LIMS Entry for Laboratory Parameters

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TABLE OF CONTENTS

1. SCOPE AND APPLICATION

2. SUMMARY OF METHOD

3. EQUIPMENT AND SUPPLIES

4. THERMOMETER

5. CONDUCTIVITY/ SALINITY

6. DISSOLVED OXYGEN

7. PH

8. CHLORINE

9. AMMONIA

10. ALKALINITY

11. HARDNESS

12. DATA ARCHIVAL

13. QUALITY CONTROL

14. SAFETY/HAZARDOUS WASTE MANAGEMENT

15. REFERENCES

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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 (DO), pH, Ammonia, Chlorine, Hardness, and Alkalinity) are entered into LIMS with accuracy and consistency. The methods outlined will be used to provide accurate documentation of data values obtained from the DO meter, pH meter, conductivity meter, Ammonia Colorimeter II, Chlorine Colorimeter II, Hach Alkalinity kit, and Hach Hardness kit.

2. SUMMARY OF METHOD

2.1. Lab samples are measured for their respected endpoints. All values obtained from instrument 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 triple rinsing of 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. EQUIPMENT AND SUPPLIES

3.1. YSI 4010-1W Multilab IDS One Channel Benchtop Instrument DO meter (SOP TA-06.44)

3.2. Fisherbrand accumet AB315 pH/mV meter (SOP TA-06.43)

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

3.4. Traceable Thermometer (SOP TA-06.13)

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

3.6. Hach Alkalinity and Hardness Kits (SOP TA-06.08)

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

3.8. 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. A logbook entry must be done before the DO and pH meters are used in sample testing.

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

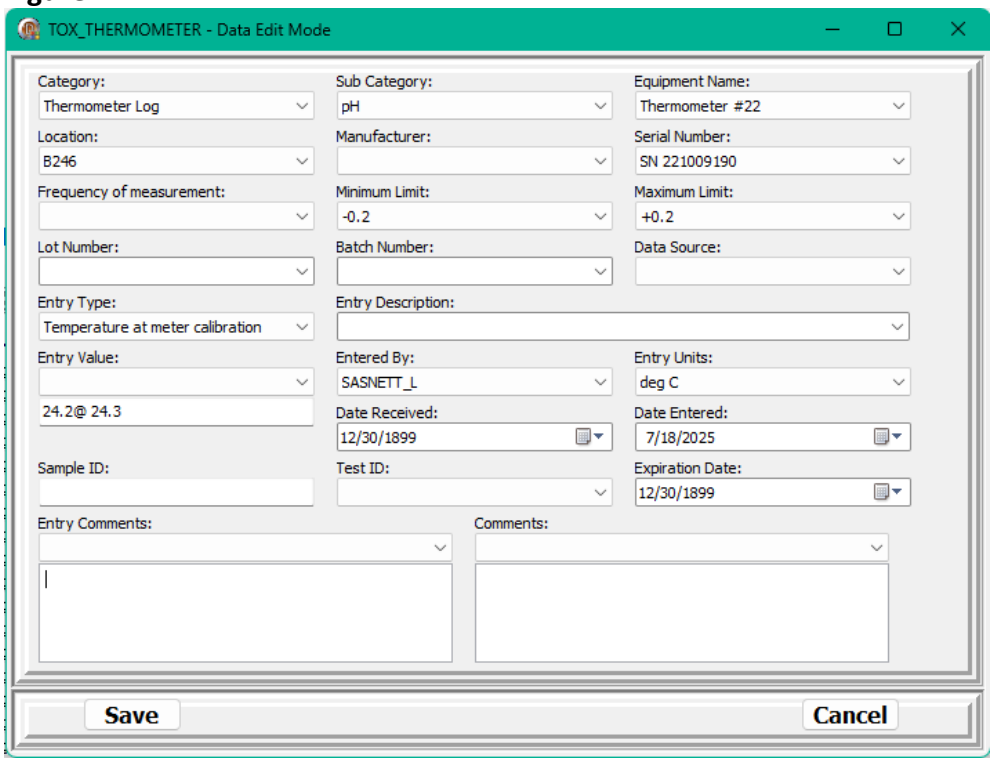
4.3. For entry of the calibrated thermometer against the ATC pH probe, click on the last entry with the **Sub_Category** labeled **pH**.

4.3.1. Ensure that the **Equipment Name** and **Serial Number** fields match the information for the thermometer being used.

4.3.2. The pH temperature reading should be within 0.2˚C of the NIST certified thermometer reading.

4.3.3. In the **Entry Value** field, the pH meter temperature reading will be listed first, then the reference thermometer. For reference refer to **Figure 1** (ex. pH meter @ reference thermometer, 24.2 @ 24.3).

4.3.4. **Figure 1**



4.4. For entry of the thermometer against the DO meter, click on the last entry with the **Sub_Category** labeled **DO**.

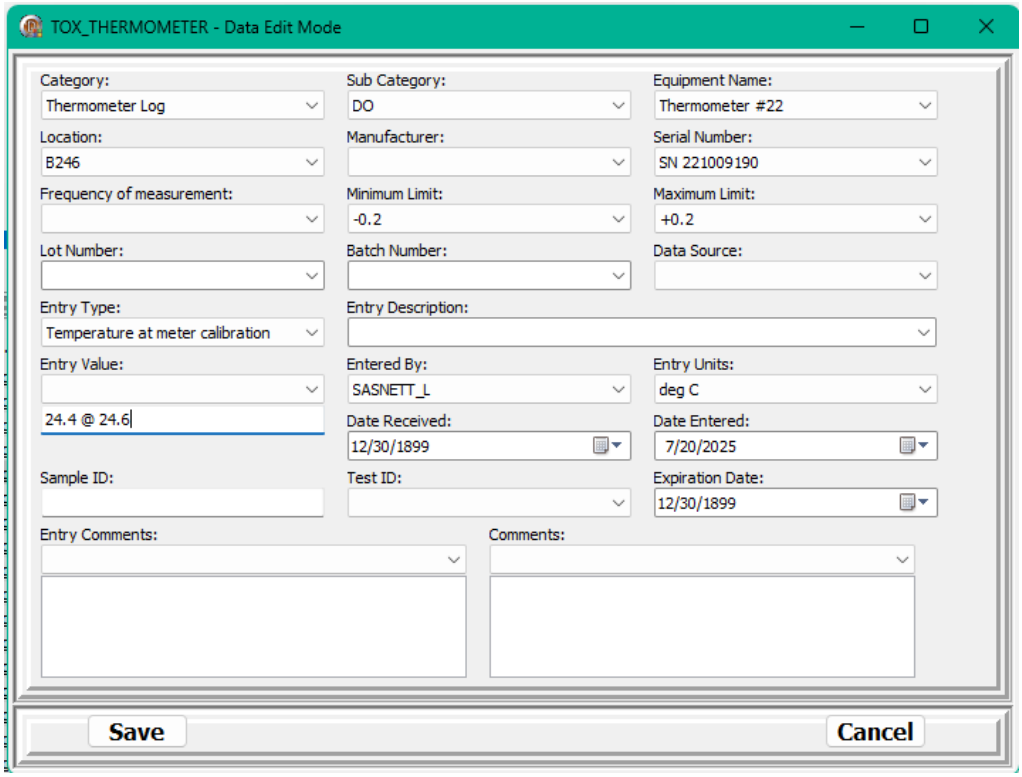
4.4.1. Ensure that the **Equipment Name** and **Serial Number** fields match the information for the thermometer that you are using.

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4.4.2. Both thermometers should read within 0.2 degrees C of each other.

4.4.3. In the **Entry Value** field, the DO meter temperature reading will be listed first then the reference thermometer. For reference refer to **Figure 2**.

