Quality Assurance (QA) Plan

for the

Charlotte Harbor Estuaries Volunteer Water Quality Monitoring Network (CHEVWQMN)

Original May 1999

Prepared: August 2024; Revised from January 2023

Managed By:

Charlotte Harbor Aquatic Preserves
12301 Burnt Store Rd
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Effective Date: January 20th, 2025

Signature Page

The undersigned have read and understood this Quality Plan, are charged with managing and improving the quality system, and are responsible for ensuring that all staff properly execute the procedures discussed in the plan.

Signature: _____ Date: 1/22/2025__
Southwest Florida Aquatic Preserves Manager
Melynda Brown

Signature: _____ Date: _01/16/2025
CHEVWQMN Coordinator
Arielle Taylor-Manges

Signature: _____ Date: _01/30/2025_
Quality Assurance Officer
Cheryl Clark

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Project Description

The Charlotte Harbor Estuaries Volunteer Water Quality Monitoring Network (CHEVWQMN) is a network of volunteer monitors that sample 46 sites throughout six aquatic preserves in the greater Charlotte Harbor area. These 46 sites are fixed stations along the southwest Florida coastline that have been sampled since 1998. The sampling locations are in Charlotte, Lee and Sarasota Counties within the waterbodies of: Charlotte Harbor, Gasparilla Sound, Cape Haze, Lemon Bay, Pine Island Sound, Matlacha Pass and Estero Bay. The sampling locations and water quality parameters to collect were chosen to support two goals: 1) to characterize existing baseline water quality conditions throughout the estuarine system, and 2) to determine changes in localized conditions over time.

Volunteer monitors collect water quality data on a regular basis once a month. Monitoring is conducted simultaneously throughout the estuaries and major tributaries on the first Monday morning of each month at sunrise, when dissolved oxygen levels are near their lowest levels of the day. This synoptic “snapshot” characterization of all six estuaries each month makes the monitoring program unique within the region. The monthly sampling frequency and long-term nature of the program have provided information about tidal, seasonal and yearly changes in estuary conditions at specific locations, which can be affected by localized weather conditions, resource management practices and land use changes. Data is available to local, regional, state and federal agencies, scientific and educational institutions, elected officials, citizen support groups and the public.

Ethics

All employees and volunteers of the DEP Charlotte Harbor Aquatic Preserves are held to a high professional ethical standard in the performance of their duties. All staff are required to read, understand, and sign an ‘Ethics Statement’ attesting to their commitment to honesty and integrity in performance of their duties. In addition, all employees are required to attend an annual ethics training class. Improper, unethical or illegal actions will be dealt with according to the published Administrative Directives of the Florida Department of Environmental Protection.

Project Organization & Responsibilities

The Florida Department of Environmental Protection’s (FDEP) Charlotte Harbor Aquatic Preserves (CHAP) office in Punta Gorda serves as the overall manager and coordinator of the monitoring network. It is responsible for volunteer recruiting, scheduling, field sampling training, data management, report preparation, equipment inventory and distribution, and laboratory support including sample bottle preparation. Assistance with training and quality assurance is given by the FDEP Estero Bay Aquatic Preserve (EBAP) and the Charlotte Harbor Environmental Center (CHEC), which all serve as regional volunteer coordinators. Laboratory samples are analyzed by the FDEP Central Laboratory in Tallahassee, Sanders Laboratory in Ft. Myers, and the Florida Fish and Wildlife Research Institute in St. Petersburg.

To facilitate efficient volunteer recruiting, communication, and training, the monitoring network area is divided into 4 geographic regions: Englewood (Lemon Bay, Gasparilla Sound, Cape Haze), Punta Gorda (Charlotte Harbor), Pine Island (Pine Island Sound, Matlacha Pass, San Carlos Bay) and Fort Myers Beach (Estero Bay). Regional volunteer coordinators assist with volunteer recruitment and training within their region, as well as assist with Quality Assurance (QA) sessions twice a year. They also manage equipment and information needs, serving as a liaison between the volunteers in their region and the CHAP office. CHAP staff (Arielle Taylor-Manges) serve as the regional coordinator for the northern Charlotte Harbor volunteers, while the regional coordinator for the southern Charlotte Harbor/Pine Island Sound/Matlacha Pass/San Carlos Bay volunteers is a

volunteer, formerly at CHNEP (Judy Ott). The regional coordinator for the Lemon Bay/Gasparilla Sound volunteers is staff at CHEC in Englewood (Tome Shaaltiel), and the regional coordinator for the Estero Bay volunteers is staff at EBAP (Rebecca Cray).

In reviewing the data quality objectives and data quality indicators, it aides in staff reviewing procedures and corrective actions (Table 1).

Table 1. Data Quality Objectives and corresponding Data Quality Indicators for CHEVWQMN.

Data Quality Objectives	*Data Quality Indicators*
CHEVWQMN water quality data will be conducted by FDEP trained staff, and the volunteers are expected to attend Quality Assurance sessions twice a year, either in person or virtually	• Conduct in-person, hands-on initial training on the sampling procedures and sampling equipment. • Records will be kept of all training activities.
Revisit and update Sampling Procedures and Quality Assurance Plan with any changes to FDEP SOPs, staff or other logistical changes	• Track and save older versions. • Change in QA Plan will require approval from QAO and FDEP-DEAR staff

Documents & Records

Detailed sampling procedures are included in the CHEVWQMN Monitoring Manual: Standard Procedures for Water Quality Monitoring (*aka* Sunrise Sampler, Appendix A.1). Each volunteer monitor receives this manual during their initial training session and is instructed to refer to it regularly during their monthly field monitoring and sampling. The Sunrise Sampler describes the proper procedures for performing sample collection, field analyses, and sample transport. Every volunteer follows the sampling protocols laid out in the Sunrise Sampler, which is updated regularly by CHAP staff.

After initial training, each volunteer must fill out a record of training form for the YSI ProPlus instrument (Appendix B.1) in addition to a volunteer service agreement form (Appendix B.2). These training and service forms are kept on file at the CHAP office. CHAP staff also keep all monthly volunteer data sheets, copies of all lab submittal and Chain of Custody forms, and copies of all lab analyses results. Additionally, a record of all parameter readings at each Quality Assurance (QA) session is kept on file in house.

Calibration standards are logged when they are first received at the CHAP office, and a list is kept in house (Appendix B.11). This includes the receipt date, lot number, and expiration date of the standard. The lot number of each standard is documented on the volunteer's datasheet each month. It is the volunteers' responsibility to keep track of how much standard they have left and when the expiration date is. Volunteers let staff know if they need more standard and supplies are also handed out twice a year at the quality assurance sessions.

Other documents kept in house are the quarterly nutrient sample pH check spreadsheet (Appendix B.3), and a list of sites with a field pH reading <7.

Quality Assurance Objectives

Volunteer Training

Regular volunteer training and quality assurance check-ups are the keys to providing accurate, precise and usable data to the scientific and educational community. Volunteer monitors receive individual training prior to their initial sampling event. New staff and coordinators are given the same training, in addition to YSI Handheld troubleshooting. Additionally volunteers are expected to attend a twice a year Quality Assurance (QA) session.

Volunteers are required to participate in 2 bi-annual QA sessions per year. QA sessions are conducted twice a year at 4 locations within the program area (Englewood- Charlotte Harbor Environmental Center, Punta Gorda- Gilcrest Park, Pine Island- Matlacha Community Park, and Fort Myers- Lakes Park). Regional coordinators attend these QA sessions, as well as assist CHAP staff during the training. During the QA sessions, volunteers receive program updates and results, and participate in hands-on sampling in which everyone samples the same body of water at the same time. A comparison of the volunteers' results helps to ensure precision among volunteer data. Readings are also taken using a calibrated YSI instrument, and the results compared with the volunteer data to ensure precision and accuracy of the sampling methods. Data from each of the QA sessions are entered into an Excel spreadsheet (see Appendix B.4) and screened for 20% accuracy (compared to the CHAP YSI Pro Plus reading). Discrepancies outside the +/- 20% are discussed, and methods, equipment and calibration techniques are reviewed to correct any problems or discrepancies before the next sampling date. During 2020, due to the global pandemic the QA sessions were held virtually over GoToMeeting and the trainings were recorded. In person QA sessions were resumed in Fall 2021 but going a forward, there is the option to host one virtual QA will be offered annually- now through Zoom. Volunteers are still expected to attend two QAs a year and are encouraged to choose in-person QA sessions for both times. Following Hurricane Ian, locations of the Pine Island and Fort Myers Beach QA's were severely damaged. Locations of these two QAs will be changed, potentially permanently going forward. QA's resumed at Matlacha Park in the summer of 2023 but the Estero Bay QAs have been relocated to Lakes Park starting in summer of 2023.

During monthly sampling, volunteers are required to conduct a check, calibration, initial calibration verification (ICV) and continuing calibration verification (CCV) for dissolved oxygen, pH, and conductivity and to ensure that these readings are within acceptable parameters. If a CCV does not pass, a recalibration must be conducted, otherwise the data will be J qualified (see Appendix A.6 of laboratory qualification codes).

Field Sampling Procedures and Schedule

At the end of each calendar year, CHAP develops a sampling schedule (see Appendix B.5) for the upcoming year to sample on the first Monday of every month (unless a holiday like 4th of July or Labor Day fall on the Monday, sampling is scheduled for the following Tuesday instead). Staff then coordinate with DEP Tallahassee lab manager (Josh Ayres) to schedule the CHEVWQMN next year's sampling dates, bottle shipment delivery to CHAP and delivery dates to the lab, in LIMS. Water sample bottles are shipped from the DEP Tallahassee lab at least 2 weeks in advance of the next sampling date and prepared for distribution by CHAP staff during the month prior to sampling. This includes adding 1mL of 1:1 sulfuric acid for sample preservation to each nutrient sample bottle and labeling all sample bottles for each monitoring site with the correct sample date and site name (and space for the volunteer to include sampling time). See Appendix B.8 for label example. Each volunteer receives a cooler that is clearly marked with their monitoring site name containing four pre-

cleaned, pre-preserved bottles (for chlorophyll, nutrients, color/turbidity, and bacteria) in a large plastic bag. Coolers are distributed to regional volunteer coordinators at least one week prior to sampling for the volunteers to pick up on sampling day to use for the following month.

Each site is monitored at sunrise on the first Monday of every month according to the steps laid out in the CHEVWQMN SOPs/Sunrise Sampler, that follow DEP SOPs. Volunteers record field data and observations directly onto their field data sheet that include rainfall, weather conditions, wind speed and direction, water depth and clarity, water surface conditions, and tide stage. The site number, location, monitors' names and sampling date and time are also included on the data sheet (see Appendix B.6).

Physical and chemical parameters measured with handheld meters include air and water temperature, conductivity, salinity, pH and DO. *In situ* sampling is conducted using a YSI ProPlus instrument. (As of May 2018 all sites have been transitioned over to using the YSI instruments)..

Water samples are collected on site per DEP SOP FS 2100 for lab analyses of total phosphorus, total nitrogen (TKN + NO_2/NO_3), chlorophyll a, turbidity, water color, and enterococci or Escherichia coli (E.coli) bacterias. (The switch to entero and e.coli from fecal coliform occurred in Sept. 2018). A clean, twice rinsed plastic bucket on a rope is carefully lowered into the water (1.5' into the water column) from a bridge, pier or boat bow and allowed to fill with surface water slowly. Volunteers are instructed not to agitate the bottom sediment or the water in the sampling bucket during collection. The collected water is then carefully poured into the four provided sample bottles. A few sites (CHV007, CHV009, and all EB sites) also collect samples for red tide and other harmful algal blooms. These bottles are not rinsed since an iodine preservative is placed in the bottle by FWRI red tide staff. After being filled, all bottles are placed in the provided cooler and surrounded by ice for transport to either the CHAP office or a regional volunteer coordinator.

In addition to standard sampling, approximately once or twice a year each site receives an extra cooler with four sample bottles to use for collecting either a field duplicate or laboratory blank sample (for chlorophyll, color/turbidity, nutrients and bacteria analyses). Duplicate/blank coolers are picked up along with the sampling cooler the month before and are noted on the applicable month's sampling 'Cooler Log (see appendix B.7).' These duplicates and blanks are a critical step in the quality assurance/control process that ensures that the data are technically sound. Historically there were approximately eight stations collecting either a duplicate or blank sample each month. However, due to downsizing samples sent to the lab, four stations are assigned duplicate or blank samples, starting in 2020 and have continued indefinitely. Successfully collected duplicates and blanks are noted on a spreadsheet in house so to track that each site only receives one a year.

After sampling, volunteers clean their own sampling equipment by rinsing thoroughly with clean tap or distilled water, then air drying and storing the equipment in a cool dry place. They make a copy of the data sheet(s) for their records and send the original data sheet in with their cooler. They transport their sample cooler and data sheet either directly to the CHAP office, or to their regional coordinator for distribution to the CHAP office. Each water monitor is responsible for transporting their sample cooler to the local collection location within one hour of sampling. Regional coordinators then transport datasheets and samples to the CHAP office. Upon dropping off their filled coolers at the CHAP office or to their regional coordinator, volunteers receive their cooler for the following month.

Locations of cooler drop off/pick up:

- Charlotte Harbor Environmental Center:
  Cedar Point: 2300 Placida Rd Englewood, FL 34224
- Charlotte Harbor Aquatic Preserves office:
  12301 Burnt Store Rd. Punta Gorda, FL 33955
- Greater Pine Island Water Association:

5281 Pine Island Rd. NW. Bokeelia, FL 33922

- Estero Bay Aquatic Preserve office:
  2295 Victoria Ave., Fort Myers, FL 33901

The volunteers collect field data and lab samples per DEP SOPs:

SOP	Description
FD 1000	Documentation
FM 1000	Field Mobilization
FQ 1000	Quality Control
FS 1000	General Sampling
FS 2000	General Water Sampling
FS 2100	Surface Water Sampling
FT 1000	Field Testing General
FT 1100	Field pH
FT 1200	Field Specific Conductance
FT 1300	Field Salinity
FT 1400	Field Temperature
FT 1500	Field Dissolved Oxygen

Calibration Procedures & Frequency

Meters are calibrated every month, prior to sampling, as outlined below. Detailed calibrations and verification instructions are included in the Sunrise Sampler field procedures document. Meter numbers are recorded on the datasheet each month.

- Specific Conductance (DEP SOP FT 1200): for volunteers using a YSI meter, a 1-point calibration is conducted with 50.0 standard, either the night before or the morning of sampling. Volunteers record check, calibration and ICV values on their datasheet, as well as the conductivity standard lot number. Verification is conducted onsite after taking the estuary reading with 10.0 standard, and the verification value must be between 9.5-10.5 mS/cm (5% of the 10.0 standard).
- pH (DEP SOP FT 1100): A 2-point calibration is conducted either the night before or the day of sampling, using pH 7 and pH 10 standards. Volunteers record check, calibration and ICV values on their datasheet, as well as the lot numbers of the standards. Verification is conducted onsite after taking the estuary reading. If the estuary pH measurement is <7, verification must be conducted with a pH 4 standard for proper bracketing. If the estuary pH reading is between 7-10, verification can be conducted in either the 7 or 10 standards. The pH verification reading must be within +/- 0.2 of the standard used (for pH 4: 3.80-4.20; for pH 7: 6.80-7.20; for pH 10: 9.8—10.20). The following sites have had <7 pH readings three or more times within a three-year period and must therefore verify with a pH 4 standard when their pH reading is <7: *CHV002, CHV013, CHV015, LBGOT2, LBANG1, GSV005, and EBV004.*
- DO (DEP SOP FT 1500): calibrated, ICV and verified onsite. Volunteers record check, calibration and ICV values on their datasheet. The DO verification value shown on the meter must be within +/- 0.3 mg/L of the value stated on the ‘Table FT 1500-1: Solubility of Oxygen in Water’ (found in the Sunrise Sampler), taking into account the air temperature.

