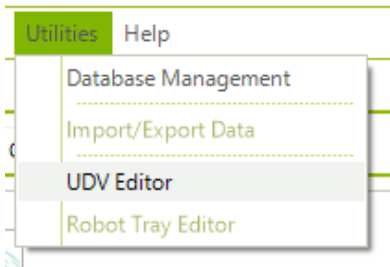


Adding Gran Alkalinity Method to Mantech Pro

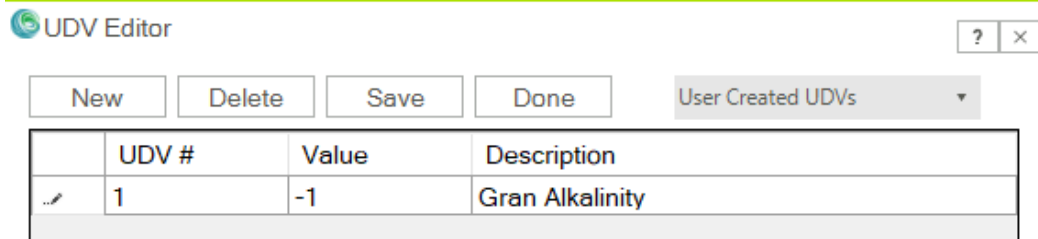
There should already be the hardware for the total alkalinity method on the Mantech system. If not, then please contact your local Mantech Representative.

Here are the steps for adding Gran Alkalinity:

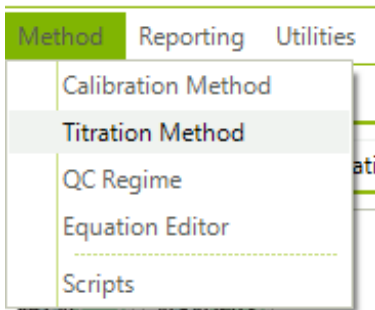
1. Add the UDV for Gran Alkalinity. This will be where the result is stored for your final report.
 - a. Go to the Utilities at the top of the main page and open UDV Editor.



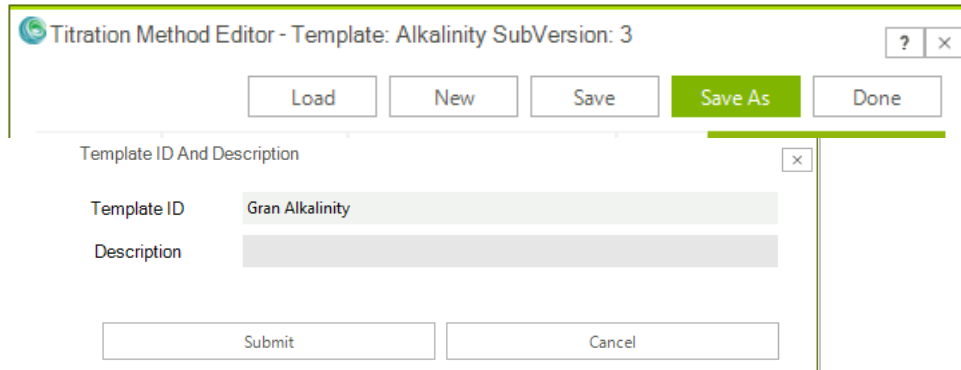
- b. Add a new UDV for Gran Alkalinity. The name can be long or short-form depending on the spacing on the report.



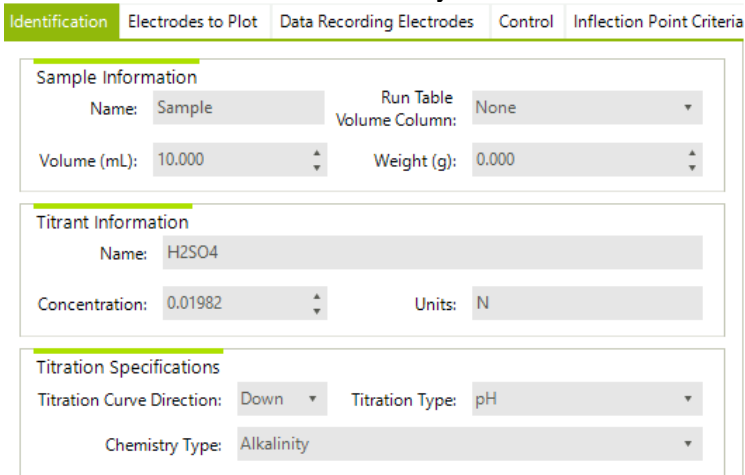
2. Make the Titration Method for adding the acid to the sample.
 - a. Go to Method, then Titration Method.