4.4.4. Figure 2



5. CONDUCTIVITY/SALINITY

5.1. Conductivity and Salinity 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.

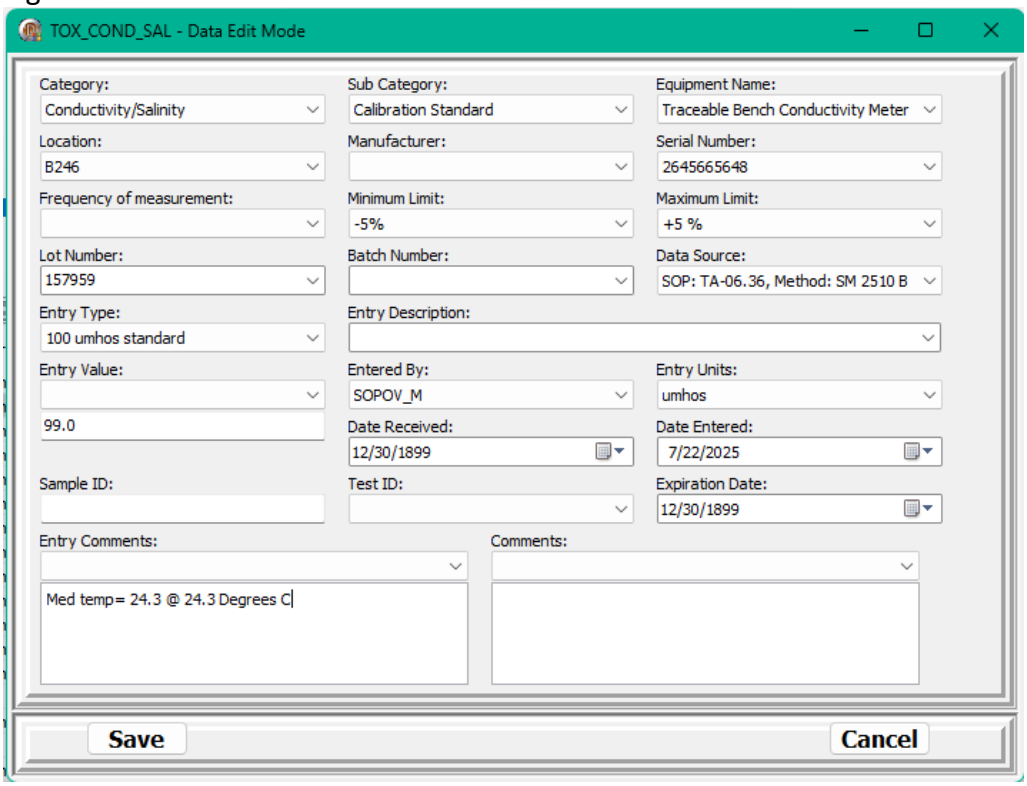
5.3. Open LIMS. Go to **Laboratory > Laboratory Logbook > TOX_COND_SAL**.

5.4. Conductivity has a low and high standard used for calibrating before sample analysis.

5.4.1. To enter the low standard (100 µhmos standard), click on the latest entry with **Entry_**Type “100 µmhos standard” to pull up the data entry page as shown in **Figure 3**.

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5.4.2. Figure 3



5.4.3. The **Entry Type** field should correspond to the standard the analyst is measuring. The **Category** field should read “Conductivity/Salinity” and the **Sub Category** field should read “Calibration Standard”.

5.4.4. The **Lot Number** field is filled in with the standard’s LIMS number located on the bottle.

5.4.5. The **Entered By** and **Date Entered** fields will auto populate.

5.4.6. Enter the value from the meter in the **Entry Value** field.

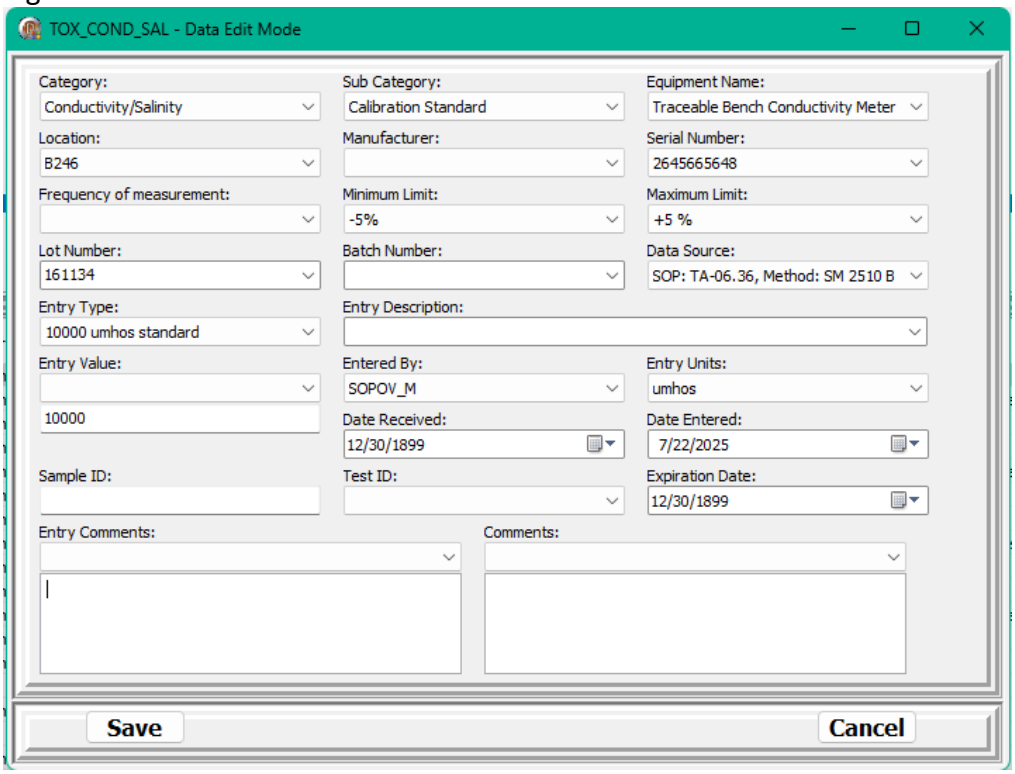
5.4.7. The temperature of the medium (1,000 µmhos) standard should be taken and entered in the **Entry Comments** field. The comment should read “med temp = XX.X degrees C” (see **Figure 3**). Once all fields have been filled out, the analyst can click the **Save** button.

5.4.8. Find and click on the most recent **Entry_Type** labeled “10000 µmhos standard”.

5.4.9. Fill in the **Entry Value** field. Before clicking **Save**, the entry should resemble **Figure 4**.

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5.4.10. Figure 4



5.5. Entry of a Facility Sample, Organism Water, or Lab Water conductivity sample.

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

5.5.2. When entering data, note the **Entry Units** field which can be switched between umhos and mmhos.

5.5.3. In the **Lot Number** field, the LIMS number for the lab water should be entered. For DI water, well water, organism water, and facility samples, no lot number will be entered.

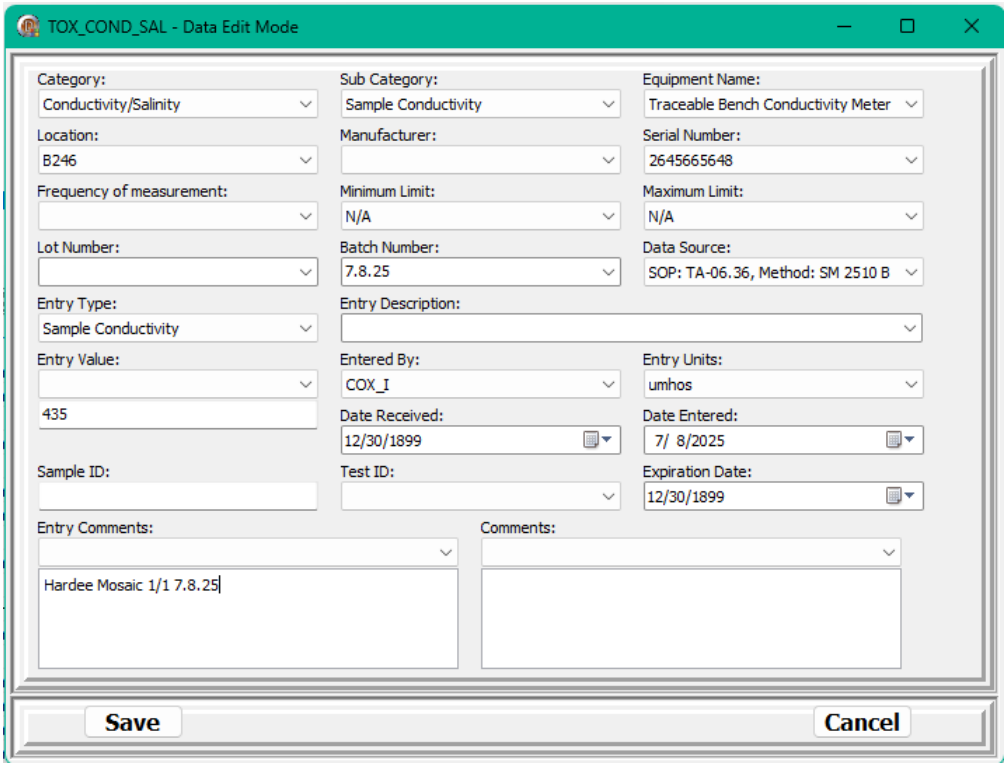
5.5.4. The **Batch Number** field is filled in for samples being measured and is typically the day the sample was made (MHW/CD, ASW), day collected (DI, well), or day it arrived (organism water, facility water).