If a verification value for DO, pH, or Specific Conductance does not pass, the volunteer must recalibrate the meter for the applicable parameter, retake the estuary reading, and conduct the verification process again, as specified in the Sunrise Sampler. Volunteers have been instructed that if the probe fails verification after a second calibration, that they can deem there is an issue with the probe and don't have to recalibrate again, and instead, notify staff to troubleshoot the probe. After sampling, any used standards are disposed of down the sink. Fresh standards are required for calibration. A supply of replacement calibration standards is kept at the CHAP office.

Sample Custody Procedures

Water quality samples are preserved on ice in the field for transport to the CHAP office. Volunteers deliver their cooler(s) to their predesignated drop off point within one hour of sampling. Regional coordinators are then responsible for ensuring that all their volunteers' sample coolers arrive at CHAP by 11am to allow for processing by staff within the fecal coliform holding time (see Appendix A.2 for list of all parameters hold times). CHAP staff verify datasheets, sampling times on bottles, perform quarterly pH Quality Control checks on all nutrient bottles, and prepare samples for shipment.

Upon receiving a sample cooler, the data sheet is removed and information including site name, sampling date and time is verified with that on the labels of the enclosed four sample bottles. Sampling information (site number, location, date, time, and salt (>2.5 ppt) or fresh water (<2.5 ppt) matrix) is written onto the FDEP Central Laboratory Sample Submittal Form (Appendix B.9). Site number, date and time is recorded on the Sander's Chain of Custody form (Appendix B.10) for each site sampled. If salinity is less than 2.5ppt, then the bacteria sample needs to be changed from Enterococci to E.coli, cross out 'ENT' on the sampling bottle and write 'ECQ' and cross out 'A' in the Group: and replace with 'B' On the Sanders Chain of Custody by crossing out the Entero and adding an 'X' in the E.coli column.

Staff check pH for all nutrient samples (quarterly; Feb., May, August, Nov.) by pouring a small amount of water from the nutrient sample bottle (the tall, clear bottle with yellow sticker indicating preservative) over a piece of narrow range litmus paper. Litmus paper is not placed directly into the sample bottle. Verification is recorded onto the pH quarterly check spreadsheet. If the pH reading is >2 then staff add additional preservative and note on the spreadsheet.

Each site's chlorophyll, nutrient and turbidity sample bottles are placed together in a small plastic bag, sealed and packed into a shipping cooler. Each shipping cooler is lined with a large plastic garbage bag containing 4-5 sealed small plastic bags (with the chlorophyll, nutrient and turbidity samples), all surrounded with ice. Staff ensure that each shipping cooler also includes a temperature check bottle and, when full that the plastic garbage bag is tied shut. After all chlorophyll, nutrient and turbidity samples have been processed and put into shipping coolers, the original Central Lab Submittal form is sealed in a plastic bag along with a copy of all the volunteer data sheets and is placed in one of the coolers to be shipped. The shipping coolers are then closed and sealed with packing tape. Each shipping cooler has a completed shipping label placed in a plastic shipping label sleeve and secured to the cooler lid. The coolers are then ready for shipping to the FDEP Central Laboratory in Tallahassee. Samples (excluding bacteria and red tide) are shipped to the DEP Central Lab in Tallahassee via FedEX Next Day Air service with preprinted labels provided by the Central Lab. When coolers are ready to ship, staff will call FedEx (1-800-464-4449 or (800)Go-FedEx)) for an Express pick up of the coolers and the red tide sample. . If, for some reason FedEx states that a timely pick up is not possible, CHAP staff will deliver the samples, by 5 p.m. at the latest to the nearest FedEx drop off. This is currently:

FedEx Ship Center
9301 Piper Rd.

Punta Gorda, FL 33982

Alternate FedEx drop off location

The Shipping Store
1133 Bel Harbor Blvd.
Punta Gorda, FL 33950
941-575-7400
M-F 7:30 a.m.- 6 p.m.; Sat 9 a.m.- 3 p.m.

After arriving in Tallahassee, the samples are analyzed by the FDEP Central Laboratory within the holding times given by the standard methods for each parameter. The Central Lab then e-mails the CHAP office when the data is available, and a completed and scanned Chain of Custody is provided on an FTP site, along with the sample analyses results. CHAP staff used UPS to ship the samples to Tallahasse up until 2022, when the contract between FDEP and UPS ended. In the future, it would be advisable to return using UPS, due to less risk of getting weather delayed coolers during the winter time.

Bacteria samples are analyzed at the Sanders Lab in Ft. Myers due to a limited holding time. Bacteria sample bottles from every site are placed into a cooler lined with a large plastic garbage bag, and then surrounded by ice. Information on the lab's Chain of Custody form is filled out by CHAP staff and includes site name, sampling date and time, parameter (entero or e.coli) and preservation mode (ice) (see Appendix B.10 for Sanders Lab Chain of Custody Form). CHAP staff verify the number of samples bottles in the cooler, making sure they are consistent with the number of samples listed on the Chain of Custody form, before sending the samples off to the lab. The cooler is transported to Sanders lab by EBAP staff, along with a copy of the volunteer data sheets and the original Sanders lab Chain of Custody form. CHAP staff scan the Sanders Chain of Custody form, before sending it to the lab, and email to DEP-Overflowmicro@dep.state.fl.us. CHAP staff sign the Chain of Custody form when releasing the samples to EBAP staff, and EBAP staff sign to accept the samples from CHAP. EBAP staff then sign the form again to release the samples to Sanders lab. The lab signs the form to accept the samples from EBAP staff, who then forward a copy of the completed Chain of Custody form back to CHAP staff for record keeping.

CHAP staff keep the original data sheets submitted by volunteers. They also keep a copy of the Central lab submittal form, the Sanders lab Chain of Custody form and the top carbon copy of the shipping labels for FedEx. The Central lab receives the original Central lab submittal form and a copy of the Sanders lab Chain of Custody form. CHAP staff also e-mail them a copy of the Sanders lab Chain of Custody form. The Sanders lab receives a copy of the volunteer data sheets and the original Sanders lab Chain of Custody form. All samples are therefore tracked throughout collection and analysis by a series of written records on sample bottle labels and tracking sheets. The information on the sample bottle labels and the signatures on the lab submittal and Chain of Custody forms reflect the history of each sample. The FWC lab in St. Petersburg receives a copy of the volunteer data sheets from sites that collected red tide water samples. Packaging is provided by FWC. CHAP staff create and print a shipment label via FedEx.com and samples are mailed overnight using FedEx. For creating a shipment label use the following information:

Deliver to: Karen Henschen Fish and Wildlife Research Institute; 100 Eight Avenue SE; St. Petersburg, FL 33701

Package Details: FedEx Pak

Service Type: FedEx Priority Overnight

Billing and Tax IDs

Transportation cost to: Recipient

FedEx Account No.: 488988603

These samples do not need to be preserved on ice and there is no chain of custody form. Scanned copies of the volunteer datasheets are saved in a folder, on the FDEP server (Y:\CH Vol Water Monitoring\Data\Lab Data Reports\DEP-Tallahassee\LIMS files) under the appropriate Year & Month.

Quality Control (QC) Checks

Field quality control checks include standardized training, quality assurance practice sessions, duplicate samples, field equipment blanks for 5% of samples and standards record keeping.

At the bi-annual QA sessions, meter readings are verified against a calibrated YSI by CHAP staff. Annual temperature verifications include recording the temperature readings in both cold and warm water buckets (based on proper probe range) per DEP SOP FT 1400, with results recorded by meter number. These results are compared to a NIST thermometer with an acceptance criterion of +\- 0.5 degrees. Volunteer results and comparisons at all QA sessions are kept in house and results are incorporated into the QA data.

In addition to bi-annual QA sessions, approximately four blank samples and four duplicate samples are performed at various monitoring locations each month for Quality Assurance purposes per DEP SOP FQ 1000 (see Appendix B.7; Sample of a *Cooler Log*). Blank samples are collected prior to normal sampling, before the bucket has been used to collect a water sample. The purpose of collecting a blank sample at a site is to assure that the field equipment is not contaminating the samples. Duplicate samples are collected after normal sample collection. The purpose of collecting the field duplicate sample is to verify lab analyses and assure consistency in both the field sampling and lab techniques. In the field, volunteers must determine if DO, pH, and specific conductance (for YSIs) values pass in order to determine if recalibration is necessary. The FDEP DO saturation chart is used to check if DO is in range (+/- 0.3 of the chart value). For pH, the verification result has to be +/- 0.2 of the pH buffer solution (3.8-4.2 for pH 4 standard; 6.8-7.2 for pH 7 standard and between 9.8-10.2 for pH 10 standard). Specific conductance (for YSIs) verification must be within 5% of the 10 ms/cm standard (or 9.5-10.5ms/cm). If either value fails, then the volunteer must recalibrate the appropriate instrument in the field, retake the estuary reading, and re-record the verification on the datasheet. If any verification is out of range the verification fails and is marked on the data sheet by CHAP staff. Data is also qualified if verifications are incomplete (i.e. missing temperature or calibration value) or if calibrations aren't verified after the sample is taken.

CHAP staff test every nutrient sample that arrives at the CHAP office (on a quarterly basis) with a narrow range litmus paper (0-3) per DEP SOP FQ 2000. Staff record the sample date, site number and pH check value, along with acid type, lot number and amount added. If a sample reading is >2, staff add acid for proper preservation and qualify the data (recording it on the DEP Lab Sample Submittal form.) This information is added to the 'pH monthly check' spreadsheet log and is kept in house.

Equipment Maintenance

As of May 2018, the only meter used in the CHEVWQMN program is the YSI Professional Plus and Pro Quatro instruments.

Volunteers check all probes and meters the night before sampling to check batteries and perform preventative maintenance. DO membranes for the YSI instruments are changed as needed or every 6 months at the QA's.

When a meter is not working properly or a problem cannot be fixed/determined by the volunteer, the meter is returned to the regional coordinator. The coordinator then goes through with the volunteer to try to determine the cause of the problem. If the meter still does not work properly it is returned to the CHAP office where the meter is reviewed and serviced in-house or returned to the manufacturer for repair, if needed.

In 2022, 4 Pro Plus's were sent in to YSI for annual maintenance and repair, with the funding from a one-time funding source. This should be a pursued effort going forward, when funding allows.

Data Validation and Management

CHAP staff manage the CHEVWQMN data in house using the CHEVWQMN Access database and Excel spreadsheets. The Access database can be found on the server: O:\CHAP\CH Vol Water Monitoring\Data\Current CHEVWQMN Data Base\CHEVWQMNXXXXXX (X indicating most recent date). After an email notification from the lab that the data is available, CHAP staff save the lab data results from the lab ftp site to the server; O:\CHAP\CH Vol Water Monitoring\Data\Lab Data Reports\DEP-Tallahassee\LIMS files. Field and laboratory data from the field data sheets and LIMS/lab results are entered into the CHEVWQMN Access database by CHAP staff. Specific instructions are detailed in the 'CHEVWQMN Database Description and Data Entry Instructions' document (See Appendix A.4). Trained interns or data entry volunteers assist with QA efforts comparing the field datasheets to the data in the database.

Rounded numbers are not used in calculations and DO values are entered to the 0.1 value. Once completed, the converted DO value and all other field data are entered into an Access database.

The 'How To: LIM's Data Entry' instructions' (Appendix A.5) include specific information regarding uploading data into the Florida STORET database. CHAP staff use these instructions to upload CHEVWQMN data into STORET, qualifying data, when needed, with the data qualifier codes listed in Rule 62-160.700, F.A.C. and any associated comments. Specifically, CHAP staff ensure that a J qualifier and any associated comment are entered if DO data verification fails. DO measurements taken from a plastic bucket must also be J qualified. Additionally, if a pH reading is <7 and isn't quantitatively bracketed (or the probe fails verification), the pH value is qualified with J and a 'not bracketed/failed verification' comment in the STORET submittal. Nutrient samples found to have a pH <2 during the quarterly pH check must also be J qualified. The lab results within LIMS are sent with the qualifiers (Appendix A.6) and comments already attached to the data. Data entered into the STORET database are QA'd every six months to verify accuracy and to check that any failed verification contains a J qualifier and a comment indicating why the value was qualified.

Before the CHEVWMQN lab and field data are sent to the Charlotte Harbor NEP Water Atlas staff for inclusion to their website portal, all data is QA'd again.
http://www.chnep.wateratlas.usf.edu/chevwqmn/ Contact Jason Scolaro: jscolaro@usf.edu.

Corrective Actions and Audits

Corrective Actions

When sampling problems occur, CHAP staff will email individual volunteers to inform them that their data must be flagged due to verification issues (see 'QC verification correction e-mails' document, Appendix B.12). Most of the sampling errors include incomplete verifications or no data due to trouble with the probes. This corrective action is to assist with quality checking and to help address any issues the volunteer may be having with the instrument or the sampling procedures.

Examples of atypical situations include:

- Missing temperature value in the DO verification: if the initial calibration is collected shortly before the verification, then that air temperature may be used, but data must be qualified.
- Missing salinity or pH readings: a small amount of water from the Chl a sample is poured into a cup and tested with CHAP's YSI Pro Plus. This value is recorded on the datasheet with comment that CHAP staff performed test in CHAP lab with YSI. The water is then tossed out, not put back into the bottle.

DO recorded as percent saturation: value is converted to DO mg/L using in-house Excel spreadsheet. The source of this Excel spreadsheet is: https://view.officeapps.live.com/op/view.aspx?src=http%3A%2F%2Fwww.vanwalt.com%2Fpdf%2Finformation-sheets%2FDO-percent-to-mg-per-L-Calculator.xls

Additional corrective actions taken by CHAP staff include replacing standards, meters and parts for field analysis kits, contacting the volunteer monitor for missing data, and conducting individual training sessions to evaluate a volunteer monitor's sampling methods, equipment and standards.

Staff verify field data is entered correctly in the Access Database and LIMS with a secondary check prior to exporting the file and uploading it into WIN. Additionally, staff will review the lab data that is copy/pasted into the Access database, ensuring correct transcription from the lab reports. Data that is not entered correctly will be changed and the initial staff will be notified for any corrections.

Audits

Audits provide the opportunity for feedback on the sampling procedures and ensure the quality of the data collected. The Florida Department of Environmental Protection Aquatic Ecology and Quality Assurance Section conducted an audit on CHEVWQMN in 2015, which spurred many of the corrective actions and sampling procedures currently employed by the program.

Additional audits of the program currently occur during the QA sessions, where the volunteers exemplify the Check, Calibrate, ICV, and Verify portion with their YSI Handheld instrument. They will then collect field readings with their handheld instrument during the QA session and CHEVWQMN coordinators assess that data within +/-20% of a standard reading (using the FDEP-CHAP YSI Pro DSS Handheld meter).

