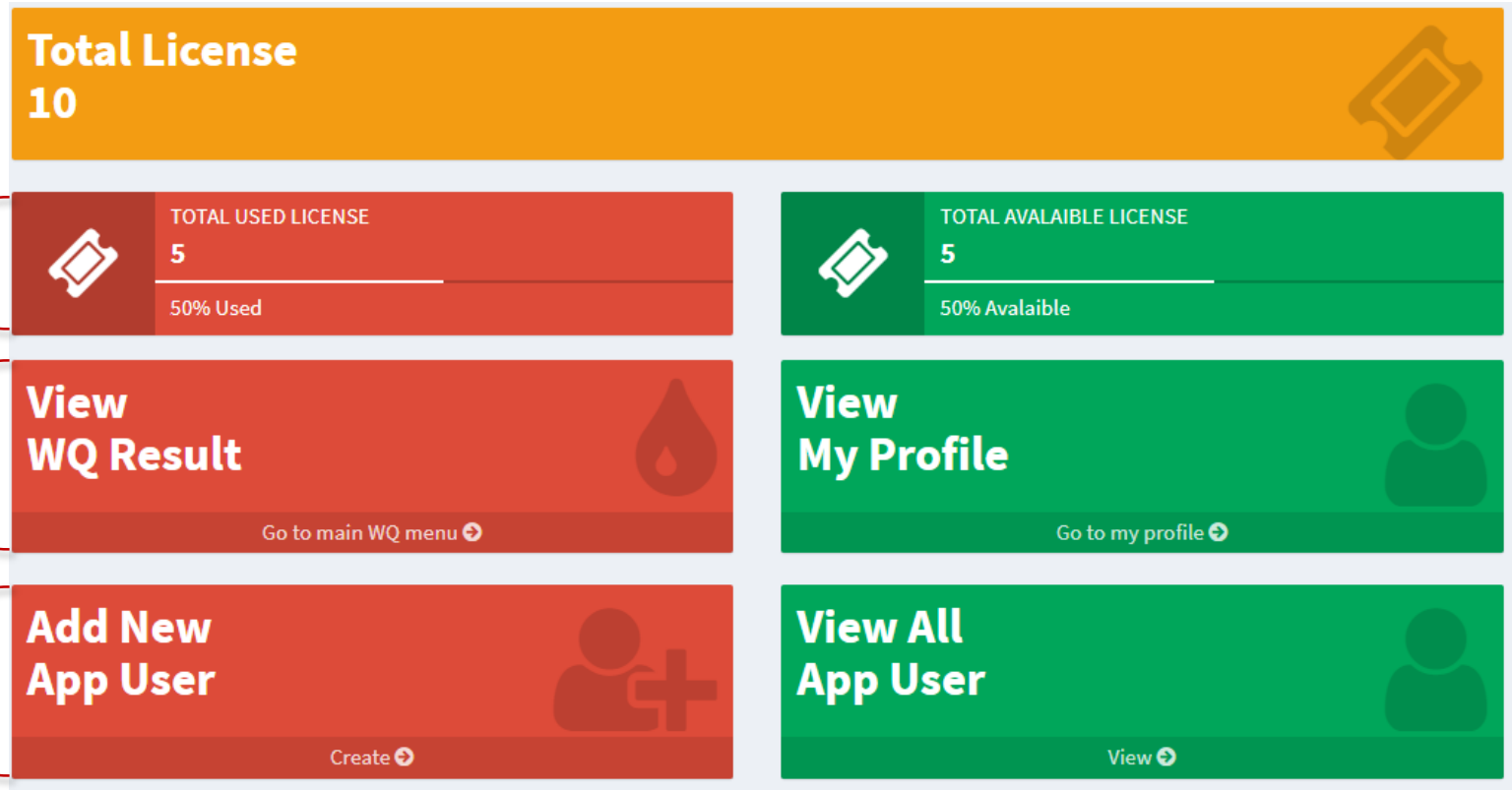
1. Name of your organisation which will be displayed on your ASMS site.
2. Contact telephone
3. Email address for where the email alerts will be sent (see Contamination Alerts)
4. Upload a logo of your organization.
5. Password change if you need a password change to login to the dashboard.



My Settings

Each ASMS Dashboard is either using the ADVANCE or the BASIC version of the dashboard, here you are able to delegate these licenses to the field engineers – the image below explains the same (Note- Please Revise ‘Section TWO’ again)

This User has 10 Licenses in Total – Out of which 5 have been exhausted & 5 are still in stock- We can ‘VIEW’ the details of all EXISTING App USERS from here & New App USERS can be assigned from here (Continued in the following Pages)



The amount of license you have currently active

The amount of license you have available to allocate

View current water quality results

Takes you to your profile settings page as seen before

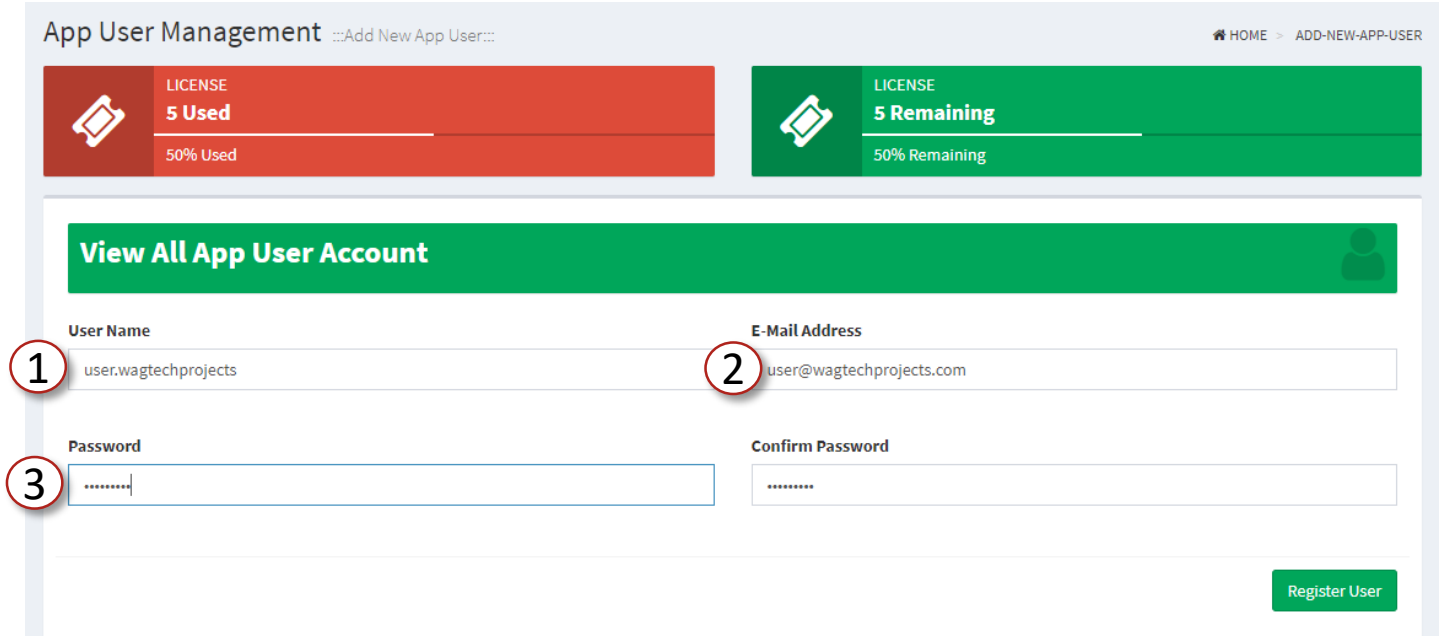
To add a new app user to your team

To view your current App users and their individual settings

Add New App User

Adding an App USER is as simple! Filling in the details as you see here you are able to create a login for the App that will allow you to start gathering data.

1. User Name – This will be their username to login.
2. Email address – An email address for that engineer/
3. Password – The password that will be used to log the engineer into the app.



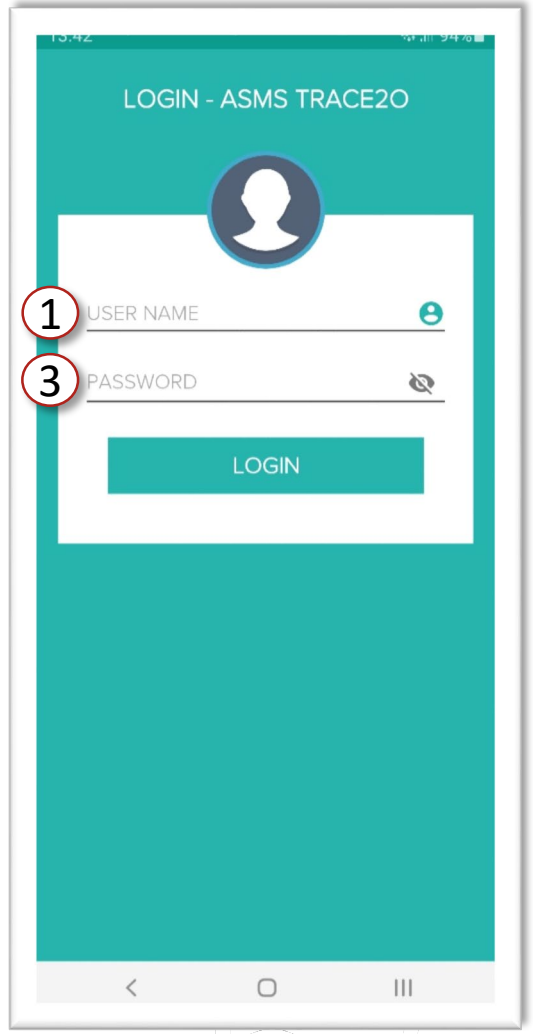
NOTE

Once a user name & password has been created it can only be used on one particular/specific device at the same time.

Duplication is not possible.

The dashboard manager can, at any point of time, de-register any user and the assign the same license/user name & password to any other device.

The App User view:

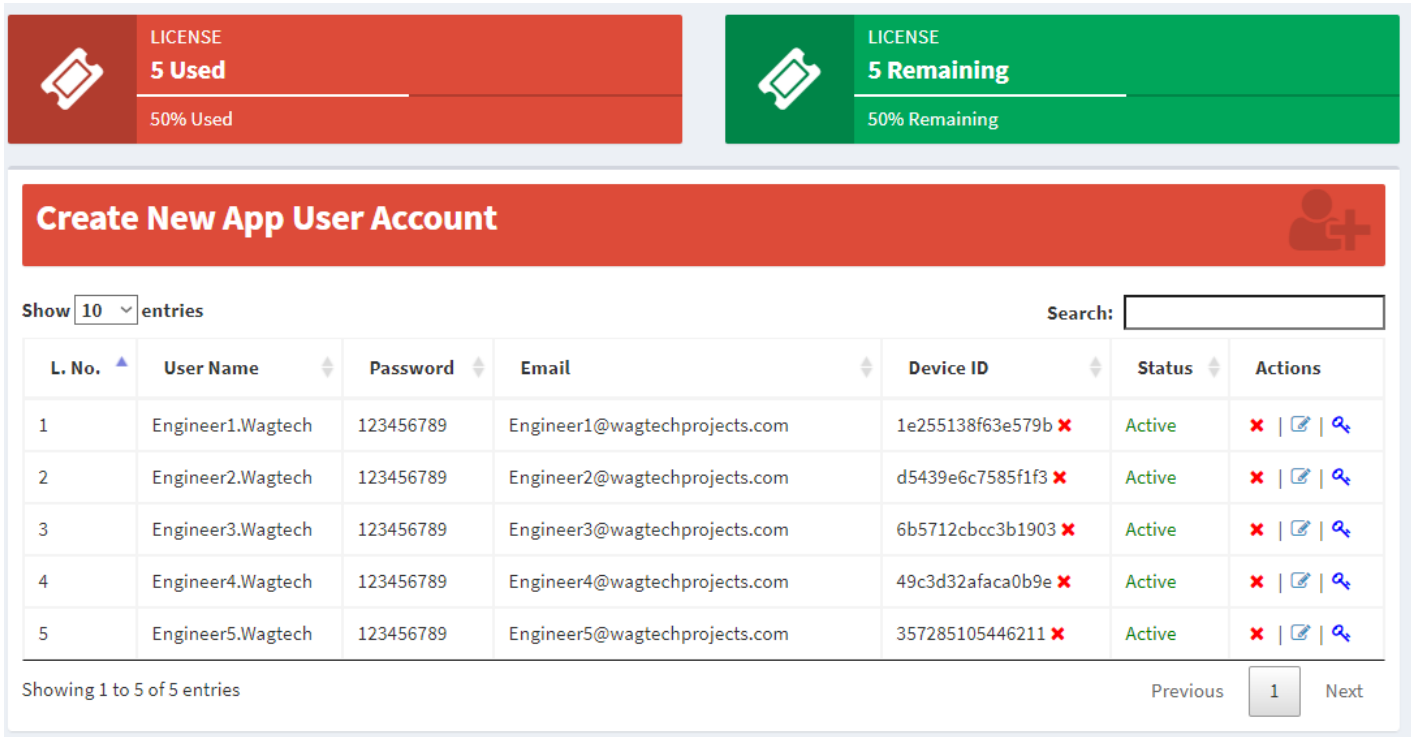


View All App User

Viewing all the current app users you will see their username, password, email address, device id, the status of the app license and the actions you can take. As you can see ASMS will capture the device id known as the IMEI (International Mobile Equipment Identity) and bind it to that user.

The ASMS Smartphone Application is an OFF-LINE app which means it does not require internet connection for most functionalities. However the internet is required while uploading data to the dashboard.

In the event that app user's device is lost/damaged you are able to unbind that license from the device by clicking the cross next to the device id. Unfortunately any unsent data from the lost/damaged device will be lost permanently. Once done the same login details can be used on any other device, immediately the device id will be registered by the dashboard.



When the red cross is visible the dashboard operator can use it to inactivate an active user. when the green tick is visible the dashboard manager/operator can click it to activate an inactivated user.

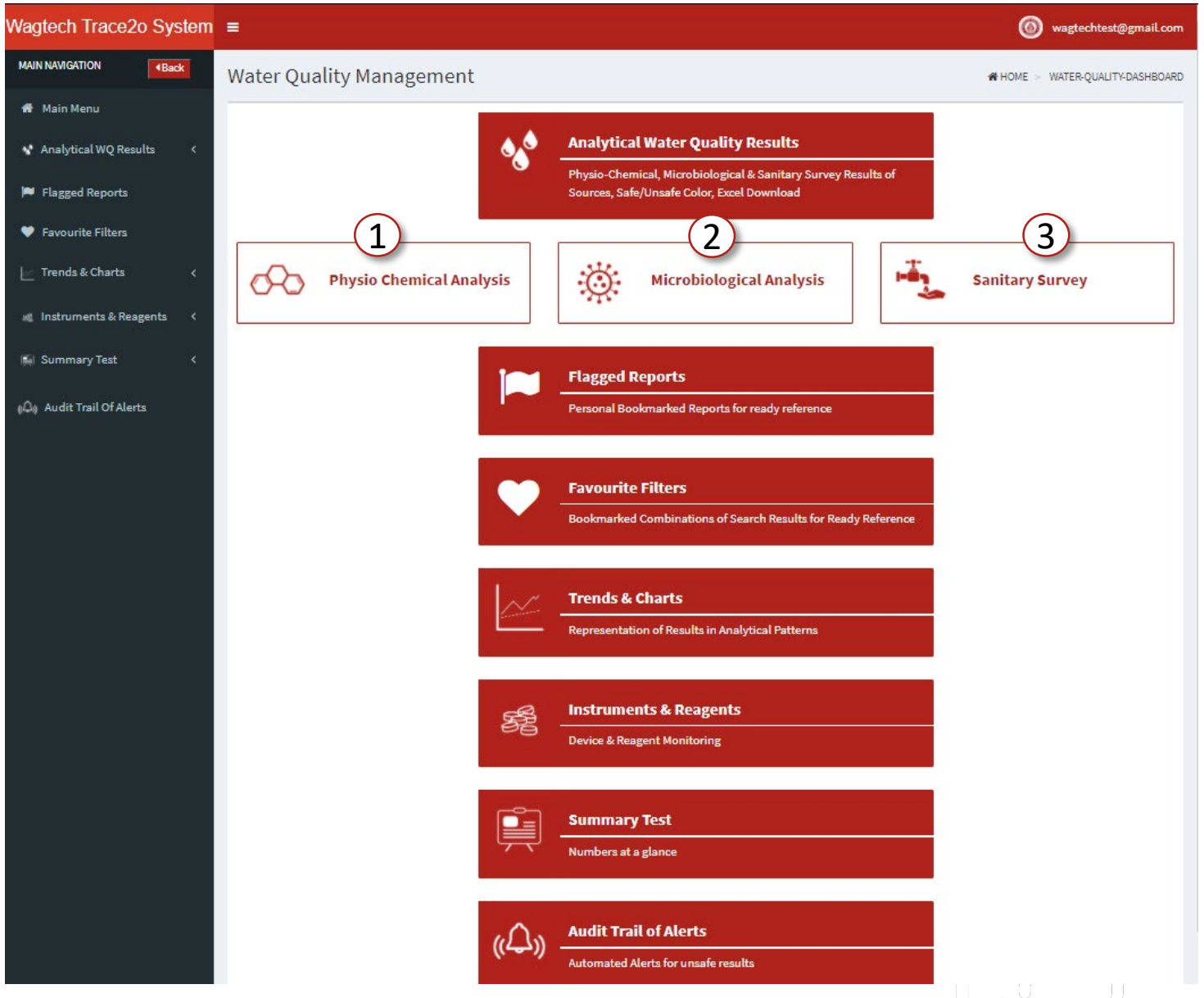
The notebook icon is used to update the e-mail id