5.5.5. The **Entry Value** field should be filled out with the measurement obtained from the Traceable Bench Conductivity Meter.

5.5.6. For the **Entry Comments**, the following information should be entered for a facility: facility name, sample number (acute = 1/1, chronic = 1, 2, or 3/3) batch number (day sample arrived). Refer to **Figure 5** for example. For lab waters, the comment should read: water type, LIMS number, batch number (ex. MHWCD ###### MM.DD.YY). For best reference, observe previous comments similar to your entry type. (Note: the comments are the same for salinity samples.)

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5.5.7. Figure 5



5.6. Entry of Salinity sample standard and values.

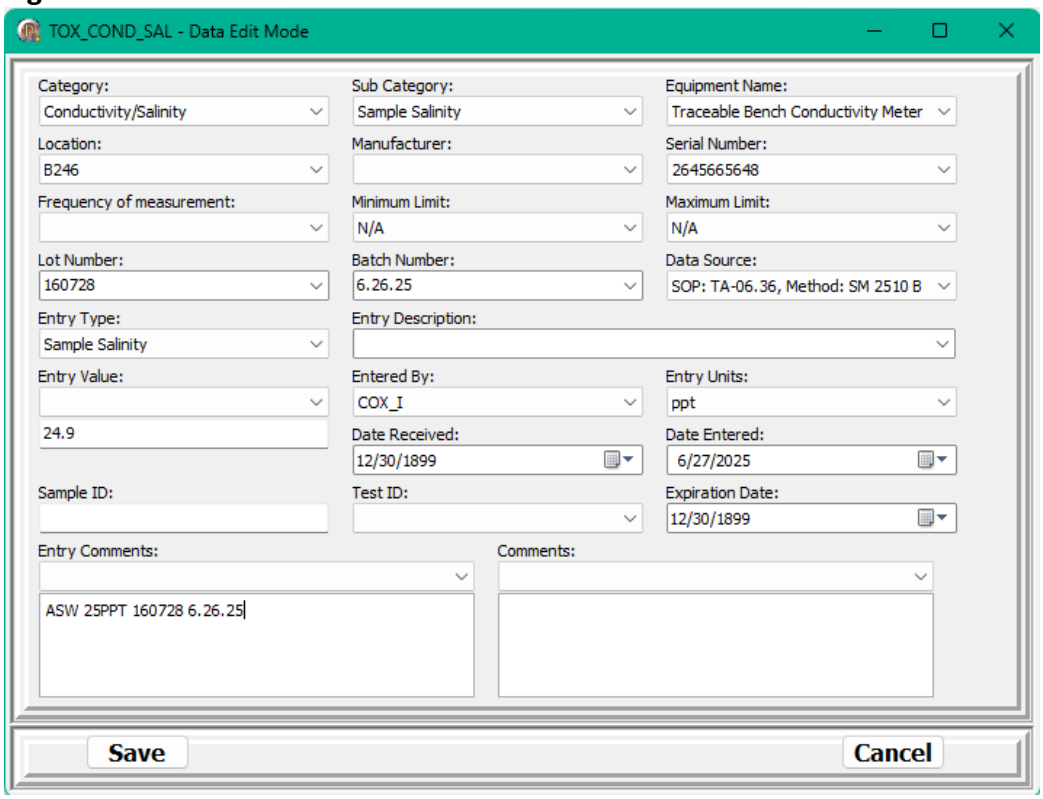
5.6.1. The salinity standard is measured with the conductivity probe and meter. ~25 mL of 35 ppt standard is poured into a 30 mL plastic cup. The meter is switched to salinity mode and the probe is gently swirled in the cup. The salinity needs to be within ± 2 ppt of the standard.

5.6.2. The salinity standard check value is entered by selecting the last **Entry_Type** "35 ppt". Enter the value obtained from the meter in the **Entry Value** field.

5.6.3. "Sample Salinity" is the **Entry_Type** used to record a sample. Entry units will read as ppt. Refer to **Figure 6** on how to enter the salinity for ASW.

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5.6.4. **Figure 6**



5.7. Entering End of Day (EOD) Check

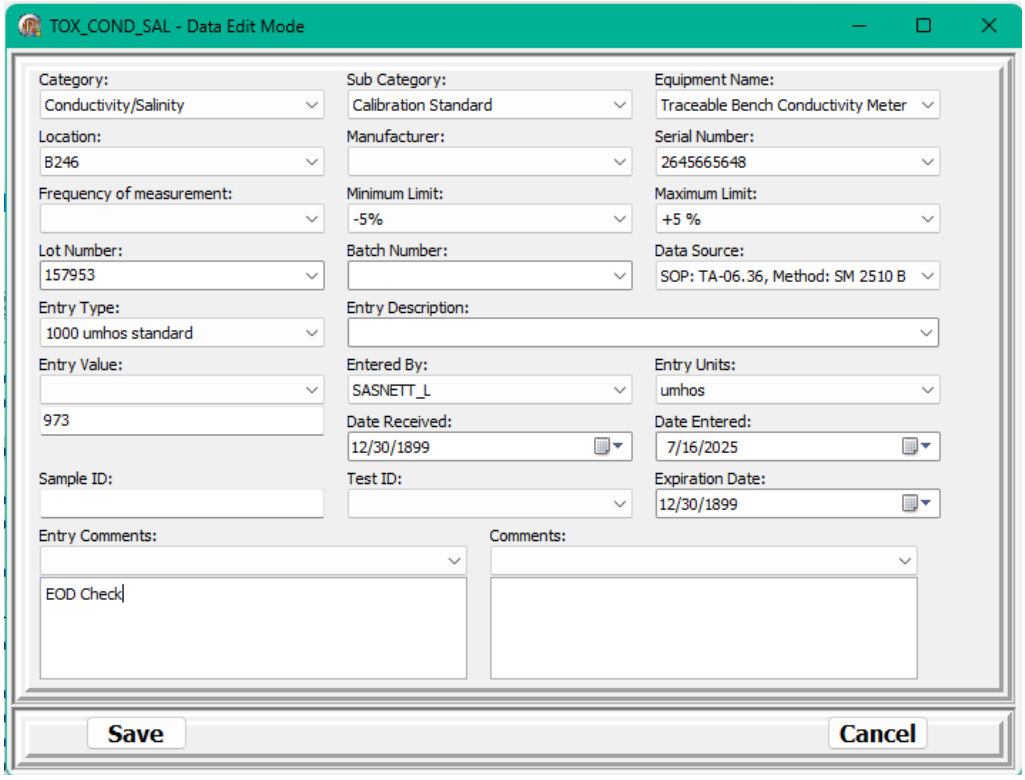
5.7.1. For the entry of an EOD Check, select the last **Entry_Type** of “1000 µmhos standard” for conductivity and “35 ppt” for salinity (the comments should say “EOD Check”).

5.7.2. The **Lot Number** should be filled in with the LIMS number found on the Medium Standard bottle or Salinity Standard bottle used for the check.