Appendix A- SOPs and Directions

A.1 YSI CHEVWQMN SOPs/Sunrise Sampler

STANDARD FIELD PROCEDURES FOR WATER QUALITY MONITORING

WITH YSI Multi-Parameter Instrument

for the

CHARLOTTE HARBOR ESTUARIES VOLUNTEER

WATER QUALITY MONITORING NETWORK (CHEVWQMN)

Updated December 2023

Prepared by

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION

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phone: (941) 389-5200

In cooperation with:

ESTERO BAY AQUATIC PRESERVE

2295 Victoria Ave #364

Fort Myers, FL 33901

phone: (239) 530-1002

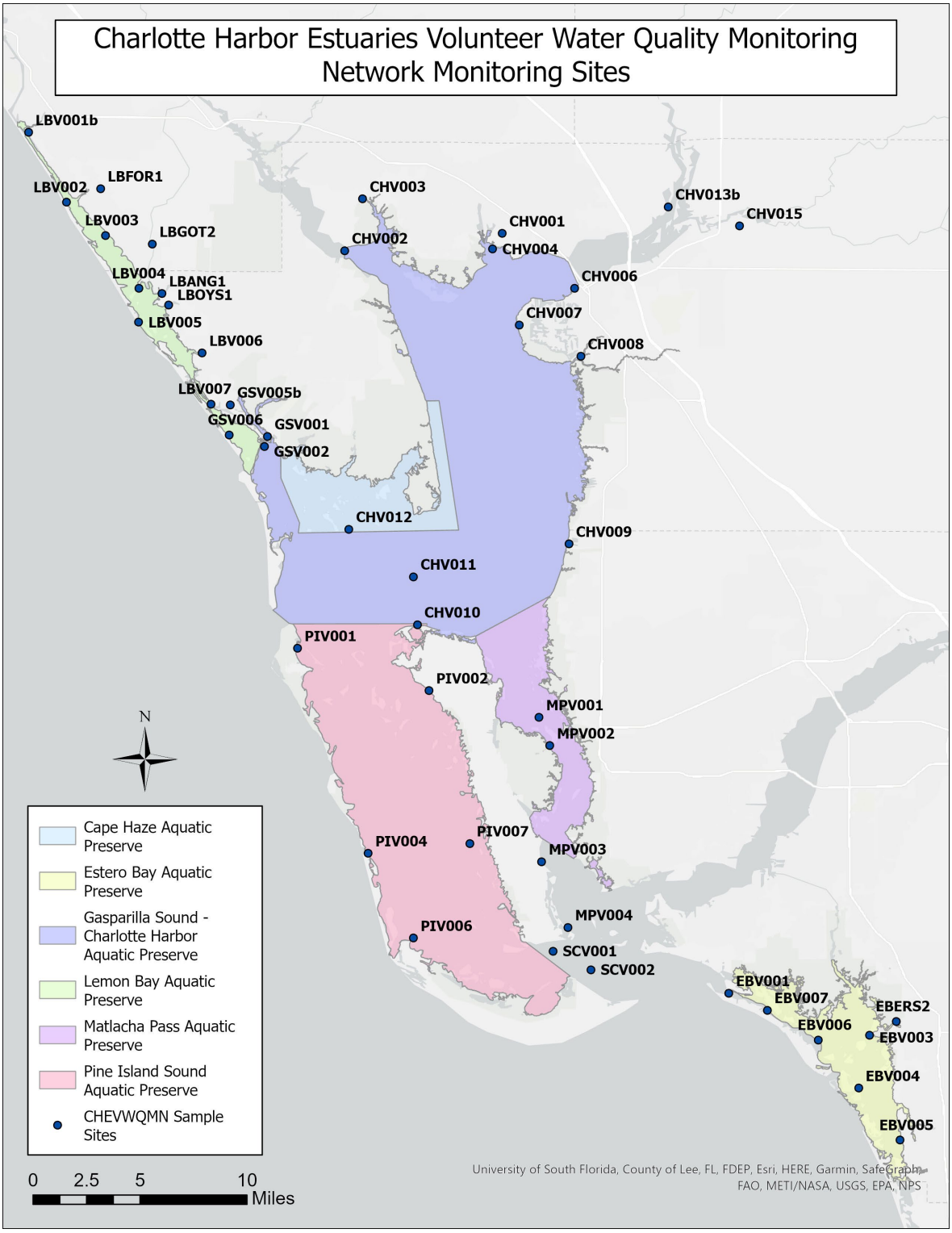
and

Cedar Point Environmental Park

2300 Placida Rd

Englewood, FL 34224

phone: (941) 475-0769


Charlotte Harbor Estuaries Volunteer Water Quality Monitoring Network Monitoring Sites
LBV001b
LBFOR1
LBV002
LBV003
LBGOT2
LBV004
LBANG1
LBOYS1
LBV005
LBV006
LBV007
GSV005b
GSV006
GSV001
GSV002
CHV003
CHV002
CHV001
CHV004
CHV013b
CHV015
CHV006
CHV007
CHV008
CHV012
CHV009
CHV011
CHV010
PIV001
PIV002
MPV001
MPV002
PIV004
PIV007
MPV003
PIV006
MPV004
SCV001
SCV002
EBV001
EBV007
EBERS2
EBV006
EBV003
EBV004
EBV005
N
Cape Haze Aquatic Preserve
Estero Bay Aquatic Preserve
Gasparilla Sound - Charlotte Harbor Aquatic Preserve
Lemon Bay Aquatic Preserve
Matlacha Pass Aquatic Preserve
Pine Island Sound Aquatic Preserve
CHEVWQMN Sample Sites
0 2.5 5 10
Miles
University of South Florida, County of Lee, FL, FDEP, Esri, HERE, Garmin, SafeGraph, FAO, METI/NASA, USGS, EPA, NPS

Introduction

Purpose: The Charlotte Harbor Estuaries Volunteer Water Quality Monitoring Network (CHEVWQMN) has been following the Standard Field Procedures for Water Quality Monitoring since 1996. These Procedures are an integral part of the approved Quality Assurance/Control (QA/QC) Plan for the CHEVWQMN. Each step of these Procedures is important for collecting accurate, precise and reliable water quality data, as well as assuring consistency between water monitors. Please refer to these Procedures in the field when conducting water monitoring.

Parameters: The complete set of parameters included in these Procedures is necessary to fully characterize water quality in the estuaries. The parameters and methods were chosen because of their role in determining estuary health, as well as the ability to collect them reliably. Some analyses are conducted in the field and some are conducted in the laboratory from samples collected in the field. The field parameters include weather conditions, air temperature, precipitation, tide stage, water depth, water temperature, water clarity (Secchi depth), dissolved oxygen and pH. The laboratory parameters include water color, turbidity, nitrogen, phosphorous, chlorophyll and Enterococcus or E.Coli.

Dissolved oxygen is important for invertebrate and fishery viability. Water color, turbidity and chlorophyll affect light availability for important seagrasses. Nitrogen and phosphorus affect marine plant growth, and elevated levels can cause excess algae growth. Enterococcus or E.Coli bacteria indicate the amount of human and mammal wastes carried into the estuary with stormwater runoff, septic system leaching and other sources. Salinity, color, nutrients and bacteria levels reflect freshwater inflows from the watershed. Sustainability of estuary health depends on identifying and correcting human sources of changes to water quality and quantity from the watershed.

Guidelines: Please follow these Procedures carefully for properly conducting field monitoring and collecting and preserving laboratory samples. The laboratory analyses for chlorophyll, nitrogen, phosphorus and bacteria must be collected carefully in the field to avoid contamination. Pre-cleaned, pre-preserved bottles for chlorophyll, nutrients, color, turbidity and bacteria are provided each month in a bag in a small cooler. The bottles are to be filled according to steps U-Z on pages 11 and 12 of these Procedures. The samples are returned to the bag in the cooler and surrounded with ice cubes. **Each water monitor is responsible for transporting their samples to the local collection location within 1 hour of sampling**. CHEVWQMN staff will then transport the samples to a local lab for analysis of Enterococcus or E.Coli within the required sample holding time, while the other samples will be sent to the Department of Environmental Protection Lab in Tallahassee.

In addition, usually once or twice a year, each sampling site will receive an extra cooler of sample bottles to use for collecting a field duplicate or laboratory blank sample for the chlorophyll, color, turbidity, nutrients and bacteria analyses. These Duplicates and Blanks are a critical step in the QA/QC process that validates the samples are technically sound. The instructions for collecting the Blank samples are given in Step G, page 7 and 8, of these Procedures. Instructions for collecting Duplicates are given in Step AA on page 12.

Note: To validate the data and fulfill the QA/QC plan, monitors are required to attend two bi-annual Quality Assurance sessions. These sessions are important in order to conduct annual audits on the data being collected, review and update sampling procedures, exchange information, and compare QA sampling results for precision and accuracy. Your local coordinators will inform you of the dates, in advance, of the Spring and Fall QA sessions. Choose one of the four local meetings in Englewood, Matlacha, Punta Gorda or Estero, to attend. Please bring all of your sampling equipment to the QA session so that you will be able to complete a full test.

THE DAY BEFORE SAMPLING

A. Empty rain gauge early in the morning.

B. Check sunrise time and weather report for the following day.

C. Check tide chart for following day.

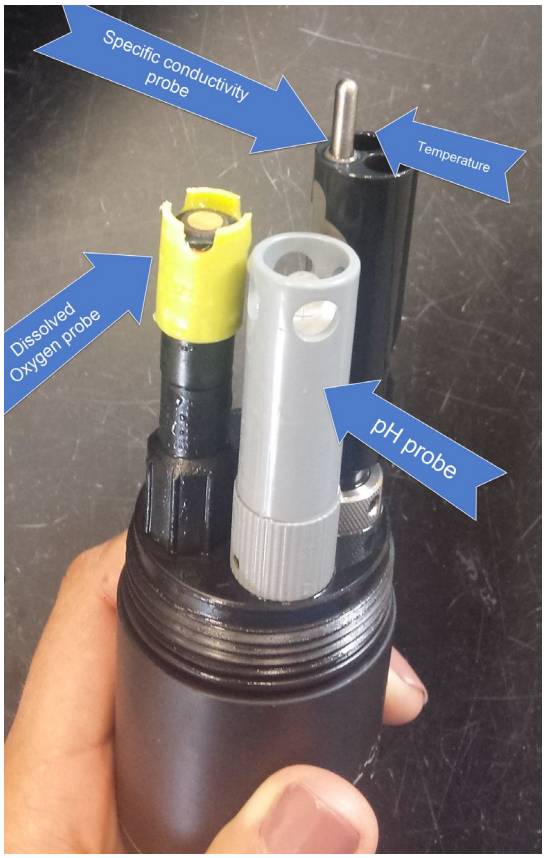
D. Make arrangements to meet your sampling partner the next day.

E. Freeze water for ice cubes.

F. Prepare sampling gear. Do you have:

1. safety equipment (gloves, goggles, flashlight, pocket knife needed?)
2. field procedures
3. clip board & pen
4. data sheet
5. compass or phone app
6. rinsed and dried plastic bucket provided
7. Secchi disk and attached graduated rope
8. YSI Pro-Plus/Quatro multi-parameter instrument
9. Conductivity standards (50.0 for calibration and 10.0 for verification)
10. pH standards- pH 7 and pH 10 bottles, and pH 4 bottle if applicable
11. De-ionized (DI) water for rinsing probes
12. cooler with bag containing: acidified nutrient bottle (white), chlorophyll bottle (brown), color/turbidity bottle and small enterococci/ e.coli bacteria bottle
    i. *check for correct site number on coolers & bottles- make changes if necessary*
13. extra duplicate cooler or blank cooler (with DI water jug) if scheduled

G. <u>Check YSI Instrument and probes</u> (night before sampling for preventative maintenance)



1. Check DO probes with yellow cap- If you see white crust/precipitate on the outside of the probe or membrane, then you need to either replace the membrane cap if it's torn or replace the DO solution inside. Bring the instrument back to your coordinator the morning of sampling and have them look at the meter.
2. Turn on the meter- Look to see the battery icon on the corner of the screen. If this is less than 50%, it is recommended to replace the batteries. Replace with 2 C batteries. After new batteries are in the meter, you will have to enter the Date and Time before going to the main screen (instructions for this procedure can be found on page 14).

H. Check/Calibrate/ICV Specific Conductance-

A 1 point calibration conducted at home the night before or the morning of sampling.

1. Empty the water in sensor storage container and fill 1/4 of the way with the 50-conductivity rinse solution. Rinse the black probe and holes thoroughly, and finally pour the conductivity solution from the container over all the probes to rinse them as well.
2. Fill the container 2/3 with new conductivity solution and place the probes into the solution. **Make sure the conductivity sensor and hole are submerged in solution, and check to make sure there are no air bubbles in the hole.** Also ensure that the temperature probe is submerged, otherwise the readings will be incorrect.
3. Turn on the YSI meter by pushing the green power button. (If ProQuatro hold down green power button for 5 seconds). If additional lighting is needed to see the screen, push the 'sun/lamp' button.
4. Allow a few minutes for the Sp. Cond. and temperature values to stabilize (i.e. until the values do not change).

5. When the Sp. Cond. value is stable, record value on the datasheet: In the Specific (Sp.) Conductance box, on the **Check row,** under the 50.0 standard column. Record the Date and Time of Check on the same line.
6. **Calibration:**

   -Press the Cal button and select **Conductivity**, then press Enter.

   -Select **Sp. Conductance** by highlighting it using the arrow buttons and then press Enter.

   -Choose **SPC-mS/cm** (second option). Press Enter.

   - Check to make sure the **Calibration Value** at the very top of the screen reads [50.0]. If the calibration value is not [50.0], highlight the reading at the top using the arrow buttons, press Enter and change value to 50.0 using the up/down and left/right arrow buttons.

   - Highlight **Accept Calibration** and press Enter. Once calibration results have been saved, the meter will automatically go back to the main screen (If ProQuatro returns to calibration list. Press escape to return to home screen).

7. Record the Date and time of Calibration on the **Calibrate** lines. Note- no calibration values need to be recorded.
8. **Initial Calibration Verification (ICV):** From the main screen, record the current Sp. Conductivity value, for the ICV, in the 50 standard column (it should read within hundredths of 50.0).
9. Record the date and time of the ICV, and the lot number of the 50-conductivity standard in the top of the Sp. Conductance box.
10. Pour the 50-conductivity standard into your rinse bottle of 50-conductivity standard.

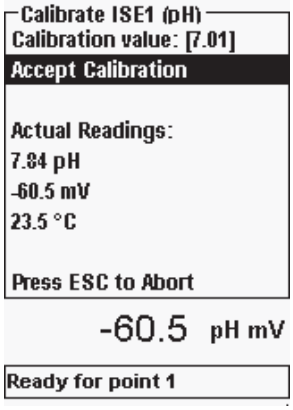
I. <u>Check/Calibrate/ICV pH-</u>

A 2 point calibration conducted the night before or day of sampling

1. Empty the container cup and fill the empty calibration cup 1/4 full of rinse pH 7 standard and rinse the probes thoroughly. Pour the pH 7 standard from the sensor storage container over the probes. Refill sensor storage container 1/2-2/3 full with *fresh* pH 7 and screw back onto the sensor storage container. Make sure the bottom of the pH probe (grey with 4 holes along bottom) and the temperature probe are submerged in the solution.
2. Allow the pH value to stabilize. This may take a couple minutes.
3. Record the Date and Time of the pH check in the **pH** box on the **Check** row.
4. Once the pH value is stable, record the pH value for **Check,** under the **7 buffer** column. Empty fresh buffer into the pH 7 rinse bottle or rinse storage cup.
5. Rinse probes with DI water, then with rinse pH 10 standard and Pour the pH 10 standard from the sensor storage container over the probes. Then place probes in container filled with fresh pH 10 standard. Allow value to stabilize and record the value for **Check, under pH 10 buffer column**.

   - If *both* 7 and 10 check values are within 0.2 of the standard (6.8-7.2 and 9.8-10.2) then a calibration is not needed; skip steps 6-15 and write N/A across the Calibrate and ICV rows.

6. **Calibration**: If you need to calibrate, store the pH 10 in a cup for rinse later. Re-rinse the sensor storage container and probes with DI and pH 7 rinse. Then add fresh pH 7 standard to sensor



storage container. Ensure the pH probe is covered. Press Cal, **highlight ISE (pH)** using the arrow buttons and press Enter. A message will show towards the bottom on the meter screen stating, "Ready for point 1".

7. Check the Calibration Value at the top of the screen to confirm it's [7.01]. If not, highlight Calibration Value, press Enter and input 7.01 using the arrow and enter buttons.
8. Highlight **Accept Calibration** and press enter. The message at the bottom will now say "Ready for point 2", which means you will calibrate to pH 10 next.
9. Empty the pH 7 standard from sensor storage container into rinse bottle (or pour into extra cup to use later for rinsing/verification). Rinse the probes and container with DI and refill a small amount of pH 10 for rinsing. After rinsing container and pH probe, pour the rinse pH 10 standard onto the probes. Refill storage container 1/2 full with *fresh* pH 10 standard. Ensure the bottom of the pH and temperature probes are fully covered.
10. The instrument should automatically recognize the pH 10.
11. Verify that the Calibration value (at the top) reads [10.01]. If incorrect, highlight Calibration value and press enter, then input 10.01 using the arrow and enter buttons.
12. **Highlight Accept Calibration and press enter** to confirm calibration.
13. **If using a YSI ProPlus press Cal to complete calibration**. If using a YSI ProQuatro select **Finish Calibration.** It will then save your calibration values for both pH 7 and 10 and switch back to the main screen (If ProQuatro returns to calibration list. Press escape to return to home screen).
14. Record Date and Time for pH Calibration on the **Calibrate** line. No calibration values need to be recorded.
15. **Initial Calibration Verification (ICV):** With the meter still in the pH 10 solution, **record** the value it is reading on the **ICV** row under the **10 buffer column**. Record the date and time of ICV.
16. Empty 10 standard (or save in extra cup, if the pH 7 wasn't saved, for verification), rinse probes with tap water and refill storage container with 1/8 full of tap water for overnight storage.
17. Record the lot numbers of the pH 7 and 10 standards.