The key icon will allow you to change the password of the users' login

Main Menu

The ‘Main Menu’ is what you will see once logged in, this is where the Water Quality Data is stored and viewed in this section we will discuss about the first three sections of the Analytical Water Quality Results:

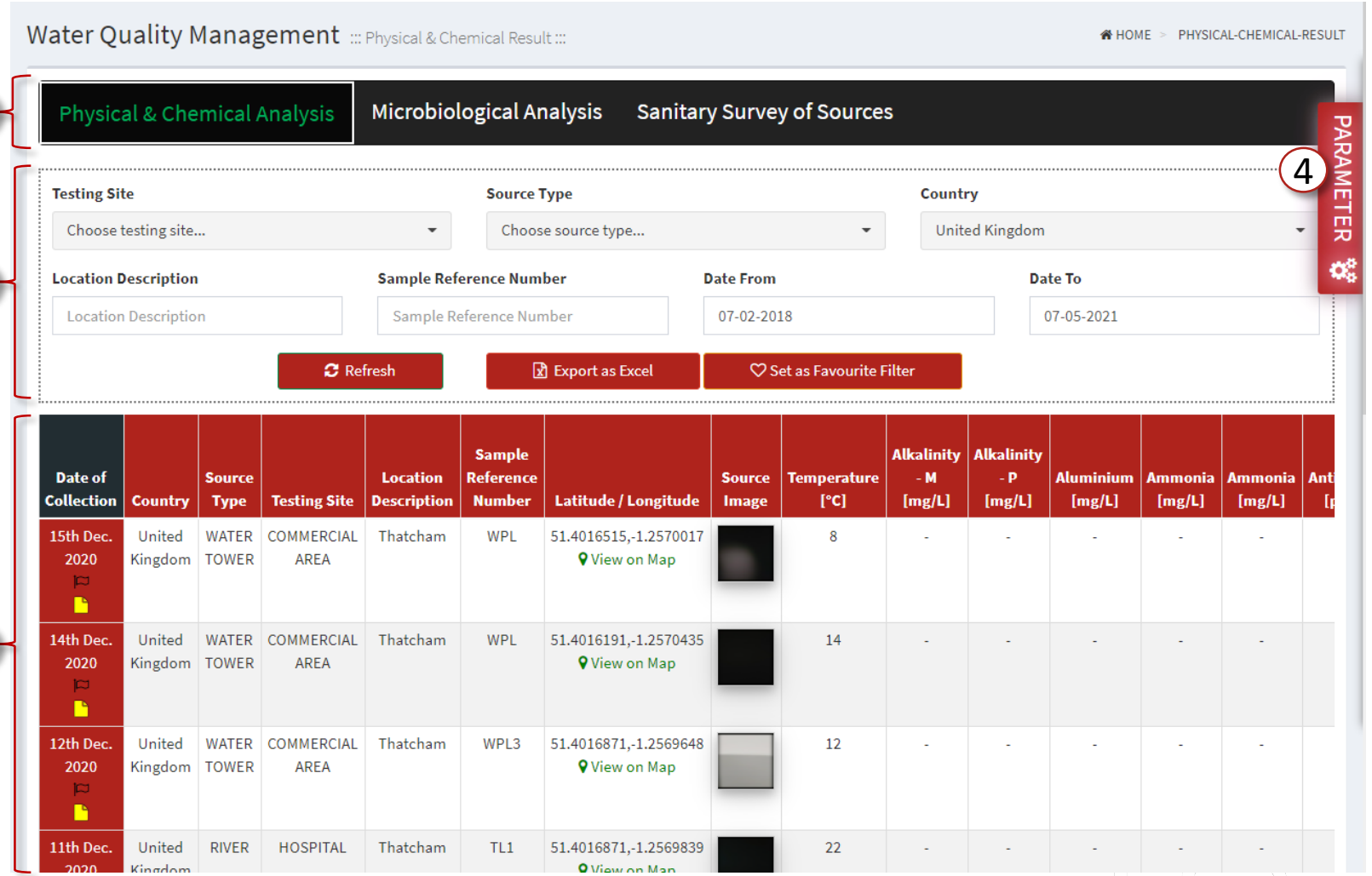
1. Physio-Chemical - Results of the physical testing collected such as pH, iron and Electrical conductivity.
2. Microbiological – Results of the microbiological testing that’s been collected such as Faecal coliforms and total coliforms.
3. Sanitary Survey - Results of the Environmental study of the surrounding area at a Water Source to ascertain its vulnerability to contamination.



Physical & Chemical Analysis Results

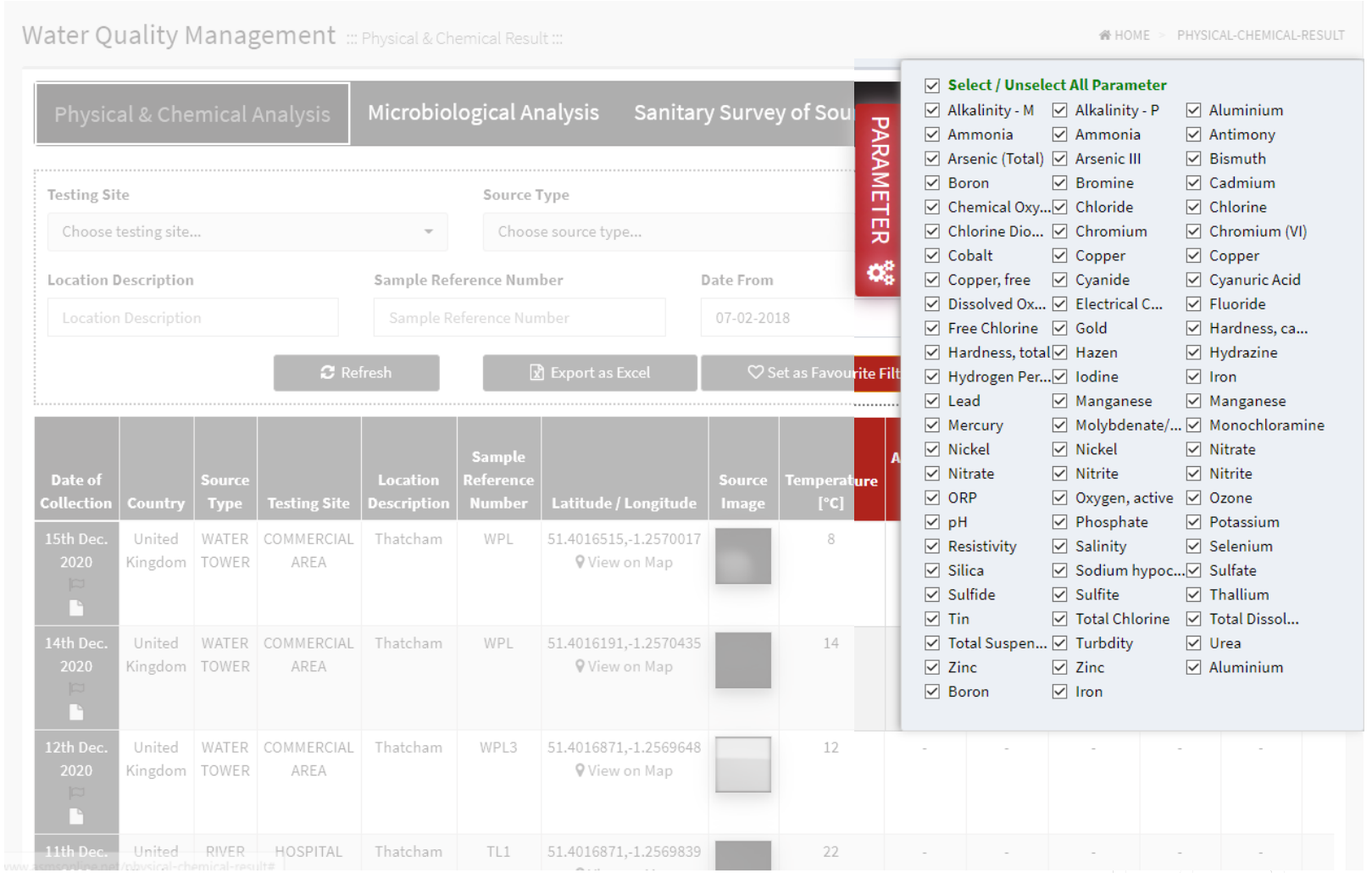
Opening the results will display your data in a tabulated form.

1. The tabs at the top will allow you to change to the different sections of results as seen previously
2. Filters that allows you to easily view records from the set of data based on criteria you provide. Making it easier to find your specific results.
3. Results in the tabulated form, starting with the information about the source. All the Columns that follow are the magnitudes of Water Quality Parameters one after the other in Alphabetical order, with the UNITS of expression on the top header of each column.
4. By clicking on the Parameters along the right you are able to pull out the parameter filters.



Physical & Chemical Analysis Results

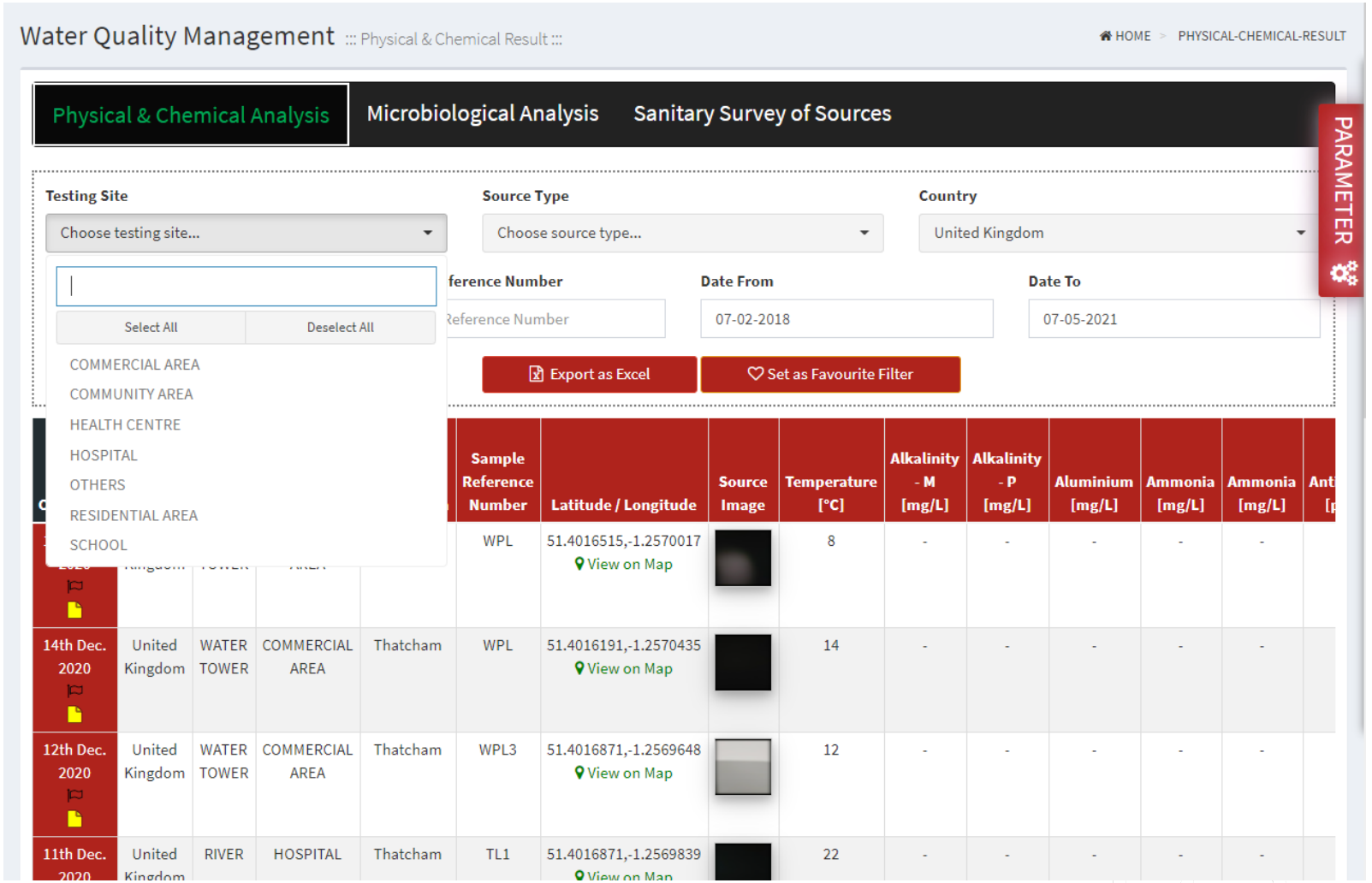
the ‘Parameter Tab’ clicking on this will open the whole range of Physio Chemical Parameters (Image Alongside). you is free to select/de-select any number of Parameters by checking/unchecking the Tick Box. This will then hide/show the parameters below making it easier to display the parameters that you want to see. Since all parameters are selected, all the parameter columns are now showing in the table.



Physical & Chemical Analysis Results

To Filtering results you results, use the drop down menus to select/de-select the different source types, location information and the date range. All these filters are set by the engineer when out in the field. The app will ask you to set these and this is where they are displayed.

Testing site, Source Type and Country are all pre-set dropdowns. This is to help better categorise your results.



Physical & Chemical Analysis Results

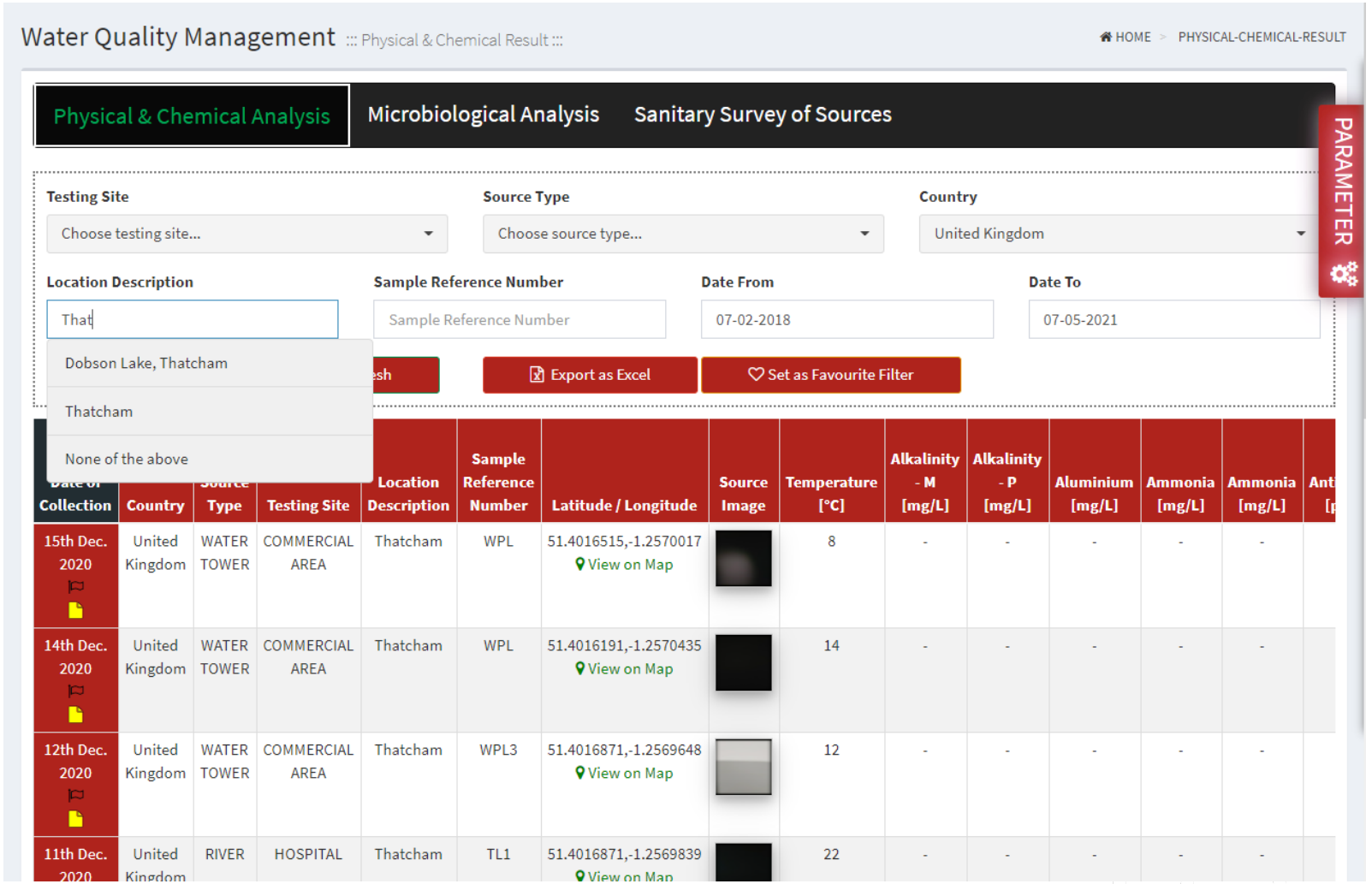
Location Description – When ever an USER uses the ASMS App to capture the data of a specific water source the 'Location Description' is a mandatory input which is used to specifically describe a source, its like the name of a person, typical 'Location Description' inputs look like 'South side of school X' , '3rd Bank of the Danube' etc.

