LIMS Entry for Laboratory Parameters

DEPARTMENT OF ENVIRONMENTAL PROTECTION BUREAU OF LABORATORIES BIOLOGY SECTION TALLAHASSEE FLORIDA

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1. SCOPE AND APPLICATION

1.1. This method is used to ensure that entry of all parameters (Conductivity/Salinity, Dissolved Oxygen, and pH, Ammonia, Chlorine, Hardness, and Alkalinity) are inputted into LIMS with accuracy and consistency. The methods outlined will be used to provide accurate documentation of data value obtained from the Thermo Scientific Orion Star A213 Benchtop RDO/DO meter, Fisherbrand FE150 pH Meter, and the Traceable Bench Conductivity Meter, Hach Ammonia Nitrogen Pocket Colorimeter II, Hach Chlorine Pocket Colorimeter II, Hach Alkalinity kit, and the Hach Hardness Kit.

2. SUMMARY OF METHOD

2.1. Lab samples are measured for their respected endpoints.All values obtained from readings must be transcribed into LIMS in an expedited manner with no errors.

2.1.1. Interferences include contaminated glassware, airborne particulates (including dust and microscopic organisms), and improperly prepared samples.

2.1.2. Cross contamination of samples can lead to inaccurate readings. A lack of sanitizing the meter probes in between samples and concentrations can lead to inaccurate readings. The analyst must make sure that all samples and concentrations are organized appropriately to prevent cross contamination.

2.2. Data entry of all values obtained must be entered as shown by the corresponding meters to reflect true values of all samples.

3. 3. EQUIPMENT AND SUPPLIES

3.1. Thermoscientific Orion Star A213 (SOP TA-06.39)

3.2. Fisherbrand FE150 (SOP TA-06.37)

3.3. Traceable Bench Conductivity Meter (SOP TA-06.36)

3.4. Hach Ammonia Nitrogen Pocket Colorimeter II (SOP TA-06.22)

3.5. Traceable Thermometer

3.6. Hach Chlorine Pocket Colorimeter II (SOP TA-06.22)

3.7. Alkalinity (Hach Kit) and Hardness (Hach Kit) (SOP TA-06.08)

3.8. Hach Ammonia Nitrogen Pocket Colorimeter II Test Kit (SOP TA-06.35)

3.9. Computer with access to LIMS

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4. THERMOMETER

4.1. The DO and pH meters require a calibration check for the Automatic Temperature Compensation (ATC) probes. This requires a Logbook entry before being used in sample testing.

4.2. All thermometers should be calibrated in accordance with SOP TA-06.13.

4.3. For entry of data, open LIMS. Go to Laboratory > Technical > Laboratory Logbook > open TOX_THERMOMETER.

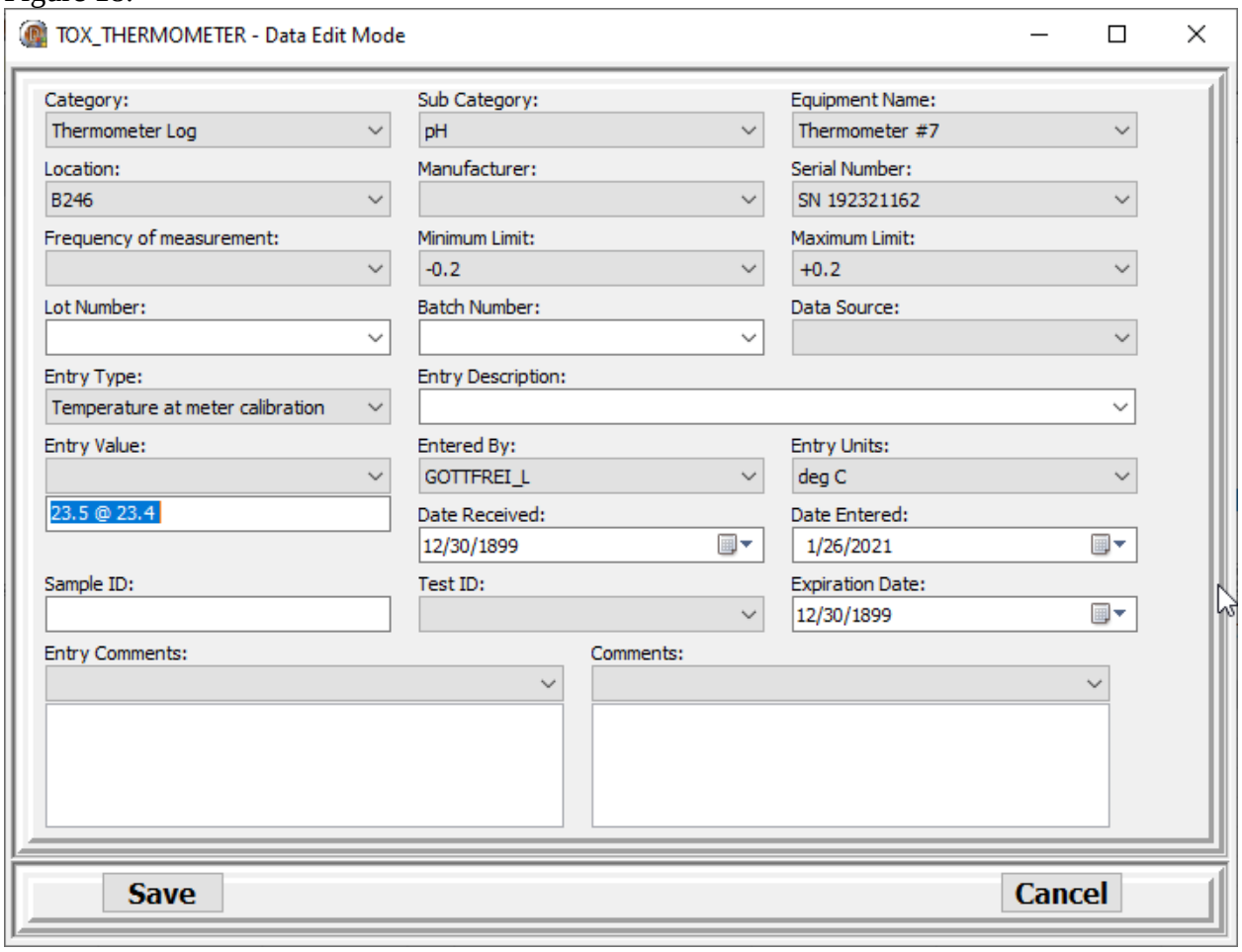
4.4. For entry of the calibratedThermometer against the ATC Ph probe you will click on the last entry with the Sub_Category labeled pH.

4.5. Ensure that the Equipment name and Serial number fields match the information for thermometer that you are using. Both thermometers should read within 0.2 of each other.

4.6. In the Entry value field, the pH meter temperature reading will be listed first then the reference thermometer. For reference refer to figure 18.

4.6.1. Example: pH meter ATC probe reads 23.5. The reference thermometer reads 23.4. The entry should read 23.5 @ 23.4.

4.7. Figure 18.



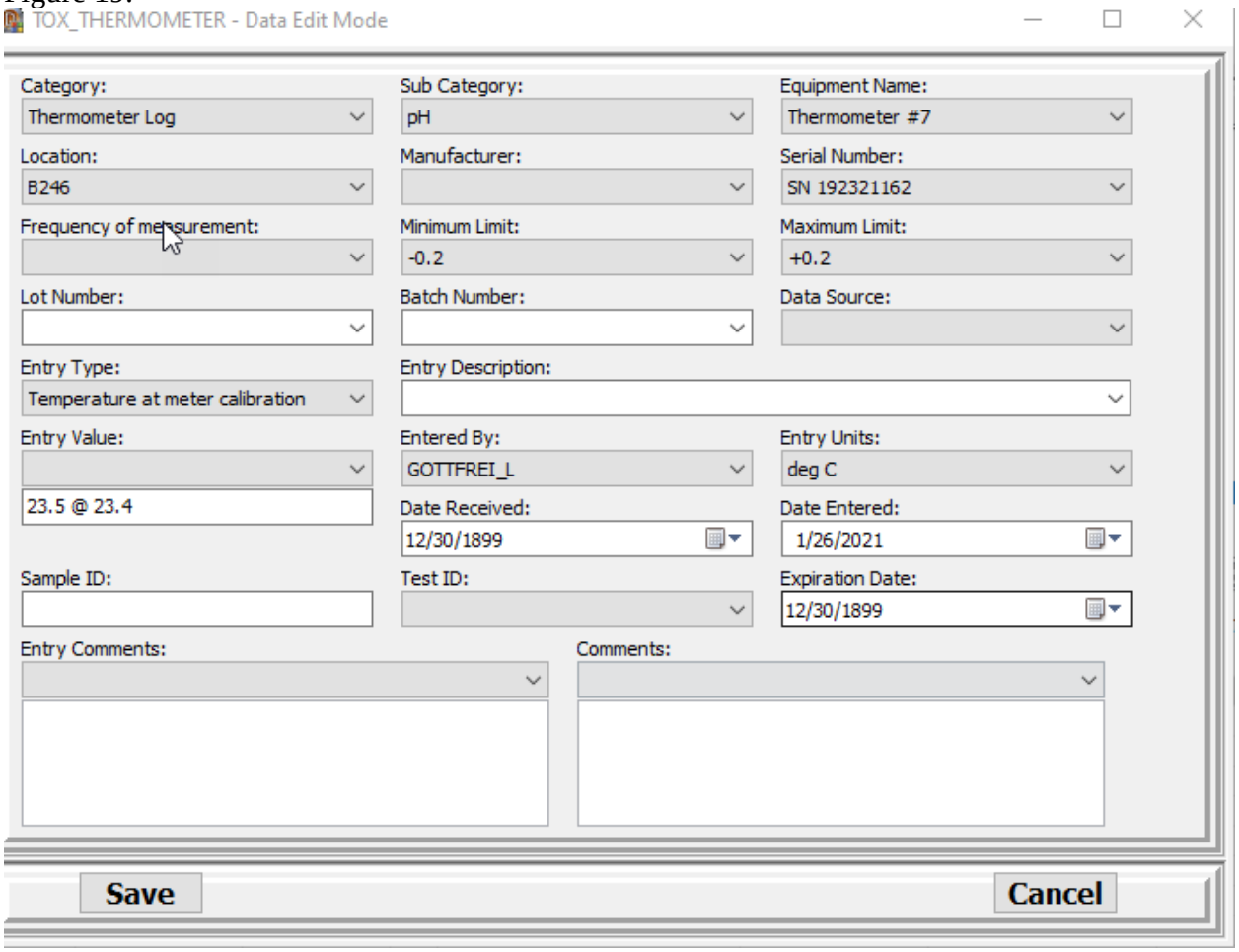
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4.8. For entry of the Thermometer against the DO meter you will click on the last entry with the Sub_Category labeled DO.

4.9. Ensure that the Equipment name and Serial number fields match the information for thermometer that you are using. Both thermometers should read within 0.2 of each other.

4.10. In the Entry value field, the DO meter temperature reading with be listed first then the reference thermometer. For reference refer to figure 19.