ON SAMPLING DAY (i.e. THE FIRST MONDAY OF THE MONTH)

A. Safety First: It is up to each individual monitor to determine if weather conditions permit for safe sampling at their site. Sampling will NOT be made up the following day. The consistent sampling time for all sites throughout CHEVWQMN is designed to give a uniform time 'snapshot' of water quality conditions throughout the region.

1. **When using standards:**
   i. Store all standards away from children and animals in a cool dry place.
   ii. The use of gloves is suggested while handling standards. If you get any chemicals on your hands or face thoroughly rinse immediately with water.
   iii. Dispose of used standards in sink.

B. Fill your cooler with ice, completely surrounding the bag of sample bottles**. Recheck your gear before you leave home.**

C. Complete the top part of the Data Sheet with site number, date, name of the monitor collecting data with the meter, name of the monitor collecting water samples, estuary region, waterbody name, and YSI ProPlus meter #.

D. Check the rain gauge and record the amount of precipitation in the last 24 hours on the data sheet. If unknown put N/A.

E. Bring your YSI ProPlus instrument and calibration standards (for verification and in case you'll need to recalibrate in the field), along with your other gear to your sampling site.

F. Drive and walk to your site, arriving within 1/2 hour of sunrise.
1. As you walk to the site, observe the wind speed effect on trees around you.
2. When you get to the site, observe the starting tide level & if the pilings are wet or if barnacles are exposed.

G. Collect the Blank Sample if you have a blank cooler. If not proceed to step H.

IMPORTANT: If you have received a blank cooler, collect the Blank sample **prior** to normal sampling, before the bucket has been used to collect a water sample. The purpose of collecting a blank sample at a site is to assure that our field equipment isn't contaminating the samples.

To collect the Blank sample:

1. Make sure you have a second cooler marked "Blank" with a set of sample bottles, surrounded by ice and a jug of De-ionized Water (DI) from the laboratory. (Use the jug of DI water provided marked with your site number only- not a personal supply.)
2. Prior to sampling, rinse your sample bucket 2 times with a small amount of DI water. Make sure to rinse all sides of the bucket. Discard the water each time.
3. Fill the sample bucket with all of the remaining DI water from the jug provided. Record the time at the bottom of the datasheet next to 'Blank Collected?' and on all bottles. Circle Yes for each parameter/Blank bottle that is filled, below. Circle Y next to 'Blank Collected?'
4. Fill the brown chlorophyll bottle at least 2/3 full leaving about an inch of space below neck. You can fill the bottle to the top and then pour water out to reach appropriate level.

5. Repeat step 4 for the color/turbidity bottle.
6. Do not rinse small bacteria bottle, remove cap and fill to 100mL line near the top.
7. Pour the DI water into the white nutrient bottle (with the yellow sulfuric acid sticker) next. Fill the bottle 2/3 full (to the top of white label) leaving about an inch of space. Do **not overfill or rinse this bottle** because the acid preservative will be lost. If this bottle is rinsed or overfilled, please note at the bottom of the datasheet.
8. Place the sample bottles into a bag provided in the "Blank" cooler and ensure samples are surrounded with ice.
9. Make another copy of the data sheet, by hand or Xerox, to put in the pocket of the "Blank" cooler.
10. Deliver blank cooler and empty DI jug to the local drop off point along with normal sample cooler.

H. Record the Start Time and Sunrise Time on the Data Sheet.

I. Observe the Wind Direction and Speed:

1. Find the direction the wind is coming from by turning your face back and forth into the wind until you find the direction the wind is the strongest. Use a compass to determine the direction the wind is coming from & record on the data sheet.

2. Use the Beaufort Scale handout (page 16) to use visual observations of smoke, leaves and trees to estimate the wind speed and record the speed on the data sheet.

J. Observe the Weather Conditions and record them on the data sheet. Remember, any clouds in the sky count as 'partly cloudy' category.

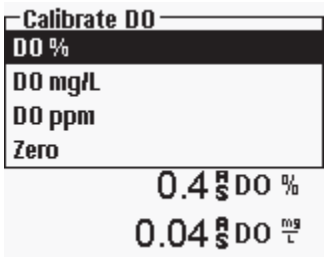
K. Check to make sure you recorded the precipitation amount from the last 24 hours if you know what it is within 2-3 miles of your sampling location.

L. Measure the Air Temperature. Turn on the YSI, unscrew and take the cup off and place in a shaded spot. Shake off any excess water on the silver temp. probe. Let the reading stabilize and record onto the datasheet under Air Temp.

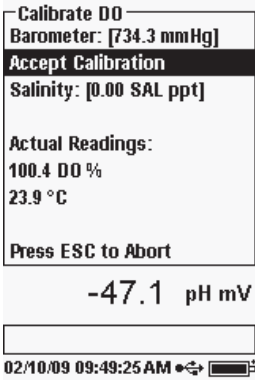
M. <u>Calibrate/ICV Dissolved Oxygen (DO)</u> – *Calibrate/ICV and verify DO *on site**

1. Make sure there are no water droplets on the DO membrane or temperature sensor.

2. Place the probes back into the storage container and confirm there is a small amount of *tap water* (not DI) in the bottom (about 1/8th of an inch of water).
3. Do not screw the cup all the way on the probes. Ensure it is resting in the cup, loose enough for proper venting. Check to make sure that none of the probes are touching the water in the bottom of the cup.
4. Allow 5-15 minutes for DO to stabilize. Note- the colder the temperature, the longer it takes to stabilize.
5. **Calibration**:
   -Press the Cal button at the top of the meter.
   -Select *DO* then press *Enter*.
   -With the arrow buttons, press down until DO % is highlighted, then press enter.



6. Record the Barometer reading at the top of the Dissolved Oxygen section on the datasheet. The Barometer reading does not have to be changed.
7. Record the Air temp (under the Actual Readings), on the Calibrate line, as well as the Date and Time of Calibration. Note that the Air Temp in this step refers to the temperature in the cup and not the ambient air temperature.



8. Highlight **"Accept Calibration" and press Enter**. This will calibrate DO close to 100% saturation. Allow probe to save configuration and the screen will go back to the main menu and the calibration is complete. If ProQuatro returns to calibration list. Press escape to return to home screen. No calibration readings need to be recorded.
9. **Initial Calibration Verification (ICV):** From the main screen, record the current **DO mg/L, DO% and Air Temp** values, for the **DO ICV** on the datasheet.
10. Record the Date and Time of ICV as well.

N. Observe the Water Surface Conditions and record on the data sheet.

O. Observe the Tide Stage at Your Site:

1. It is important to record the tide stage observed at your site, because it may be different than reported in your local newspaper. Note if the water level has come up or down since you observed it as you were walking to the site. Are more or less barnacles exposed or is the wet area of the pilings greater or smaller?
2. If there is a noticeable change in the tide level, record it appropriately as incoming or outgoing.
3. If there is not a noticeable change in the tide level, wait until later in the sampling session and observe it again. If there is still no noticeable change in the tide level upon departing the site, it may just be a period of slack tide.

P. Measure the Water Temperature, Dissolved Oxygen, pH and Salinity. After successfully calibrating for DO, pH and Sp. Conductance, collect water quality readings directly from the estuary.

1. Carefully screw the probe guard (black with holes) onto the sensors.
2. Submerge the probes at 0.5m depth (marked off with zip tie on the cable).
3. Values will be displayed on the main display screen. Confirm that the main menu display has all the parameters that you will need: temperature in C°, DO%, DO mg/L, pH, salinity, Sp Cond mS/cm (specific conductance).
4. Allow readings to stabilize (especially temperature and DO) and **record the water temperature, DO mg/L, DO % sat, pH, Salinity ppt *and* Sp.Conductance** readings under the far right column of the datasheet. Note- if in swift moving waters, DO may fluctuate slightly.
5. After collecting measurements, take off the black probe guard, **rinse all probes,** probe guard and cable (not the meter) with tap water.

Q. <u>Verifications</u>- *conducted onsite after estuary measurements*

1. **Verify DO first**- Place the probes back into the storage container and confirm there is a small amount of *tap water* (not DI) in the bottom (about 1/8 of an inch of water). Do not screw the cup all the way on the probes, ensure it is resting in the cup, loose enough for proper venting. Check to make sure the DO probe (with yellow cap) and the conductivity probe are not touching the water. Allow 5-15 minutes for DO to stabilize. Note- the colder the temperature, the longer it takes to stabilize.
    i. Allow for temperature and DO to stabilize, then record **DO mg/L and % value and temperature** for DO **Verify**.
    ii. Record Date and Time in the Dissolved Oxygen Box next to Verify.
    iii. Reference the chart on page 15 to ensure the verification value **is within +/- 0.3 mg/L of the value on the chart** for the air temperature in the cup. If the value for DO is not +/- 0.3 mg/L from the value on the chart (failure), recalibrate for DO and retake DO estuary reading. Then, redo verification as well, crossing off old values to maintain record of actions. Do not obliterate any data by erasing or scribbling out.
2. **pH verification**- Use pH 7 or 10 to verify. *If the estuary pH measurement was less than 7, use pH 4 to verify for proper bracketing.*
    i. Record the Date and Time in the pH box next to Verify.

ii. Rinse calibration cup with small amount of pH 7 or 10 (or 4) standard, and be sure to rinse the probes as well. Pour pH standard into rinsed storage container- same amount as calibration. Allow temperature and pH to stabilize and make sure the holes on the bottom of the gray pH probe sensor are submerged by the standard. **Record pH value for pH Verify and confirm that value is within +/- 0.2 of the standard** (for pH 4: 3.8-4.2/ pH 7: 6.80-7.20/ pH 10: 9.80-10.20). If the verification does not pass: recalibrate, take new pH estuary measurements and verifications, crossing off old values to maintain record of actions. Do not obliterate any data by erasing or scribbling out.

3. **Sp. Conductance verification-** Rinse probe and cup with tap water then with Conductivity 10 rinse. Pour fresh 10.0 standard into the rinsed storage container.
   - **i.** Allow conductivity to stabilize, making sure the hole in the black conductivity/temperature probe is completely covered by the standard, then **record the value in the Sp. Conductance box on the Verify line.**
   - **ii. Value must be between 9.5-10.5 mS/cm** (5% of the 10.0 standard). If the verification does not pass, recalibrate and take new salinity estuary measurements and verifications, crossing off old values to maintain record of actions. Do not obliterate any data by erasing or scribbling out.
   - iii. Record the verification date and time on the Verify line.
   - iv. Record the lot number for the 10.0 standard on the line next to "10:" at the top of the Sp. Conductance box.
4. You're done verifying! Turn off meter and rinse probes with DI or tap water. Pour about a ½ inch of **tap water** into the clear storage container and screw back onto the probes for storage.

R. **Observe & Record Apparent Water Color** by lowering the Secchi disk into the water & noting the water color above the white sections of the Secchi disk. Lower the disk to the sampling depth of 0.5 meters or about 1.5 feet. Use your best judgment about which of the color choices on the data sheet the apparent water color is closest to or circle "other" and write in a more descriptive color.

S. **Observe Tide Stage** based on the tidal changes that occurred during your sampling time. Record the tide as incoming, high slack, outgoing or low slack on the data sheet.

T. **Record Any Additional Comments and Observations**- odor, film, dead fish, any problems while sampling, wildlife observed, etc.

U. **<u>COLLECT WATER SAMPLES FOR LABORATORY ANALYSIS</u>:**

-Find the cooler marked with your site number and follow directions below.

1. Using the plastic bucket provided, rinse with estuary water 2 times. It is important that you do not contaminate the water for laboratory analysis by putting your hands into it or along the top rim of bucket.
2. Submerge the bucket 0.5m (1.5ft) down into the estuary, from an undisturbed area of water away from the discarded water from Step 1. Carefully fill and raise bucket.
3. **Note the time and record on the datasheet under Samp. Collect. Time and on all the bottles.**

V. Collect Chlorophyll sample:

1. Fill the large brown chlorophyll bottle 2/3 full or to the shoulder of the bottle- leaving an air space for the chemist to mix sample thoroughly. This can also be done by overfilling the bottle and pouring off a small amount.
2. Cap tightly and place in provided ziplock bag in cooler surrounded by ice.

W. Collect Nitrogen/ Phosphorous sample:

1. Find the white bottle with a yellow sticker indicating it has acid for preservation. Check label for proper site number and date, fill in if blank. Let the bottle sit upright before taking cap off so acid can drain down. If you get acid on hands flush thoroughly with estuary water and don't touch your eyes afterward.
2. Please **do not rinse this bottle** because it will remove the acid preservative.

   Carefully pour water from bucket into bottle, up to the shoulder, leaving about an inch of air space at the top. **Be careful not to overfill** this bottle because it will wash out the acid preservative. If bottle is accidentally rinsed or overfilled please make note at the bottom of the datasheet under **Observations and Comments**.
3. Cap bottle tightly and place in bag in cooler.

X. Collect Color/Turbidity sample:

1. Find the small color/turbidity bottle.
2. Fill the bottle to the shoulder leaving an air space on top.
3. Cap tightly and place in bag in cooler.

Y. Collect E.coli/Enterococci Bacteria sample:

1. Twist the cap off the small bottle to break the seal.
2. Do not rinse, fill the bottle to the shoulder and replace cap.
3. Place bottle in bag, **close bag and ensure ice completely surrounds bottles**.

Z. Circle Yes for all sample bottles collected and ensure all sample bottle times match time recorded on the datasheet. Cover bag of bottles with ice and close cooler.

<u>If you received a Duplicate cooler, follow instructions AA. If not move on to Step AB.</u>

AA. Collect the field duplicate sample:

The purpose of collecting the field duplicate sample is to assure consistency in both the field sampling & lab techniques. Duplicate samples should be collected AFTER your regular sample. To collect the duplicate sample, follow steps below:

1. Make sure you have a second cooler marked “Duplicate” with an extra set of sample bottles in a bag and ice.
2. After sampling and filling the regular bottles for the lab, empty the water from the bucket. *Rinse the bucket twice with estuary water* and fill it back up again from an undisturbed area of water. Record collection time on the bottom of datasheet next to ‘Duplicate collected?’ and record time on all bottles. Circle Yes for all Duplicate bottles filled below, and circle Y for ‘Duplicate Collected?’
3. Fill the “Duplicate” bottles exactly the same as your site samples bottles. (see steps V-Z above)
4. Place the sample bottles in bag provided into the “Duplicate” cooler, and surround completely with ice.
5. Make another copy of the data sheet, by hand or Xerox copy, and put it in the pocket of the “Duplicate” cooler.

AB. Measure the Secchi Depth:

1. Remove sunglasses while conducting the Secchi measurement and, if there is sun, conduct the measurement on the shady side of the dock or boat.
2. Lower the black and white disk into the water <u>just until</u> it disappears. Note the water level on the line (rope). Bring the Secchi out of the water to read the depth if necessary (the point at which the line (rope) is wet).
3. Record the depth the Secchi disappeared to the nearest 0.1 meter, as marked on the line.
4. If the Secchi rests on the bottom and is still visible at all, record the Secchi Depth as ">B", meaning "greater than bottom".
5. Lower the Secchi back into the water, past where it disappears and slowly bring it back up <u>just until</u> it reappears. Note the water level on the line.
6. Record the depth the Secchi reappears to the nearest 0.1 meter.
7. Average the depths the Secchi disappears/reappears and **record the average**.