'Sample Reference Number' - the number noted down on the Sampling Bottle by the engineer while colleting the sample on site.

Note: Both 'Location description' and 'Sample Reference number' are manual Entry Inputs , no dropdowns are provided, you needs to type in, although a simple AI algorithm guides you with 'Probable Options' based on the typing inputs of you (Refer Image), in this case you simply types 'That' & the probable suggestions are displayed.

Date Range - you needs to customise a 'Date Search Range'.

Once all the selections are done you needs to click 'Refresh' and the Filter will work its way out to customise the table.

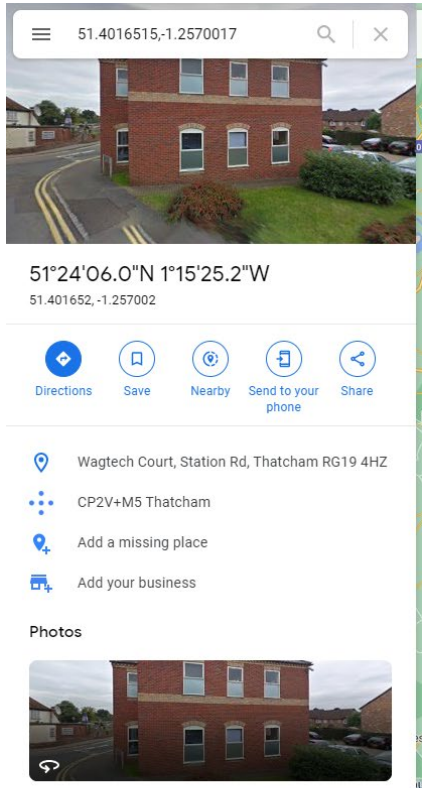


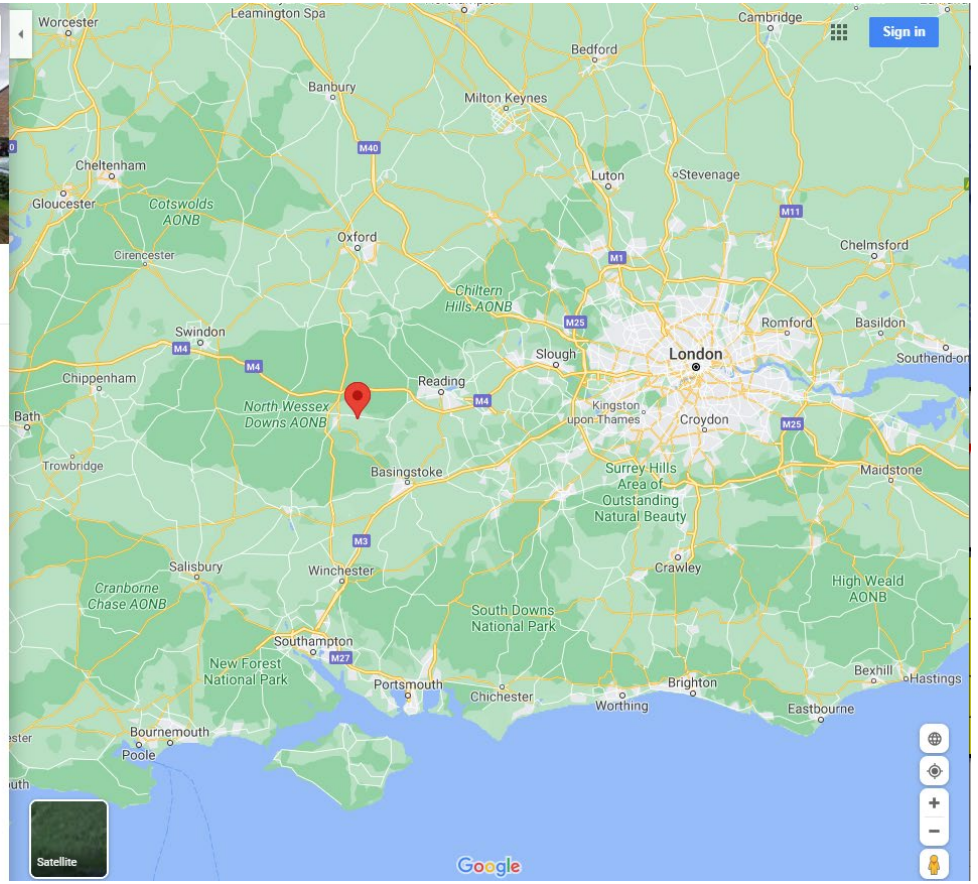
View on Map

Google Maps
Website

All views should be Column, the Latitude/Longitude column of the specific Water Source captured by the ASMS App on-site, there is provision to view the specific source on Google Maps simply by clicking the green link “View on Map”.

Country	Source Type	Testing Site	Location Description	Sample Reference Number	Latitude / Longitude
United Kingdom	WATER TOWER	COMMERCIAL AREA	Thatcham	WPL	51.4016515,-1.2570017 View on Map





Remarks

So What is a Remark?

A Remark cannot be entered from the Dashboard, like most other info, it can only be entered from the ASMS App and checked from the Dashboard by clicking the Icon (as shown in the previous page). A 'Remark' is a short note which a engineer may or may not enter while entering the results of testing. As is evident from the Image in the previous page, no remarks was entered.

Water Quality Management ::: Physical & Chemical Result :::

HOME > PHYSICAL-CHEMICAL-RESULT

Physical & Chemical Analysis | Microbiological Analysis | Sanitary Survey of Sources

PARAMETER

Testing Site: Choose testing site...
Source Type: Choose source type...
Country: United Kingdom
Location Description: Location Description
Sample Reference Number: Sample Reference Number
Date From: 07-02-2018
Date To: 07-05-2021

Refresh | Export as Excel | Set as Favourite Filter

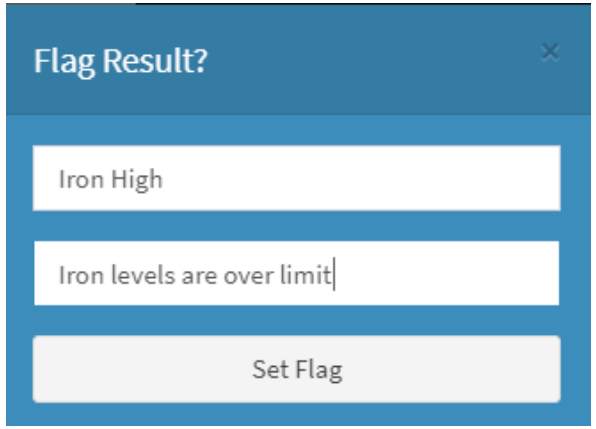
Date of Collection	Country	Source Type	Testing Site	Location Description	Sample Reference Number	Latitude / Longitude	Source Image	Temperature [°C]	Alkalinity - M [mg/L]	Alkalinity - P [mg/L]	Aluminium [mg/L]	Ammonia [mg/L]	Ammonia [mg/L]	Ant [
15th Dec. 2020	United Kingdom	WATER TOWER	COMMERCIAL AREA	Thatcham	WPL	51.4016515,-1.2570017 View on Map		8	-	-	-	-	-	
14 2	United Kingdom	WATER TOWER	COMMERCIAL AREA	Thatcham	WPL	51.4016191,-1.2570435 View on Map		14	-	-	-	-	-	
12th Dec. 2020	United Kingdom	WATER TOWER	COMMERCIAL AREA	Thatcham	WPL3	51.4016871,-1.2569648 View on Map		12	-	-	-	-	-	
11th Dec. 2020	United Kingdom	RIVER	HOSPITAL	Thatcham	TL1	51.4016871,-1.2569839 View on Map		22	-	-	-	-	-	

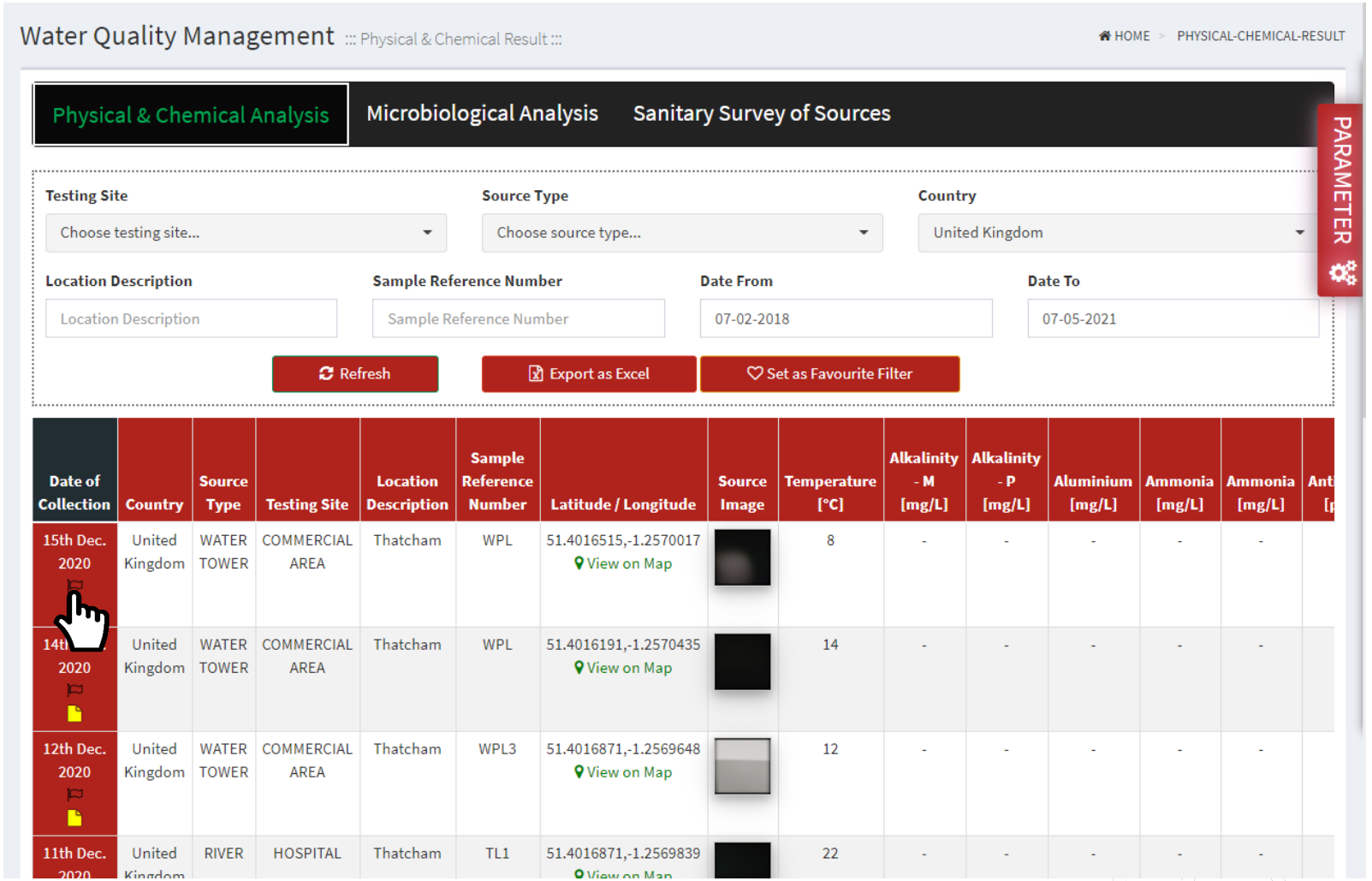
Flagged Results

What is Result Flagging ?

This is typical bookmarking of a specific result to seek it out instantly- use the Flag Icon, the Dialogue Box will appear

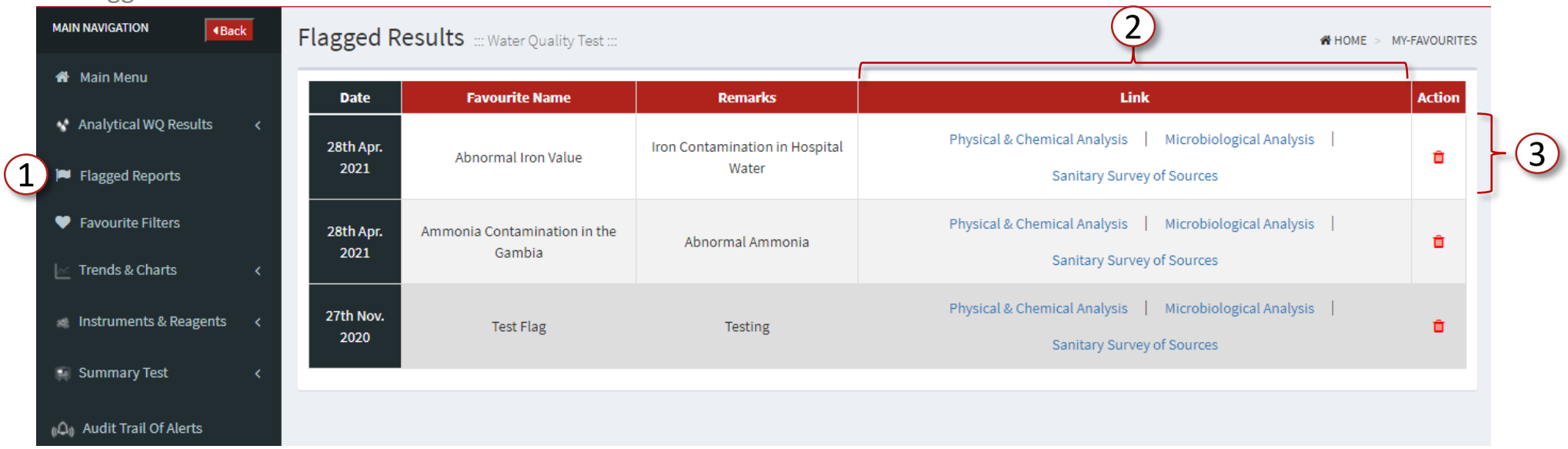
Fill up the Dialogue Box by assigning a name and note to your Flagged Result and Click ‘Set Flag’ , once the Flag has been set the icon will appear BLUE





Flagged Results

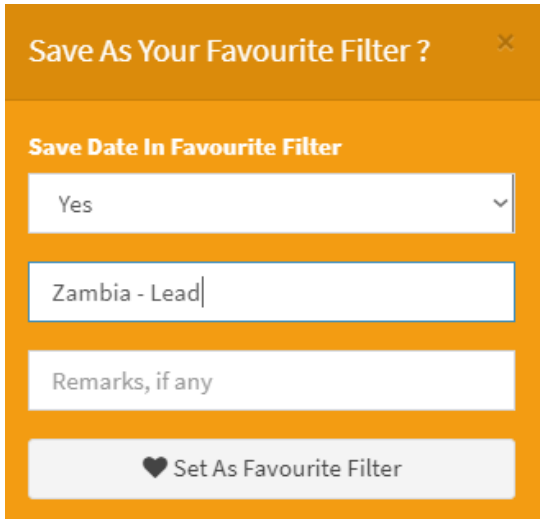
1. There is a separate Tab on the Dashboard Main Menu list to view and access Flagged Results
2. Use these links to readily access the Flagged Result.
3. Use the ‘Bin Icon’ to delete the Flagged Result