- b. Load the current Alkalinity Titration Method (you can also make a new titration method from scratch, but it is easier to have some steps pre-loaded).
 - c. Save As Gran Alkalinity.



- d.
- i. Keep the identification page the same, unless the sample volume or titrant being used is different from the Alkalinity Method.



- e. Keep the Electrodes to Plot and Data Recording Electrodes pages the same as well.

Identification Electrodes to Plot Data Recording Electrodes Control Inflection Point Criteria

Primary Electrode to Plot

Port: 1

Calibration: pH Calibration

Temperature Compensation: Automatic

Temperature Source: Temperature Probe

Secondary Titration Plots

Follow titration with pH plot Follow titration with mV plot
 Follow titration with conductivity plot Selected titration type only

Conductivity Probe

Conductivity Meter: COM4(Conductivity)

Calibration: None

Identification Electrodes to Plot Data Recording Electrodes Control Inflection Point Criteria

Electrode at Port 1

Calibration: None Temperature Compensation: None

Raw mV Temperature Source: Temperature Probe

Electrode at Port 2

Calibration: None Temperature Compensation: None

Raw mV Temperature Source: Temperature Probe

Electrode at Port 3

Calibration: None Temperature Compensation: None

Raw mV Temperature Source: Temperature Probe

Electrode at Port 4

Calibration: None Temperature Compensation: None

Raw mV Temperature Source: Temperature Probe

Temperature To Record

Temperature Source: None

- f. Adjust the Control page to make the titration go down to pH 3.0. Also don't have the max injection be over 0.1mL as you will want multiple points for the regression analysis. The max injection can also be further lowered if more points are needed.

Identification Electrodes to Plot Data Recording Electrodes Control Inflection Point Criteria

Titration Injection

Inject to Target Constant:

Injection Volume (Δ mL): 0.000 Reading Change (Δ pH): 0.20

Volume Control (mL)

Pre-Injection: 0.000 Min Injection: 0.010

First Injection: 0.010 Max Injection: 0.100

Stability Control Type: Δ pH / Δ Time

Delta

Δ pH: 0.200 Δ Time (s): 3 Timeout (s): 10

Titration Stopping Criteria

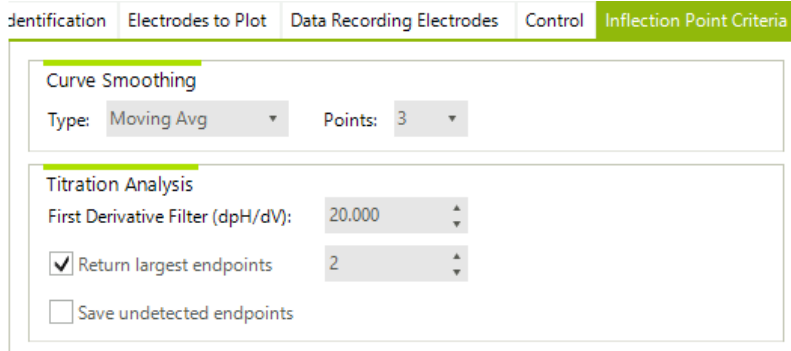
Stopping pH: 3.000 Prompt for new stopping criteria during titration

Max Volume to Inject (mL): 25.000

Max Run Time (m): 20.000

Max Endpoints: 10

g. The inflection point criteria can be kept the same as well.