4.11. Figure 19.



5. CONDUCTIVITY/ SALINITY

5.1. Conductivity calibration data entry must be done before any sample is tested.

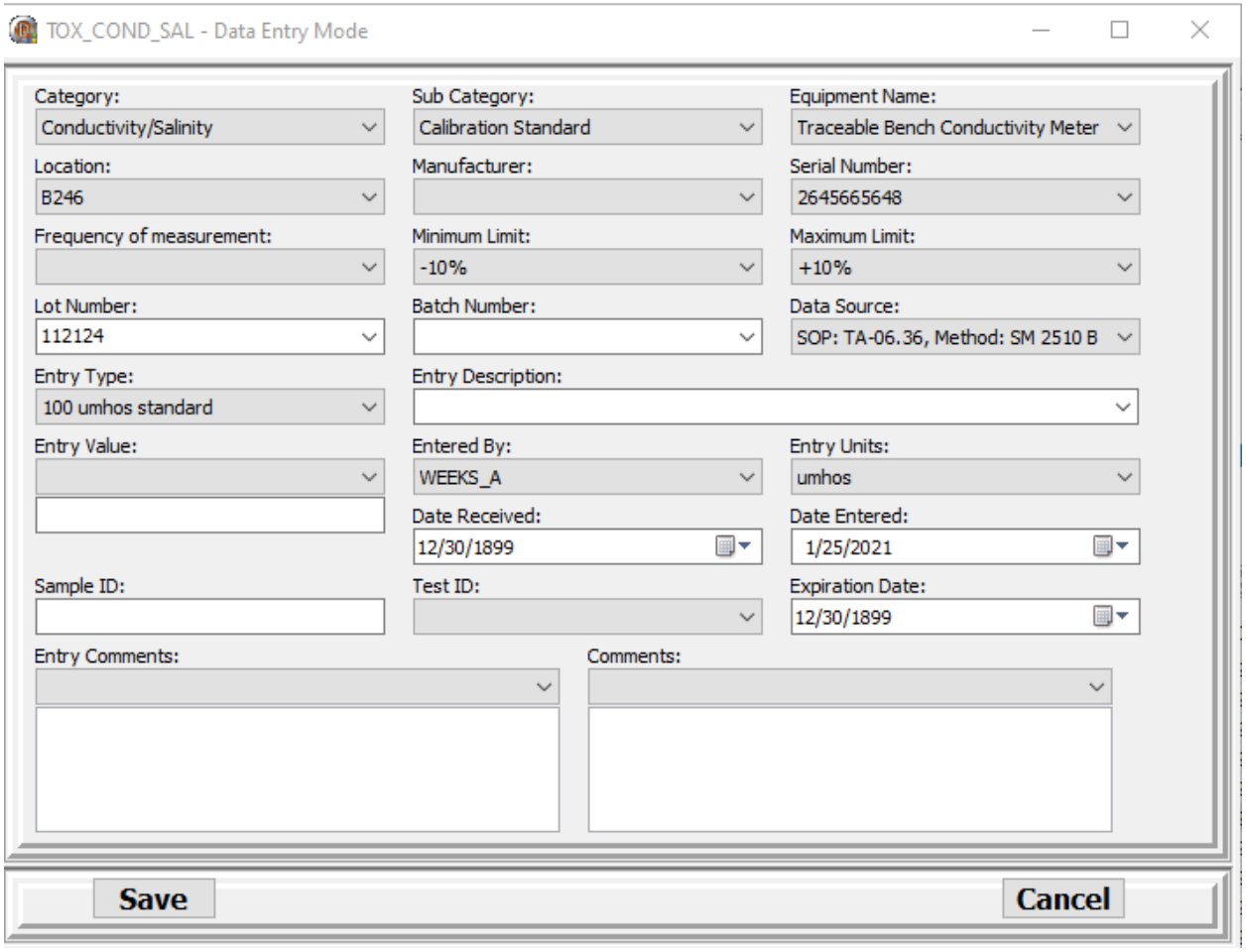
5.2. Calibration of the Traceable Bench Conductivity Meter should be performed in accordance with SOP TA-06.36.

5.3. Open LIMS. Go to Laboratory >> Click Laboratory Logbook > open TOX_COND_SAL

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5.4. To enter the low standard (100 µhmos standard) and click on the latest entry to pull up the data entry page as shown in Figure 1.

5.5. Figure 1.



5.6. The Entry Type field should correspond to the standard or sample that the analyst is measuring. The category should read “Conductivity/salinity” and the sub-category should ready “Calibration Standard”.

5.7. The ‘Lot Number’ box is filled in with the standard’s LIMS number located on the bottle.

5.8. The entered by and entry date will auto populate.

5.9. Enter the value from the meter in the ‘Entry Value’ box.

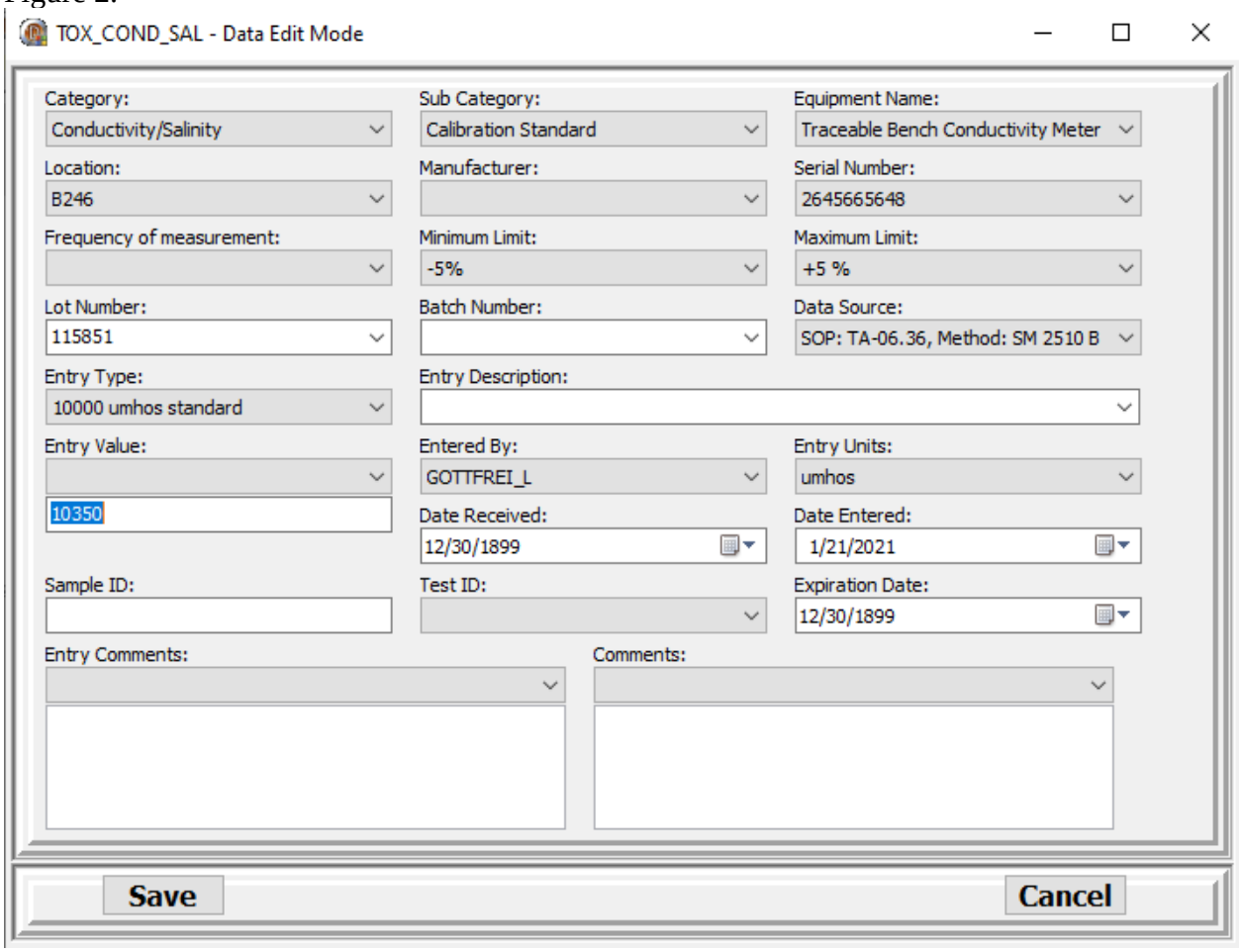
5.10. The temperature of the medium (1,000 µmhos) standard should be taken and entered in the Comments box. The comment should read “med temp = XX.X degrees C.” Once all fields have been filled out the analyst can then hit save. (Note: After clicking save the home screen will then appear and after clicking refresh the previous entry will then populate)

5.11. Find and click on the most recent entry that is labeled 10,000 µmhos standard. (Note: For instructions on how to enter other standards refer to steps 4.1.1.2-4.1.1.8)

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5.12. Before clicking save the entry should resemble Figure 2.

5.13. Figure 2.



5.14. Entry of a Facility sample or Lab Water sample.

5.14.1. For data entry of a sample, the analyst will look for the last Entry_Type labeled as “Sample Conductivity.”

5.14.2. In the ‘Lot Number’ field, the LIMS number for the sample or dilution water should be entered. For DI water, well water, and facility samples no lot number will be entered.

5.14.2.1. For facility samples, the sample number is entered in the ‘Sample ID’ box. This can be filled out at a later date if the sample has not been given a LIMS number at time of testing.

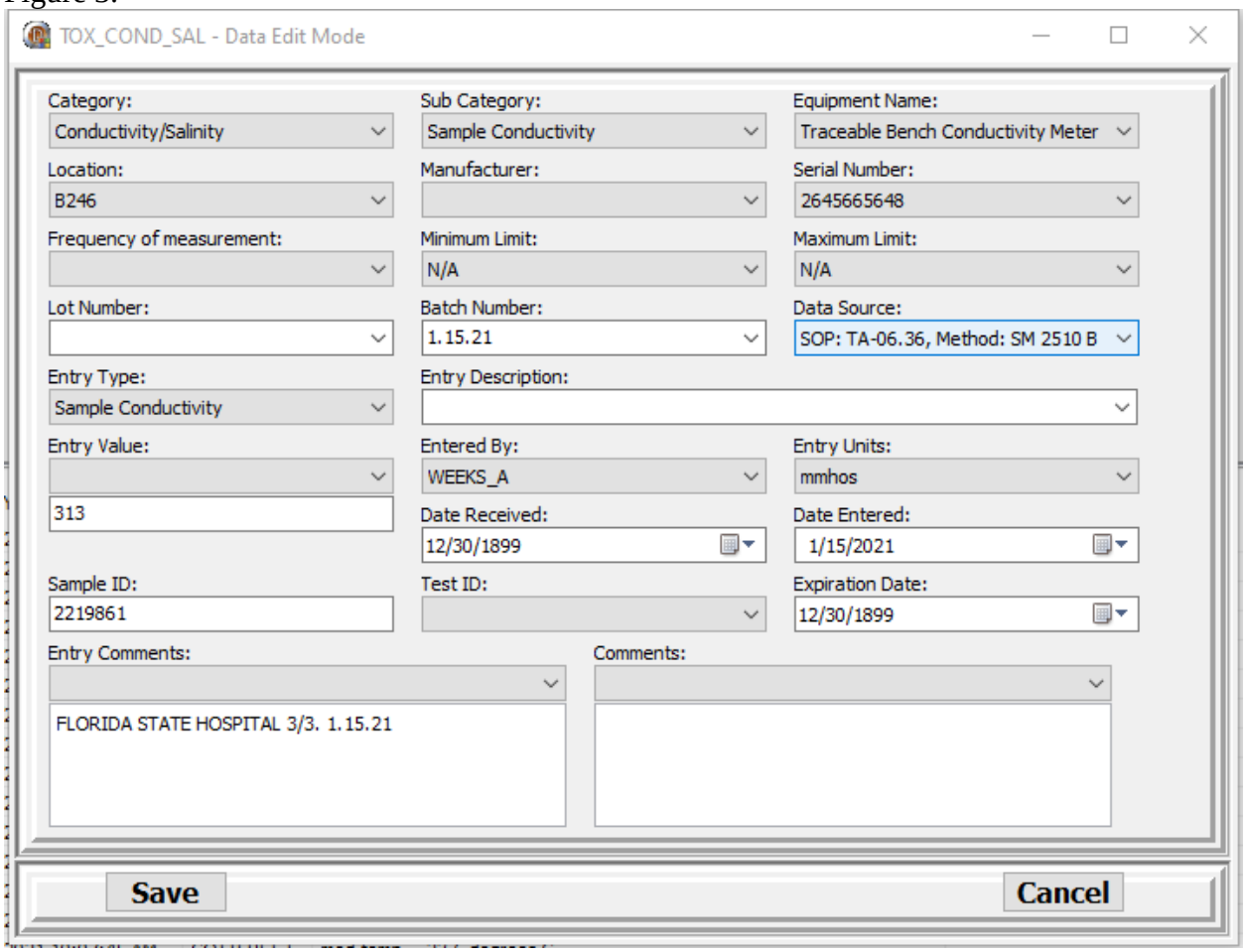
5.14.3. In the Batch Number field ‘Batch Number’ box is filled in for samples being measured and is typically the day the sample was made; if it is organism water or facility water it is the day it arrived.