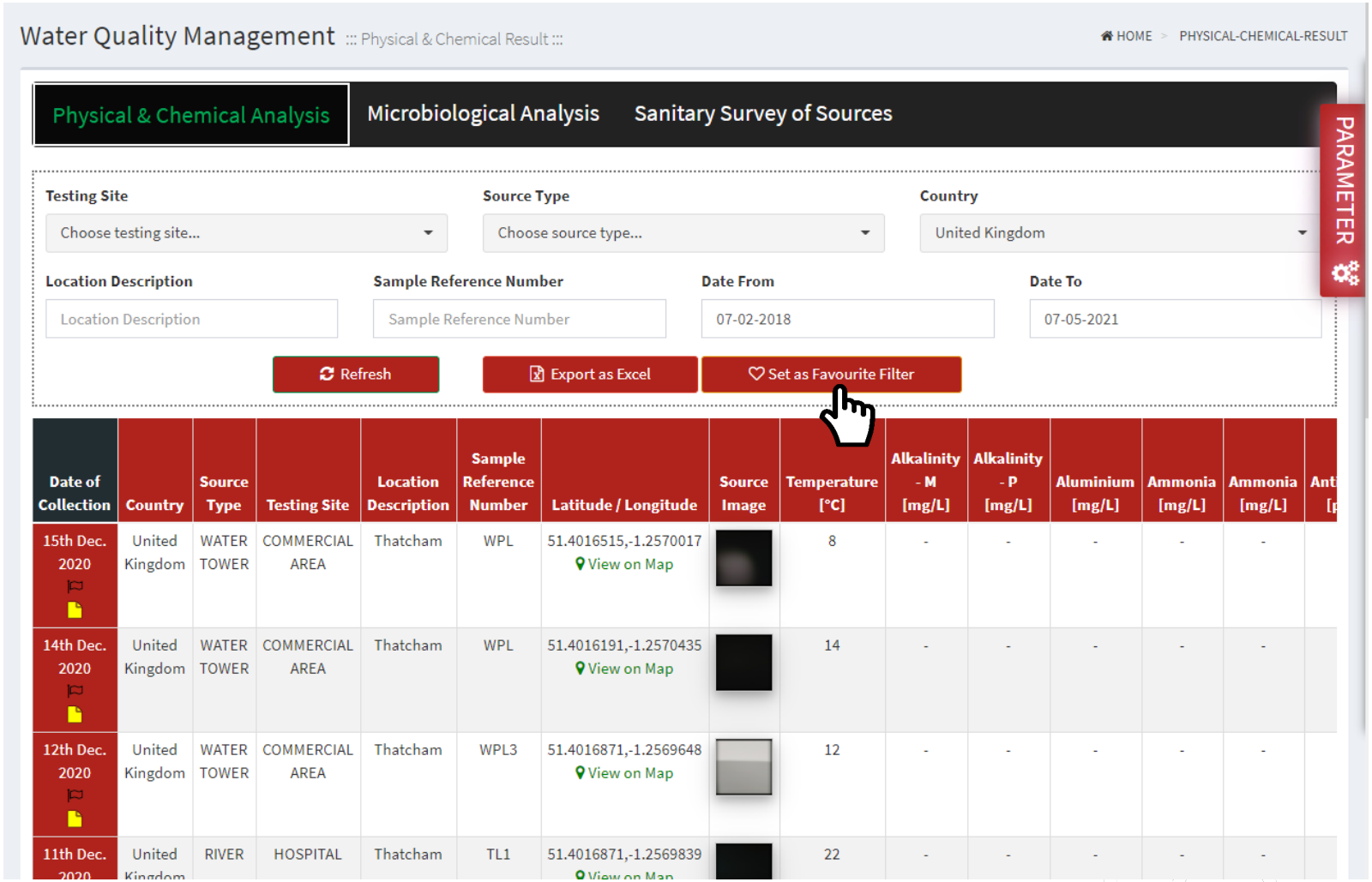


Favourite Filter

What is Favourite Filter?

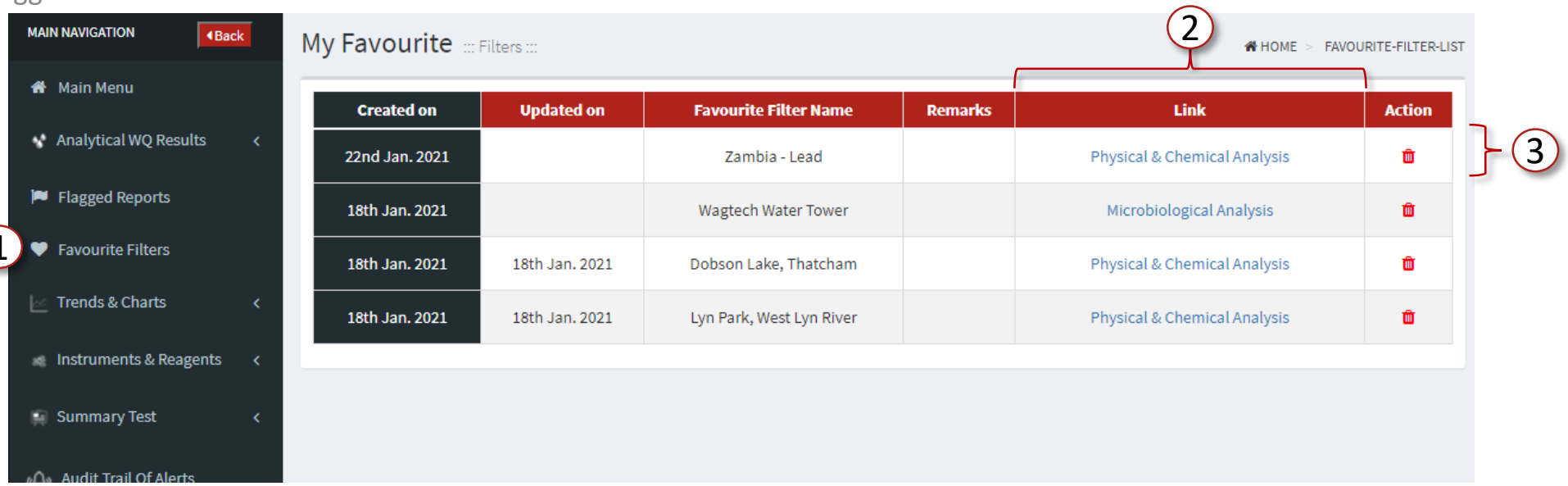
The Tab is Filter Combination, similar to used to Bookmark a specific the ‘Flagging of Results’. Suppose you is specially interested in Piped Water Supplies in Zambia, for a specific date range looking at Lead as a parameter. Click on the ‘Set as favourite’ and the set filters will be saved.





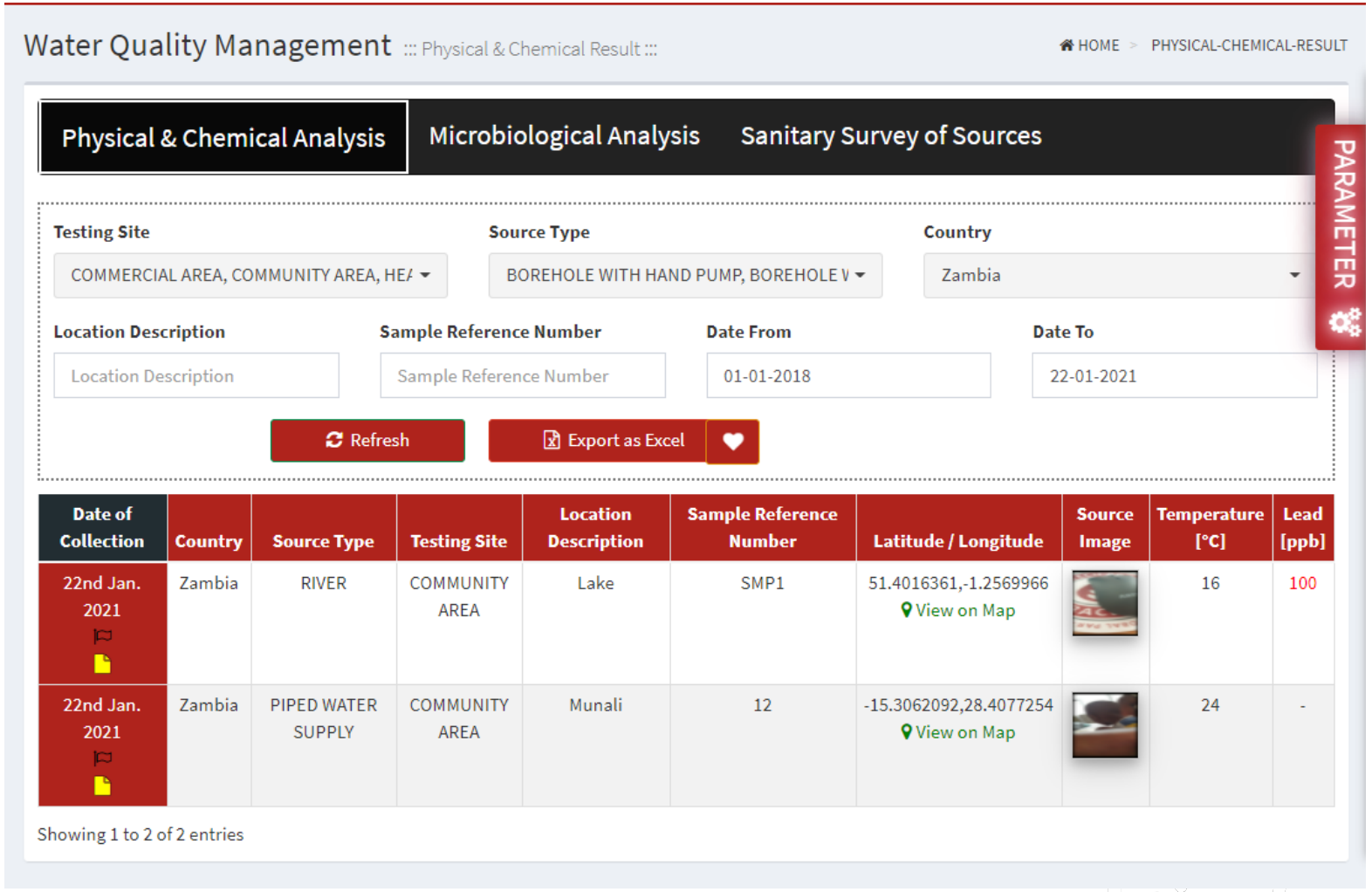
Favourite Filter

1. To view your favourite filtered results, click on the ‘Favourite Filter’ in the main menu. This will display all of your saved filters.
2. Then click on your desired filter to display those results.
3. Use the ‘Bin Icon’ to delete the Flagged Result



Favourite Filter

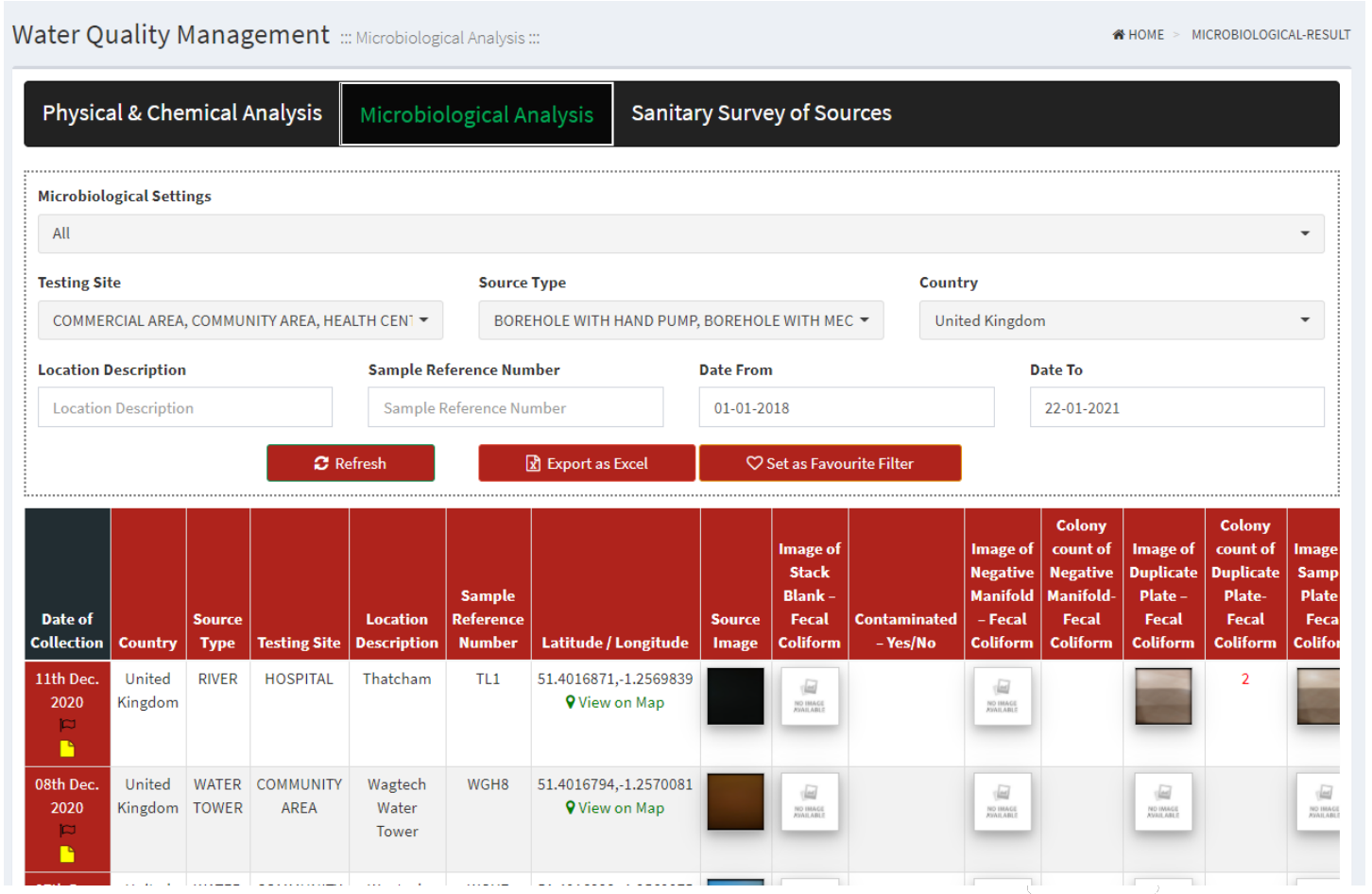
And as in the previous picture you can see that only the results for lead, in Zambia are showing.



Microbiological Analysis

In the ‘Microbiological Analysis’ segment , everything is similar to the ‘Physical & Chemical Analysis’ section, there is however one small dis-similarity which is illustrated.

For obvious reasons the ‘Parameter Settings’ are different (from the Physical & Chemical Analysis Section). You can change the difference parameter for with the ‘Microbiological Settings’ drop down.



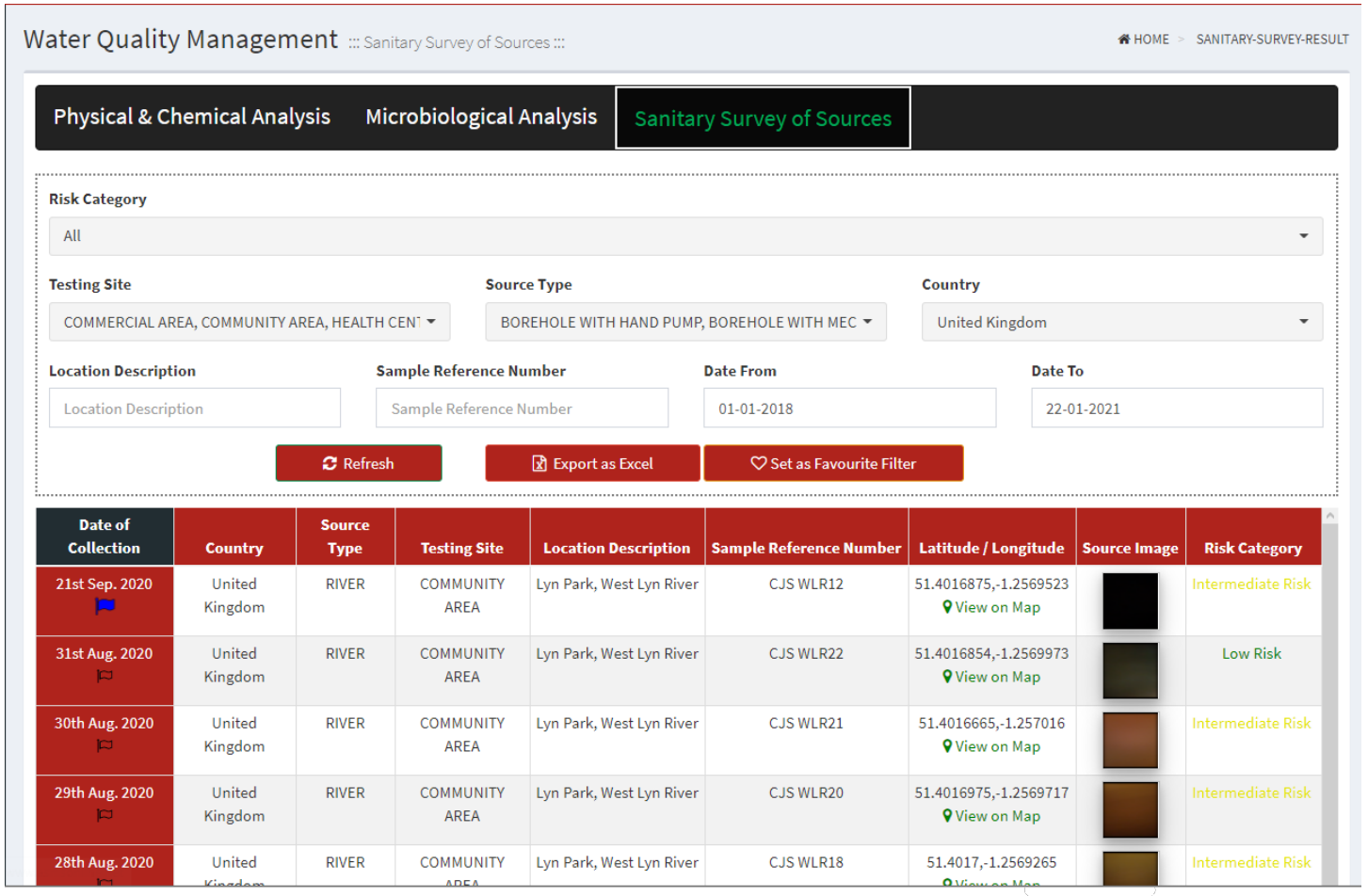
Sanitary Survey

In the ‘Sanitary Survey’ segment , everything is similar to the ‘Physical & Chemical Analysis’ section, so we are not going to repeat the same things again, the dis-similarities are illustrated below.