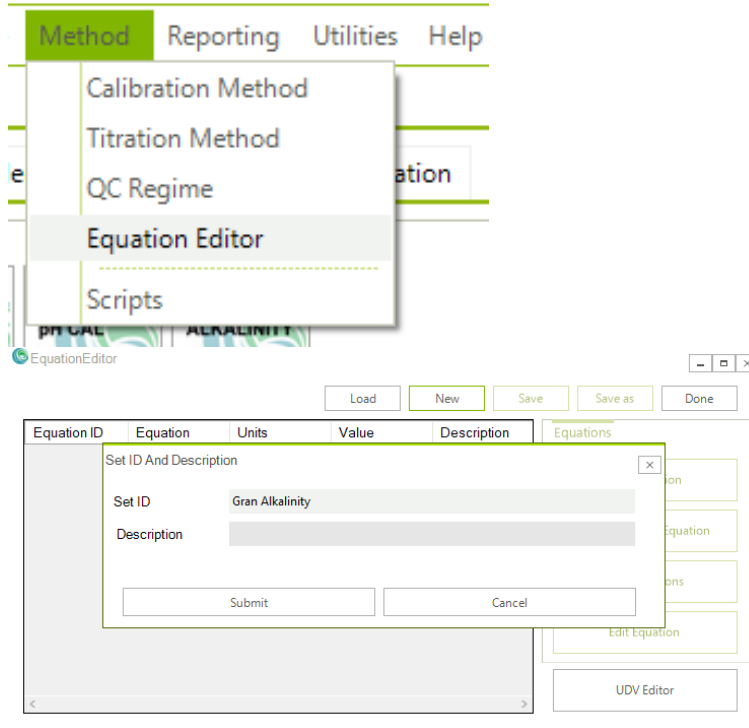


Identification | Electrodes to Plot | Data Recording Electrodes | Control | **Inflection Point Criteria**

Curve Smoothing
 Type: Moving Avg | Points: 3

Titration Analysis
 First Derivative Filter (dpH/dV): 20,000
 Return largest endpoints: 2
 Save undetected endpoints

- h. Save the Changes
- 3. Set up the Gran Alkalinity Equations
 - a. Go to Method then Equation Editor, and make a New equation set



Method | Reporting | Utilities | Help

- Calibration Method
- Titration Method
- QC Regime
- Equation Editor**
- Scripts

EquationEditor

Load | **New** | Save | Save as | Done

Equation ID	Equation	Units	Value	Description	Equations
Set ID And Description					
Set ID	Gran Alkalinity				
Description					
Submit Cancel					

Edit Equation

UDV Editor

b. Add the following equations:

Equation ID	Equation	Units	Value	D
Gran Alkalinity After Regression	$udv1047 * tcon * 50000 / svol$	ppm		
Gran Alkalinity Before Regression	$udv1046 * tcon * 50000 / svol$	ppm		
GVE1	udv1046	mL		
GVE2	udv1047	mL		
Sample Volume	svol	mL		
Titrant Concentration	tcon	N		

c. Save the equations.

4. Make the script for the titration and Gran Regression Analysis

a. Go to Method and Scripts.

b. Make a new Subscript for performing the Gran Analysis and calculations.

Script ID And Description ✕

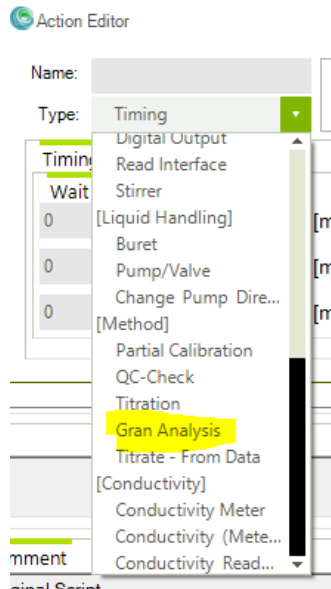
Script ID

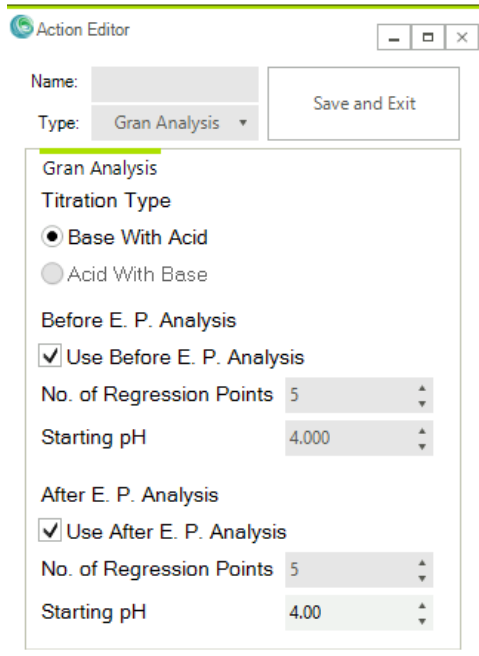
Description

c.