5.7.3. The **Entry Comment** should read, “EOD Check”. Refer to **Figure 7** for a completed conductivity entry.

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5.7.4. Figure 7



6. DISSOLVED OXYGEN

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

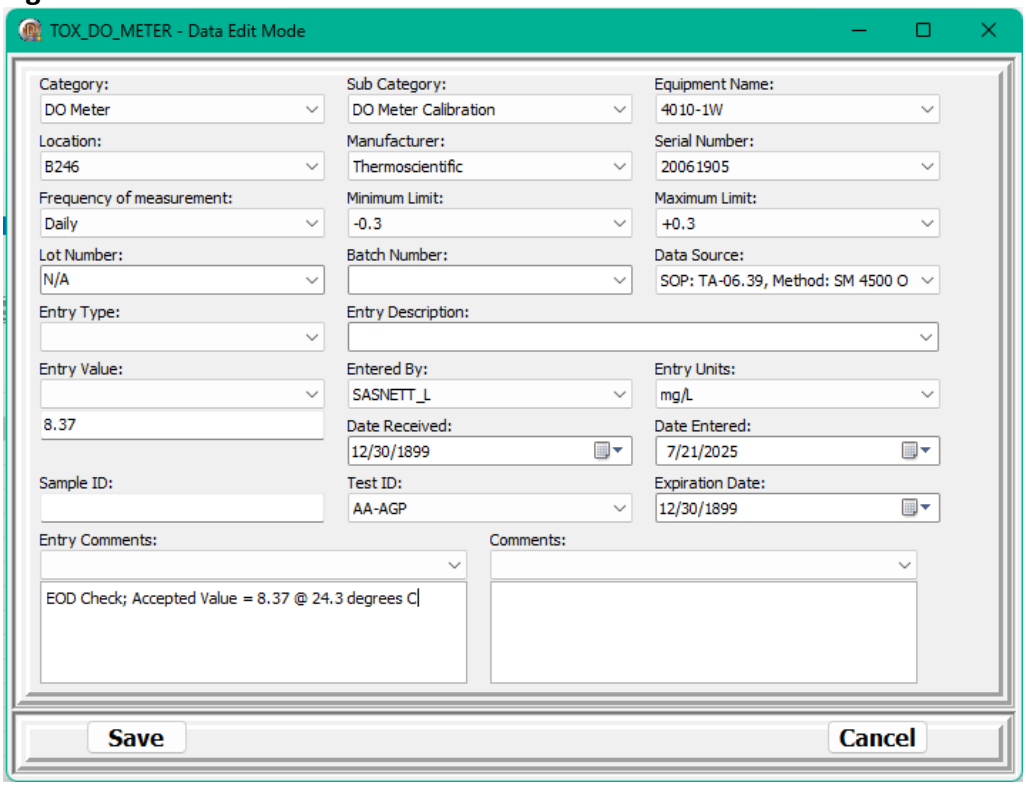
6.2. Calibration of the YSI MultiLab 4010-1 meter should be performed in accordance with SOP TA-06.44.

6.3. Open LIMS. Go to **Laboratory> Technical > Laboratory Logbook > TOX_DO_METER**.

6.4. To pull up the data entry page as shown in **Figure 8**, click on the latest “DO Meter Calibration” entry in the **Entry_Type** field.

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6.5. **Figure 8**



6.6. The reading provided by the meter will be entered in the **Entry Value** field. This reading will then be compared to the DO 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** ("Accepted Value = 8.37 @ 24.3 degrees C").

6.7. The accepted value obtained from the chart and the reading obtained from the meter must be ± 0.3 mg/L to be within calibration.

6.8. For recording a sample DO (facility sample or organism water only), the following process should be followed.

6.8.1. Find the last entry labeled "Sample DO" and open the entry.

6.8.2. The **Batch Number** field is typically the day the sample arrived.

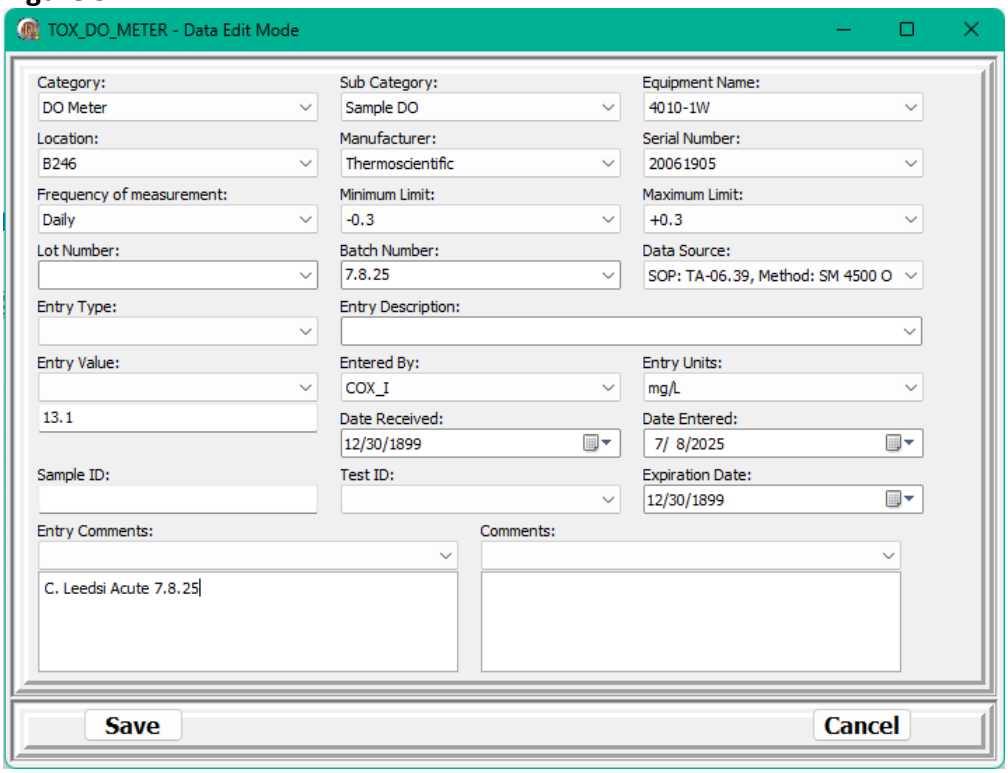
6.8.3. For a facility sample, in the **Entry Comments** field enter the facility name, the sample number (acute = 1/1, chronic 1, 2, or 3/3), and the date (ex. Florida State 2/3 06.07.25). For best reference, observe previous comments similar to your entry type.

6.8.4. When test organisms are received, a DO reading of the shipping water must be taken. Enter the DO measurement with the following comments: name of the species, the test being conducted, and the date. See **Figure 9** for a

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completed example. For best reference, observe previous comments similar to your entry type.

6.8.5. **Figure 9**



6.9. Once measurements are completed for the day, an EOD check will be performed before the meter can be shut down.

6.9.1. For the EOD check, open the last DO meter calibration that has the **Entry Comments** of “EOD Check”.

6.9.2. The same process as the beginning of day calibration check will be followed except the comment will include the words “EOD Check”. Refer to **Figure 8** for a completed entry.