Sanitary Survey has four risk categories:

- LOW
- INTERMEDIATE
- HIGH
- VERY HIGH

The Dashboard allows you to filter according to need and view a specific Risk Category or all of them together. The FIRST COLUMN from the RIGHT is the Risk Category Column – All are clickable links.

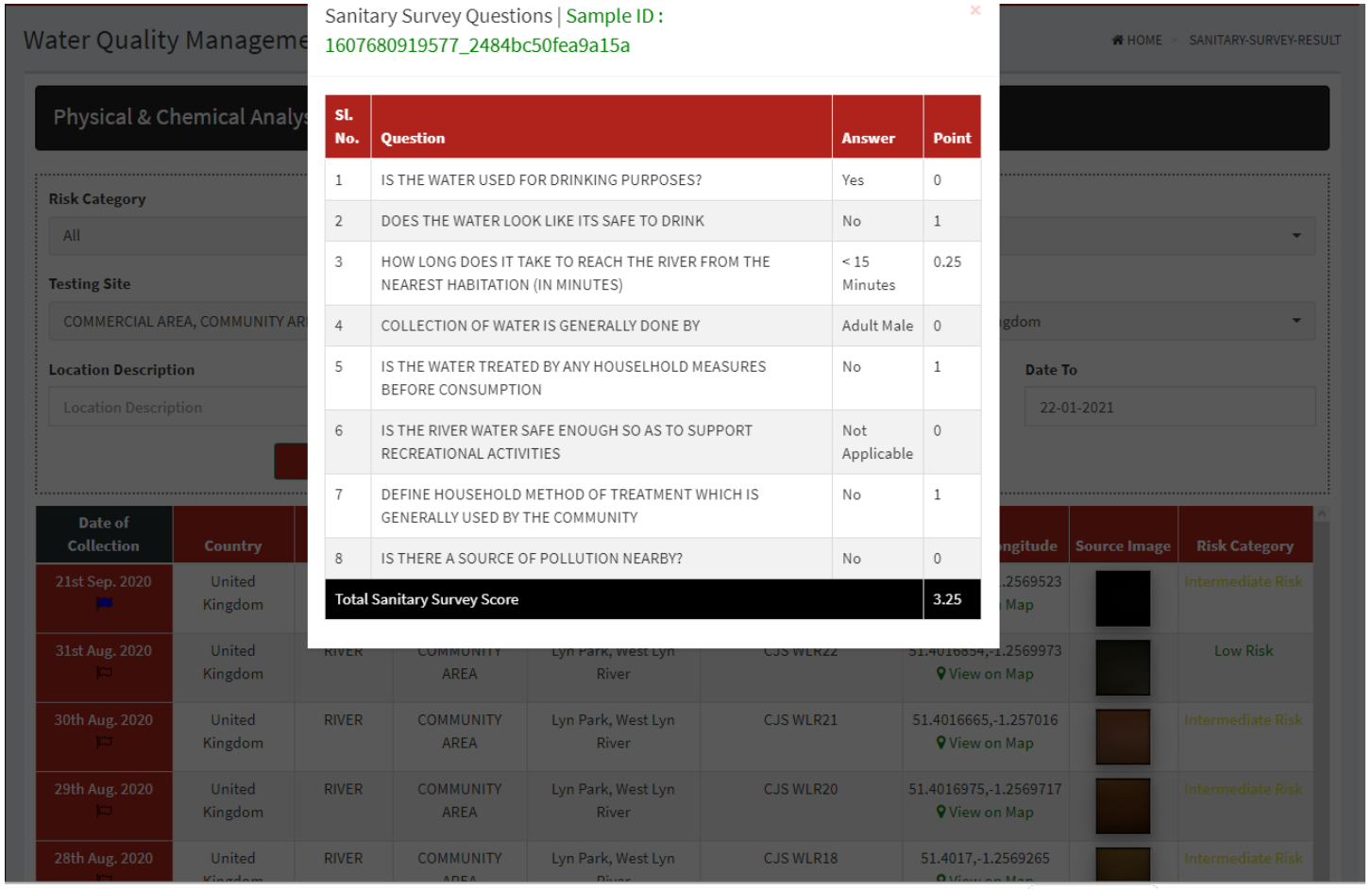


Date of Collection	Country	Source Type	Testing Site	Location Description	Sample Reference Number	Latitude / Longitude	Source Image	Risk Category
21st Sep. 2020	United Kingdom	RIVER	COMMUNITY AREA	Lyn Park, West Lyn River	CJS WLR12	51.4016875,-1.2569523 View on Map		Intermediate Risk
31st Aug. 2020	United Kingdom	RIVER	COMMUNITY AREA	Lyn Park, West Lyn River	CJS WLR22	51.4016854,-1.2569973 View on Map		Low Risk
30th Aug. 2020	United Kingdom	RIVER	COMMUNITY AREA	Lyn Park, West Lyn River	CJS WLR21	51.4016665,-1.257016 View on Map		Intermediate Risk
29th Aug. 2020	United Kingdom	RIVER	COMMUNITY AREA	Lyn Park, West Lyn River	CJS WLR20	51.4016975,-1.2569717 View on Map		Intermediate Risk
28th Aug. 2020	United Kingdom	RIVER	COMMUNITY AREA	Lyn Park, West Lyn River	CJS WLR18	51.4017,-1.2569265		Intermediate Risk

Sanitary Survey

Upon clicking a link in the 'Risk Category' column a POP UP BOX with the detailed questionnaire & Observed response will open up. The total Sanitary Survey Score obtained by the specific source is also depicted. Higher the score greater the risk. In this case the source has scored 3.25 out of 9 which makes it an INTERMEDIATE risk.

Look at the sample ID on the top right, this is an alpha numeric code which is used by the backend database to locate a specific source/result from the database.

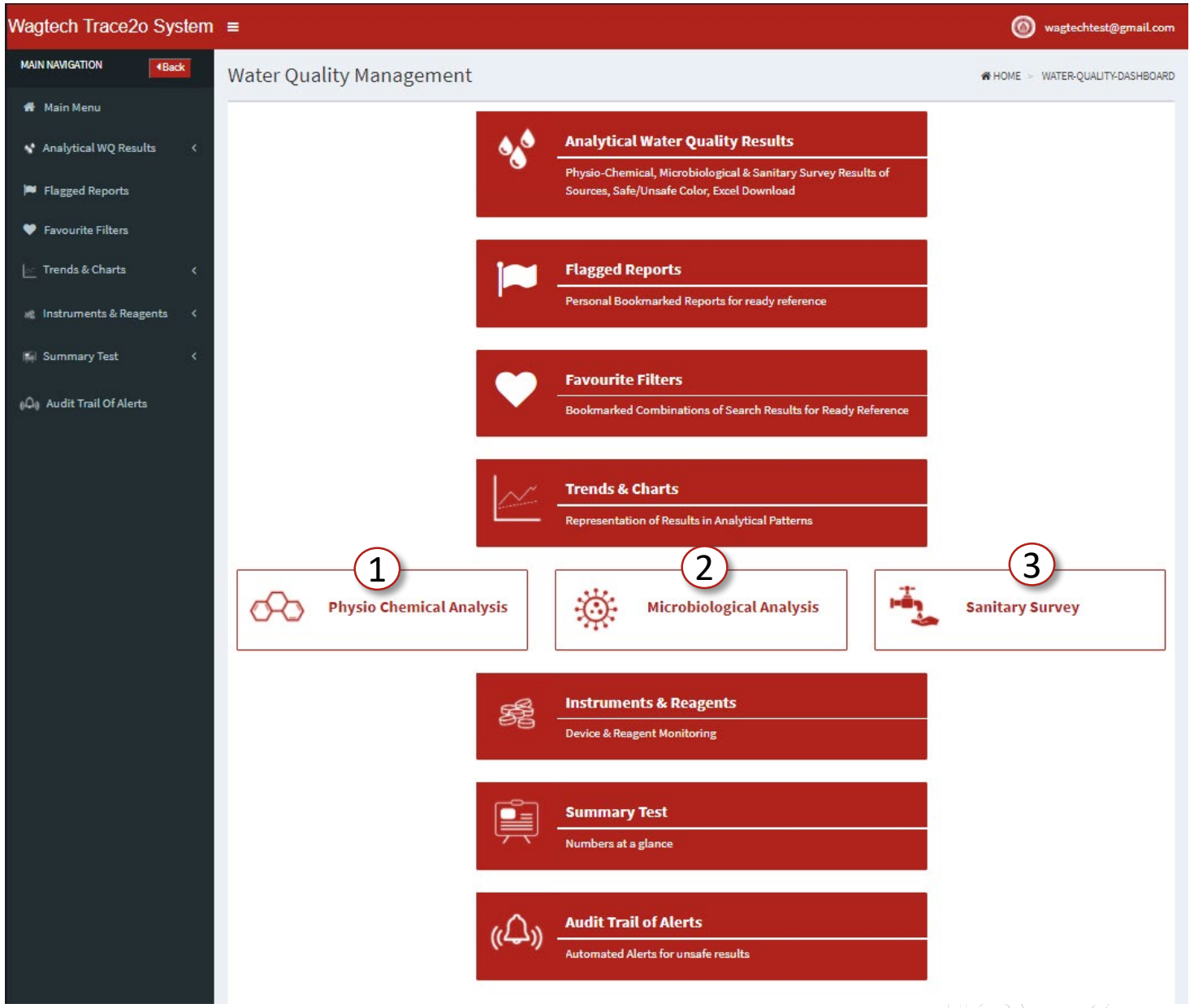


Trends & Charts

The ASMS Dashboard has the ability to plot and chart illustrative graphs using the data present in the Dashboard- this is valid for all three sections of WQ results namely:

1. Physical & Chemical
2. Microbiological
3. Sanitary Survey

Each of the three sections have been further subdivided into two sub-sections representing two different types of charts/graphs/plots using the same set of data. The Images shown below shows how to access each section/sub section from the dashboard. In the live ASMS Dashboard you needs to click the links and the subsections will appear

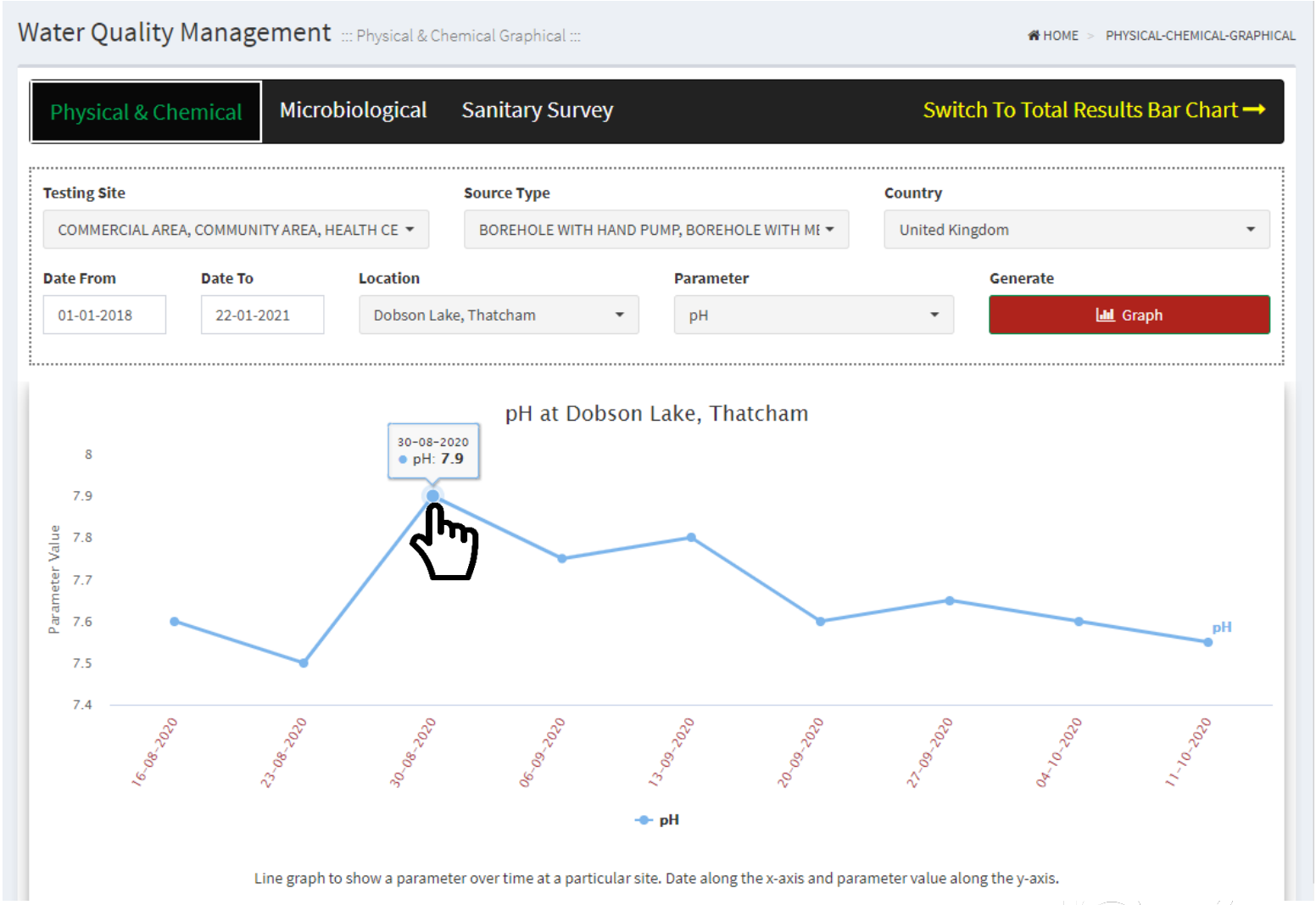


Trends & Charts - Physical & Chemical

In the 'Physical & Chemical' Analysis section we have two types of graphs:

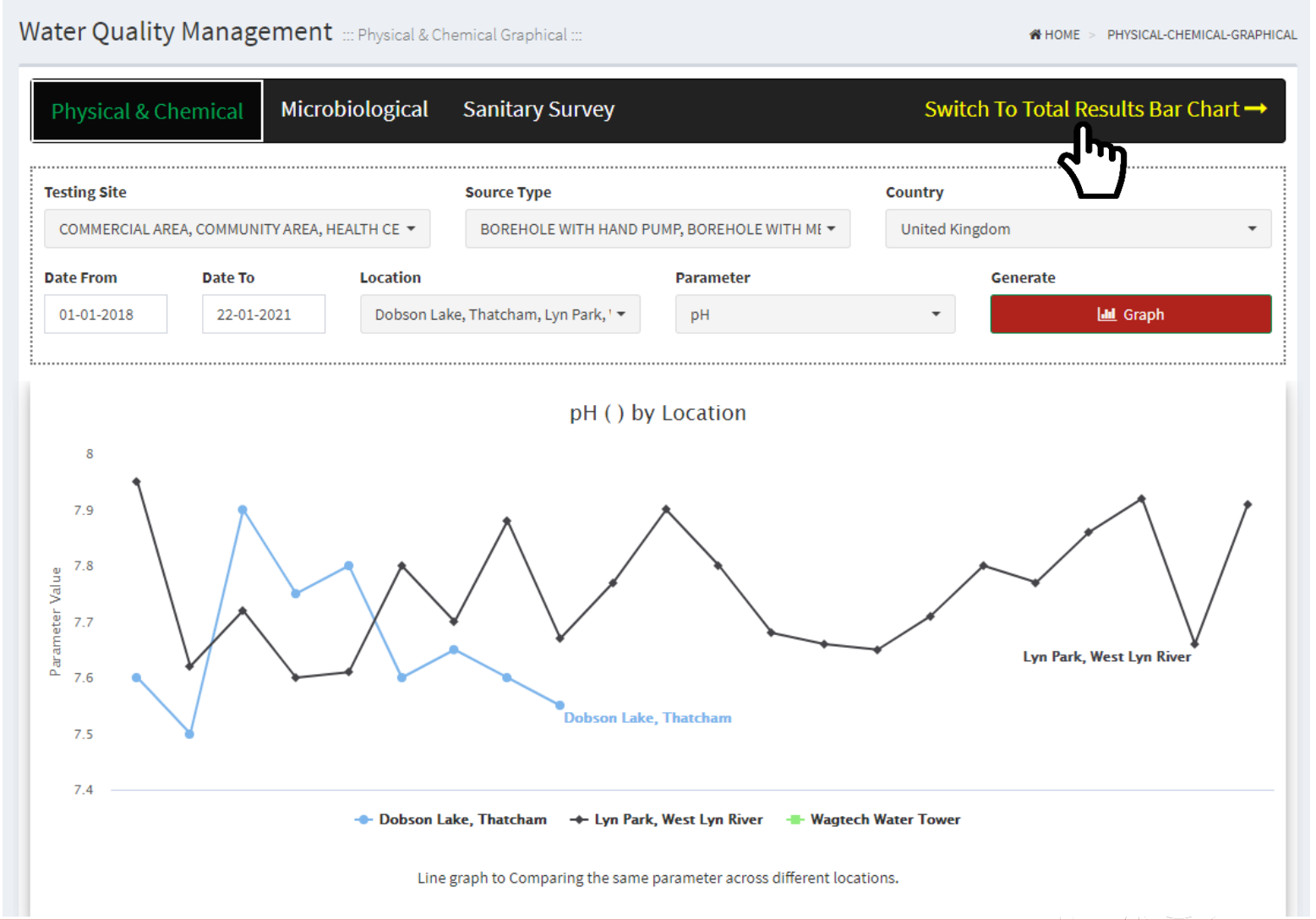
- Line Graph Over Time
- Total Results Bar Chart

For Line Graph Over Time (Image right) either a single Parameter (in this case pH) is plotted against all/more than one different 'Locations' it has been tested in or All Parameters are plotted in One or More than one Locations those have been tested in – the filters/dropdowns work exactly the same way as shown before.