AC. Measure the Water Depth by lowering the Secchi all the way to the bottom and noting the water level on the line (rope); the line should feel taut. Record the water depth to the nearest 0.1 meter on the data sheet. If the line is not straight or you are unable to get a Secchi or total depth reading due to strong current, please note on datasheet.

AD. Review the Data Sheet for Any Missing Data!! (Fill in any empty spaces)

AE. Record the End Time of the sampling session on the Data Sheet.

AF. Place datasheet into the front pocket of the cooler.

AFTER SAMPLING

A. Deliver the sample cooler to local drop off point (along with any blank or duplicate coolers) **as soon as possible.**

B. Pick up next month's cooler (and duplicate cooler or blank w/DI jug if assigned).

C. Clean sampling equipment as soon as possible.

1. Rinse the bucket thoroughly with tap water 2 times, then rinse thoroughly with

   distilled water from grocery store 2 times. Do not use soap because it will contaminate the nutrient samples even if thoroughly rinsed. Place the bucket in clean, dry place before storing other equipment in it.

2. Rinse the probes and cable with tap water (not the meter-it is not waterproof). Wipe down case with tap water and air dry as well.

3. Rinse the Secchi with tap water. Air dry and store in cool, clean, dry place.

4. Store the YSI in a safe, dry and cool place, keeping the cable nicely coiled (not kinked).

5. If any equipment needs to be replaced, please notify coordinator.

   The pH and conductivity standards will be replenished at the next QA, but if you should need more please contact your coordinator as soon as possible.

6. If any of the parameters are not reading or calibrating correctly, please notify coordinator so that a backup instrument is available for next sampling day and the instrument can be fixed.

HELPFUL HINTS - Call your local volunteer coordinator with any questions.

A. Safety is most important. Be careful, check the weather & work with a partner.

B. It is important to perform all calibrations, tests, and verifications each time. (Please check the data sheet for completion.)

C. Please conduct the calibration for pH and conductivity at home if possible. Then conduct DO calibration, and all the verifications on site.

D. When filling the sample bucket, do not agitate the water to introduce excess air bubbles.

E. If you need to replace a Secchi line (rope), soak it in hot water before marking measurements so the line will shrink first.

F. Backlight Adjustment for ProPlus

For a **darker** contrast display:

Press the  and  simultaneously to increase the contrast display (deeper color of wording)

For a **lighter** display:

Press the  and  simultaneously to decrease the contrast display (lighter color of wording)

* for ProQuatro no adjustment just bright on/off

G. Battery Installation- *2 C batteries. Should be changed every 3-6 months.*

-Turn the instrument over to view the battery cover on the back.

-Unscrew the four captive battery cover screws.

-Remove the battery cover and remove old batteries, then install the new batteries ensuring correct alignment on the instrument and the cover.

-Replace the battery cover on the back of the instrument and tighten the four screws. Do NOT over-tighten.

NOTE*- You will have approximately 2 minutes to change the batteries before the clock resets.

If the clock resets: It will automatically bring up the Date/Time menu the next time it is powered on. You must update this information to log data.

Highlight **Date Format** and press Enter, Select MM/DD/YY.

Highlight **Date** and press Enter, use the numeric screen to set correct date.

Highlight **Time Format** and press Enter to open submenu to select the preferred time format of 12-hour or 24 hours.

Highlight **Time** and press Enter to use numeric entry screen to set the correct time.

Press Esc to close out.

Table FT 1500-1: Solubility of Oxygen in Water at Atmospheric Pressure (1,2)

Temperature	Oxygen Solubility		Temperature	Oxygen Solubility
°C	mg/L		°C	mg/L
0.0	14.621		26.0	8.113
1.0	14.216		27.0	7.968
2.0	13.829		28.0	7.827
3.0	13.460		29.0	7.691
4.0	13.107		30.0	7.559
5.0	12.770		31.0	7.430
6.0	12.447		32.0	7.305
7.0	12.139		33.0	7.183
8.0	11.843		34.0	7.065
9.0	11.559		35.0	6.950
10.0	11.288		36.0	6.837
11.0	11.027		37.0	6.727
12.0	10.777		38.0	6.620
13.0	10.537		39.0	6.515
14.0	10.306		40.0	6.412
15.0	10.084		41.0	6.312
16.0	9.870		42.0	6.213
17.0	9.665		43.0	6.116
18.0	9.467		44.0	6.021
19.0	9.276		45.0	5.927
20.0	9.092		46.0	5.835
21.0	8.915		47.0	5.744
22.0	8.743		48.0	5.654
23.0	8.578		49.0	5.565
24.0	8.418		50.0	5.477
25.0	8.263			

1. The table provides three decimal places to aid in interpolation
2. Under equilibrium conditions, the partial pressure of oxygen in air-saturated water is equal to that of oxygen in water-saturated

Beaufort Wind Scale

Force	Speed mph	Sea description	Wave height (ft)	Effects on Sea	Effects on Land
0	<1	calm		Like a mirror	Smoke rises vertically
1	1-3	rippled	0.25	Ripples with scales forming but no foam crests	Smoke drifts; wind vanes unmoved
2	4-7	smooth	.5-1.0	Small wavelets, short and more pronounced crests do not break	Wind felt on face; leaves rustle; vane moved by wind
3	8-12		2-3	Large wavelets; crests begin to break; scattered whitecaps	Leaves and twigs in motion; wind extends light flag
4	13-18	slight	3.5-5	Small waves becoming longer; frequent whitecaps	Raises dust and loose paper small branches are moved
5	19-24	moderate	6-8	Moderate waves; taking longer form; many whitecaps; some spray	Small trees with leaves begin to sway crested wavelets form on inland water
6	25-31	rough	9.5-13	Larger waves forming; whitecaps everywhere; more spray	Large branches in motion; whistling heard in phone wires
7	32-38	very rough	13.5-18	Sea heaps up; white foam from breaking waves begins to blow in streaks	Whole trees in motion; difficult to walk

8	39-46	high	18-25	Moderately high waves of greater length; edge of crests begin to break into spindrift; foam is blown in well-marked streaks	Breaks twigs off trees; impedes progress
9	47-54		23-32	High waves; dense streaks of foam along direction of wind; sea begins to roll	Slight structural damage
10	55-63	very high	29-41	Very high waves with long overhanging crests; surface appears white	Trees uprooted; considerable structural damage
11	64-73		37-52	Sea completely covered with long white patches of foam lying along wind direction. Visibility affected	
12	74-82	phenomenal	>45	Air is filled with foam and spray; sea completely white; visibility seriously affected.	

A.2 Sampling Parameters, Preservatives & Holding Times

Taken from: DEP SOP Table FS 1000-4 40 CFR Part 136 Table II: Required Containers, Preservation Techniques, and Holding Times (Water/Wastewater Samples) and Table FS 1000-5

PARAMETER	CONTAINER	PRESERVATIVE	MAX. HOLDING TIME
Total Phosphorus (TP)	500 ml polyethylene bottle, pre-cleaned	H_2SO_4	run within 28 days
NO_2/NO_3	include in TP sample bottle	H_2SO_4	run within 28 days
Total Kjeldahl Nitrogen (TKN)	include in TP sample bottle	H_2SO_4	run within 28 days
chlorophyll a	1 L brown plastic bottle	ice	filtered within 48 hours, run within 28 days
turbidity	clear plastic bottle 125 mL up to 1L	ice	run within 48 hours
water color/lab analysis	clear plastic bottle 125 mL up to 1L	ice	run within 48 hours
Enterococci or Escherichia Coli	120 mL plastic cup with screw top	ice	run within 8 hours
red tide	125 mL amber container	Iodine	

A.3 CHEVWQMN Database Description and Data Entry Instructions

CHEVWQMN Database Description and Data Entry Instructions

November 2016 Update

I. Introduction

a. Forms in which raw data is provided

1. Copied field sheets
2. DEP Central lab:

-DEP Central lab data comes from LIMS files on the FDEP server and includes fecal coliform (1996-2019), Enterococci/e.coli (2019-present) bacteria results from contract lab (Sanders)

II. Description of the Database

a. location and naming scheme

\\Harbor\data\CH Vol Water Monitoring\Data\Current CHEVWQMN Data Base\CHEVWQMN-**date of the most current version**

-This folder also contains a folder of old versions of databases and this document.

******it is very important that anytime changes are made to the database the most current date is added to the file name, consistent with the naming scheme of previous files. This is the only way to track versions and changes**

b. files within the database

1. Tables:

Extra/Erroneous Sites: This table contains information from sites containing limited information, discontinued sites, sites in the wrong location, etc.

Monthly entry: This site contains information that stays consistent for all sites within each month. It contains information provided by the labs that describe a result including, season, units, lab ID's, methods

SITES: This is a table of site information

Water data2: location of all water quality records

tblStackStructureOnly: contains the structure of the table in which the stacking form inputs data for STORET. This table is for STORET purposes and does not pertain to data entry.

2. Queries: many but self-explainable
3. Forms:

frm Water Data: old version of data entry form, not used anymore

frmStack: stacking form for STORET

4. Macros

Format: for STORET

StrataEstuaryUpdates: updates strata and estuary fields based on site number in the water data table

c. Inclusion of QA data

1. The CHEVWQMN database contains lab duplicate and blank data integrated within the routine sample data
2. Activity category defines whether the sample was a routine sample, duplicate or blank. This field is necessary for entry into STORET

3. The field titled QA CODE, describes which samples were blanks (B) and duplicates (D) as well as the corresponding original samples (SB or SD)

4. The database entitled **Dec 15 2005** contains samples averaged with duplicate values when QA data was available for that date for the period between 1996 through 2005

III. Instructions for QA & data entry

1. Review field data- Look over data that was recorded in the field. Confirm salinity value is correct. Before entering data, confirm sure that datasheets are in alphabetical order-make sure creeks are before waterbodies (ex: Enter LBOYS1 then LBV001)
    - QA verifications for DO, pH and Sp. Conductance
        i. DO: Use the DEP Dissolved Oxygen Saturation chart to check if DO is in range (+/- 0.3 of the chart value). If out of range, verification fails & marked on data sheet.
        ii. pH: Verification result has to be +/- 0.2 of the pH buffer solution (3.8-4.2 for pH 4 standard, 6.8-7.2 for pH 7 standard and between 9.8-10.2 for pH 10 standard). If out of range, the verification fails and marked on the data sheet.
        iii. Sp.Cond: Verification result has to be 5% or +/- 0.5 of the Sp. Conductance buffer 10 (9.5-10.5). If out of range, the verification fails and marked on the data sheet.
    - DO conversion for data collected by Hanna probes (this is not necessary for YSI Professional Plus):
        i. Go to server address: Z:\CH Vol Water Monitoring\Data\DO conversions by temp
        ii. Open excel file titled: Current DO_Conversion.xlsx
            1. Enter recorded Water Temperature, Salinity, and DO value. When DO conversion value is calculated, write down new DO value in DO result box on data sheet in a red pen. Do NOT cross out original value. When finished with Converted DO sheet, enter date that you used the excel sheet, then save.
2. Enter field data.
   Copy last month's version of the database onto desktop and save with current sampling date, or 'save as' with current date.

    - After you've opened the database, click on the Security Warning Options and then click on "Enable this Content"

   To make the data easier to look at you can filter by month, to do this type in field data for one site and then filter by that date to get only results for that particular month

1. Go to a table titled, Monthly Entries. You have to enter the information in this table BEFORE entering any data into WaterTable2.
    a. Enter Date of Sample, Sample Year, Season (Rainy: June-Oct, Dry: Nov-May), and Sample Month. The rest of the fields are the same each month as above
2. Entry of Field Data:
    a. Enter data into Waterdata2 in alphabetical order. Enter the field data in order that is listed in the top row.
    b. Any comments left by the recorder add to comment section
        1) If DO, pH or specific conductance failed the QC-make note of that in the adjacent column. For qualifier, mark "J" and for comment, state why the value

failed (i.e. calibration failed verification, probe failed verification, calibration not verified after sample). Also make note of that in the comments section

2) In the case that some data is missing, try to make note of that in the comments

3. For QA data- Enter site Sample Blank or Sample Duplicate data directly under the site data;

-copy and paste the site field information onto the row with the Sample Blank or Sample Duplicate. For Activity Category, enter either DUPLICATE or BLANK accordingly. For QA code enter either SD for Sample DUPLICATE or SB for Sample BLANK

A.4 LIM's Data Entry Instructions

Enter DEP Tallahassee LIMS files data when it comes back from the lab (typically 3 weeks after sample date)

a. The report, associated field sheets and custody forms can be accessed as Adobe Acrobat PDF files at the following FTP site:

ftp://cama-charl:T2T45L@ftp.dep.state.fl.us/chevwqmn/

Copy and paste the FTP link into Windows Explorer (not Internet Explorer). This is done by opening "My Computer" (the icon is most likely on your desktop).

b. Copy and paste all files on the server :

\\Harbor\data\CH Vol Water Monitoring\Data\Lab Data Reports\DEP-Tallahassee

c. Open Excel and open text delimited text files downloaded from the ftp site- Data/Get External Data/From text/ navigate to folder and correct month files. Import both …b and …c files into separate spreadsheets

1. The text import wizard will run

-delimited, delimiter=|, text qualifier=none, change date to DMY,

2. Highlight the entire table and sort by parameter name
3. Cut the TKN, NOX, and TP results and paste into separate tables
4. Delete Phaeophytin-a results
5. Sort each parameter table by site/Field ID (make sure to highlight the whole table) and make sure the order and number of sites matches exactly to the order of sites for that month in the ACCESS database
6. If all sites match up, copy and paste all required fields into the ACCESS database that is filtered for that particular month
7. Save monthly Excel file on server Month_year
S:\CH Vol Water Monitoring\Data\Monthly Data Summaries
8.Order for Access database: TKN, NOx, TP, Chl. a, Fecal col., Turbidity, Color

IV. Instructions for performing queries

1. If you wish to query by water body name, strata or estuary you must add the site table to the query and then add the field and criteria of interest

2. If you wish to receive units or any of the data from the monthly data entry table you must add this table separately as well.

V. Instructions for quality assurance checking of data

1) Double check the columns with text values that describe each sample, particularly samples with blanks and duplicates associated with them. The field named QACode will provide information concerning the QA data. A Sample 'twinned' with a blank is SB while the blank is labeled B, this applies to duplicates as well. Make sure each sample twinned to a blank or a duplicate is labeled correctly. Also double check to make sure that duplicates have a 1 in the Replicate number field (silly STORET thing).

2) Sort each column in ascending and descending order to check for off scale values that may have been caused due to errors in data entry.

3) For 1 month double check 5 samples including a blank and a duplicate sample for both lab and field data.

4) "G" qualify both the sample value if the blank value is >MDL (not qualified with a U) and if multiplied by 10, is still greater than the sample value. Example: sample is 0.059 mg/L and blank is .012 mg/L.

5) Double check formatting and make sure dates and times look correct and consistent.

6) Missing data: some fields will just not be filled in but a sample/end time should be entered if it's not recorded, usually an hour after time start, or 5 minutes after samples were taken time.

A.5 LIM's Data Entry Instructions

Before starting on LIM's data entry, make sure all the data is complete (Central Lab and Contract Lab). Check the Tallahassee data for qualifiers that require re-sampling and make sure any field data qualifiers are accounted for! Omit any qualified field data that is greatly inaccurate.