d. Select New Sibling for making the script actions.

e. The first action will be the Gran analysis





Action Editor

Name:

Type: Gran Analysis Save and Exit

Gran Analysis

Titration Type

Base With Acid
 Acid With Base

Before E. P. Analysis

Use Before E. P. Analysis

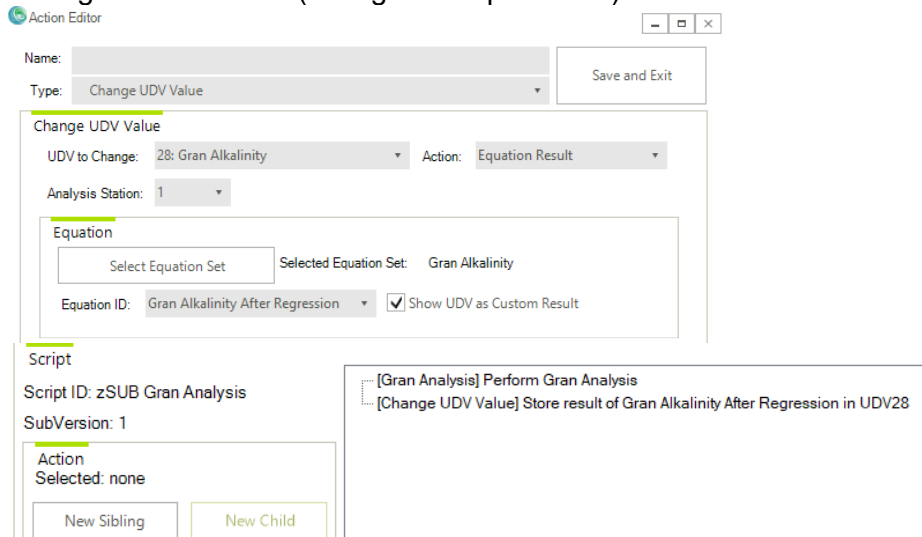
No. of Regression Points: 5
 Starting pH: 4.000

After E. P. Analysis

Use After E. P. Analysis

No. of Regression Points: 5
 Starting pH: 4.00

- i. Regression points and pH are set by the user.
- f. Calculate Gran Alkalinity depending on whether the endpoint volume is going to be from before the regression or after (change the equation ID).



Action Editor

Name:

Type: Change UDV Value Save and Exit

Change UDV Value

UDV to Change: 28: Gran Alkalinity Action: Equation Result

Analysis Station: 1

Equation

Select Equation Set Selected Equation Set: Gran Alkalinity

Equation ID: Gran Alkalinity After Regression Show UDV as Custom Result

Script

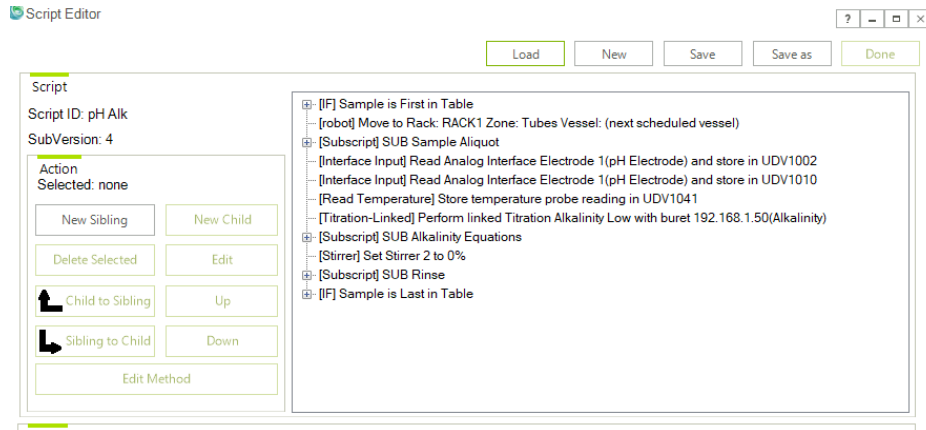
Script ID: zSUB Gran Analysis
 SubVersion: 1