Trends & Charts - Physical & Chemical

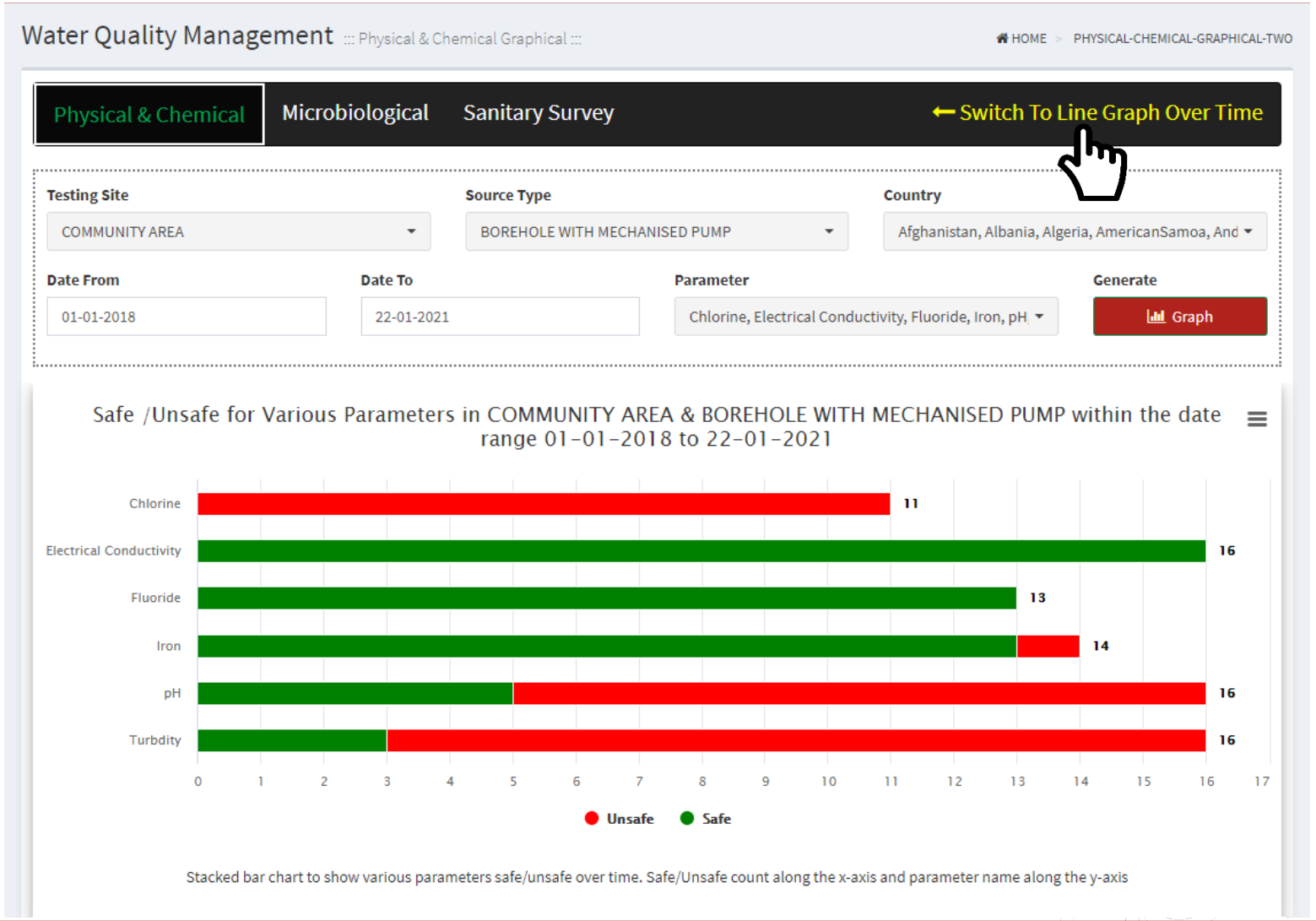
Viewing one parameter at multiple locations or view multiple parameters at one location



Trends & Charts - Physical & Chemical

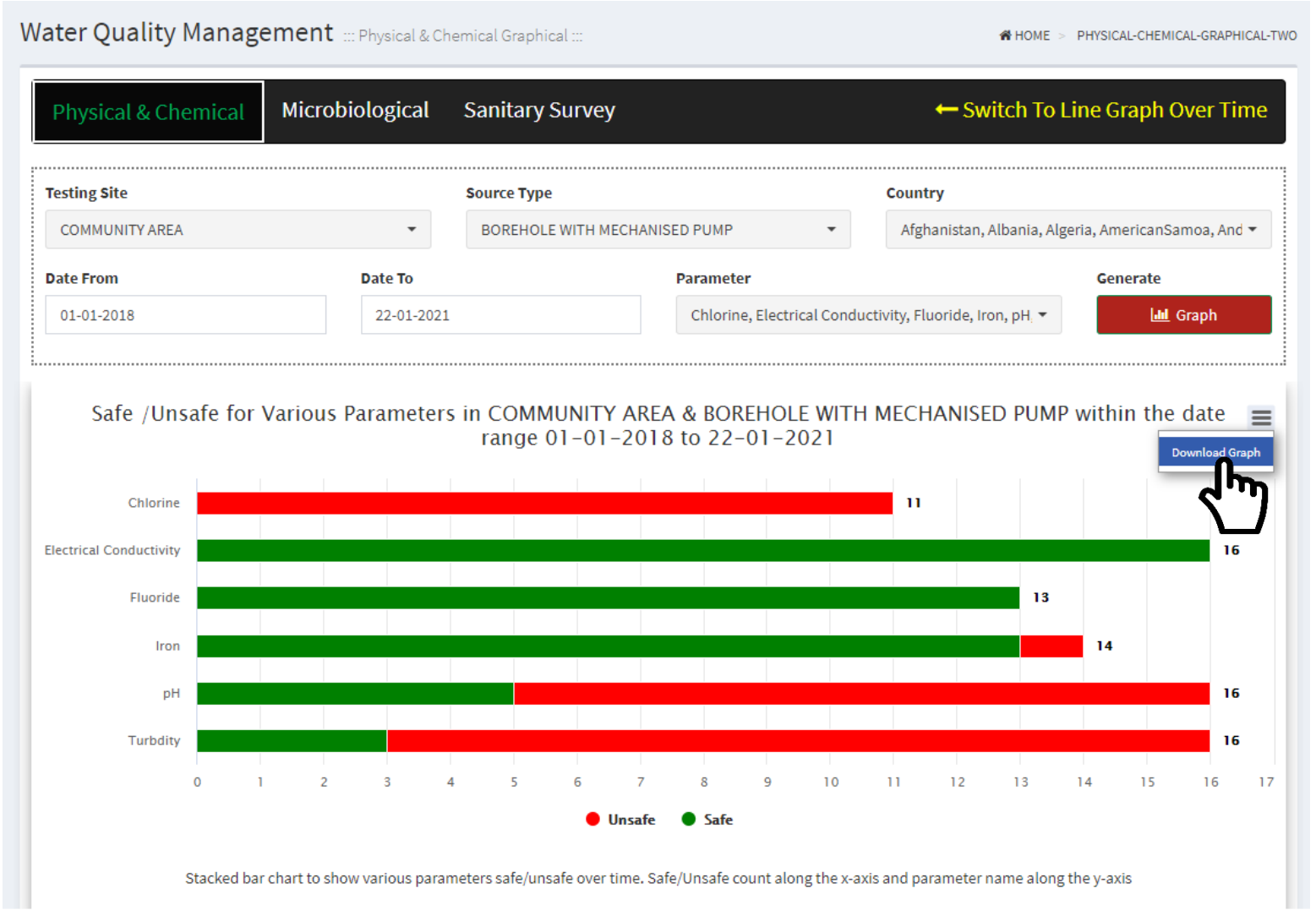
For the second type of chart, Total Results Bar Chart will display the total amount of Safe and Unsafe results that has been recorded to your Dashboard. Currently we are using the W.H.O (World Health Organization) standard levels of which a parameter is deemed safe or unsafe.

From the example currently 16 results for pH has been collected. From the graph we can see that 5 results are at a level of Safe and 11 results are at a level of Unsafe.



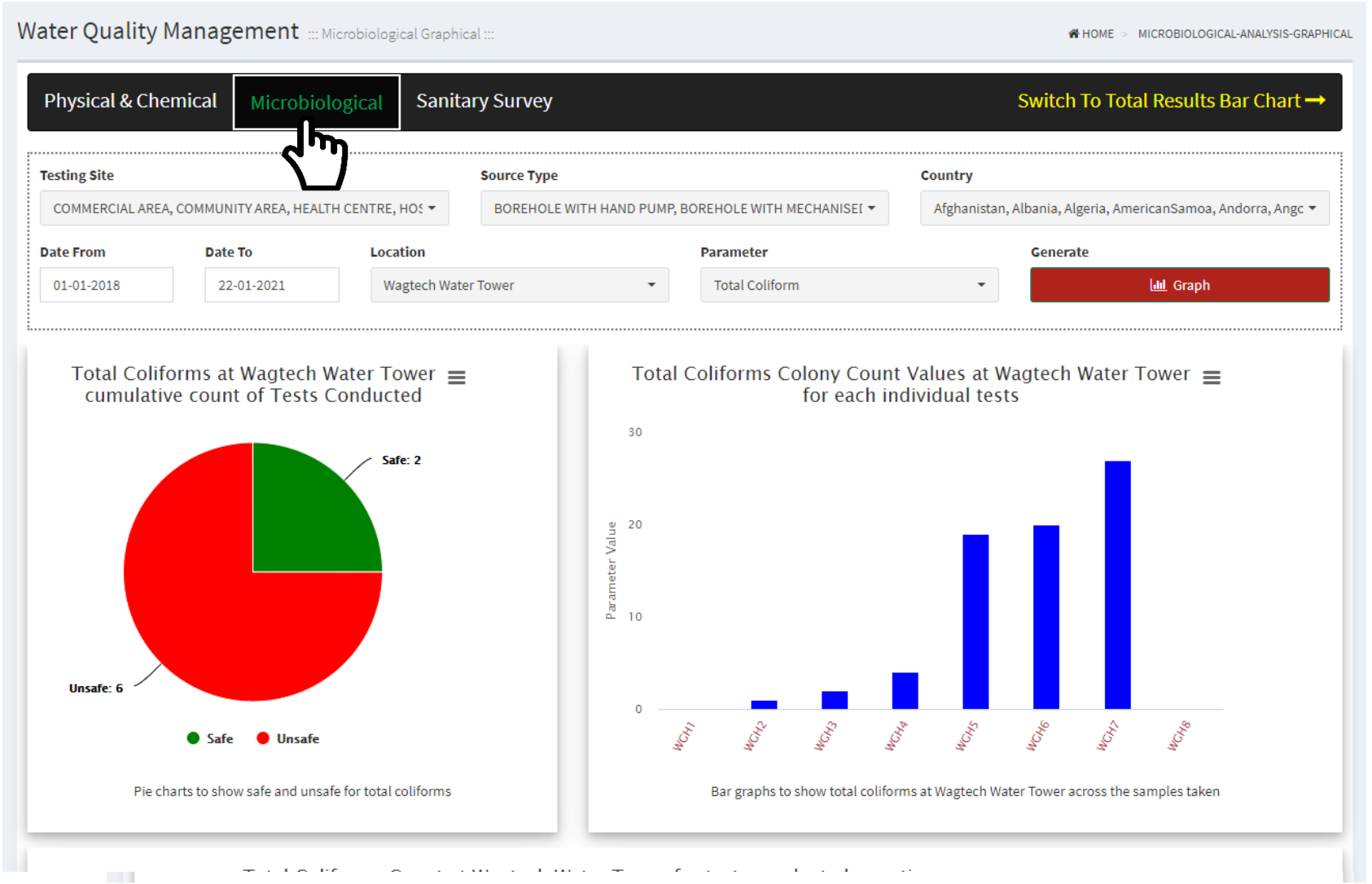
Trends & Charts - Physical & Chemical

Clicking the 'Menu button' ≡ to the top right of a graph will allow you to download that graph as a .png file. Giving you freedom take graphical data from the ASMS.



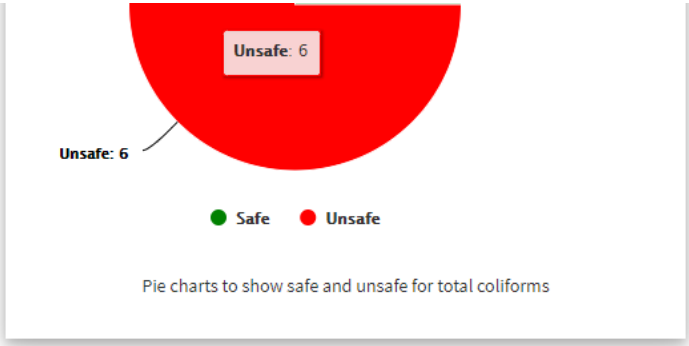
Trends & Charts - Physical & Chemical

Moving on to Microbiological Charts in Charts Of Location, the only two filters to work with are ‘Parameter’ & ‘Location Description’ but both are single selection which means you cannot select multiple values from either dropdown. The Pie Chart on the left shows how many times the source with Location ‘Wagtech Water Tower’ has been tested for Total Coliform and the results are Safe or Unsafe, in this case it has only been tested once within the mentioned Date Range, the Bar Chart on the right shows the value of contamination for each time the source has been tested.