5.14.4. The Entry Value Field should be filled out with the measurement obtained from the Traceable Bench Conductivity Meter.

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5.14.5. For the Entry Comments the following information should be entered as follows: Facility/sample type, Batch number. Refer to Figure 3 for example. For in-house waters, the comment should read “water type, batch number, LIMS number” (for example: “MHWCD 2.1.21 123456.”)

5.15. Figure 3.



5.16. Entry of the End of Day (EOD) Check/Afternoon check.

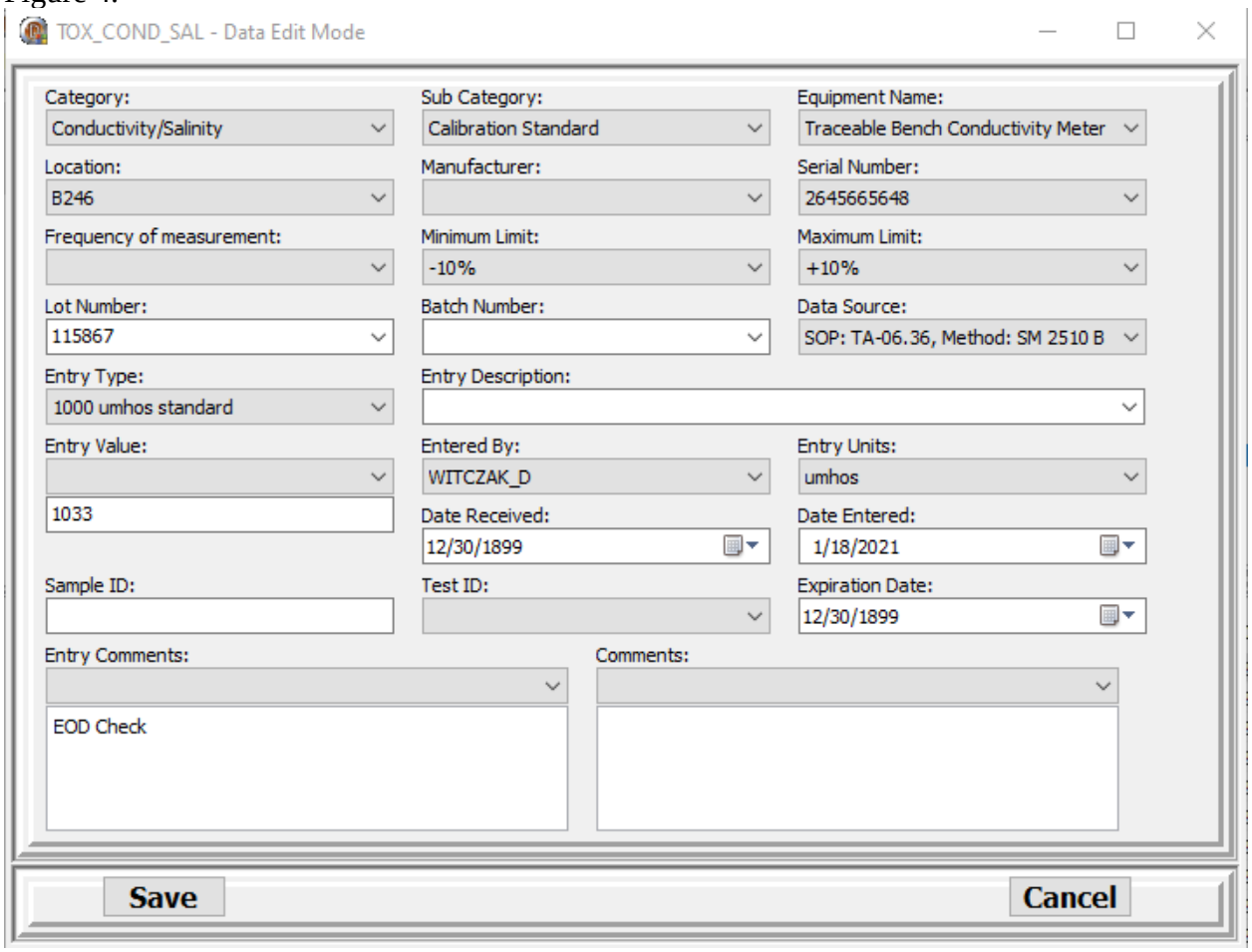
5.16.1. For the entry of an EOD Check look for the last Entry_Type of 1000 µhmos standard and double click.

5.16.2. The Lot Number should be filled in with the LIMS label number that is on the Medium Standard bottle used for the test.

5.16.3. For the entry comment the following comment should be typed in, “EOD Check”. Refer to Figure 4 for a completed entry. For the afternoon check, refer to step 4.1.3.1-4.1.3.3 and make an entry comment that states, “Afternoon Check.”

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5.17. Figure 4.



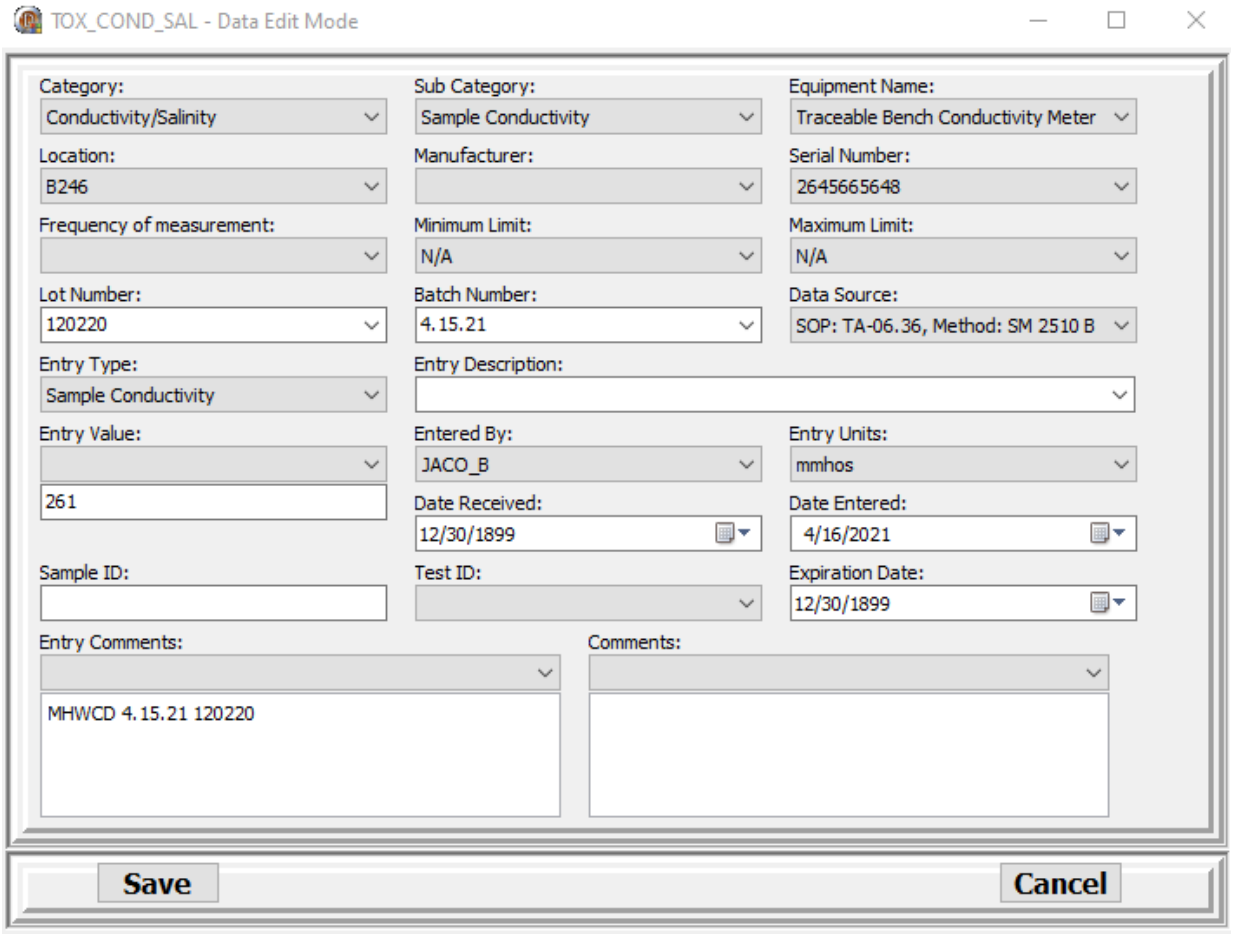
5.18. Salinity values should also be entered into LIMS in sequence.

5.19. Salinity standard is measured with the same conductivity probe and meter. 25 mL of 35 ppt standard is poured into a 30 mL plastic cup. The meter is switched to salinity mode and the probe is gently swirled in the cup. The salinity needs to be within ± 2 ppt of the standard.

5.20. Salinity is entered by selecting the “Salinity Standard” subcategory. Enter the value obtained from the meter in the ‘entry value’ box. “Sample Salinity” is used when measuring a sample. Entry units will read as ppt. Refer to Figure 5 on how to enter the salinity for ASW.