Log onto LIM's: then press **General,** then press **LIM's Browser** and select **Search**

1) **Search by box:** verify the **"Request ID" box** is checked
2) Type in the RQ# of the event you are looking for in the **"Search For.." box** then click "**build list**" button
3) Once you find the RQ you are looking for, highlight it and press **OK**
4) Verify all of the data has been completed. Click on the event ID to highlight the data, then press "**Sim Data Merge_Tool" button.**

A new window will open taking you to the SIM_Data_Form

1) *Begin* by checking the "Org.ID" drop down box in the top right corner of the screen and select 21FLTPA (NOTE: there are multiple 21FL… in the system so be sure to select the correct Org ID).
2) Verify the "Project ID" at the top of the page (by pressing the Project ID button you can select the correct ID if incorrect)
   G:\Watershed\(A) WATERSHED DATA\STORET\iNFORMATION\ProjectCodes
   Fill in the Trip Name box with the same information as the Project ID
3) Press **Select All**: press "**Verify Station ID's" button on top of page** (this should be your first station ID check)
4) Stay on Select All: press "**Range Check Field Params" button on top of page**
5) Also while on Select All: press "**Add Parameter" button on bottom of page** and add "Secchi disk depth"(m), "Dissolved oxygen saturation" (%), "Temperature, air"(deg C), "Salinity" (ppth), "Wind Velocity" (mph), "Cloud Cover" (%), and "Depth, bottom" (m) as applicable
6) Also while on Select All: press "**Add parameter" button on bottom of page** and add "Velocity-stream" (ft/sec).
   Note: This is in ft/sec and we record in m/sec., convert using the following table. Be sure to use "J" qualifier when it's greater or less than.

M/Sec	Ft/Sec	M/Sec	Ft/Sec	M/Sec	Ft/Sec	M/Sec	Ft/Sec
0.00	0.00	**0.25**	0.82	**0.55**	1.80	**0.90**	2.95
0.01	0.03	**0.30**	0.98	**0.60**	1.97	**0.95**	3.12
0.05	0.16	**0.33**	1.08	**0.65**	2.13	**1.0**	3.28
<0.10	0.33 J	**0.35**	1.15	**0.70**	2.30	**>1.0**	3.28 J
0.10	0.33	**0.40**	1.31	**0.75**	2.46		
0.15	0.49	**0.45**	1.48	**0.80**	2.62		
0.20	0.66	**0.50**	1.64	**0.85**	2.79		

7) Make sure all fields have the correct unit(s) assigned to them that reflect what was recorded in the field (i.e. sample depth feet or meters) Hint: while in Select All is also the ideal time to add any qualifiers that apply to all sites
8) Verify Collection Date for all samples (if this is incorrect you must contact the Tallahassee lab to fix it) Contact: 850-245-8095
9) Verify all Storet ID's are accurate and correctly assigned to the right sample. Common errors include: putting O instead of zero "0", spacing, and slight errors on naming (some have"." periods in front of the Storet ID for label format issues, delete the".")
10) Now one by one select and check each individual Sample_Field_ID. Use the original field sheet(s) to verify all data for entry errors (common errors are decimal points in the wrong spot, transpose numbers, or putting the incorrect readings in the incorrect component box such as entering the DO readings for pH)
11) Enter each site's Secchi Disk Depth (add "S" qualifiers for all readings that were visible on bottom)
12) Enter each site's Depth, bottom (this is total depth and include any comments)
13) Enter each site's Dissolved oxygen saturation reading (include any qualifiers ex. "J" and a comment that corresponds to why the reading was qualified.)
14) Delete any field comments unless they are warranted
15) Press the "**Verify Station IDs"** and **"Range Check Field Params" buttons on top of page** for a final check
16) If no errors pop up after the above checks, press "**Select All"** and then press the "**Apply Updates" button on bottom of page** (this saves any changes)
17) Close out of the SIM_Data_Form

The **Next Day** or **another Person the same day**:

1) Follow all of the steps above to verify the data a second time (if you find any errors correct them, document them on the field data sheet and once complete hit the **"Apply Updates"** button on bottom of page)
2) Press "**Select All" button on top of page**
    a. Individually select data if you have blanks or duplicates, the **blank and duplicate data does not go into STORET**.
    b. Be sure to look over the blank data to verify all data is under **MDL**, if not verify qualifiers (Use "G" qualifier on an associated sample if the value of the blank is >10% sample

value) on other stations for that parameter and write up corrective action on how to avoid future issues. Contact supervisor if this occurs and if you have questions.

3) **T**hen press "**Generate" button on bottom of page**
4) A new page will open. Skim the data to verify all stations are present and accurate. Once this verification is complete press **"Save To File"**
5) Save the file in the STORET folder on the WF_common drive (G:\Watershed\(A) WATERSHED DATA\STORET). Be sure to add your initials to the end of the file name. **For example:** SWD-DIST-2012-04-20-02_05-09-2012_ER
6) Lastly open the SIM text file and make sure all stations are on it. Check for errors. See the common errors cheat sheet on the common share drive G:\Watershed\(A) WATERSHED DATA\STORET\iNFORMATION

A.5 Qualifier Codes (Updated in September 2020)

The following codes shall be used by laboratories and/or field organizations when reporting sample data values that either meet the specified descriptions outlined below or do not meet the applicable quality control criteria specified for the laboratory or field result. Data qualifier codes listed in summary reports or other presentations comprising information that has been reformatted from original reports generated by field or laboratory organizations or individuals shall meet the requirements of subsections 62-160.240(4) and 62-160.340(7), F.A.C. Data qualifier codes added to sample results during data review procedures conducted by organizations or individuals other than the generators of original reports shall meet the requirements of subsections 62-160.240(5) and 62-160.340(8), F.A.C.

CODE	DEFINITION
A	Value reported is the arithmetic mean (average) of two or more determinations. This code shall be used if the reported value is the average of results for two or more discrete and separate samples. These samples shall have been processed and analyzed independently. Do not use this code if the data are the result of replicate analysis on the same sample aliquot, extract or digestate (for example, for Stream Condition Index, biochemical oxygen demand or bacteriological analyses, or instrumental analyses such as Inductively Coupled Plasma).
B	Results based upon colony counts outside the acceptable range. This code applies to microbiological tests and specifically to membrane filter colony counts. The code is to be used if the colony count is generated from a plate in which the total number of coliform colonies is outside the method indicated ideal range. This code is not to be used if a 100 mL sample has been filtered and the colony count is less than the lower value of the ideal range.
F	When reporting species: F indicates the female sex.
H	Value based on field kit determination; results may not be accurate. This code shall be used if a field screening test (e.g., field gas chromatograph data, immunoassay, or vendor-supplied field kit) was used to generate the value and the field kit or method has not been recognized by the Department as equivalent to laboratory methods.
I	The reported value is greater than or equal to the laboratory method detection limit but less than the laboratory practical quantitation limit.
J	Estimated value. A "J" – qualified sample value shall be accompanied by a detailed explanation to justify the reason(s) for designating the value as estimated. Where possible, the organization shall report whether the actual sample value is estimated to be less than or greater than the reported value, to assist data users in any evaluation of the usability of the sample value. A "J" data qualifier code shall not be used as a substitute for G, K, L, M, S, T, V, or Y; however, if additional reasons exist for identifying the value as an estimate (e.g., laboratory control spike or matrix spiked failed to meet acceptance criteria), the "J" code may be added to a G, K, L, M, T, U, V, or Y qualifier. The following are examples of when a "J" code must be reported: instances where a quality control item associated with the reported value failed to meet the established quality control criteria (the specific failure must be identified); instances when

	the sample matrix interfered with the ability to make any accurate determination; instances when data are questionable because of improper laboratory or field protocols (e.g., composite sample was collected instead of a grab sample); instances when the analyte was detected at or above the method detection limit in an analytical laboratory blank other than the method blank (such as a calibration blank) and, the blank value is greater than 10% of the associated sample value; or, instances when the field or laboratory calibrations or calibration verifications did not meet calibration acceptance criteria, including quantitative or chronological bracketing requirements for field testing data.
K	Off-scale low. Actual value is known to be less than the value given. This code shall not be used for microbiological tests or for biochemical oxygen demand. This code shall not be used for field-testing measurements where quantitative bracketing is required. This code shall only be used for those tests using a calibration curve if:
	1. The value is less than the lowest calibration standard and the calibration curve is known to be non-linear; or
	2. The value is known to be less than the reported value based on sample size, dilution.
	This code shall not be used to report values that are less than the laboratory practical quantitation limit or laboratory method detection limit.
L	Off-scale high. Actual value is known to be greater than value given. This code shall not be used for microbiological tests or biochemical oxygen demand. This code shall not be used for field-testing measurements where quantitative bracketing is required. To be used when the concentration of the analyte is above the acceptable level for quantitation (exceeds the linear range or highest calibration standard) and the calibration curve is known to exhibit a negative deflection.
M	When reporting chemical analyses: presence of material is verified but not quantified; the actual value is less than the value given. The reported value shall be the laboratory practical quantitation limit. This code shall be used if the level is too low to permit accurate quantification, but the estimated concentration is greater than or equal to the method detection limit. If the value is less than the method detection limit use “T” below.
N	Presumptive evidence of presence of material. This qualifier shall be used if:
	1. The component has been tentatively identified based on mass spectral library search; or
	2. There is an indication that the analyte is present, but quality control requirements for confirmation were not met (i.e., presence of analyte was not confirmed by alternative procedures).
O	Sampled, but analysis lost or not performed.
Q	Sample held beyond the accepted holding time. This code shall be used if the value is derived from a sample that was prepared or analyzed after the approved holding time restrictions for sample preparation or analysis. This code shall be reported with sample results calculated from two or more component analyses, if one or more component sample preparations or analyses were performed out of holding time.
T	Value reported is less than the laboratory method detection limit. The value is reported for informational purposes only and shall not be used in statistical analysis.
U	Indicates that the compound was analyzed for but not detected. This symbol shall be used to indicate that the specified component was not detected. The value associated with the qualifier shall be the laboratory method detection limit. This code shall also be used to indicate the laboratory reporting limit, where applicable to the specific test, according to paragraph 62-160.340(3)(c), F.A.C. (e.g., biochemical oxygen demand, chlorophyll or microbiological tests). Unless requested by the client, values less than the method detection limit shall not be reported (see “T” above).
V	A “V” – qualified sample value indicates that the analyte was detected at or above the method detection limit in both

	the sample and the associated method blank and the blank value was greater than 10% of the associated sample value. The 10% criterion shall not apply to blank results for biochemical oxygen demand (BOD) or microbiological tests. For BOD tests, the "V" code shall be used for all sample results where the associated method blank result exceeds the maximum blank DO depletion specified in the analytical method. For microbiological tests, the "V" code shall be used for all samples where the associated method blank indicates growth of the target organism. Note: unless specified by the method, the value in the blank shall not be subtracted from associated samples.
X	Indicates, when reporting results from a Stream Condition Index Analysis (SCI 1000), that insufficient individuals were present in the sample to achieve a minimum of 280 organisms for identification (the method calls for two aliquots of 140-160 organisms), suggesting either extreme environmental stress or a sampling error.
Y	The laboratory analysis was from an improperly preserved sample. The data may not be accurate.
Z	Too many colonies were present for accurate counting. Historically, this condition has been reported as "too numerous to count" (TNTC). The "Z" qualifier code shall be reported when the total number of colonies of all types is more than 200 in all dilutions of the sample tested using a membrane filter technique. When applicable to the observed test results, a numeric value for the colony count for the target microorganism tested may be estimated by a laboratory from the highest dilution factor (smallest sample volume) and the upper limit of the ideal colony count range indicated in the method used for the test, and reported with the qualifier code. Atypical, non-target, spreading colonies or other interferences may prevent estimation of typical target organism counts, and reporting a numerical result may not be possible. Report "No Result" along with the qualifier code when this condition is observed, or when more than 200 non-target colonies are observed. Additional comments such as "confluent growth" may be reported with the "Z" code. When required by Chapter 62-550, F.A.C., the samples with verified, positive colonies must be reported as detections.
?	Data are rejected and should not be used. Some or all of the quality control data for the analyte were outside criteria, and the presence or absence of the analyte cannot be determined from the data.
*	Not reported due to interference.

The following codes deal with certain aspects of field activities. The codes shall be used if the laboratory has knowledge of the specific sampling event. The codes shall be added by the organization collecting samples if they apply:

CODE	DEFINITION
D	Measurement was made in the field (i.e., in situ). This code applies to any value (**except** field measurements of pH, specific conductance, dissolved oxygen, temperature, total residual chlorine, transparency, turbidity or salinity) that was obtained under field conditions using approved analytical methods. If the parameter code specifies a field measurement (e.g., "Field pH"), this code is not required.
E	Indicates that extra samples were taken at composite stations.
G	A "G" – qualified sample value indicates that the analyte was detected at or above the method detection limit in both the sample and the associated field blank, equipment blank, or trip blank, and the blank value was greater than 10% of the associated sample value. The value in the blank shall not be subtracted from associated samples.
R	Significant rain in the past 48 hours. (Significant rain typically involves rain in excess of 1/2 inch within the past 48 hours.) This code shall be used when the rainfall might contribute to a lower or higher than normal value.
S	Secchi disk visible to bottom of waterbody. The value reported is the depth of the waterbody at the location of the Secchi disk measurement.
!	Data deviate from historically established concentration ranges.

Rulemaking Authority 403.061, 403.0623 FS. Law Implemented 373.026, 373.309, 373.409, 373.413, 373.414, 373.416, 373.4592, 376.303, 376.305, 376.3071, 403.0623, 403.0625, 403.087, 403.088, 403.0881, 403.504, 403.704, 403.707, 403.722, 403.853 FS. History–New 1-1-91, Amended 2-4-93, 2-27-94, Formerly 17-160.700, Amended 3-24-96, 4-9-02, 6-8-04, 12-3-08, 7-30-14, 4-16-18.

Appendix B- Forms

B.1 Record of Training Forms

RECORD OF TRAINING

For

YSI ProPlus instrument

I _____, hereby certify that I have been trained on the operation, calibration and maintenance of the YSI ProPlus, and will adhere to this training in accordance with FDEP SOPs.

_____	_____
Volunteer Signature	Coordinator Signature
_____	_____
Date	Date

B.2 Volunteer Service Agreement Form

Days/Hours of Service: First Monday of the month for 2 hours at sunrise and attendance of 2 Quality Assurance

Sessions a year (5 hours)

Duties and Responsibilities (includes equipment and chemicals to be used):

Test water at sunrise on a monthly basis at the scheduled site according to training and the CHEVWQMN field procedures manual. Drop off cooler with samples at scheduled drop off site. The following equipment and standards will be used: Secchi disk, hydrometer, Hanna pH and dissolved oxygen meter and probe or YSI ProPlus multiparameter probe, pH standards 7 and 10, and conductivity standard 50ms/cm. Must attend the quality assurance sessions held twice a year. Volunteers assume responsibility for their own safety and care of their equipment loaned to them. Equipment must be returned to regional coordinating office after resignation.

Special Provisions: The volunteer understands that the above described services will be provided to the department with no monetary or material compensation. Volunteers are not considered employees of the State of Florida, and therefore, are not entitled to rights under the Career Service System.

Volunteers are expected to comply with department standards of conduct and other applicable department rules. Volunteers shall be covered by state liability protection in accordance with Section 110.504, F.S. and by workers' compensation in accordance in Chapter 440, F.S.. Volunteers shall comply with all applicable department and agency rules.

Emergency Information:

Person to contact in case of Emergency: _____

Relationship: _____

Street Address: _____

City, State and Zip code: _____

Phone # : (home) _____ (work) _____

This agreement may be canceled by either party at any time following notice of the other party.