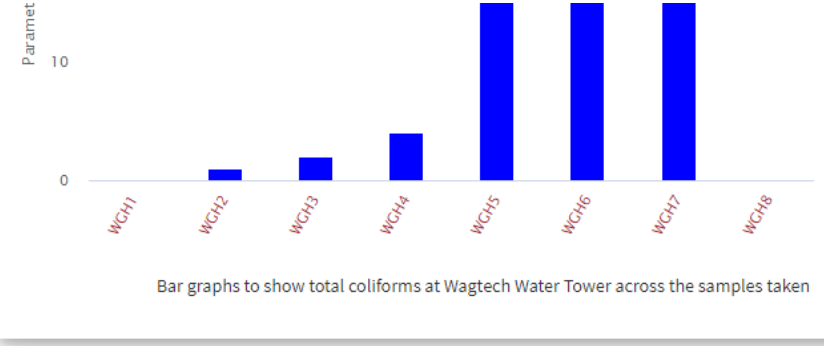


Trends & Charts - Microbiological

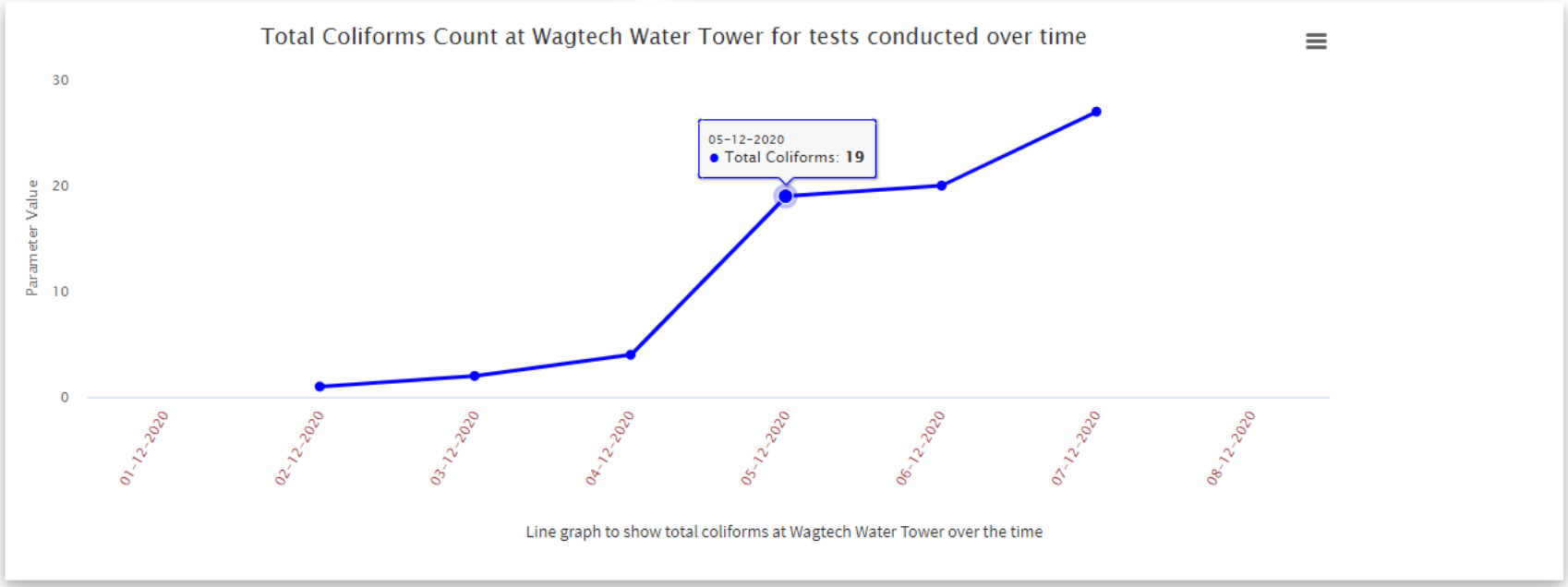
Scowling down you'll see another graph which displays the coliform count over the time period in a line graph format.



Pie charts to show safe and unsafe for total coliforms



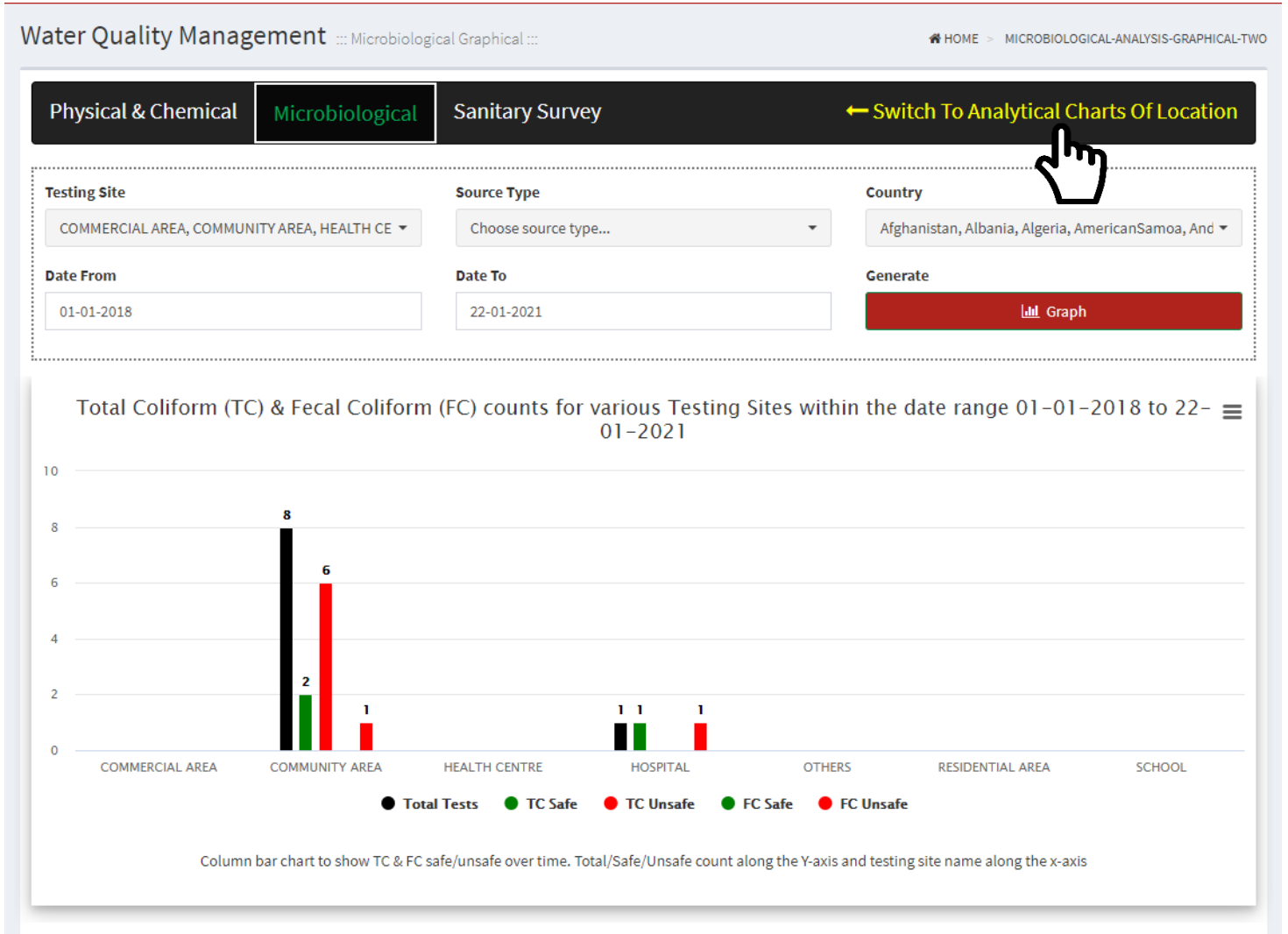
Bar graphs to show total coliforms at Wagtech Water Tower across the samples taken



Line graph to show total coliforms at Wagtech Water Tower over the time

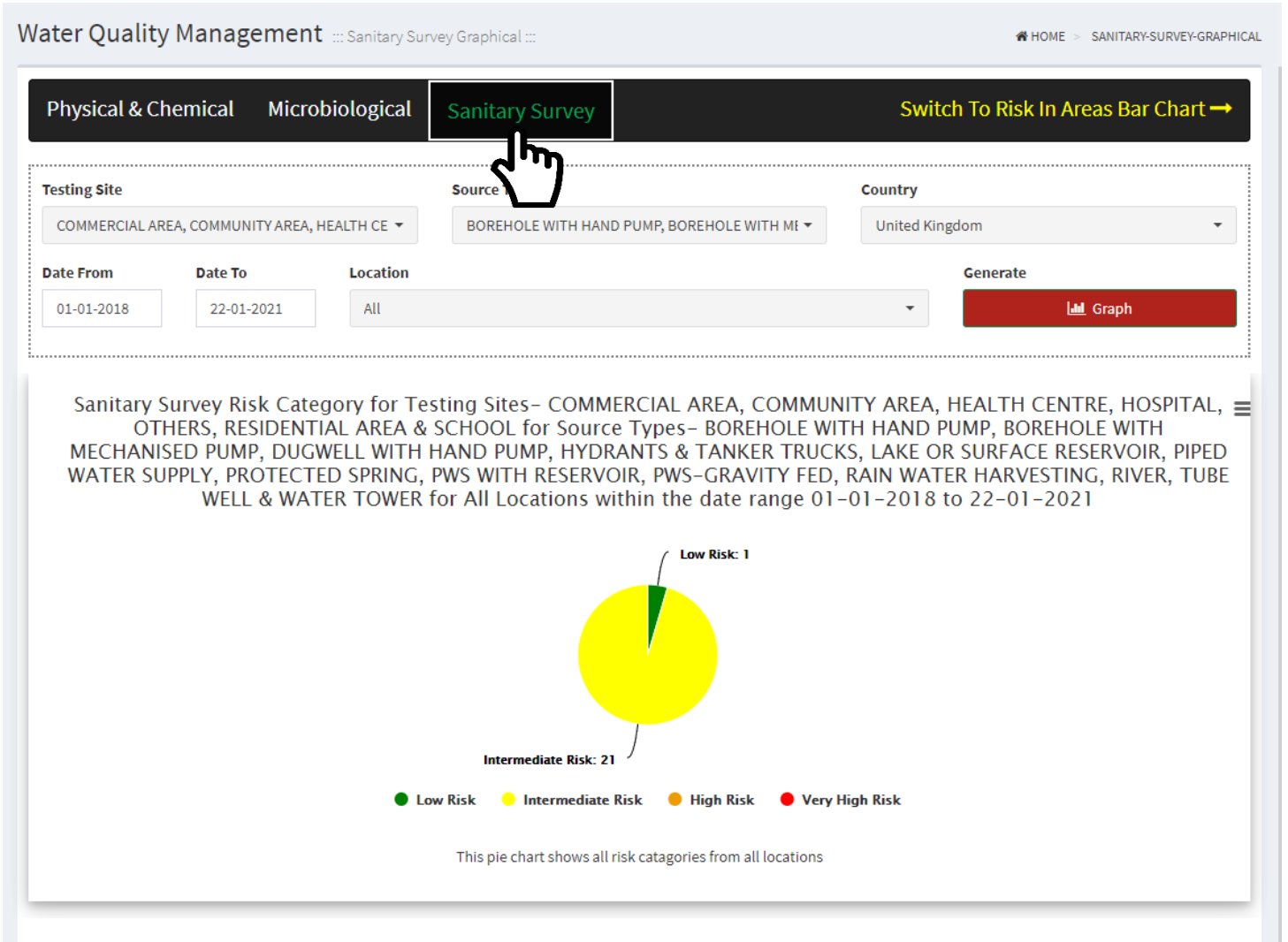
Trends & Charts - Microbiological

Moving on to Microbiological Charts in Total Results Bar Chart you can select either one or more ‘Testing Site’ OR one or more ‘Source Type’ in the filters/dropdowns but not both simultaneously, the date range can be customised and the chart generated will depict Total Number of tests against contamination by Total & Faecal Coli formic entities



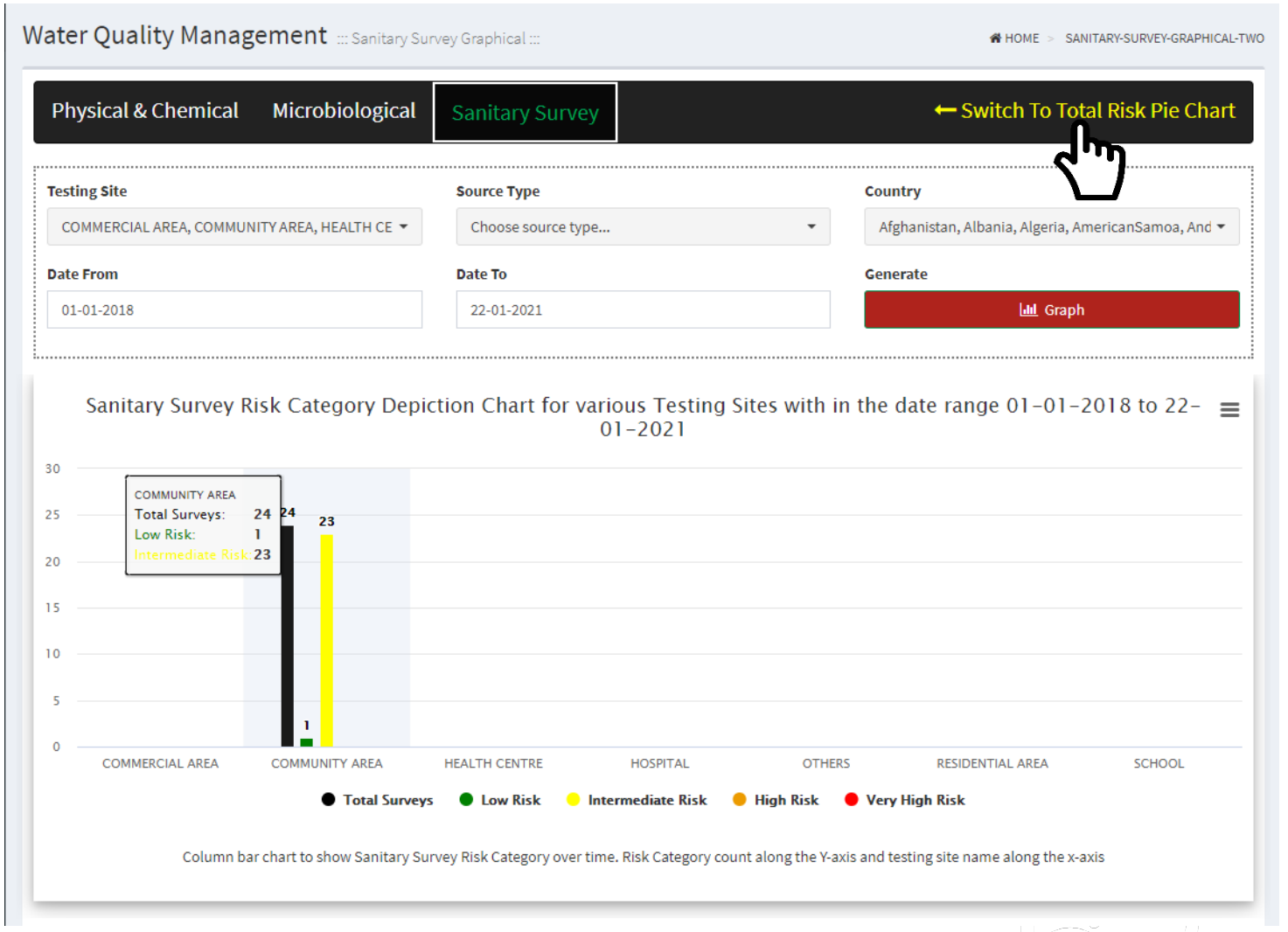
Trends & Charts - Sanitary Survey

In Sanitary Survey, Total Risk Pie Chart will generate a Pie Chart based on the total number of risk levels. You may select as many Testing Sites, Source Types and Location Descriptions from the filter dropdowns as required and that too simultaneously, this chart maps the number of sources in each risk category over the pre selected date range.