7. PH

7.1. LIMS data entry of the pH meter calibration must be done daily before any sample is tested.

7.2. Calibration of the Fisherbrand accumet AB315 pH/mV meter should be performed in accordance with SOP TA-06.43.

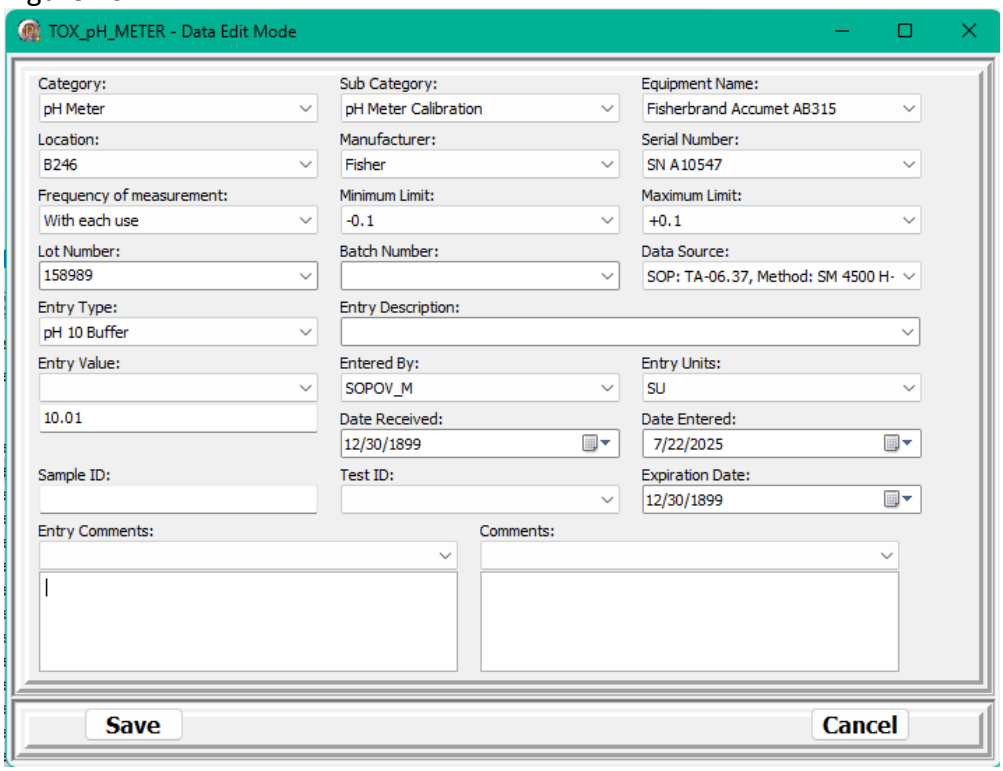
7.3. Open LIMS. Go to **Laboratory > Technical > Laboratory Logbook > TOX_pH_METER**.

7.3.1. Measure the pH 4,7,10, and Orion pH 7 standards and enter the values in their corresponding **Entry Value** fields by selecting the most recent entry with the matching **Entry_Type**. The pH meter is within calibration if all standards read ± 0.10 SU of assigned value.

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7.3.2. The Lot Number field is where the LIMS number for the standard being used is entered. Refer to **Figure 10** for a complete entry.

7.3.3. Figure 10



7.4. For logging a sample measurement, the following process should be used.

7.4.1. Open the most recent entry with an **Entry_Type** of “Sample pH”.

7.4.2. Fill in the **Batch Number** field for the samples being measured. The batch number is typically the day the reagent was made/collected, or the sample was received. If the sample is a lab water such as MHWCD, MHW or ASW, enter the LIMS number in the **Lot Number** field.

7.4.3. In the **Entry Comments** field for a facility sample, enter the facility name, the sample number (acute = 1/1, chronic 1, 2, or 3/3), and the date (ex. Florida State 3/3, MM.DD.YY). For best reference, observe previous comments similar to your entry type.

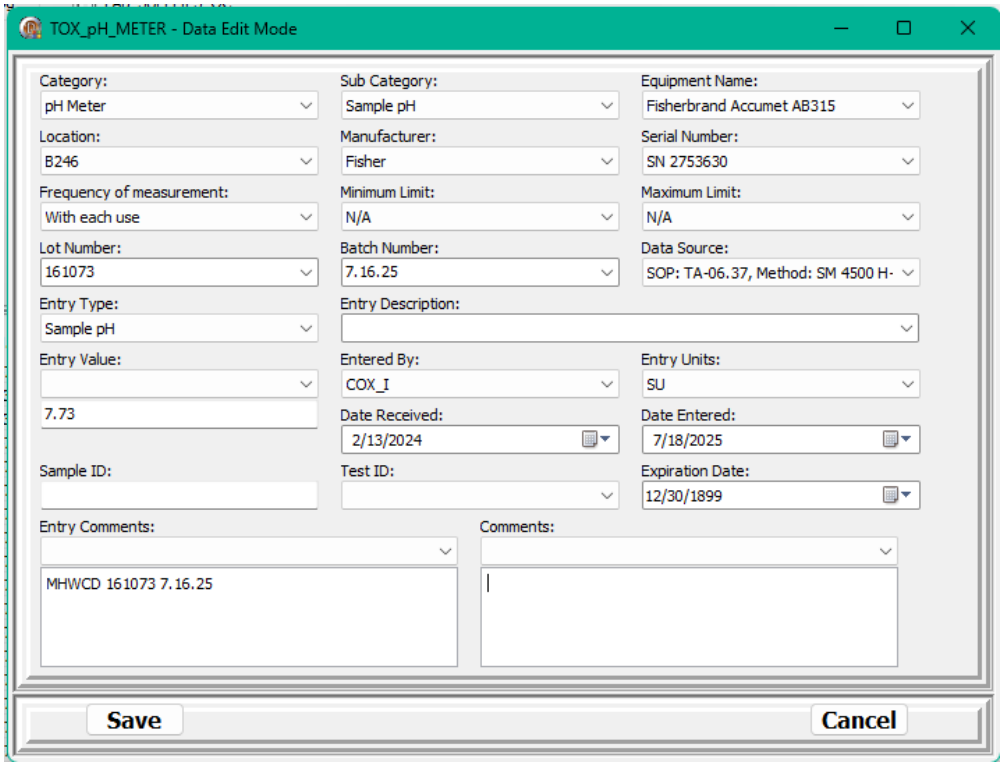
7.4.4. When test organisms are received, a pH reading of the shipping water must be taken. Enter the pH measurement with the following comments: name of the species, the test being conducted, and the date (ex. P. prom acute MM.DD.YY). For best reference, observe previous comments similar to your entry type.

7.4.5. If the sample is a lab sample such as MHWCD. MHW, DI, or well water, enter the sample name, the LIMS number (if applicable), and the date the sample was either made or collected. (ex. DI H2O MM.DD.YY or MHWCD LIMS#

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MM.DD.YY). See **Table 11** for a complete example. For best reference, observe previous comments similar to your entry type.

7.4.6. **Table 11**



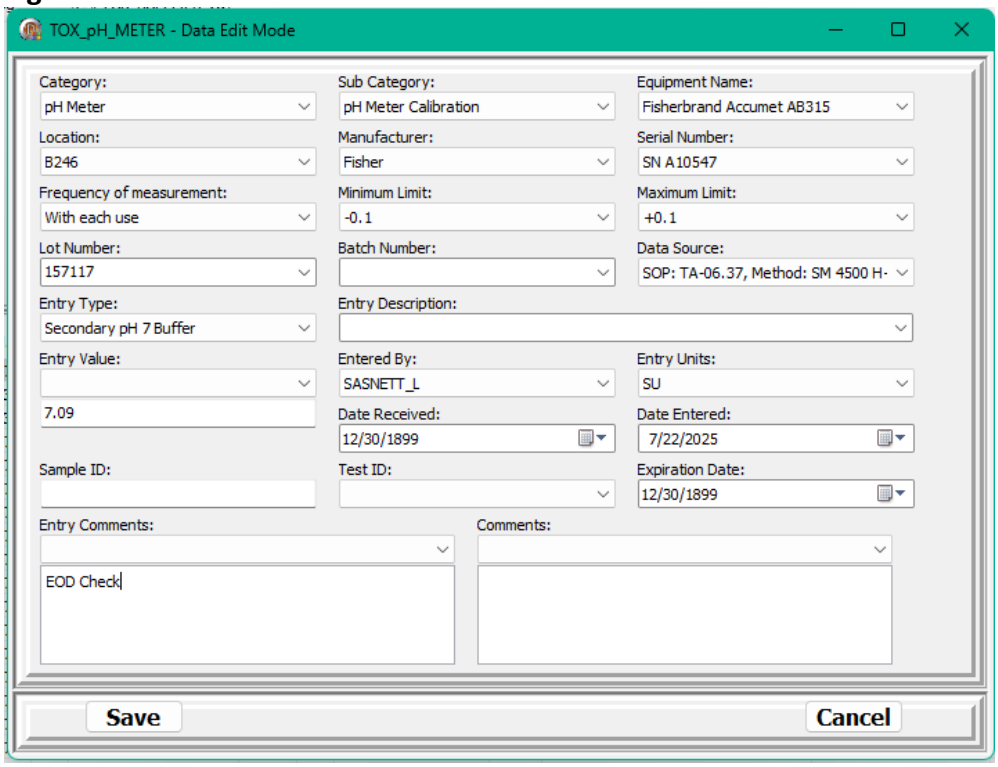
7.5. At the end of every day before the meter can be shut down, an EOD check must be performed.