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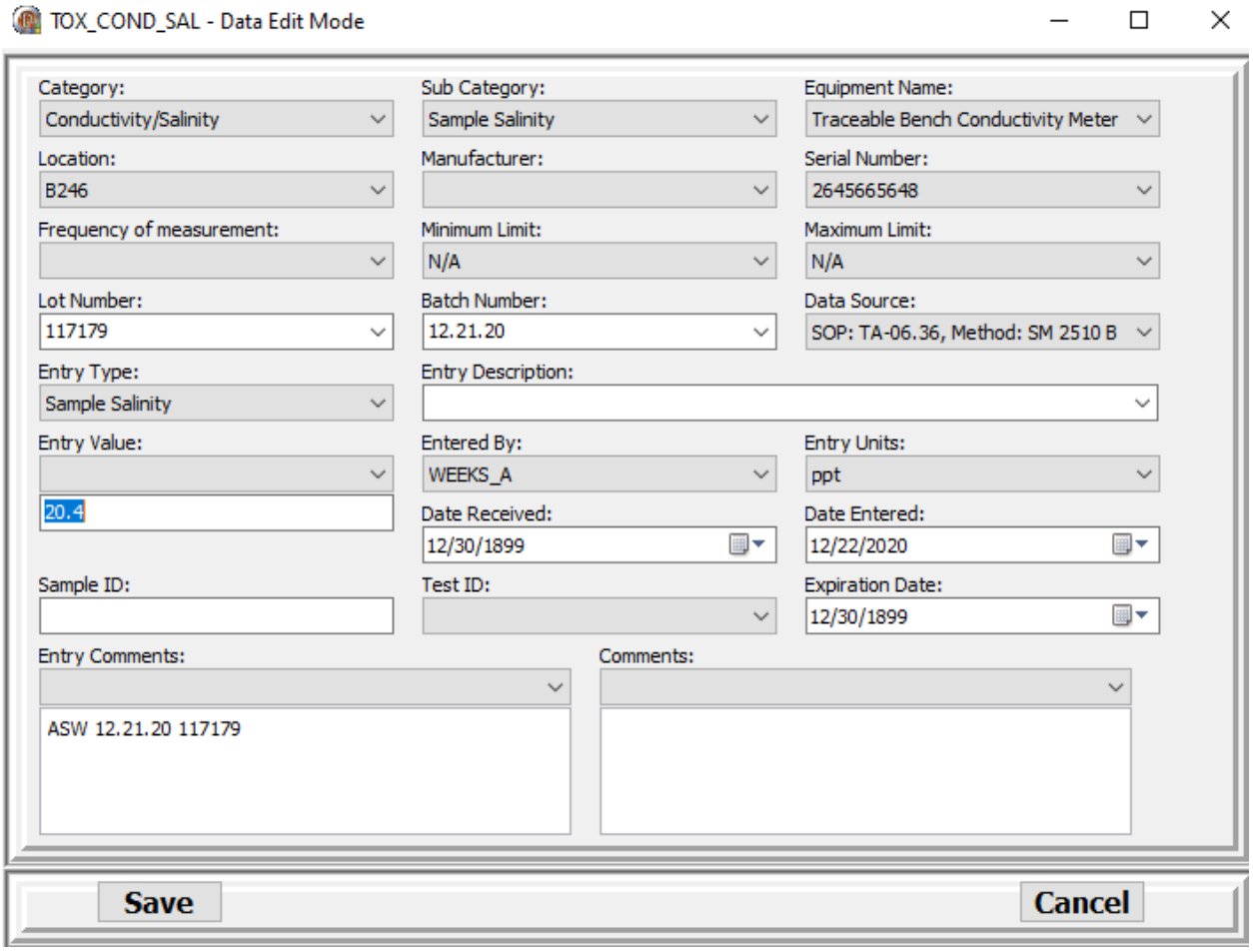
5.21. Figure 5.



5.22. For both conductivity and salinity, write the type of sample (facility or prepared reagent) in the ‘Entry Comments’ box along with the batch number and LIMS number. Refer to Figure 6 for example.

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5.23. Figure 6.



6. DISSOLVED OXYGEN

6.1. Dissolved Oxygen calibration data entry must be done before any sample is tested.

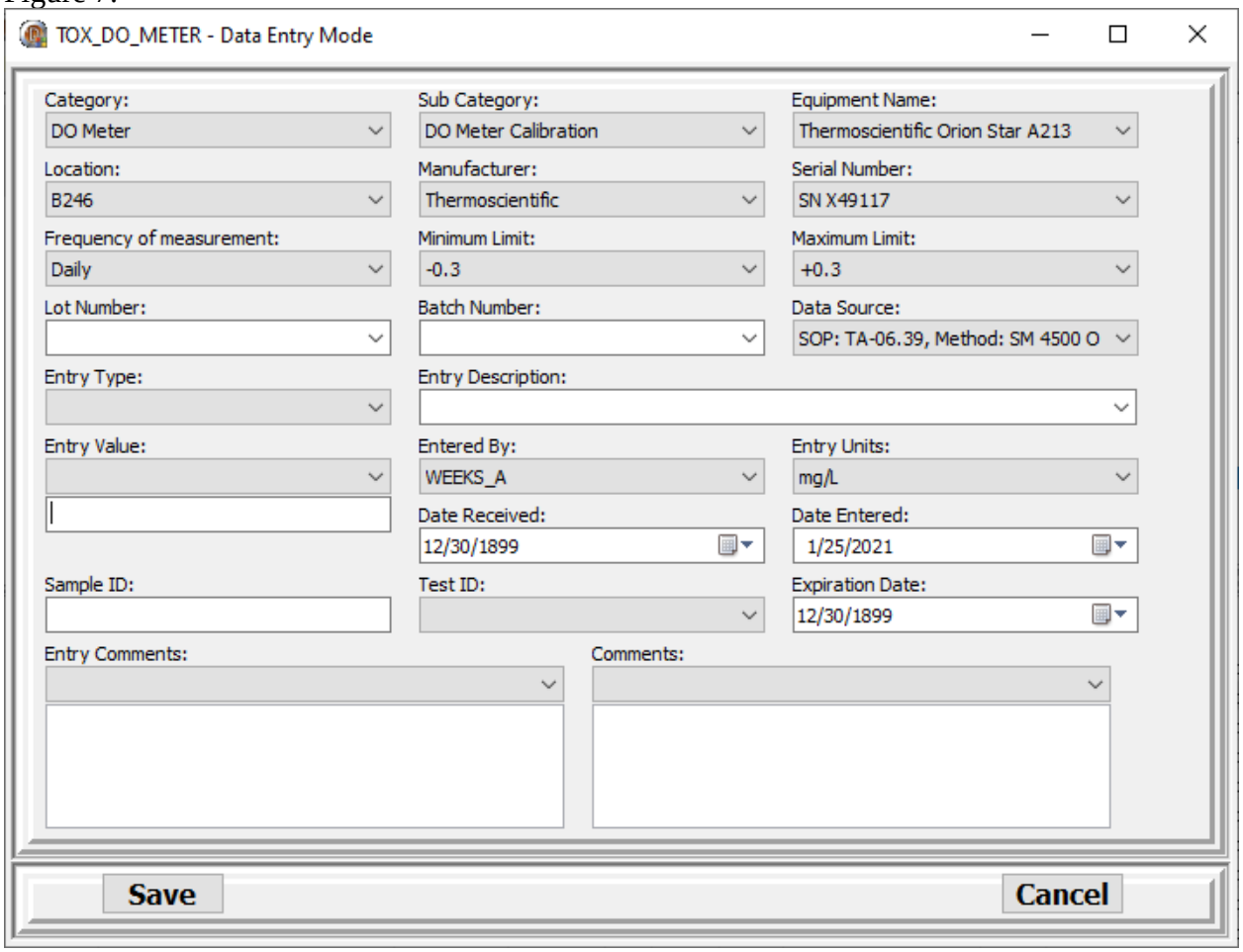
6.2. Calibration of the Thermoscientific Orion Star A213 should be performed in accordance with SOP TA-06.39.

6.3. Open LIMS. Go to Laboratory–> Technical > Laboratory Logbook > open TOX_DO_METER.

6.4. In the Entry_Type field look for DO Meter Calibration and click on the latest entry to pull up the data entry page as shown in Figure 7.

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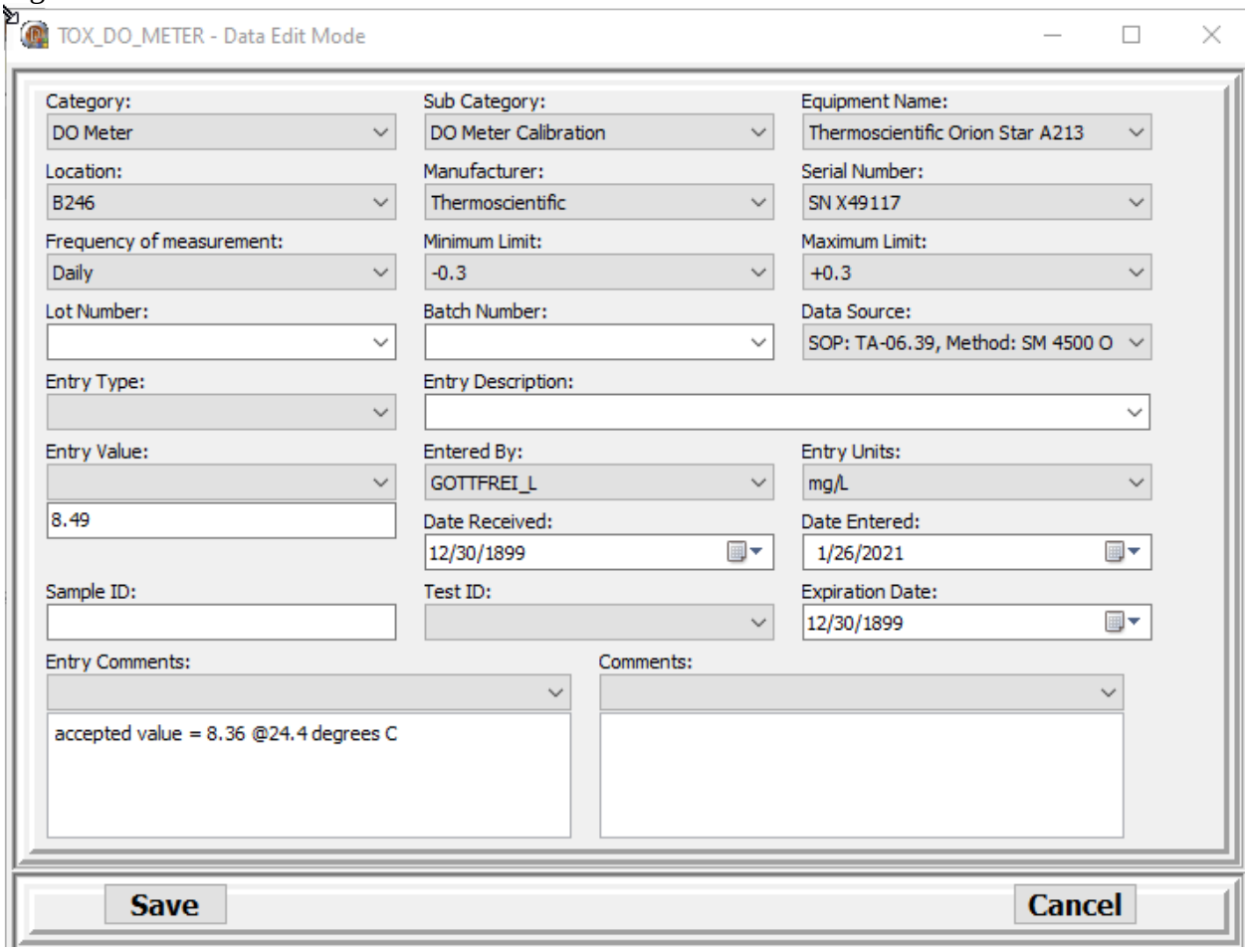
6.5. Figure 7.



6.6. The reading provided by the Thermoscientific Orion Star A213 will be entered in the 'Entry Value' field. This reading will then be compared to the Dissolved Oxygen Saturation Table sheet on the wall next to the meter station. The temperature reading on the meter will be compared to the accepted value from the sheet. Both the temperature value and corresponding reading will then be entered in the entry comments section as seen in Figure 8.

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6.7. Figure 8.



6.8. The accepted value obtained from the chart and the reading obtained from the meter must be within plus or minus 0.3 mg/L to be within calibration.

6.9. For a sample log in the following process should be followed.

6.9.1. Find the last entry labeled Sample DO and open the entry.

6.9.2. In the Batch Number field, the ‘Batch Number’ box is filled in for samples being measured and is typically the day the sample was made; if it is organism water or facility water, it is the day it arrived.

6.9.3. If the sample is a in lab sample such as MHWCD, MHW, DI, or Well Water you will enter the LIMS label number in the Lot number section.

6.9.4. In the Entry Comments box for a Facility sample you will enter the facility name, the batch, and the date for example, Florida State 2/3. 1.1.21.

6.9.5. When fish species are received for testing purposes, a DO reading of the shipping water will be taken and entered with the comments reading the name of the species, the test being administered, and the date. (For example: “P. prom acute 2.1.21”).