_____ _____

Signature of Volunteer Date

_____ _____

Signature of Local Coordinator Date version 2015

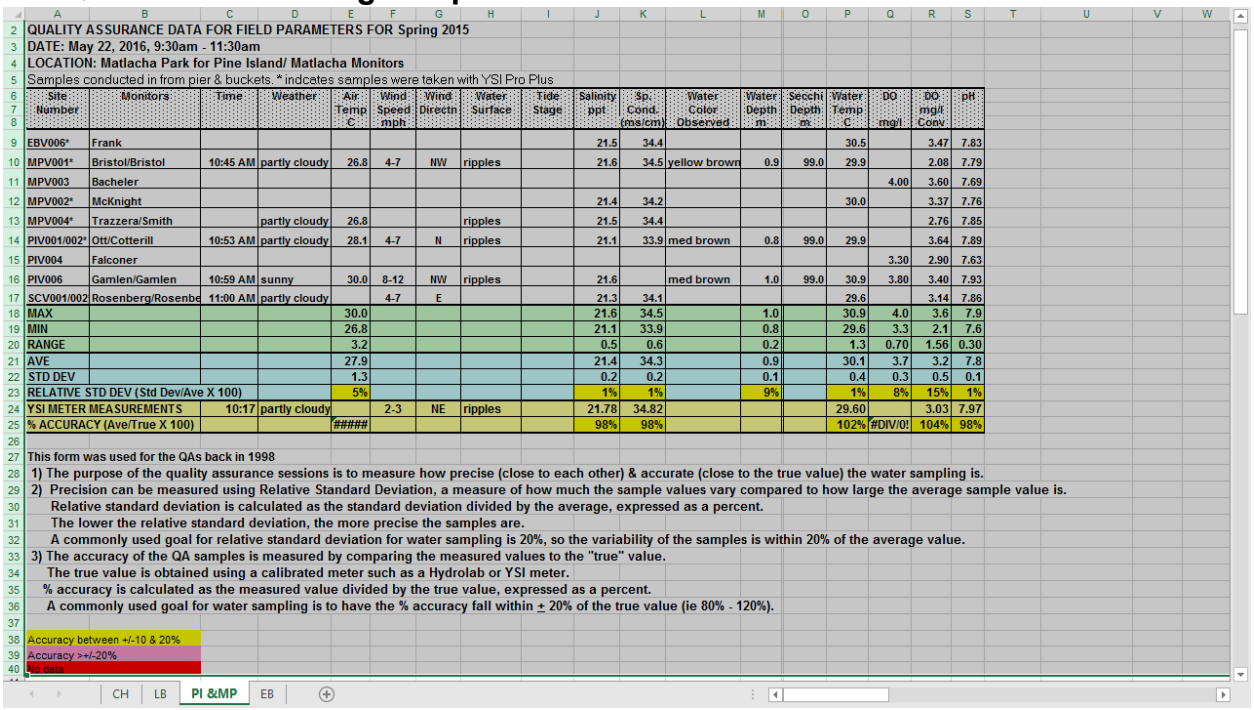
B.3 Example of Nutrient Sample pH Quarterly Check Spreadsheet

CHEVWQMN Sulfuric Acid Document and pH monthly check by site

1:1 H2SO4 lot#	Amount in each bottle	Sample Date	Site	pH check with litmus paper	If >2 was additional acid added?
D241-06	1mL	2/1/2016	CHV001		
D241-06	1mL	2/1/2016	CHV002		
D241-06	1mL	2/1/2016	CHV003		
D241-06	1mL	2/1/2016	CHV004		
D241-06	1mL	2/1/2016	CHV006		
D241-06	1mL	2/1/2016	CHV007		
D241-06	1mL	2/1/2016	CHV008		
D241-06	1mL	2/1/2016	CHV009		
D241-06	1mL	2/1/2016	CHV010		
D241-06	1mL	2/1/2016	CHV011		
D241-06	1mL	2/1/2016	CHV012		
D241-06	1mL	2/1/2016	CHV013		
D241-06	1mL	2/1/2016	CHV015		
D241-06	1mL	2/1/2016	EBV001		
D241-06	1mL	2/1/2016	EBV003		
D241-06	1mL	2/1/2016	EBV004		
D241-06	1mL	2/1/2016	EBV005		
D241-06	1mL	2/1/2016	EBV006		
D241-06	1mL	2/1/2016	EBV007		
D241-06	1mL	2/1/2016	EBERS2		
D241-06	1mL	2/1/2016	GSV001		
D241-06	1mL	2/1/2016	GSV002		
D241-06	1mL	2/1/2016	GSV003		
D241-06	1mL	2/1/2016	GSV004		
D241-06	1mL	2/1/2016	GSV005		
D241-06	1mL	2/1/2016	GSV006		
D241-06	1mL	2/1/2016	LBV001		
D241-06	1mL	2/1/2016	LBV002		
D241-06	1mL	2/1/2016	LBV003		
D241-06	1mL	2/1/2016	LBV004		
D241-06	1mL	2/1/2016	LBV005		
D241-06	1mL	2/1/2016	LBV006		
D241-06	1mL	2/1/2016	LBV007		
D241-06	1mL	2/1/2016	LBANG1		

D241-06	1mL	2/1/2016	LBFOR1		
D241-06	1mL	2/1/2016	LBGOT2		
D241-06	1mL	2/1/2016	LBOYS1		
D241-06	1mL	2/1/2016	MPV001		
H2SO4 lot#	**Amount in each bottle**	**Sample Date**	**Site**	**pH check with litmus paper**	**If >2 was additional acid added?**
D241-06	1mL	2/1/2016	MPV003		
D241-06	1mL	2/1/2016	MPV004		
D241-06	1mL	2/1/2016	PIV001		
D241-06	1mL	2/1/2016	PIV002		
D241-06	1mL	2/1/2016	PIV004		
D241-06	1mL	2/1/2016	PIV005		
D241-06	1mL	2/1/2016	PIV006		
D241-06	1mL	2/1/2016	PIV007		
D241-06	1mL	2/1/2016	SCV001		
D241-06	1mL	2/1/2016	SCV002		
D241-06	1mL	2/1/2016	CHV004 Blank		
D241-06	1mL	2/1/2016	CHV011 DUP		
D241-06	1mL	2/1/2016	EBV001 Blank		
D241-06	1mL	2/1/2016	EBERS2 DUP		
D241-06	1mL	2/1/2016	GSV005 DUP		
D241-06	1mL	2/1/2016	MPV001 DUP		
D241-06	1mL	2/1/2016	PIV001 Blank		
D241-06	1mL	2/1/2016	Blank		
D241-06	1mL	2/1/2016			

B.4 QA data for each region spreadsheet



QUALITY ASSURANCE DATA FOR FIELD PARAMETERS FOR Spring 2015
DATE: May 22, 2016, 9:30am - 11:30am
LOCATION: Matlacha Park for Pine Island/ Matlacha Monitors
Samples conducted in from pier & buckets. * indcates samples were taken with YSI Pro Plus

Site Number	Monitors	Time	Weather	Air Temp C	Wind Speed mph	Wind Directn	Water Surface	Tide Stage	Salinity ppt	Sp. Cond. (ms/cm)	Water Color Observed	Water Depth m	Secchi Depth m	Water Temp C	DO mg/l	DO mg/l Conv	pH
EBV006*	Frank								21.5	34.4				30.5		3.47	7.83
MPV001*	Bristol/Bristol	10:45 AM	partly cloudy	26.8	4-7	NW	ripples		21.6	34.5	yellow brown	0.9	99.0	29.9		2.08	7.79
MPV003	Bacheler														4.00	3.60	7.69
MPV002*	McKnight								21.4	34.2				30.0		3.37	7.76
MPV004*	Trazzera/Smith		partly cloudy	26.8			ripples		21.5	34.4						2.76	7.85
PIV001/002*	Ott/Cotterill	10:53 AM	partly cloudy	28.1	4-7	N	ripples		21.1	33.9	med brown	0.8	99.0	29.9		3.64	7.89
PIV004	Falconer														3.30	2.90	7.63
PIV006	Gamlen/Gamlen	10:59 AM	sunny	30.0	8-12	NW	ripples		21.6		med brown	1.0	99.0	30.9	3.80	3.40	7.93
SCV001/002	Rosenberg/Rosenbe	11:00 AM	partly cloudy		4-7	E			21.3	34.1				29.6		3.14	7.86
MAX				30.0					21.6	34.5		1.0		30.9	4.0	3.6	7.9
MIN				26.8					21.1	33.9		0.8		29.6	3.3	2.1	7.6
RANGE				3.2					0.5	0.6		0.2		1.3	0.70	1.56	0.30
AVE				27.9					21.4	34.3		0.9		30.1	3.7	3.2	7.8
STD DEV				1.3					0.2	0.2		0.1		0.4	0.3	0.5	0.1
RELATIVE STD DEV (Std Dev/Ave X 100)				5%					1%	1%		9%		1%	8%	15%	1%
YSI METER MEASUREMENTS		10:17	partly cloudy		2-3	NE	ripples		21.78	34.82				29.60		3.03	7.97
% ACCURACY (Ave/True X 100)				#####					98%	98%				102%	#DIV/0!	104%	98%

This form was used for the QAs back in 1998

1) The purpose of the quality assurance sessions is to measure how precise (close to each other) & accurate (close to the true value) the water sampling is.
2) Precision can be measured using Relative Standard Deviation, a measure of how much the sample values vary compared to how large the average sample value is.
   Relative standard deviation is calculated as the standard deviation divided by the average, expressed as a percent.
   The lower the relative standard deviation, the more precise the samples are.
   A commonly used goal for relative standard deviation for water sampling is 20%, so the variability of the samples is within 20% of the average value.
3) The accuracy of the QA samples is measured by comparing the measured values to the "true" value.
   The true value is obtained using a calibrated meter such as a Hydrolab or YSI meter.
   % accuracy is calculated as the measured value divided by the true value, expressed as a percent.
   A commonly used goal for water sampling is to have the % accuracy fall within ± 20% of the true value (ie 80% - 120%).

Accuracy between +/-10 & 20%
Accuracy >+/-20%
No data

CH | LB | PI &MP | EB

B.5 Sampling Schedule Example

CHEVWQMN 2016 Sampling Schedule

Date	Activity	Sunrise
1/4/2016	1st Monday Sampling	7:18 AM
2/1/2016	1st Monday Sampling	7:14 AM
3/7/2016	1st Monday Sampling	6:45 AM
4/4/2016	1st Monday Sampling	7:15 AM
5/2/2016	1st Monday Sampling	6:49 AM
6/6/2016	1st Monday Sampling	6:34 AM
TBA	**Spring QAs**	
7/5/2016	**Tuesday**	6:40 AM
8/1/2016	1st Monday Sampling	6:53 AM
9/6/2016	**Tuesday**	7:10 AM
10/3/2016	1st Monday Sampling	7:22 AM
11/7/2016	1st Monday Sampling	6:42 AM
TBA	**Fall QAs**	
12/5/2016	1st Monday Sampling	7:03 AM

Regional coordinators contact information
Mindy/Mary –Charlotte Harbor: (941) 575-5861
Rebecca –Estero Bay: (239) 463-3240
Bobbi –Lemon Bay: (941) 475-0769
Judy – Matlacha/ Pine Island: (239) 229-6899

B.6 Volunteer Field Data Sheet YSI

Charlotte Harbor Estuaries Volunteer Water Quality Monitoring Network YSI Field Data Sheet- V. 5/20
Site # _____ **Date**_____ **Time Start**_____**Time End**_____ **Sunrise time**_____
Meter Monitor_____ **Sample Monitor**_____
Estuary Region: (check one) ____Charlotte Harbor ____Estero Bay ____Gasparilla Sound ____Lemon Bay
____Matlacha Pass ____Pine Island Sound ____San Carlos Bay
Waterbody name:_____ **YSI ProPlus Meter SN #:** _____

Wind Direction: N NE E SE S SW W NW	**Direction:**
Wind Speed: 0-1 mph 4-7 mph 13-18 mph 25-31mph 2-3 mph 8-12 mph 19-24 mph ≥ 32 mph	**Speed:**
Weather: 1= sunny 3= overcast 5= drizzle 2= partly cloudy 4= fog/haze 6= rain	**# :**
Precipitation: (amount in inches for last 24 hours)	**Inches:**
Air temperature:	**°C**
Water surface conditions: 1= Calm 2=Ripples 3=Waves 4=White caps	**# :**
Tide stage: 1= Incoming 2= High Slack 3= Outgoing 4= Low Slack	**# :**
Secchi Depth: (to nearest .1 m) ***Disappear***: _____._____**m** ***Reappear***: _____._____**m**	**Secchi Average:** _____._____**m**
Water depth: (to nearest .1 m)	**Depth:** ____._____**m**
Water Temperature:	**°C**

Dissolved Oxygen: Barometer reading:_____mm Hg

	Date	Time	DO mg/L	DO%	Air temp (°C)	*Pass (± 0.3, office only)*	**Dissolved Oxygen:**
Calibrate	_____	_____	Calibrate at 100% humidity		_____		_____ mg/L
ICV	_____	_____	_____	_____	_____	Y N	_____
Verify	_____	_____	_____	_____	_____	Y N	_____ %

pH: Lot #s 7:_____ 10:_____ 4:_____ **pH reading:**

	Date	Time	4 buffer	7 buffer	10 buffer	*Pass (± 0.2,office only)*	
Check	_____	_____	xxxxx	_____	_____	Y N	
Calibrate	_____	_____	Calibrate with 7 and 10 pH buffers			Y N	N/A
ICV	_____	_____	xxxxx	xxxxx	_____	Y N	
Verify	_____	_____	_____*OR*	_____	*OR*_____	Y N	

Sp. Conductance (ms/cm): Lot# 50:_____ 10:_____ **Salinity ppt:**

	Date	Time	50 standard	10 standard	*Pass (± 5%,office only)*		
Check	_____	_____	_____	xxxxx	Y N		_____
Calibrate	_____	_____	Calibrate with 50 ms/cm standard		Y N	N/A	**Sp. Cond. (ms/cm):**
ICV	_____	_____	_____	xxxxx	Y N		
Verify	_____	_____	xxxxx	verify w/ 10 _____	Y N		_____

Water Color Observed:
1=Med Brown 3= Red brown 5= Green 7=Yellow Brown 9= Blue
2=Dark Brown 4= Green Brown 6= Yellow Green 8=Green Blue 10= Other
 # :

		circle Y or N			**Samp. Collect. Time:**
Collect & Ice Chlorophyll a Sample*?	Yes		No	Record same time on all bottles	
Collect & Ice Phosphorus/Nitrogen*?	Yes		No		
Collect & Ice Color/Turbidity Sample*?	Yes		No		
Collect & Ice Bacteria Sample*?	Yes		No		

*Surface water collected at 0.5m depth using plastic bucket

Observations and Comments:

Blank collected? Y N Time:
Duplicate collected? Y N Time:

		circle Y or N	
Collect & Ice Chlorophyll a	Yes		No
Collect & Ice Phosph./Nitrogen	Yes		No
Collect & Ice Color/Turbidity	Yes		No
Collect & Ice Bacteria	Yes		No