7.5.1. For the EOD check, open the most recent pH meter calibration **Entry_Type** "Secondary pH 7 Buffer" that has "EOD Check" in the **Entry Comments**.

7.5.2. The same process as the start of day calibration check must be followed, however only the Orion pH 7 standard is measured. The comment will read, "EOD Check". Refer to **Figure 12** for a completed entry.

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7.6. **Figure 12**



8. CHLORINE

8.1. Chlorine 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.

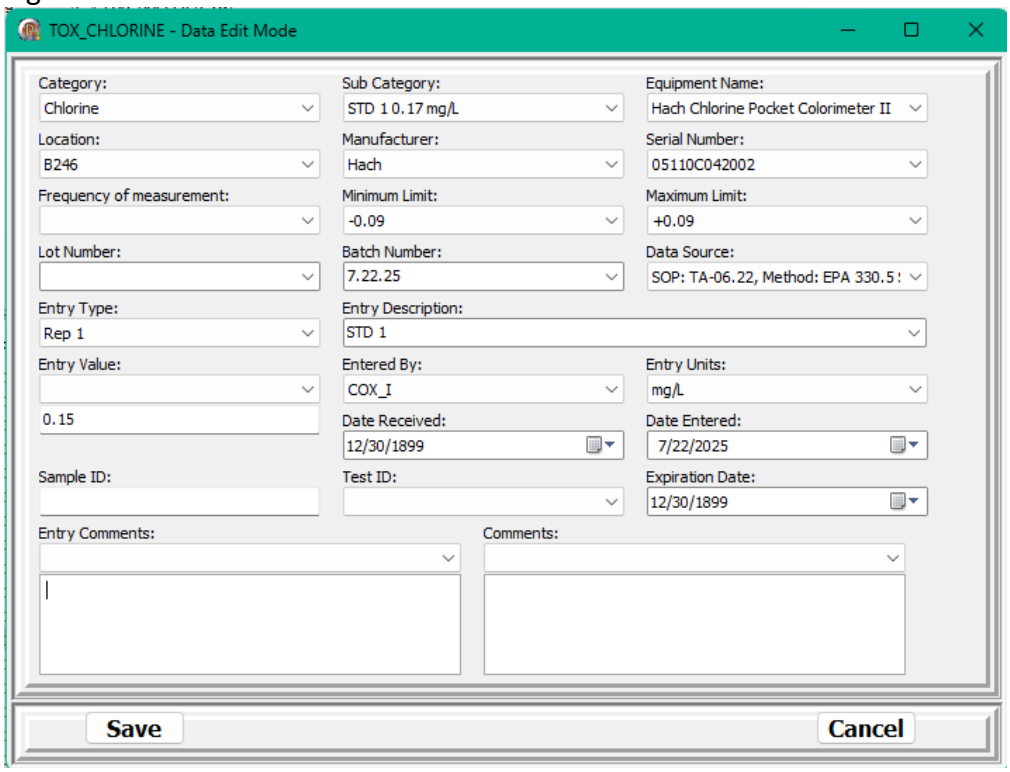
8.3. Open LIMS. Go to **Laboratory > Technical > Laboratory Logbook >LIMS > TOX_CHLORINE**.

8.4. To enter the calibration standard values, find the most recent 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 value for the right standard. Every time **Save** is selected, a new standard will appear. There is a total of three entries, STD 1, STD 2, and STD 3 and they do not always start in numerical order.) For a complete entry refer to **Figure 13**.

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8.6. Figure 13



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

8.7.1. For data entry of a sample, select the most recent entry with a **Sub_Category** of “Sample Chlorine”.

8.7.2. In the **Lot Number** field, the LIMS number for the sample should be entered (house-made lab water only). For DI water, well water, and Facility samples, no Lot Number will be entered.

8.7.3. For lab water, the **Batch Number** field is filled in with the date that the reagent was made/collected, and for facility samples it is the day it arrived.

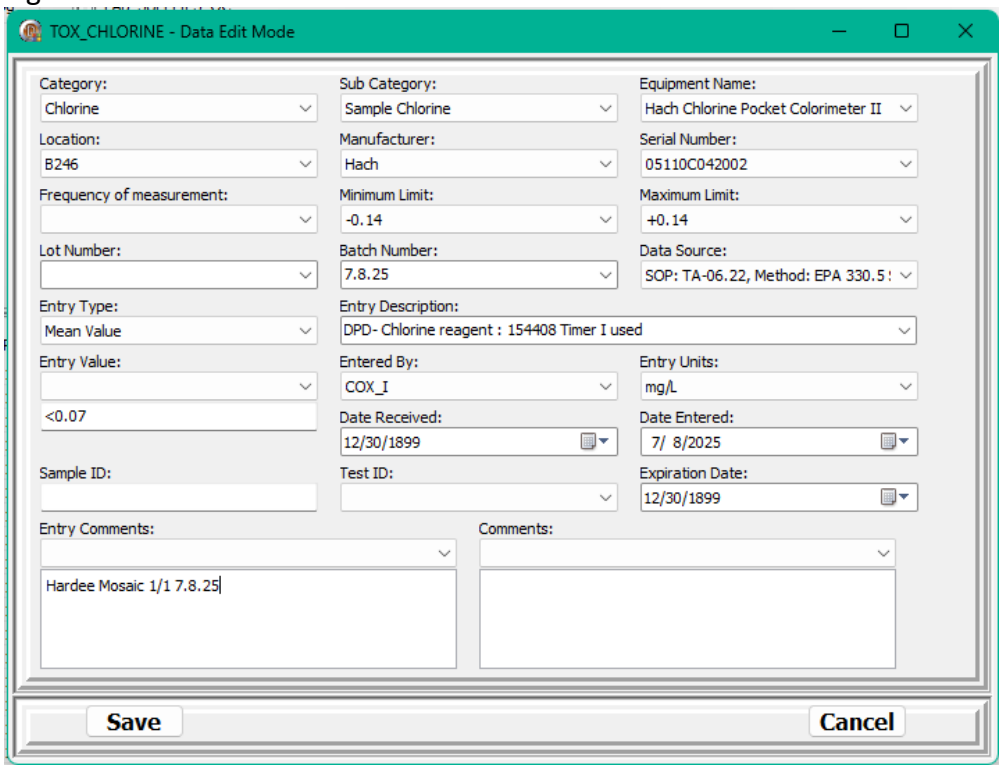
8.7.4. For the **Entry Value** field, enter the measurement obtained from the Hach Chlorine Pocket Colorimeter II.

8.7.5. For the **Entry Comment**, the following information should be entered: Facility/sample type, sample number or LIMS number (if applicable), and batch number. Refer to **Figure 14** for example. (Note: Make sure to pay attention to the Entry Type field as it will change after every entry.) For best reference, observe previous comments similar to your entry type.

8.7.6. In the **Entry Description** field, ensure that both the timer and reagent LIMS number are accurately recorded. A total of two entries along with a mean entry are required. A fourth entry is only required if a third replicate value is entered. If a third replicate was not performed, the fourth entry field can remain blank.

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8.8. Figure 14



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 must be performed in accordance with SOP TA-06.35.