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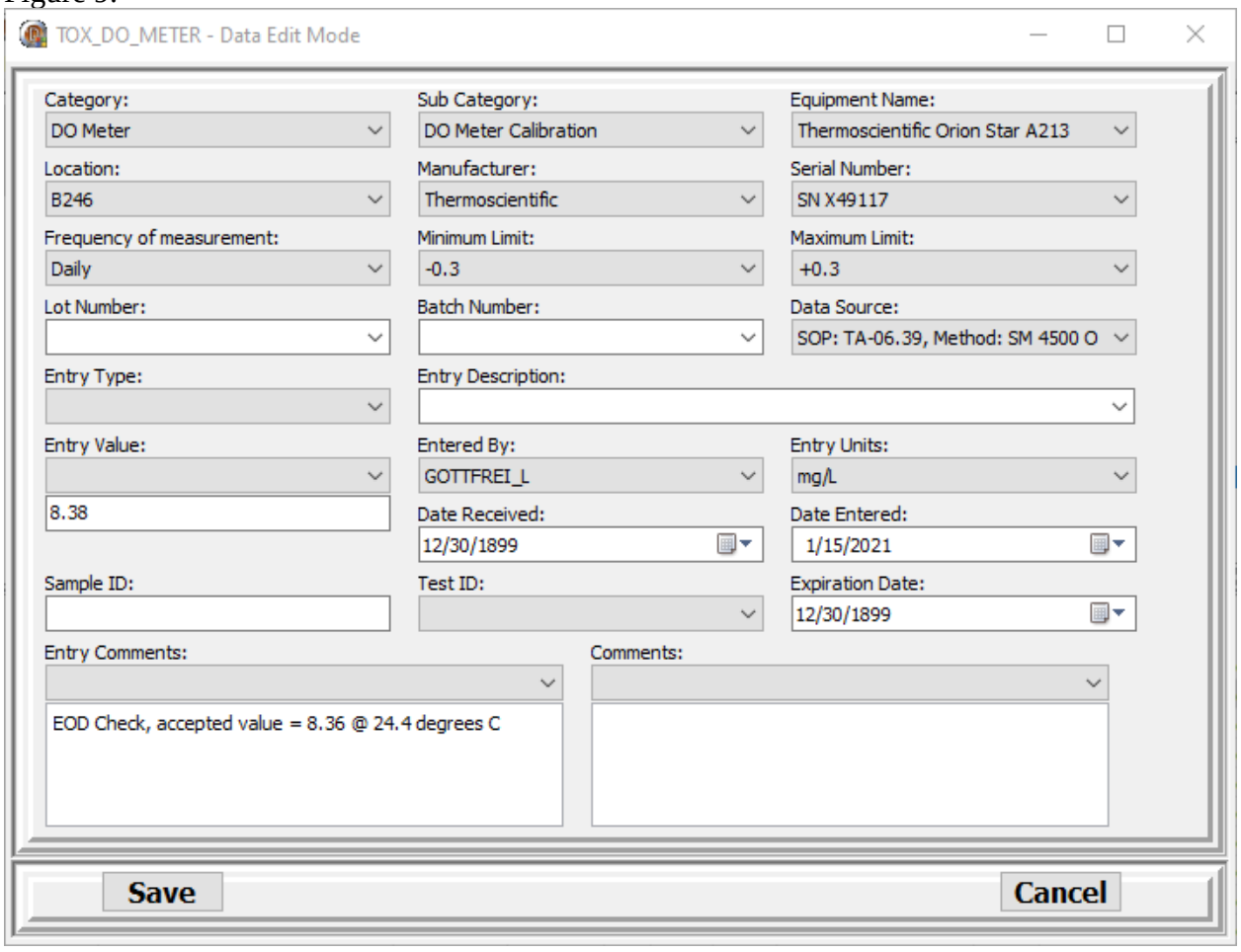
6.10. For dilution waters such as, MHWCD. MHW, DI, and Well Water, enter the sample name and the date the sample was either made or obtained, and LIMS number if applicable. (For example: “DI H2O 2.1.21” or “MHWCD 2.1.21 123456”).

6.11. At the end of every day, an End of Day (EOD) check will be performed before the meter can be shut down.

6.12. For the EOD check you will find the last DO meter calibration that has the entry comments of EOD check and open the entry.

6.13. The same process as the beginning of day calibration check will be followed with the only exception being that the comment will include the words EOD Check. Refer to Figure 9 for a completed entry. For the afternoon check, enter “afternoon check” in the entry comments. This is done 2-hours after the initial calibration.

6.14. Figure 9.



7. PH

7.1. Ph meter calibration data entry must be done before any sample is tested.

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7.2. Calibration of the Fisherbrand FE150 pH Benchtop Meter should be performed in accordance with SOP TA-06.37.

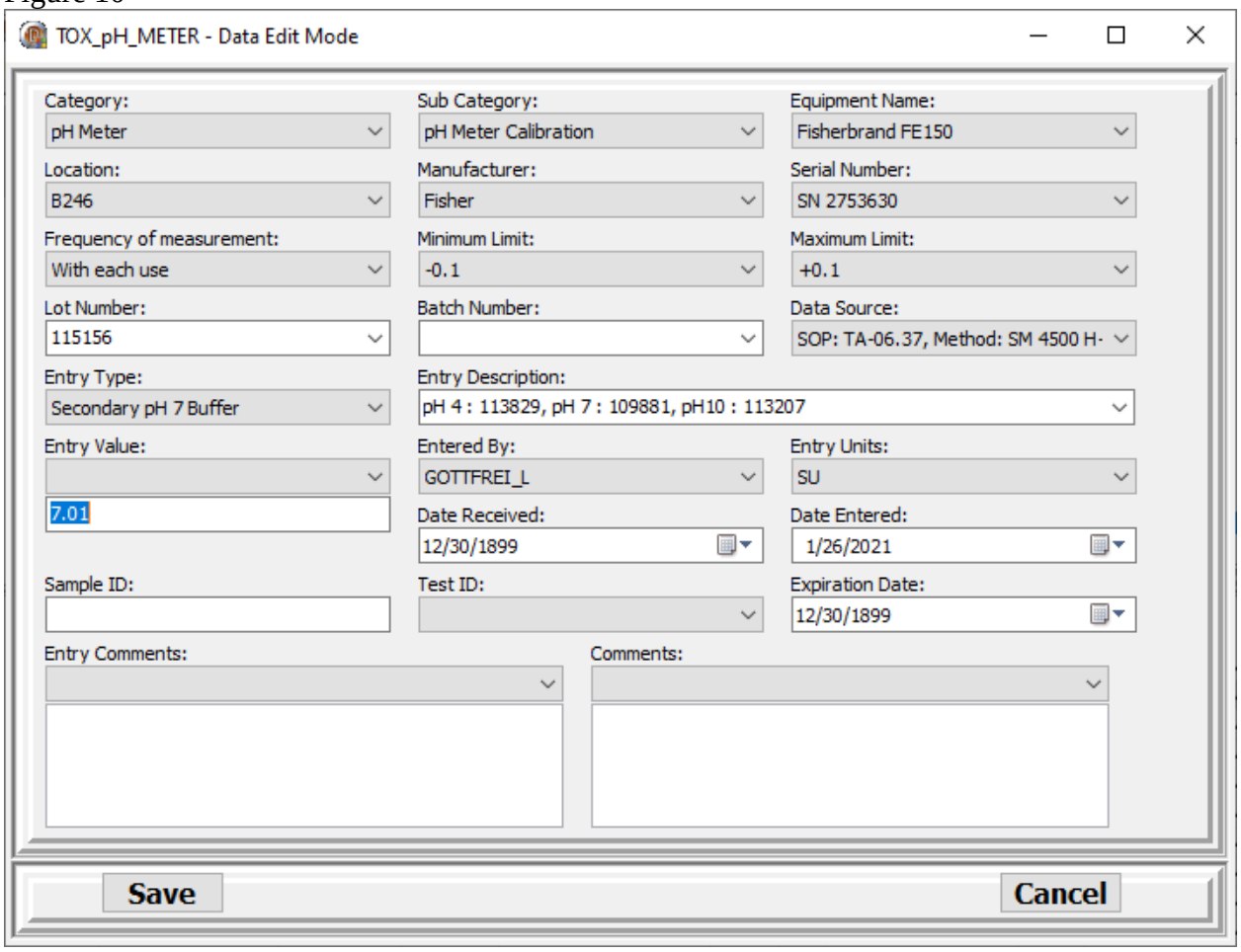
7.3. Open LIMS. Go to Laboratory > Technical > Laboratory Logbook >open TOX_pH_METER

7.4. Enter the value the from the meterin the 'Entry Value.' The pH meter is within calibration if the Orion pH 7 standard reads 7.00 SU ± 0.10 SU

7.5. In the 'Entry Description' box make sure the LIMS numbers of each standard (pH 4, 7, and 10) is entered correctly.

7.6. The 'Lot Number' box is where the LIMS number for the Orion 7 standard is entered. Refer to figure 10 for a complete entry.

7.7. Figure 10



7.8. For a sample log in the following process should be followed.

7.8.1. Find the last entry labeled "Sample pH" in the 'Sub_Category' and open the entry by double-clicking.

7.8.2. The 'Batch Number' box is filled in for samples being measured and is typically the day the sample was made; if it is organism water or facility

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water it is the day it arrived. If the sample is a in lab sample such as MHWCD. MHW, DI, or Well Water you will enter the LIMS label number in the 'Lot Number' box.

7.8.3. In the 'Entry Comments' box for a Facility sample you will enter the facility name, the batch, and the date. (for example: Florida 2/3. 1.1.21)

7.8.4. When fish species are received for testing purposes, a pH reading of the shipping water will be taken and entered with the comment reading the name of the species, the test being administered, and the date. (For example, "P. prom acute 2.1.21").

7.8.5. If the sample is a in lab sample such as MHWCD. MHW, DI, and Well Water you will enter the sample name and the date the sample was either made or obtained, and LIMS number if applicable. (For example: "DI H2O 2.1.21" or "MHWCD 2.1.21 123456").

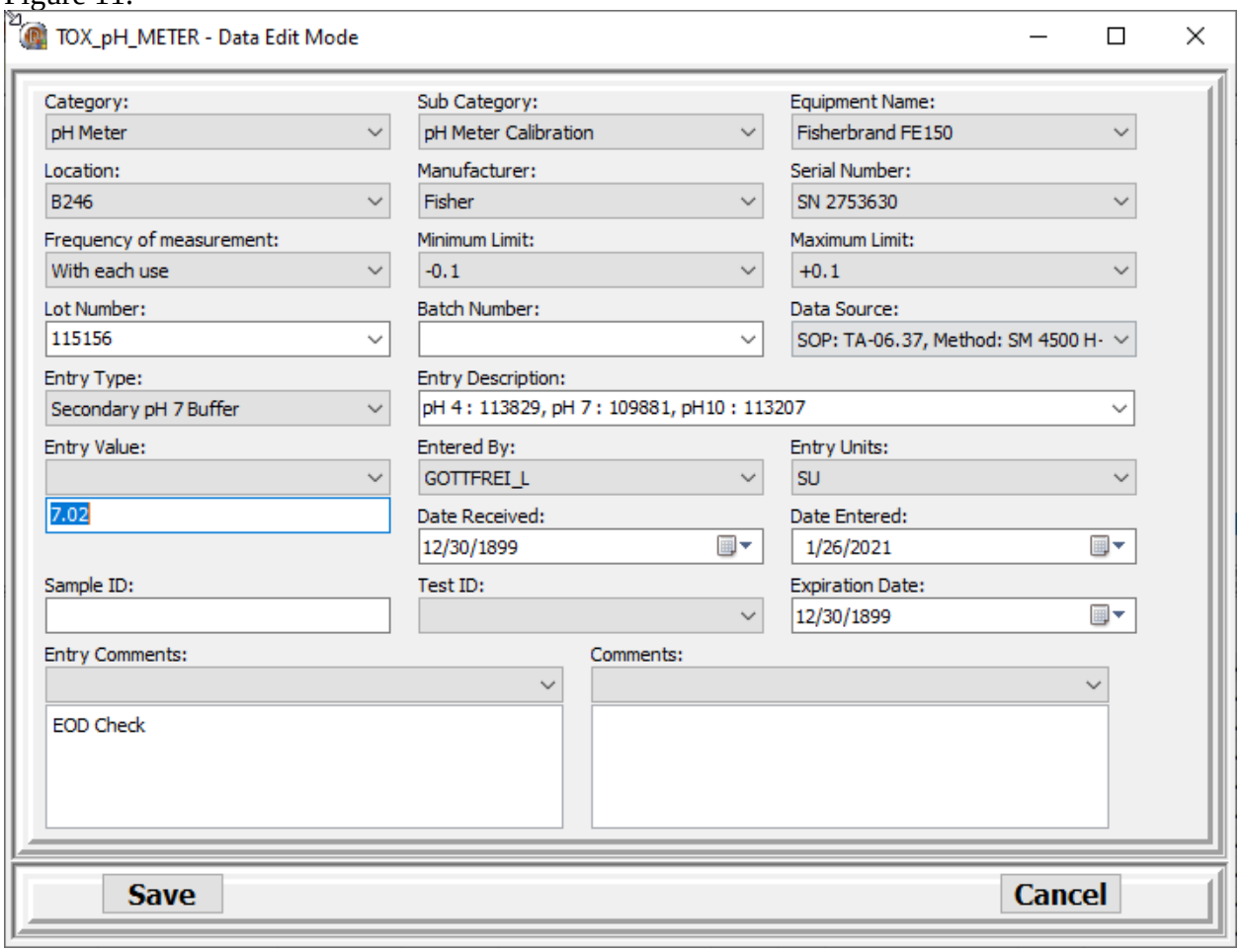
7.9. At the end of every day an End of Day (EOD) check will be performed before the meter can be shut down.