B.7 Sample of a *Cooler Log*

Cooler Log for Monday June 6, 2016

TO: Bobbi, Mindy, Judy, Cheryl, Arielle, Rebecca FROM: Mary

Blank/Dup	SITE #	MONITOR	PHONE NO.	DROP OFF	DRIVER	COORD
	CHV001	Ploskina	215-989-3647	CHAPs Office	McMurray	MB
	CHV002	Sliwinski	286-4523	CHAPs Office	McMurray	MB
dup	CHV003	Flores/Amal	979-9296	CHAPs Office	McMurray	MB
	CHV004	Cartwrights	286-9880	CHAPs Office	McMurray	MB
	CHV006	Udwari	301-801-1243	CHAPs Office	Udwari	MB
	CHV007*	Scholtes		CHAPs Office	Scholtes	MB
	CHV008	Langway	916-0991	CHAPs Office	Langway	MB
blank	CHV009*	Lough/Nicholson	734-652-8875/ 941-661-8923	CHAPs Office	Lough	MB
	CHV010	House	283-3090	CHAPs Office	Ott	JO
	CHV011	Chapin	392-0090	Pine Island	Ott	JO
	CHV012			Cedar Pt	CHEC	BR
	CHV013	DiPinto	376-0929	CHAPs Office	DiPinto	MB
	CHV015	Story	505-8904	CHAPs Office	Story	MB
	EBV001	Boese	954-592-5257	Estero Bay	Boese	RF
dup	EBV003	Mapes	225-715-3328	Estero Bay	Mapes	RF
	EBV004	Winter	239-463-1309	Estero Bay	Winter	RF
	EBV005	Sims	641-8791	Estero Bay	Sim	RF
blank	EBV006	Franklin	239-463-5012	Estero Bay	Winter	RF
	EBV007	Cain	239-641-8791	Estero Bay	Cain	RF
	EBERS2	Fretwell	239-992-4005	Estero Bay	Fretwell	RF
	GSV001	Simke	473-2948	Cedar Pt	CHEC	BR
	GSV002	Hopper	830-8590	Cedar Pt	CHEC	BR
	GSV003	X	X	X	X	X
	GSV004	X	X	X	X	X
	GSV005	Killion	697-3453	Cedar Pt	CHEC	BR
dup	GSV006	Soderquist	698-0230	Cedar Pt	CHEC	BR
	LBV001	Bickell	474-3690	Cedar Pt	CHEC	BR
	LBV002	Crampton	475-5237	Cedar Pt	CHEC	BR
	LBV003			Cedar Pt	CHEC	BR
	LBV004	Long/Rice/Hansberger	460-0719/ 475-1017	Cedar Pt	CHEC	BR
blank	LBV005	Sweeney	239-247-2739	Cedar Pt	CHEC	BR
dup	LBV006	Freeman		Cedar Pt	CHEC	BR
	LBV007	Petterson/Tall	830-8052/937-901-5459	Cedar Pt	CHEC	BR
	LBANG1	Kinsleys	999-3013	Cedar Pt	CHEC	BR
	LBFOR1	Kovach	483-6760	Cedar Pt	CHEC	BR
	LBGOT2	Klotz	460-9403	Cedar Pt	CHEC	BR
	LBOYS1	Court		Cedar Pt	CHEC	BR
	MPV001	Bristol/Schultz	282-8818/ 410-0345	Pine Island	Ott	JO
	MPV002	McKnight	898-2121	Pine Island	Ott	JO
	MPV003	Bacheler	239-851-3966	Pine Island	Ott	JO
	MPV004	Trazzera/Smith	283-5785	Pine Island	Ott	JO
	PIV001	Ott/Cotterill	229-6899/283-1876	Pine Island	Ott	JO
blank	PIV002	Ott/Cotterill	239-699-0449	Pine Island	Ott	JO
	PIV004	Falconer	815-210-7234	Pine Island	Ott	JO
	PIV005	X	X	X	X	X
	PIV006	Gamlen	558-8877	Pine Island	Ott	JO
	PIV007			Pine Island	Ott	JO
	SCV001	Rosenbergs	239-283-3871	Pine Island	Ott	JO
	SCV002	Rosenbergs	239-283-3871	Pine Island	Ott	JO
	CHEC Office/Cedar Pt/Englewood		475-0769/FAX 475-1899	Mon - Fri 9:00 - 3:00		
	DEP Office on Burnt Store Rd.		575-5861/FAX 575-5863	Mon - Fri 8:00 - 5:00		
	DEP Office in Ft. Myers Beach		463-3240/FAX 463-3634	Mon - Fri 9:00 - 5:00		
	GPIWA/Katie & Cathy		GPIWA 283-1071	Katie 896-3779 Cathy 283-3090		
	DEP/South Dist Lab		575-5810			
	* indicates red tide sample taken					

B.8 Sample Bottle Label

CHV001 DATE: 7/5/2016 TIME:	CHV001 DATE: 7/5/2016 TIME:	CHV001 DATE: 7/5/2016 TIME:
CHV001 DATE: 7/5/2016 TIME:	DATE: 7/5/2016 TIME:	DATE: 7/5/2016 TIME:
DATE: 7/5/2016 TIME:	DATE: 7/5/2016 TIME:	CHV003 DATE: 7/5/2016 TIME:
CHV003 DATE: 7/5/2016 TIME:	CHV003 DATE: 7/5/2016 TIME:	CHV003 DATE: 7/5/2016 TIME:
CHV004 DATE: 7/5/2016 TIME:	CHV004 DATE: 7/5/2016 TIME:	CHV004 DATE: 7/5/2016 TIME:
CHV004 DATE: 7/5/2016 TIME:	CHV006 DATE: 7/5/2016 TIME:	CHV006 DATE: 7/5/2016 TIME:

B.9 FDEP Central Lab Sample Submittal Form Sample

Florida Department of Environmental Protection

Request Number: RQ- 2016-01-08-02 **Central Laboratory Sample Submittal Form**
CHEVWQMN Monthly Nutrient Sampling

Event ID *

Requester: John Watts
Field Report Prepared By: Melynda Brown

Customer: CAMA-CHARL
Project ID: CHEVWQMN
PMAS:

Collected By: FDEP/CHEVWQMN monitors
Send Final Report To: Melynda Brown
Sampling Agency: FDEP/CHEVWQMN monitors
Total Samples - 43

Lab ID *	Location / Field ID / Matrix / Temp (C) / pH / Latitude / Longitude	Comp / Grab / Collection (comp begin or grab) Eastern Date Time / Tot Res Chlorine (mg/L) / Diss Oxygen (mg/L) / Sample Depth m ft / Salinity (PPTh) / Sp Conductance (umho/cm) / Comments	Composite end Eastern Date Time Central / Storet Station Number / NPDES Number	Bottle Group(s)**
	Location: Sunrise Waterway Field ID: CHV001 Matrix (include type e.g. Salt, Fresh, etc): Temp (C): pH: Latitude: ☐ dd ☐ dms Longitude: ☐ dd ☐ dms	☐ Comp ☒ Grab Collection (comp begin or grab) Eastern Date 3/7/16 Time 6:55 Central Tot Res Chlorine (mg/L): Diss Oxygen (mg/L): Sample Depth ☒ m ☐ ft: .5 ☐ Salinity (PPTh) ☐ Sp Conductance (umho/cm): Comments:	Composite end Eastern Date Time Central: Storet Station Number: CHV001 NPDES Number:	
	Location: Myakka River Field ID: CHV002 Matrix (include type e.g. Salt, Fresh, etc): Temp (C): pH: Latitude: ☐ dd ☐ dms Longitude: ☐ dd ☐ dms	☐ Comp ☒ Grab Collection (comp begin or grab) Eastern Date 3/7/16 Time 6:46 Central Tot Res Chlorine (mg/L): Diss Oxygen (mg/L): Sample Depth ☒ m ☐ ft: .5 ☐ Salinity (PPTh) ☐ Sp Conductance (umho/cm): Comments:	Composite end Eastern Date Time Central: Storet Station Number: CHV002 NPDES Number:	
	Location: Sam Knight Creek Field ID: CHV003 Matrix (include type e.g. Salt, Fresh, etc): Temp (C): pH: Latitude: ☐ dd ☐ dms Longitude: ☐ dd ☐ dms	☐ Comp ☒ Grab Collection (comp begin or grab) Eastern Date 3/7/16 Time 7:00 Central Tot Res Chlorine (mg/L): Diss Oxygen (mg/L): Sample Depth ☒ m ☐ ft: .5 ☒ Salinity (PPTh): 7.2 ☐ Sp Conductance (umho/cm): Comments:	Composite end Eastern Date Time Central: Storet Station Number: CHV003 NPDES Number:	
	Location: Charlotte Harbor Field ID: CHV004 Matrix (include type e.g. Salt, Fresh, etc): Temp (C): pH: Latitude: ☐ dd ☐ dms Longitude: ☐ dd ☐ dms	☐ Comp ☒ Grab Collection (comp begin or grab) Eastern Date Time Central: Tot Res Chlorine (mg/L): Diss Oxygen (mg/L): Sample Depth ☒ m ☐ ft: .5 ☐ Salinity (PPTh) ☐ Sp Conductance (umho/cm): Comments: NOT SAMPLED	Composite end Eastern Date Time Central: Storet Station Number: CHV004 NPDES Number:	

Relinquished By:	Date/Time	Shipping Method:	Received By:	Date/Time	Relinquished By:	Date/Time	Received By:	Date/Time
MBrown	3/7/16 12:30	UPS					MLB	3/8/16 9:48

* Shaded Areas for Lab use only.

** Please see reverse side for Bottle Group information.

last revised October 1, 2003

Page 1 of 1 4/13

B.10 Sanders Lab Chain of Custody Form

Sanders Laboratories
Environmental Testing Services

CHAIN OF CUSTODY RECORD

Workorder # (Lab Use Only)

Client ID: CAMA-CHARL
Report To EMail: Arielle Taylor Manges (arielle.taylormanges@floridadep.gov) & David Whiting (david.d.whiting@dep.state.fl.us)
Project Name: CHEVWQMN
Client: Florida DEP/CHAP
Bill to EMail: FDEP Bureau of Laboratories - Attn: David Whiting (david.d.w hiting@dep.state.fl.us)
Project Location: Charlotte Harbor
Address: MS 6515 2600 Blair Stone Rd
P.O. #: 1281569
Permit #/PWS ID:
Tallahassee, FL 32399
Requested Due Date:
Phone: (850)245-8191
Sampled By (PRINT)
Sampler Signature

Matrix	Sample Description	Sample Collection Date	Time	Type G=grab C=comp.	pH (Lab use only)	Bottle Type	Bottle Lot #	Preservative	Chem ID	Chem Exp	# Bottles	Analysis: Enterococci	Analysis: E. Coli-QT	(Lab Use Only) Sample ID #
M	CHV001-Surface	11/6/2023		G		PL-250ML		Thio, Ice			1	x		
M	CHV002-Surface	11/6/2023		G		PL-250ML		Thio, Ice			1	x		
M	CHV003-Surface	11/6/2023		G		PL-250ML		Thio, Ice			1	x		
M	CHV004-Surface	11/6/2023		G		PL-250ML		Thio, Ice			1	x		
M	CHV006-Surface	11/6/2023		G		PL-250ML		Thio, Ice			1	x		
M	CHV007-Surface	11/6/2023		G		PL-250ML		Thio, Ice			1	x		
M	CHV008-Surface	11/6/2023		G		PL-250ML		Thio, Ice			1	x		
M	CHV009-Surface	11/6/2023		G		PL-250ML		Thio, Ice			1	x		
M	CHV010-Surface	11/6/2023		G		PL-250ML		Thio, Ice			1	x		
M	CHV011-Surface	11/6/2023		G		PL-250ML		Thio, Ice			1	x		
M	CHV012-Surface	11/6/2023		G		PL-250ML		Thio, Ice			1	x		
M	CHV013b-Surface	11/6/2023		G		PL-250ML		Thio, Ice			1	x		
M	CHV015-Surface	11/6/2023		G		PL-250ML		Thio, Ice			1		x	
M	EBV001-Surface	11/6/2023		G		PL-250ML		Thio, Ice			1	x		

Kit Number
Comments: RQ-2023-09-11-01 Due to ambient waters it is not suspected to have chlorine present. E.coli analysis with quanitray.

Bottle Type Key Code		Preservative Key Code:	Okay to Run As	Relinquished Signature & Affiliation	Date	Time	Accepted Signature	Date	Time
PL	HDPE	HCL = H, HNO3= N, Na2S2O3 = ST or Thio H2SO4 = S, NaOH = SH, NH4Cl = AC, Ascorbic Acid = AA							
UN	Unpreserved								
GA	Glass Amber		Samples On Ice						
V	Vial		Yes No						
Volume=	250,500,in mL 1L 2L								
Micro	F= Flip SC= Screw Cap		Temp. °C						

By signing the Chain of Custody, the client, acknowledges, and authorizes analysis of the parameters listed above.
Form #: RCF-02 Approved KS 9/14/2023
1050 Endeavor Ct, Nokomis, FL 34275 (941)488-8103 fax:(941)484-6774 E84380 10090 Bavaria Rd., Fort Myers, FL 33913 (239)590-0337 fax:(239)590-0536 E85457

B.11 Standards Log

Staff enter received standards and preservatives into a log that is kept in the field support facility along with the MSDS. Below is an example of the pH 7 standard log however there is also a standard log for pH 4, pH 10, specific conductance 10, specific conductance 50, turbidity and sulfuric acid.

pH 7 Standard Log -CHAP for CHEVWQMN program

Date received	Lot #	Expiration date	

B.12 QC verification correction e-mails' document

QC email reminders. This is an example of the corrective action follow up email that CHAP coordinating staff will send to samplers if one of the parameters did not pass verification:

DO INCOMPLETE:
Thank you for sampling this month. While reviewing your verifications, your DO data was flagged due to incomplete verifications. Please try to remember to enter all the fields when completing the verification process so we can ensure the validity of the data collected. This is just a friendly reminder, thank you for all of the hard work you do for CHEVWQMN! If you have any questions, please feel free to call: 941-575-5861.

pH INCOMPLETE:
Thank you for sampling this month. While reviewing your verifications, your pH data was flagged due to incomplete verifications. Please try to remember to enter all the fields when completing the verification process so we can ensure the validity of the data collected. This is just a friendly reminder, thank you for all of the hard work you do for CHEVWQMN! If you have any questions, please feel free to call: 941-389-5200.

Specific conductivity INCOMPLETE:

Thank you for sampling this month. While reviewing your verifications, your salinity data was flagged due to incomplete verifications. Please try to remember to enter all the fields when completing the verification process so we can ensure the validity of the data collected. This is just a friendly reminder, thank you for all of the hard work you do for CHEVWQMN! If you have any questions, please feel free to call: 941-389-5200.

DO NO VERIFICATIONS:
Thank you for sampling this month. While reviewing your verifications, your DO data was flagged due to the lack of verification at the end of the sampling process. Please try to remember to verify your results after taking a sample. The verification process is so we can ensure the validity of the data collected. This is just a friendly reminder, thank you for all of the hard work you do for CHEVWQMN! If you have any questions, please feel free to call: 941-389-5200.

pH NO VERIFCATIONS:
Thank you for sampling this month. While reviewing your verifications, your pH data was flagged due to the lack of verification at the end of the sampling process. Please try to remember to verify your results after taking a sample. The verification process is so we can ensure the validity of the data collected. This is just a friendly reminder, thank you for all of the hard work you do for CHEVWQMN! If you have any questions, please feel free to call: 941-389-5200.

Sp.Cond. NO VERIFCATIONS:
Thank you for sampling this month. While reviewing your verifications, your salinity data was flagged due to the lack of verification at the end of the sampling process. Please try to remember to verify your results after taking a sample. The verification process is so we can ensure the validity of the data

collected. This is just a friendly reminder, thank you for all of the hard work you do for CHEVWQMN! If you have any questions, please feel free to call: 941-389-5200.

DO- incorrect reading:
Thank you for sampling this month. While reviewing your verifications, your DO data was flagged due to the verification value not meeting the +/- 0.3 mg/L value stated on the solubility of oxygen in water (see page 15 in CHEVWQMN Standard Field Procedures). If your DO value is not within +/- 0.3 mg/L when you verify, please recalibrate to the chart value matching the current air temperature and record a new DO value from the estuary. After you have recorded the new DO sample value, complete the verification process to ensure the DO probe passes. This is just a friendly reminder, thank you for all of the hard work you do for CHEVWQMN! If you have any questions, please feel free to call: 941-575-5861.

pH incorrect reading:
Thank you for sampling this month. While reviewing your verifications, your pH data was flagged due to the verification value not meeting the +/- 0.2 value of the tested pH standard. If your pH value is not within +/- 0.2 when you verify, please redo the recalibrate and check process using both pH 7 & 10, and then record a new pH value from the estuary. After you have recorded the new pH sample value, complete the verification process to ensure the pH probe passes. This is just a friendly reminder, thank you for all of the hard work you do for CHEVWQMN! If you have any questions, please feel free to call: 941-575-5861.

Sp.cond incorrect reading:
Thank you for sampling this month. While reviewing your verifications, your salinity data was flagged due to the verification value not meeting the +/- 2.5 value of the tested specific conductance standard. If your specific conductance value is not within +/- 2.5 when you verify, please redo the recalibrate and check process, and then record a new salinity and specific conductivity value from the estuary. After you have recorded the new sample value, complete the verification process to ensure the pH probe passes. This is just a friendly reminder, thank you for all of the hard work you do for CHEVWQMN! If you have any questions, please feel free to call: 941-575-5861.

Appendix C. Changes to QA Plan

C.1 QA Plan Version tracking

Version date	Updates	Purpose
June 2024	• Changed office phone number (page 1) • Removed staff who left ORCP from QA plan • Addressed QA Officers suggestions including adding Data Quality Objectives Table • Update SOPs- Appendix I	• Annual revisit of document to update for changes • Goal to have it included on FDEP QA website: https://floridadep.gov/dear/quality-assurance/content/quality-plans