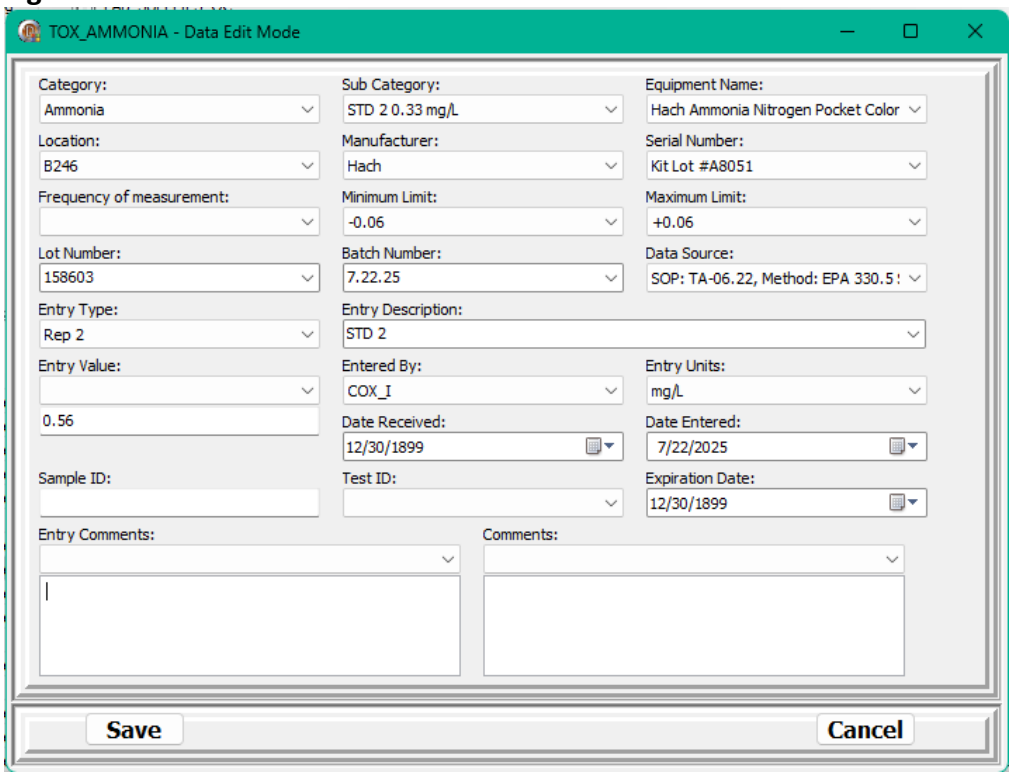
9.3. Open LIMS. Go to Laboratory > Technical > Laboratory Logbook > TOX_Ammonia.

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 and 2 in the **Entry Value** field. (Note: Be sure to pay attention to the **Entry Type** field and **Sub Category** field to make sure you are entering the value for the correct standard, they do not always go in order.) A total of two entries, one for each ammonia standard, are required. There will also be a blank third and fourth entry that requires no entry from the analyst. For a complete entry refer to **Figure 15**.

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9.6. **Figure 15**



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

9.7.1. For data entry of a sample, select the most recent entry with the **Sub_Category** of “Sample Ammonia”.

9.7.2. In the **Lot Number** field, the LIMS number for the sample should be entered when applicable. For DI water, well water, or facility samples no Lot Number will be entered.

9.7.3. The **Batch Number** field is filled in with the date that the lab water was made/collected; or the date the organism water or facility sample arrived.

9.7.4. In the **Entry Value** field, enter the measurement obtained from the Hach Ammonia Nitrogen Pocket Colorimeter II.

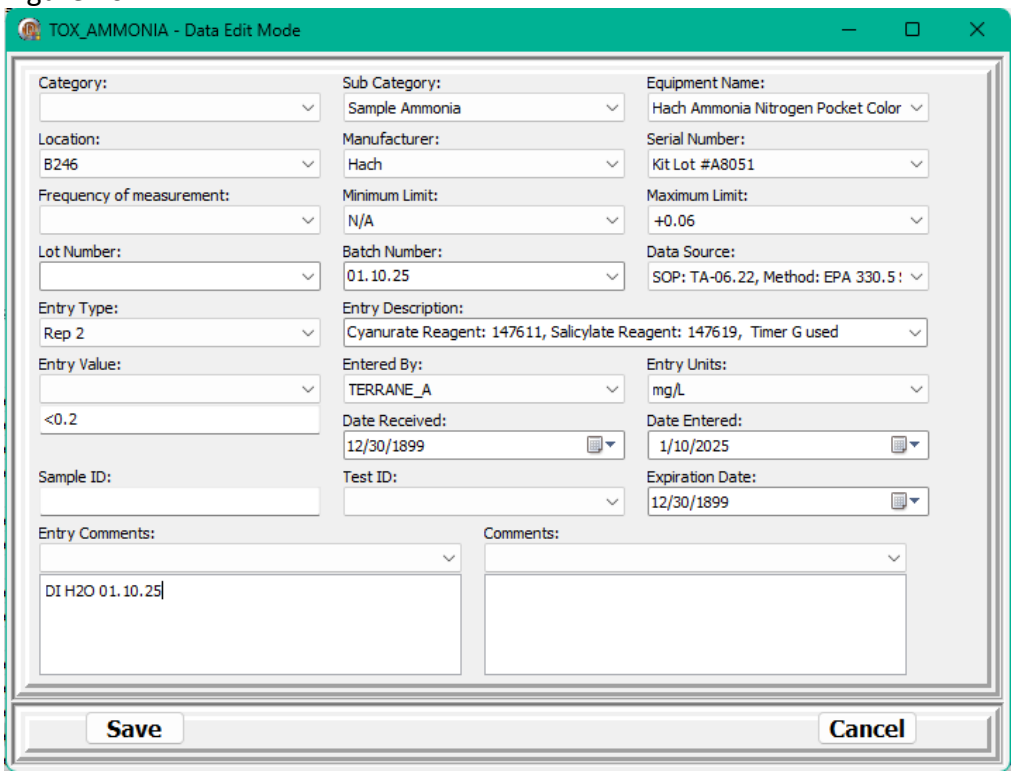
9.7.5. The **Entry Comments** should be entered as follows: Facility/sample type, sample number or LIMS number, and Batch number. Refer to **Figure 16** for example. (Note: Make sure to pay attention to the **Entry Type** field as it will change after every entry to a different replicate. Each sample will have a sample, a sample duplicate, and a mean entry.) For best reference, observe previous comments similar to your entry type.

9.7.6. In the **Entry Description** field, you will need to make sure both the Cyanurate Reagent and Salicylate Reagent LIMS numbers for the current packets are accurate as well as the Timer ID used. See **Figure 16**. A total of two entries along with a mean entry are required. A fourth entry is only

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required if a third replicate value is entered. If a third replicate was not performed, the fourth entry field can remain blank.

9.7.7. Figure 16



10. ALKALINITY

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

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

10.3. For entry of data, open LIMS, and navigate to **Laboratory > Technical > Laboratory Logbook > TOX_ALK_HARD**.

10.4. To enter the values for the standards, click on the most recent entry labeled “Alkalinity Standard” in the **Sub_Category**.

10.4.1. In the **Lot Number** field, enter the LIMS number for the standard.

10.4.2. For standards, the **Batch Number** field is filled in with the date that the standard was made.

10.4.3. In the **Entry Value** field, enter the measurement obtained from the volume needed to titrate the sample multiplied by 100 minus the DI water alkalinity correction factor (usually 10-20). The accepted value for the standard is 100 mg/L ±10%.

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10.4.4. In the **Entry Description** field, the LIMS numbers for the current Sulfuric Acid, Phenolphthalein, and pillow packet will need to be checked for accuracy.

10.4.5. When the **Save** button is clicked, the screen will move to the next entry. At this point, all fields will need to be verified again to ensure that accurate information is entered. There will be two entries for the standard and a mean entry. The fourth entry may be left blank.

10.5. Entry of a Facility Sample, Organism Water, or Lab Water Sample.

10.5.1. For data entry of a sample, the analyst will look for the most recent **Sub_Category** of "Sample Alkalinity".

10.5.2. In the **Lot Number** field, enter the LIMS number of the sample. For DI water, well water, organism water, and facility samples, no Lot number will be entered.