7.9.1. For the EOD check you will find the last pH meter calibration that has the entry comments of EOD check and open the entry.

7.9.2. The same process as the beginning of day calibration check will be followed with the only exception being that the comment will read EOD Check. Refer to Figure 11 for a completed entry.

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7.10. Figure 11.



8. CHLORINE

8.1. Conductivity calibration data entry must be done before any sample is tested.

8.2. Calibration of the Hach Chlorine Pocket Colorimeter II should be performed in accordance with SOP TA-06.22.

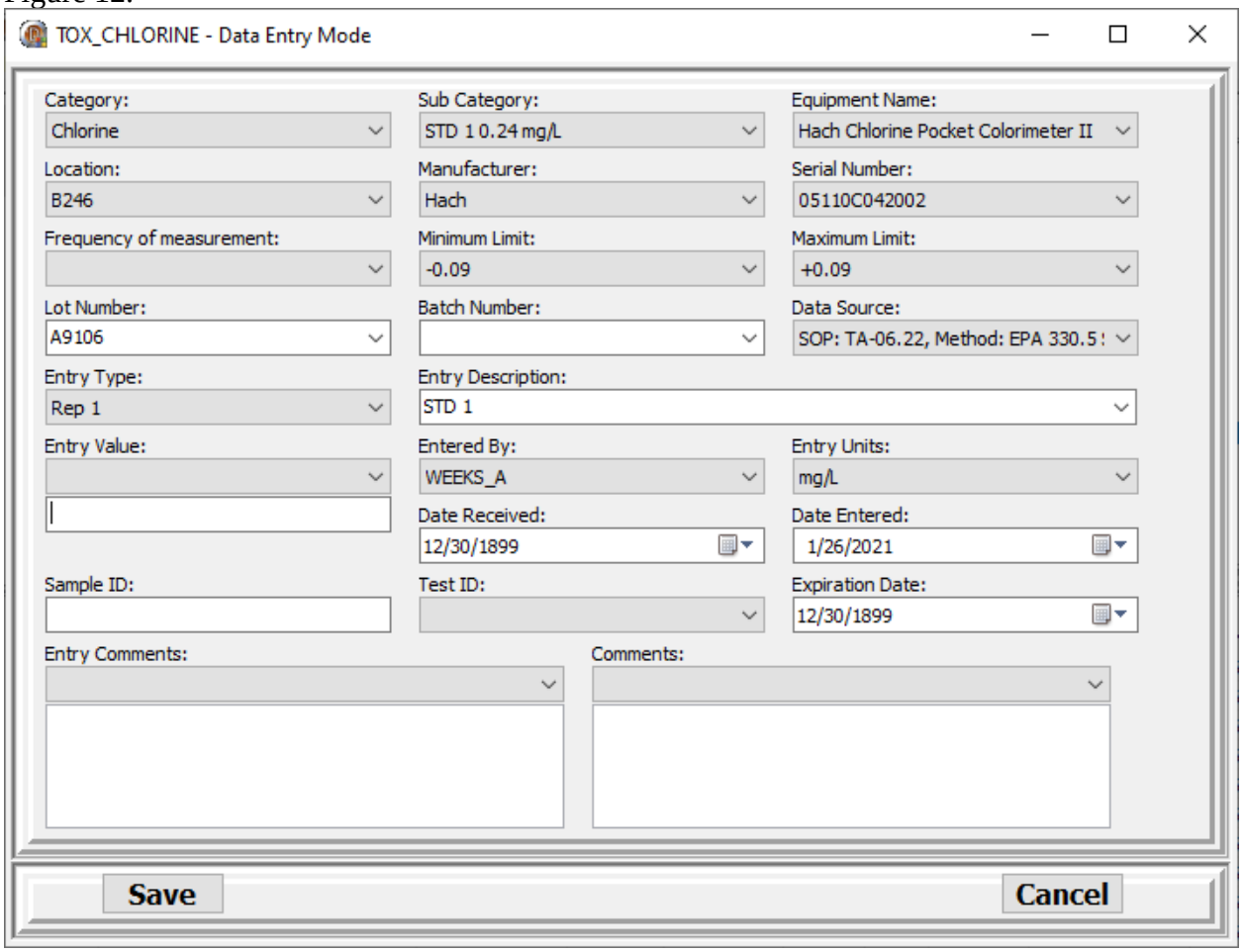
8.3. Open LIMS. Go to Laboratory > Technical > Laboratory Logbook >LIMS>open TOX_CHLORINE

8.4. To enter the calibration standard values, find the last entry labeled “STD 1” in the ‘Sub_Category’ field.

8.5. After clicking the “STD 1” entry, enter the value of STD 1 in the ‘Entry Value’ field. (Note: Be sure to pay attention to the Entry Type field to make sure you are entering the right value for the right standard. After clicking save each time a new standard will appear. There is a total of three entries.) For a complete entry refer to Figure 12.

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8.6. Figure 12.



8.7. Entry of a Facility sample or Lab Water sample.

8.7.1. For data entry of a sample, select the last entry with the 'Sub_Category' labeled as Sample Chlorine.

8.7.2. In the 'Lot Number' box, the LIMS number for the sample should be entered. For DI Water, Well Water, and Facility samples no Lot number will be entered.

8.7.3. For samples, the 'Batch Number' box is filled in with the date that the sample or dilution water was made ; if it is organism water or facility water it is the day it arrived.

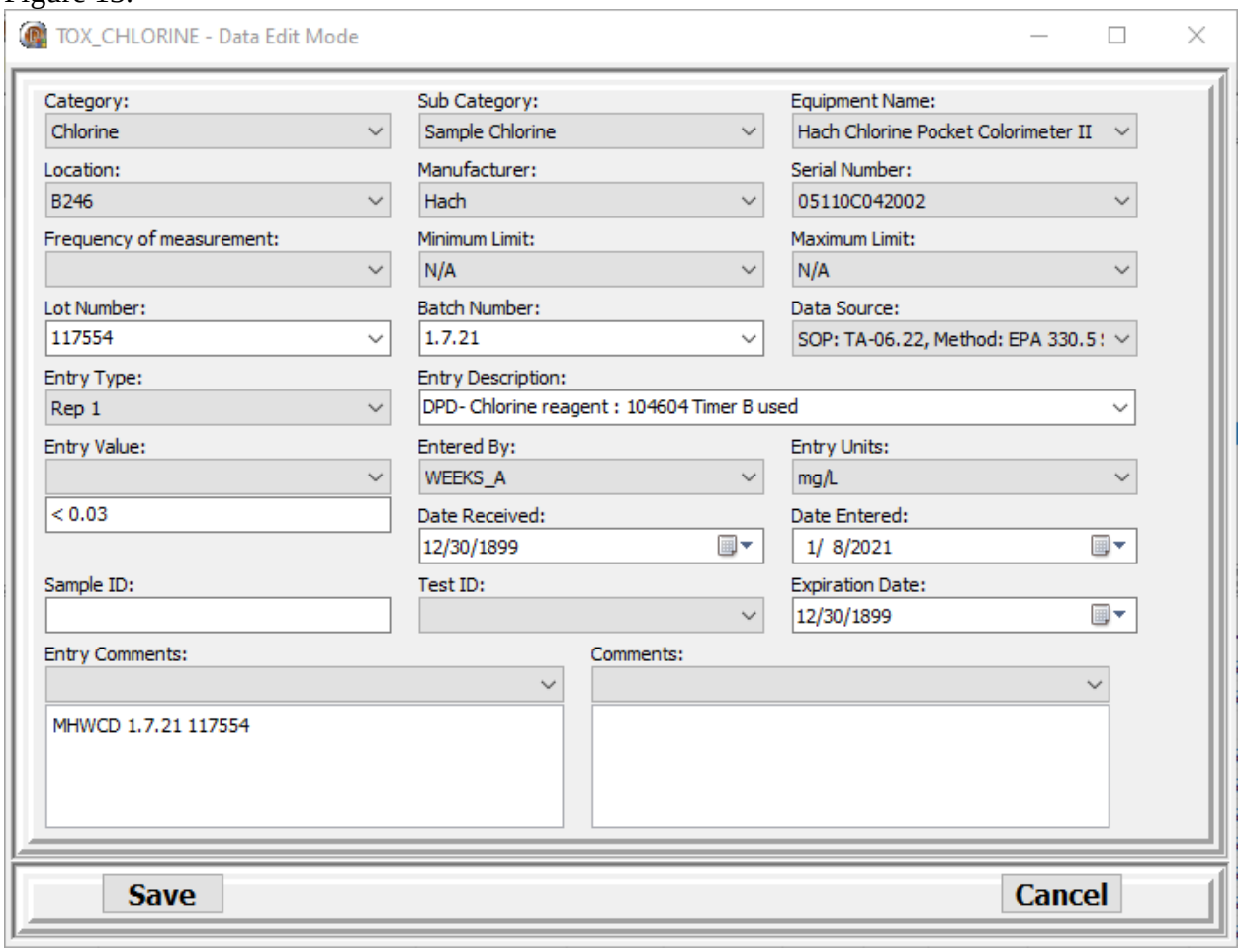
8.7.4. The 'Entry Value' box, enter the measurement obtained from the Hach Chlorine Pocket Colorimeter II.

8.7.5. For the 'Entry Comment' the following information should be entered: Facility/sample type, Batch number and LIMS number if applicable. Refer to Figure 13 for example. (Note: Make sure to pay attention to the Entry Type field as it will change after every entry.)

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8.7.6. In the Entry Description field, you will need to make sure that both the timer and reagent LIMS number are accurately recorded. There is a total of two entries along with a mean entry that are required. There will also be a blank forth entry that requires no entry unless a third replicate was required.