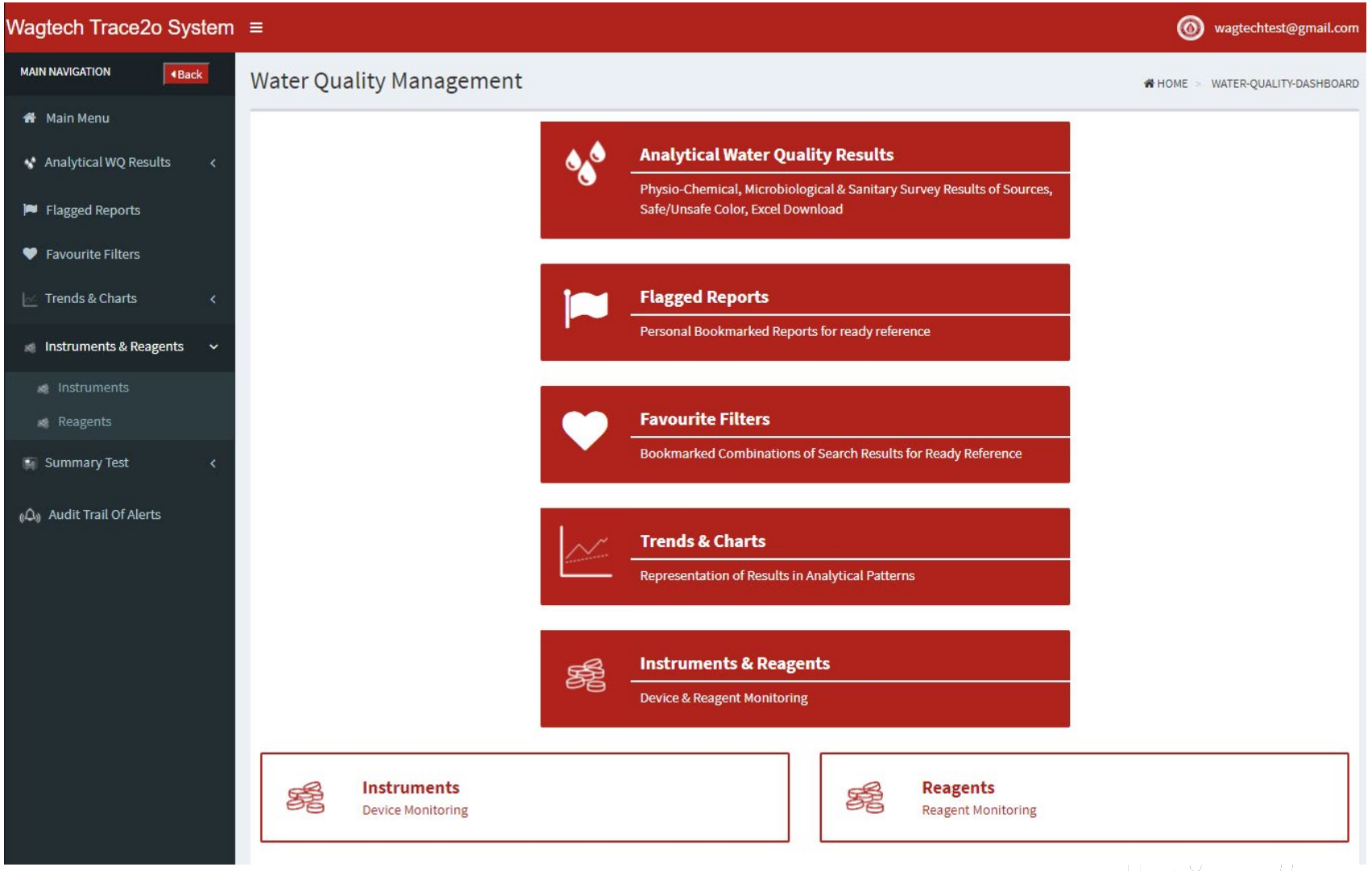
Trends & Charts - Sanitary Survey

Moving on to Sanitary Survey Charts, Risk In Areas Bar Chart, generates a bar graph you either has to select one or more ‘Testing Site’ OR one or more ‘Source Type’ but not both simultaneously – the chart shows number of sources in specific risk categories in all types of ‘Testing Sites’ within a date range

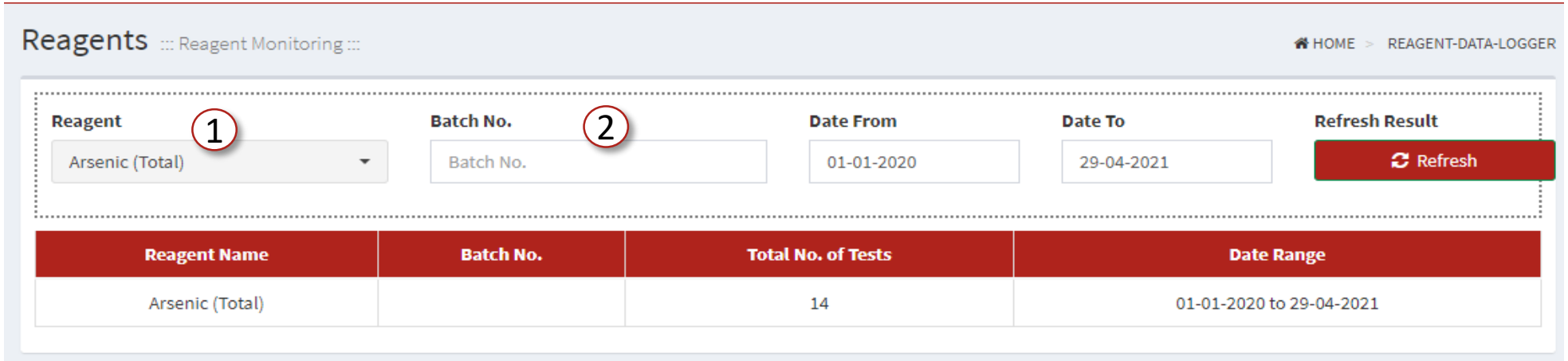


Instruments & Reagents

Wagtech deals in a range of Water Quality Instruments & Reagents and a client may end up purchasing a few or a lot of such Devices and Reagents/Consumables, over time the client may need to monitor the use of these and may need to see how many tests each Device or Reagent has been used in. The ASMS dashboard covers this too. On the Main Navigation Panel/Page you will find a link as shown below



Stock trailing of Devices & Reagents



1. Filter Dropdown of the total range of tests that uses any form of Reagent or Consumable, you will have to select the item of interest, the Reference
2. Batch Code of the Specific Reagent/Consumable, once the date range is selected the Dashboard will show the number of tests performed. In the case (above) Arsenic Total has been tested 14 times inn between 1st of Jan, 2020 till the 29th of April, 2021.

The Batch code is not a mandatory input (in the ASMS App) and so sometimes the dashboard may not give any result because if the App user does not enter the Batch Code while performing the test the Dashboard will obviously have no corresponding data. In case of Device/Instrument Monitoring the Batch code is replaced by ‘Serial Number’

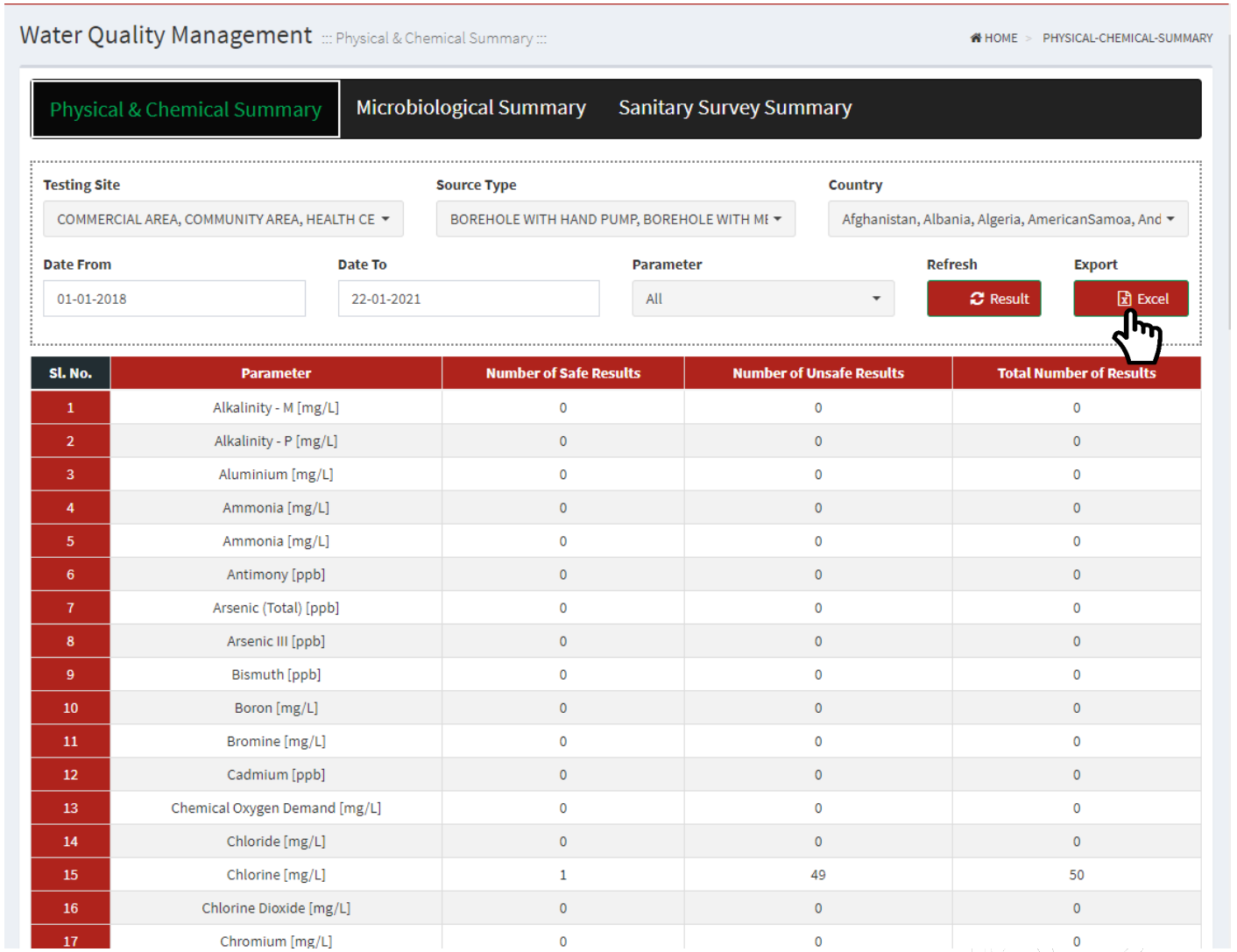
Summary Reports

The 2nd item from the bottom of the Main Menu links the ‘Summary Reports’ segment of the Dashboard. This is further divided into the:

1. Physical & Chemical
2. Microbiological Analysis
3. Sanitary Survey Summary

Generating Summary Reports from the Dashboard

Let us start with the Physical & Chemical Analysis Summary, see the image below- you can select ONE or MORE 'Testing Sites', 'Source Types' & 'Parameters' over a date range, the results will be displayed in a tabular manner and can also be downloaded in the form of MS Excel sheets



Sl. No.	Parameter	Number of Safe Results	Number of Unsafe Results	Total Number of Results
1	Alkalinity - M [mg/L]	0	0	0
2	Alkalinity - P [mg/L]	0	0	0
3	Aluminium [mg/L]	0	0	0
4	Ammonia [mg/L]	0	0	0
5	Ammonia [mg/L]	0	0	0
6	Antimony [ppb]	0	0	0
7	Arsenic (Total) [ppb]	0	0	0
8	Arsenic III [ppb]	0	0	0
9	Bismuth [ppb]	0	0	0
10	Boron [mg/L]	0	0	0
11	Bromine [mg/L]	0	0	0
12	Cadmium [ppb]	0	0	0
13	Chemical Oxygen Demand [mg/L]	0	0	0
14	Chloride [mg/L]	0	0	0
15	Chlorine [mg/L]	1	49	50
16	Chlorine Dioxide [mg/L]	0	0	0
17	Chromium [mg/L]	0	0	0

Contamination Alerts!

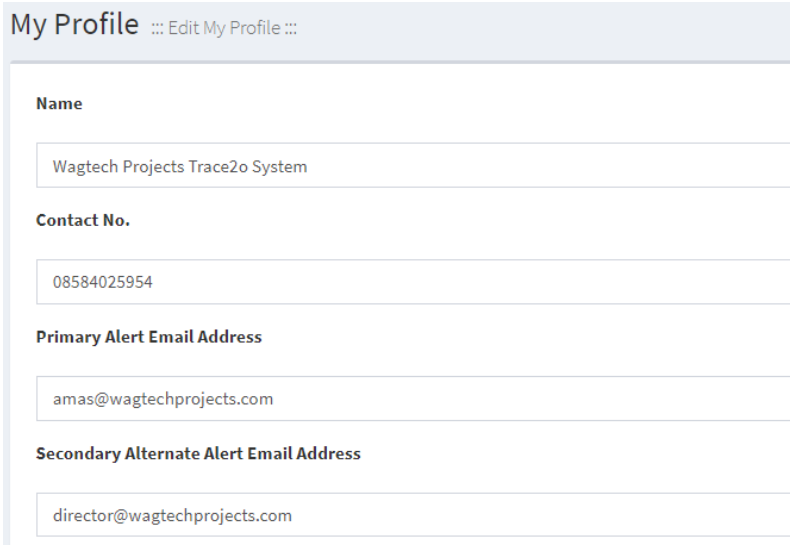
When the dashboard receives a result that is out of range (based on W.H.O standards) and email alert is sent to the dashboard managers for review. The email details the Source Identification as well as the three areas of which its out of range. Physical & Chemical, Microbiological, and Sanitary Survey. Audit Trail will list all email alerts that have been successfully sent.

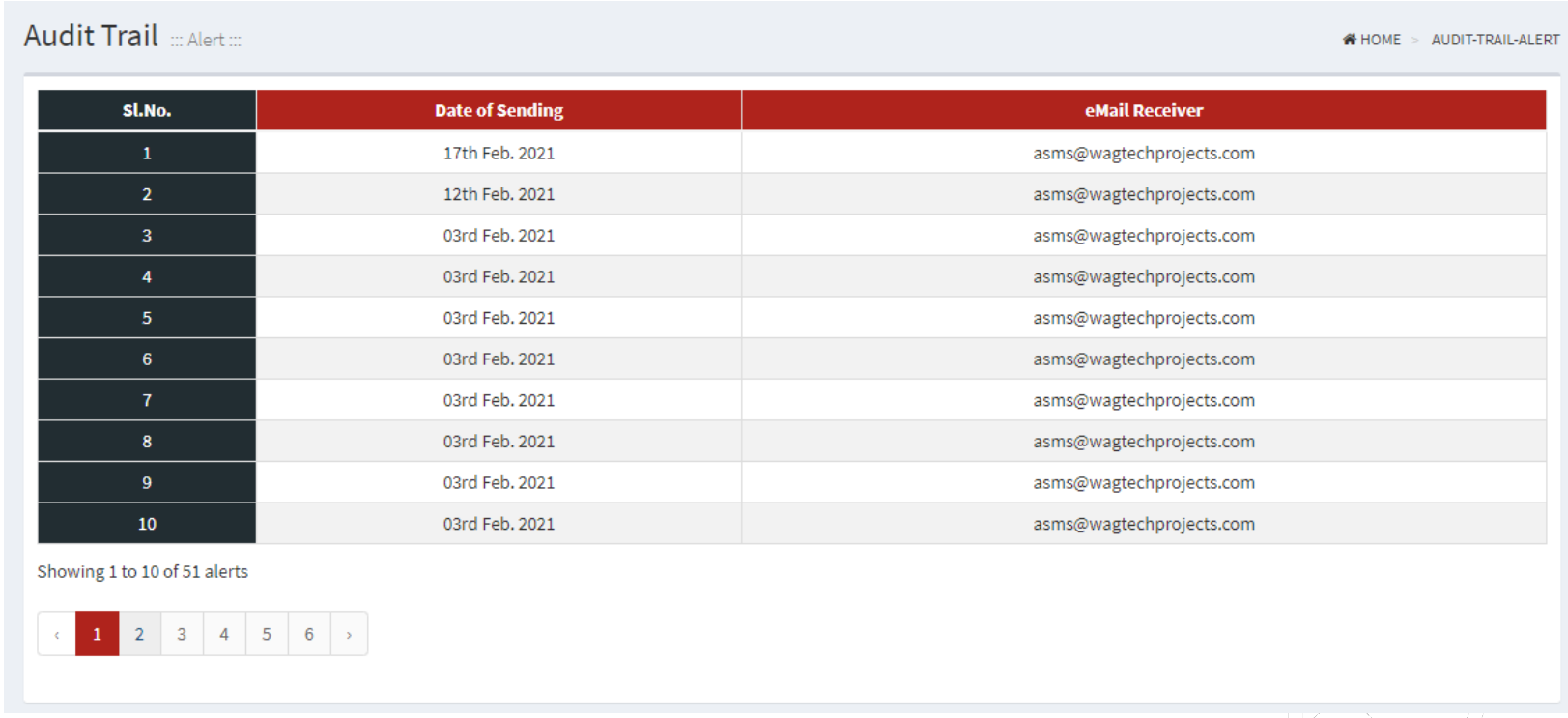
You can set up to 2 email addresses for the alert email to be sent back in the 'My Profile' page.

On-Site
- Source Tested on site
- Reported using by the ASMS App

Dashboard
- Report is received by the Dashboard
- Dashboard singles out each contaminated parameter

Email Alert!
- Contamination Alert email is sent to the registered email addresses





Sl.No.	Date of Sending	eMail Receiver
1	17th Feb. 2021	asms@wagtechprojects.com
2	12th Feb. 2021	asms@wagtechprojects.com
3	03rd Feb. 2021	asms@wagtechprojects.com
4	03rd Feb. 2021	asms@wagtechprojects.com
5	03rd Feb. 2021	asms@wagtechprojects.com
6	03rd Feb. 2021	asms@wagtechprojects.com
7	03rd Feb. 2021	asms@wagtechprojects.com
8	03rd Feb. 2021	asms@wagtechprojects.com
9	03rd Feb. 2021	asms@wagtechprojects.com
10	03rd Feb. 2021	asms@wagtechprojects.com

Showing 1 to 10 of 51 alerts

‹ 1 2 3 4 5 6 ›

Any questions or if you need support please contact:

asms_helpline@wagtechprojects.com

+44 1635 872929

www.wagtechprojects.com | www.trace2o.com

The AquaSafe Management System (ASMS)

User Manual