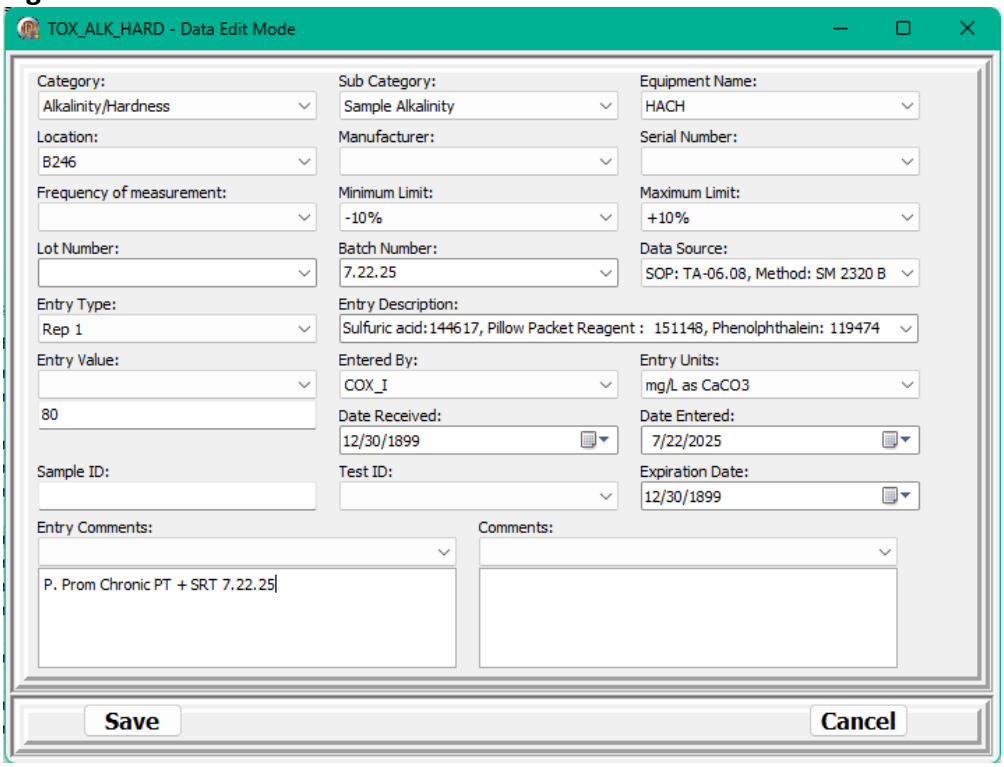
10.5.3. For samples, the **Batch Number** field is filled in with the date that the lab water was made/collected. For organism water or facility water, the **Batch Number** is the day it arrived.

10.5.4. For the **Entry Value** field, enter the measurement obtained from the volume needed to titrate the sample multiplied by 100.

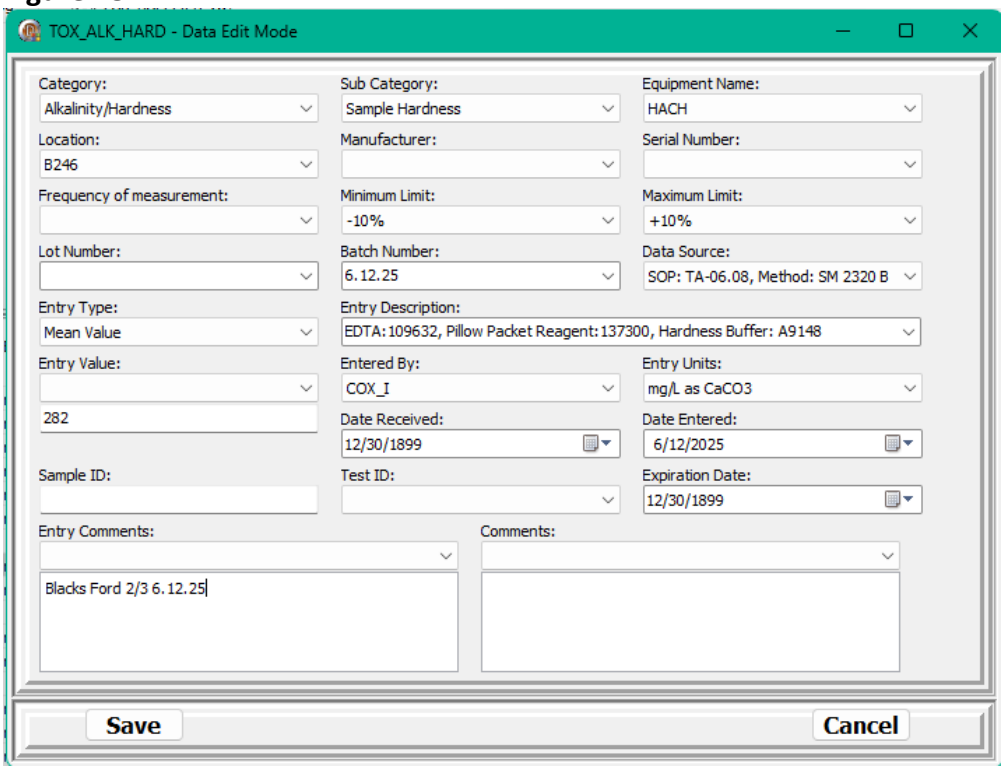
10.5.5. **Entry Comments** are entered as follows: Facility/organism/sample type, sample number/test type (for organisms)/or LIMS number (if applicable), and Batch number. Refer to **Figure 17** (Alkalinity) and **18** (Hardness) for examples. (Note: Make sure to pay attention to the **Entry Type** field as it will change after every entry and is not always in order. Every sample will consist of the sample, a sample duplicate, and the mean value of the two.) For best reference, observe previous comments similar to your entry type.

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10.5.6. **Figure 17**



10.5.7. **Figure 18**



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11. HARDNESS

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

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

11.3. For entry of data open LIMS and navigate to **Laboratory > Technical > Laboratory Logbook > TOX_ALK_HARD**.

11.4. To enter the values for the standards, click on the most **recent Sub_Category** labeled “Hardness Standard”.

11.4.1. In the **Lot Number** field, enter the LIMS number of the standard.

11.4.2. In the **Entry Value** field, enter the measurement obtained from the volume needed to titrate the sample multiplied by 100.

11.4.3. In the **Entry Description** field, check the LIMS numbers for the current Hardness Buffer, EDTA, and pillow packet reagent for accuracy.

11.4.4. When the **Save** button is clicked, the screen will move to the next entry. At this point, all fields will need to be verified again to ensure that accurate information is entered. There will be two entries for the standard and a mean entry. The fourth entry may be left blank.

11.5. Entry of a Facility Sample, Organism Water, or Lab Water Sample.

11.5.1. For data entry of a sample, select the most recent entry with the **Sub_Category** of “Sample Hardness”.

11.5.2. In the **Lot Number** field, enter the LIMS number for the sample. For DI water, well water, organism water, and facility samples, **Lot Number** will not be entered.

11.5.3. The **Batch Number** field is filled in with the date that the lab water was made/collected. For organism water or facility samples, the **Batch Number** is the day it arrived.

11.5.4. The **Entry Value** field should be filled out with the measurement obtained from the volume needed to titrate the sample multiplied by 100.

11.5.5. **Entry Comments** are entered as follows: Facility/organism/sample type, sample number/test type (for organisms)/or LIMS number (if applicable), and Batch number. Refer to **Figure 17** (Alkalinity) and **18** (Hardness) for examples. (Note: Make sure to pay attention to the **Entry Type** field as it will change after every entry and is not always in order. Every sample will consist of the sample, a sample duplicate, and the mean value of the two.) For best reference, observe previous comments similar to your entry type.

12. DATA ARCHIVAL

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

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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: click 'edit entry', select the entry you want to correct, correct the entry, and enter the current date and analyst's initials to document the correction.

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. To edit an existing log entry: click **edit entry**, select the entry you want to correct, correct the entry, and enter the current date and analyst's initials to document the correction.

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 verified before submitting. If changes need to be made, use the comment box to note the correction made with the date and initials of the analyst making the 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 DEP Laboratory Quality Assurance Manual

14.3. Refer to DEP Laboratory Health and Safety Manual

14.4. Read MSDS information for reagent handling and disposal.

15. REFERENCES

15.1. DEP Laboratory Quality Assurance Manual

15.2. DEP Laboratory Health and Safety Manual

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

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

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

15.6. DEP SOP TA-06.43, *Calibration and Use of Fisherbrand accumet AB315 pH/mV Meter*

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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-06.44, *YSI MultiLab 4010-1 Meter Calibration and YSI IDS ProOBOD DO Probe Maintenance*

15.10. MSDS safety sheets

Appendix of Changes

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