8.8. Figure 13.



9. AMMONIA

9.1. Ammonia calibration data entry must be done before any sample is tested.

9.2. Calibration of the Hach Ammonia Nitrogen Pocket Colorimeter should be performed in accordance with SOP TA-06.33.

9.3. Open LIMS. Go to Laboratory > Technical > Laboratory Logbook > open TOX_Ammonia.

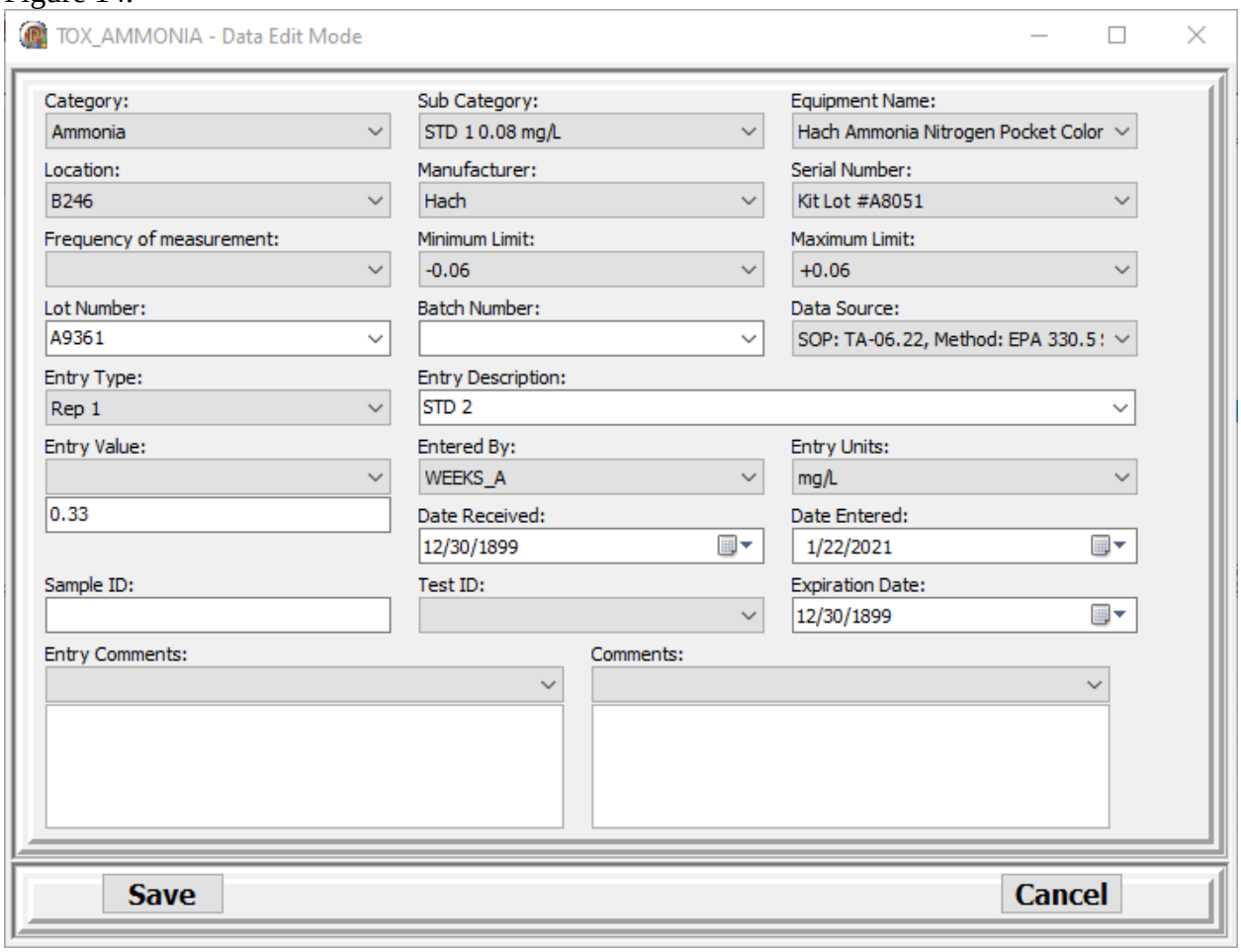
9.4. To enter the calibration standard values, find the last entry labeled “STD 1” in the ‘Sub_Category’ field.

9.5. After clicking the STD 1 entry, enter the value of STD 1 in the ‘Entry Value’ box. (Note: Be sure to pay attention to the Entry Type field to make sure you are entering the right value for the right standard.) There is a total of two entries along with a

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mean entry that are required. There will also be a blank forth entry that requires no entry from the analyst. For a complete entry refer to Figure 14.

9.6. Figure 14.



9.7. Entry of a Facility sample or Lab Water sample.

9.7.1. For data entry of a sample, selectthe last entry with the ‘Sub_Category’ labeled as “Sample Ammonia”.

9.7.2. In the “Lot Number” box, the LIMS number for the sample should be entered. For DI Water, Well Water, and Facility samples no Lot number will be entered.

9.7.3. For samples, the ‘Batch Number’ box is filled in with the date that the sample or dilution water was made ; if it is organism water or facility water it is the day it arrived.

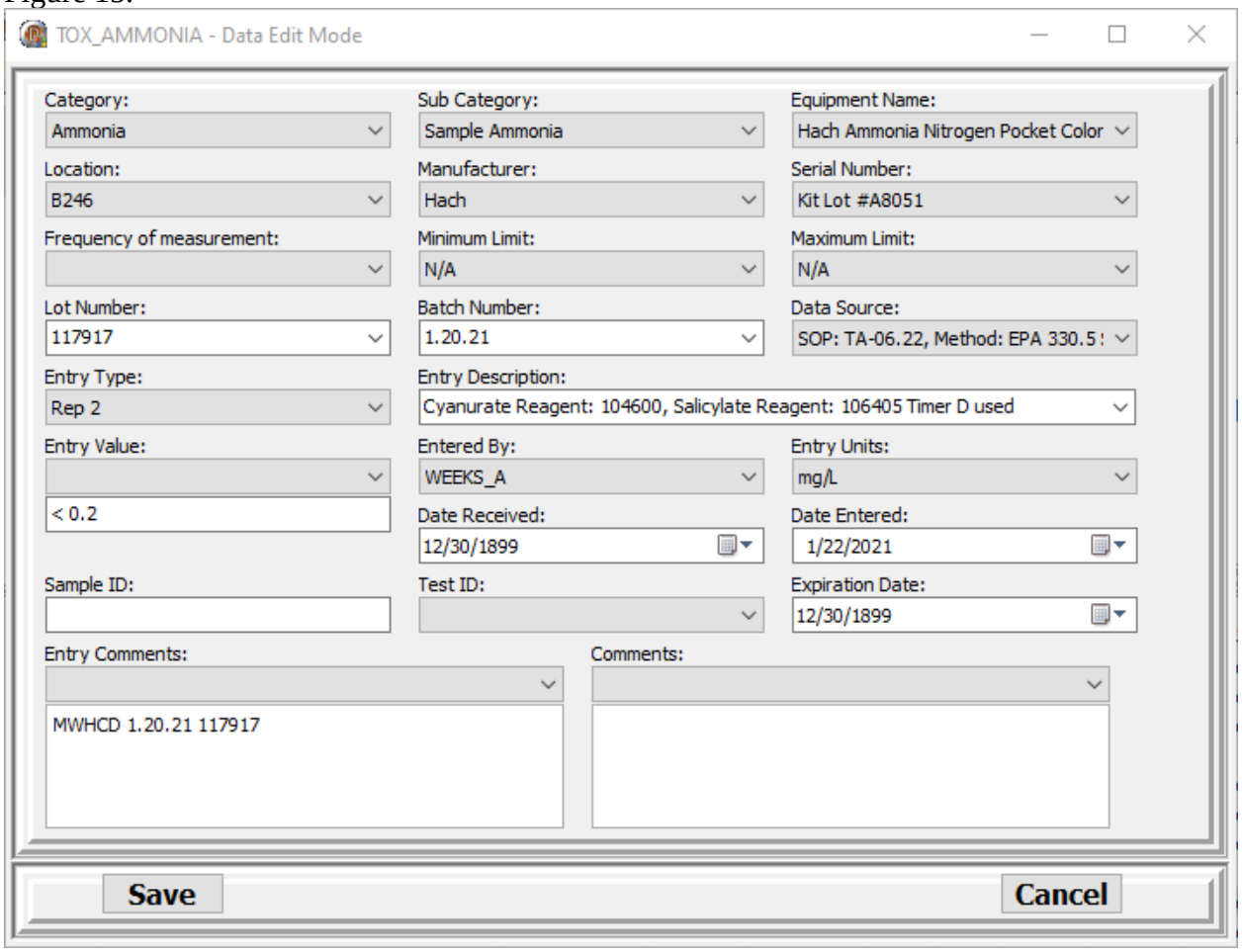
9.7.4. The ‘Entry Value’ box enter the measurement obtained from the Hach Ammonia Nitrogen Pocket Colorimeter.

9.7.5. For the ‘Entry Comments,’ the following information should be entered as follows: Facility/sample type, Batch number. Refer to Figure 15 for example. (Note: Make sure to pay attention to the Entry Type field as it will change after every entry.)

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9.8. In the ‘Entry Description’ box, you will need to make sure that the timer being used is accurately recorded. so, in this box, both the Cyanurate Reagent and Salicylate Reagent LIMS numbers for the current packets should be reflected also as seen in Figure 15. There is a total of two entries along with a mean entry that are required. There will also be a blank forth entry that requires no entry from the analyst unless a third replicate is required. Al

9.9. Figure 15.



10. ALKALINITY

10.1. Two replicates of alkalinity standards must be done before proceeding to testing samples.

10.2. All samples and standards should be measured in accordance with SOP TA-06.08.

10.3. For entry of data open LIMS Open LIMS. Go to Laboratory > Technical > Laboratory Logbook > open TOX_ALK_HARD.

10.4. To enter the values for the standards you will find and click on the last entry labeled “Alkalinity Standard.”

10.5. In the ‘Lot Number’ box, enter the LIMS number for the standard.

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10.6. For standards, the ‘Batch Number’ box is filled in with the date that the standard was made.

10.7. In the ‘Entry Value’ box enter the measurement obtained from the volume needed to titrate the sample multiplied by 100.

10.8. In the entry description field the LIMS numbers for the current Sulfuric Acid, Phenolphthalein, and pillow packet will need to be check for accuracy.

10.9. When the save button is clicked the screen will move to the next entry and at this point all fields will need to be verified so that accurate information is inputted.

10.10. No comment is needed when entering the standard.

10.11. Entry of a Facility sample or Lab Water sample.

10.11.1. For data entry of a sample the analyst will look for the last ‘Sub_Category’ labeled as “Sample Alkalinity.”

10.11.2. In the ‘Lot Number’ box, the LIMS number for the sample should be entered. For DI Water, Well Water, and Facility samples no Lot number will be entered.