Action Selected: none

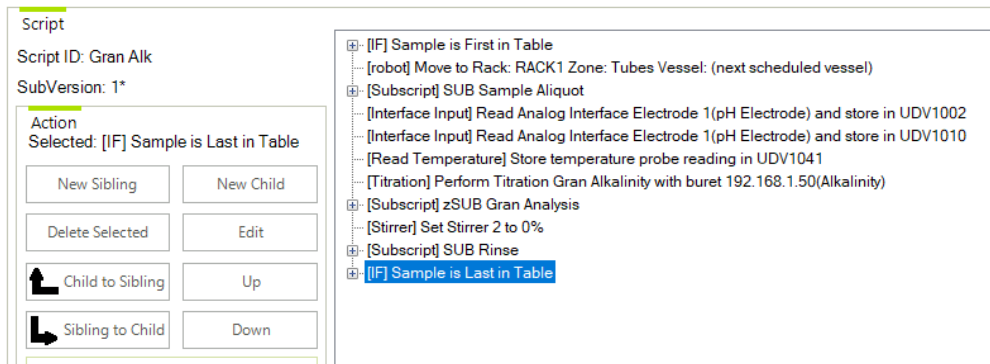
New Sibling New Child

```
[Gran Analysis] Perform Gran Analysis
[Change UDV Value] Store result of Gran Alkalinity After Regression in UDV28
```

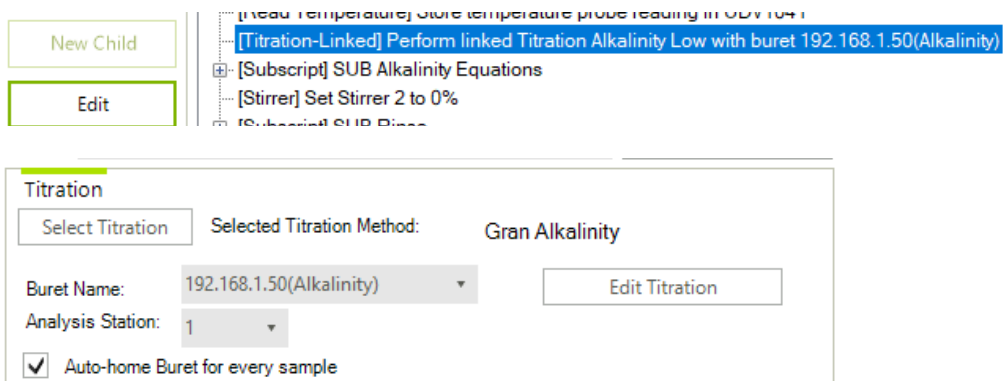
- i. Full Subscript for the Gran Analysis.
- g. Save the subscript.
- h. Load the Alkalinity Script. It could also be named pH Alkalinity



i. Save As Gran Alkalinity

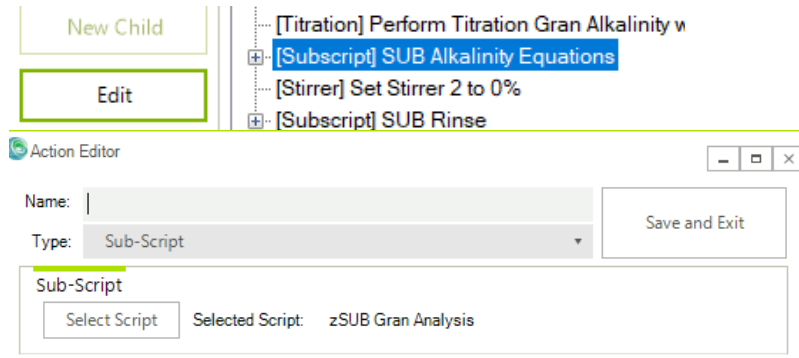


j. Edit the Titration step to be with the Gran Alkalinity Titration



k. Save and click Edit on the SUB Alkalinity Equations.

l. Change the subscript to be the zSUBGranAnalysis just made.



m. Save Changes.

5. You should now be able to add the Gran Alkalinity Script made to your Run Table for running samples.