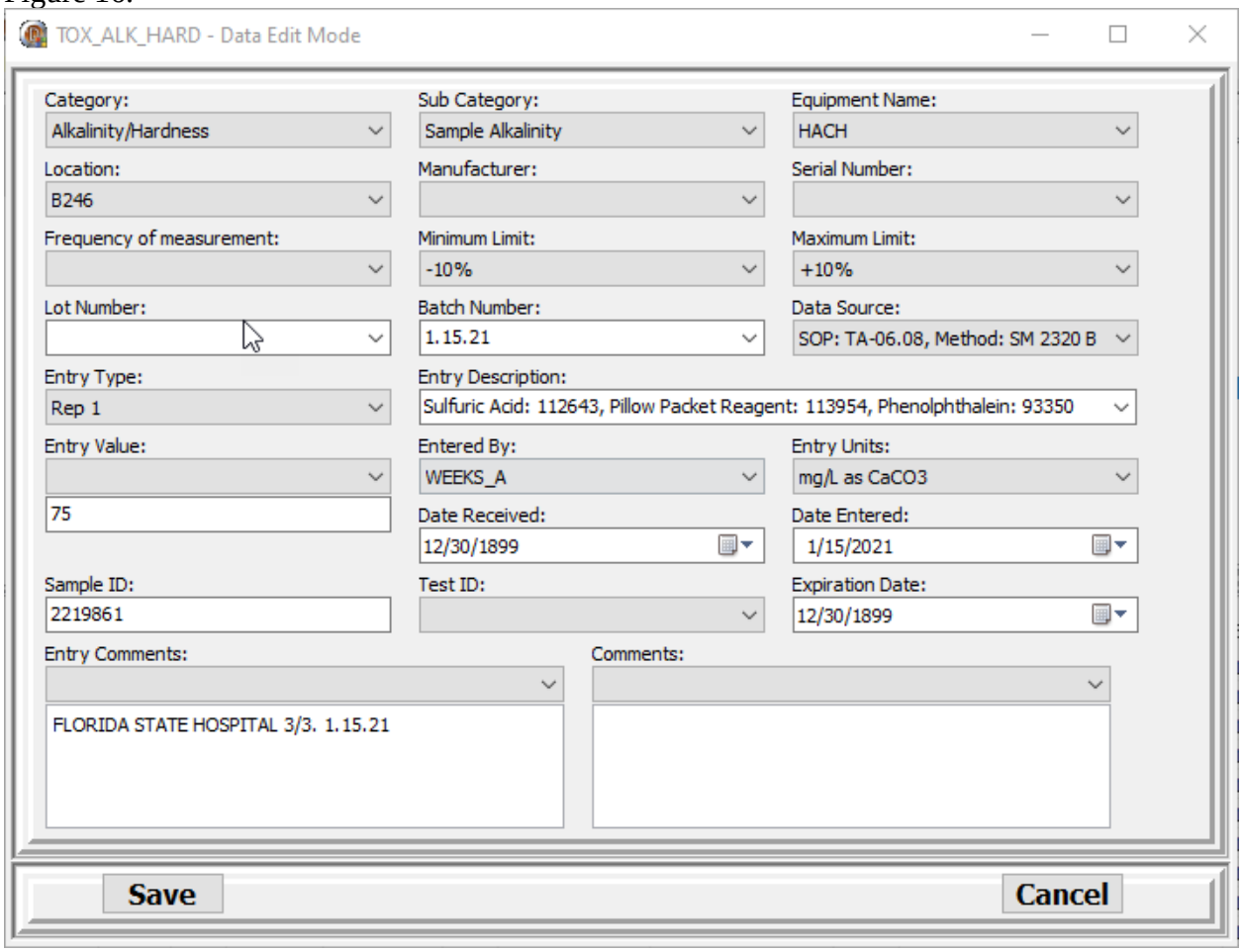
10.11.3.. For samples, the ‘Batch Number’ box is filled in with the date that the sample or dilution water was made; if it is organism water or facility water it is the day it arrived.

10.11.4. The ‘Entry Value’ box, enter the measurement obtained from the volume needed to titrate the sample multiplied by 100.

10.11.5. For the Entry Comments the following information should be entered as follows: Facility/sample type, Batch number, and LIMS number if applicable. Refer to Figure 16 for example. (Note: Make sure to pay attention to the Entry Type field as it will change after every entry.)

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10.12. Figure 16.



11. HARDNESS

11.1. Two hardness standards must be done before proceeding to testing samples.

11.2. All samples and standards should be measured in accordance with SOP TA-06.08.

11.3. For entry of data open LIMS. Open LIMS. Go to Laboratory > Technical > Laboratory Logbook > open TOX_ALK_HARD.

11.4. To enter the values for the standards you will find and click on the last entry labeled “Hardness Standard.”

11.5. In the ‘Lot Number’ box, the LIMS number for the standard should be entered.

11.6. In the ‘Entry Value’ box, enter the measurement obtained from the volume needed to titrate the sample multiplied by 100 .

11.7. In the ‘Entry Description’ box, the LIMS numbers for the current Hardness Buffer, EDTA, and pillow packet reagent will need to be check for accuracy.

11.8. When the save button is clicked the screen will move to the next entry and at this point all fields will need to be verified so that accurate LIMS numbers are inputted.

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11.9. No comment is needed when entering the standard.

11.10. Entry of a Facility sample or Lab Water sample.

11.10.1. For data entry of a sample, select the last entry with the 'Sub_Category' labeled as "Sample Hardness".

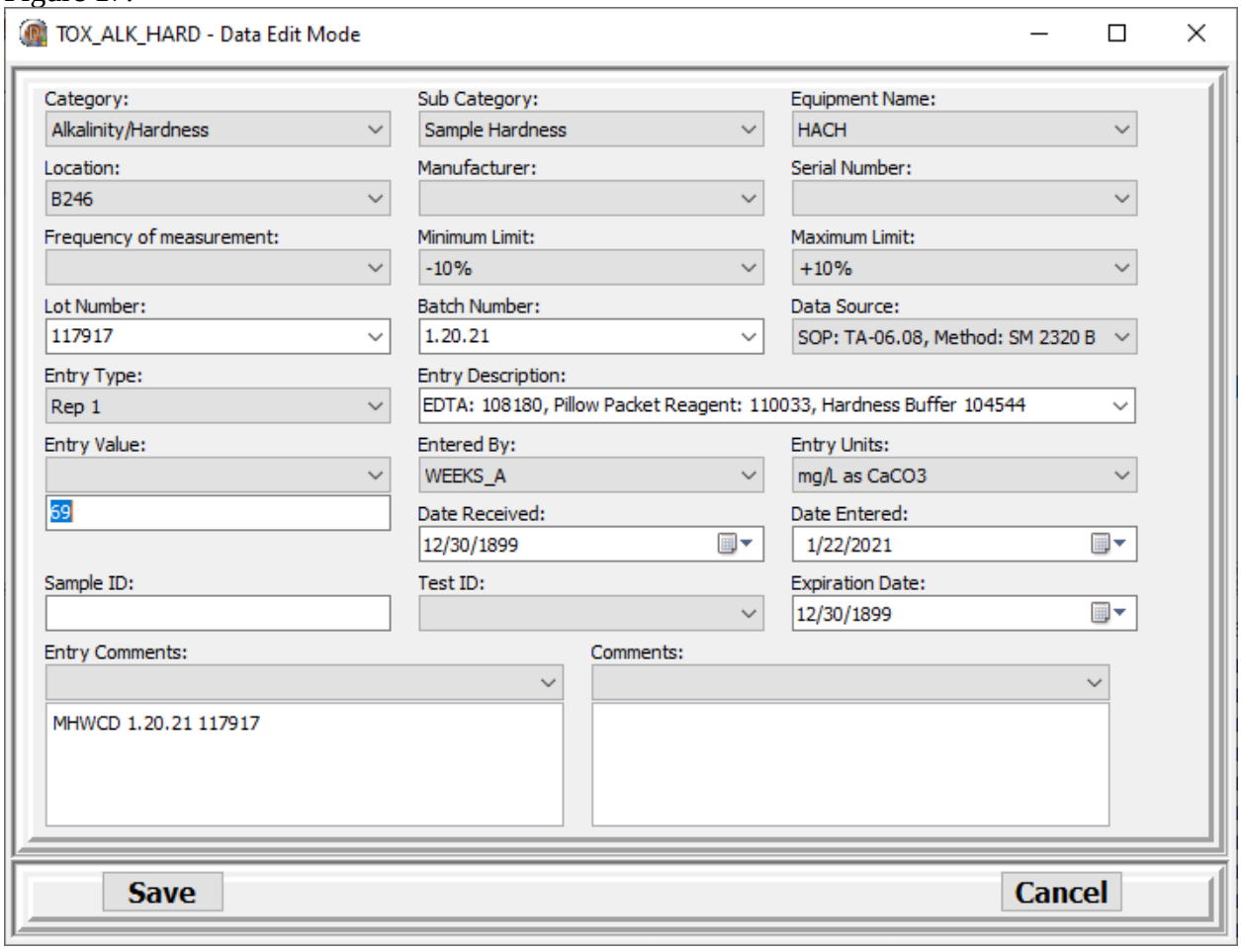
11.10.2. In the Lot Number field, the LIMS number for the sample should be entered. For DI Water, Well Water, and Facility samples no Lot number will be entered.

11.10.3. For samples, the 'Batch Number' box is filled in with the date that the sample or dilution water was made; if it is organism water or facility water it is the day it arrived.

11.10.4. The 'Entry Value' box should be filled out with the measurement obtained from the volume needed to titrate the sample multiplied by 100..

11.10.5. For the Entry Comments, the following information should be entered: Facility/sample type, Batch number. Refer to Figure 17 for example. (Note: Make sure to pay attention to the Entry Type field as it will change after every entry.

11.11. Figure 17.



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12. DATA ARCHIVAL

12.1. Use a black, waterproof pen for all bench sheets and logbooks.

12.2. To correct raw data entries, place a single line through the incorrect or illegible entry. Write the corrected entry near the error, initial and date the correction. Do not overwrite entries. To edit an existing log entry you will click edit entry then the entry you want to correct. You will then be able to correct the entry but in the comments box you will date enter the current date and your initials to show that you made a change.

12.3. The corrected entry is written as near its appropriate space as possible or else in the comment box on the appropriate bench sheet.

12.4. If the correction requires an explanation, write a comment and reference the error. Initial and date the explanation. If an edit is needed you will click “edit entry”, then click which entry you are trying to edit. Then you will make the correction and then write a comment with explanation, date, initial in the comment box.

12.5. Use sequential alphabetical annotation to identify errors and corresponding comments (use A for first error and use A for corresponding explanatory comment; use B for second error, etc.).

13. QUALITY CONTROL

13.1. For Quality Control all entries should be double verified before submitting. If changes are to be made, then the comment box will be used to edit the existing entry to be corrected. In the comment box you will list the edit follow by the analyst initials and the date of correction.

14. SAFETY/HAZARDOUS WASTE MANAGEMENT

14.1. Proper laboratory protection, including lab hood or ventilation system, lab coat, gloves, and safety glasses, is required when working with chemicals and unprocessed samples.

14.2. Refer to FDEP Laboratory Quality Manual for sample disposal.

14.3. Refer to the FDEP Laboratory Health and Safety Manual.

14.4. Read MSDS information for reagent handling and disposal.

15. REFERENCES

15.1. DEP SOP TA-06.08, *Measuring Total Alkalinity and Hardness*

15.2. DEP SOP TA-06.13, *Thermometer Accuracy Check and Use*

15.3. DEP SOP TA-06.22, *Measuring Total Residual Chlorine using the Hach Pocket Colorimeter II Test Kit*

15.4. DEP SOP TA-06.23, *Calibration and Use of Accumet Model AR10 pH Meter*

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15.5. DEP SOP TA-06.25, *Calibration and Use of Mettler Toledo SevenMulti for Measuring Conductivity, Salinity and TDS*

15.6. DEP SOP TA-06.33, *Measuring Ammonia using Hach Ammonia Nitrogen Test Kits for Freshwater and Saltwater Samples*

15.7. DEP SOP TA-06.36, *Calibration and Use of the Fisherbrand Traceable Bench Conductivity Meter for Conductivity and Salinity*

15.8. DEP SOP TA-06.35, *Measuring Total Ammonia using the Hach Ammonia Nitrogen Pocket Colorimeter II Test Kit*

15.9. DEP SOP TA-06.37, *Calibration and use of the Fisherbrand FE150 pH Benchtop Meter*

15.10. DEP SOP TA-06.39, *Thermo Scientific Orion Star A213 Benchtop RDO/DO Meter Calibration and DO Measurement*

15.11. *DEP Laboratory Quality Manual* https://floridadep.gov/dear/florida-dep-laboratory/content/dep-laboratory-quality-assurance-manual-and-sops

15.12. *DEP Laboratory Health and Safety Plan* health-safety-manual (floridadep.net)

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