

Water Sample & Management & Collection Guide

July 2005



W. A. Callegari Environmental Center
Water Quality Laboratory



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Water Sample Management, Collection and Hold Times

The following procedures are intended to assist sample collectors in the field to collect reliable representative water samples for in-time delivery to W.A Callegari Environmental Center laboratory. It is recommended that you contact the lab before collecting samples to ensure that all of the proper equipment (like bottles, ice packs and coolers, laboratory acquisition forms, etc.) is available and that specific information, such as date, time, weather conditions, are noted and correctly recorded. These procedures will ensure that samples are representative of actual conditions. Remember, all analytical data is only as good as the sampling techniques that were used to collect the sample analyzed.

General Information

Contact the laboratory prior sample collection if you have any questions about sampling not made clear in this document. Necessary materials for sampling include:

- Quart (1 L) and half gallon (2 L) glass or plastic container with water tight screw-on lid (mason jar would work in the absence of other suitable sampling container).
- A cooler of appropriate size to comfortably fit the sample and possibly the documentation.
- Ice packs work best, but regular ice will suffice. Use enough ice to keep the contents of the cooler between 35.6°F (2°C) and 44.6°F (7°C) during shipping.
- Indelible ink marker to label the sample with necessary information.
- A suitably sized Ziploc bag (if ice packs are used) or an additional sample container (if ice is used) to place the paperwork in inside the cooler for shipping. If using a Chain of Custody form, place it on the exterior of the cooler.
- One of two forms filled out by the person taking the sample:
 - A Sample Analysis Request form for samples not being analyzed for regulatory purposes, most commonly used (place inside the cooler during shipping).
 - A Chain of Custody form for samples being analyzed for regulatory purposes or for projects performed through regulatory agencies (place on the outside of the cooler during shipping, sign and date (with the time) whenever the sample(s) change hands during the shipping process.
- Any pertinent information related to the water being collected.

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Quality Assurance of Sample Collection

- All necessary precautions must be taken while collecting samples to prevent sample deterioration or contamination.
- Sample is collected in clean glass or plastic bottle, preferably with rubber or plastic-lined screw-cap. Do not use caps with paper liners, the paper fiber may disintegrate and contaminate the sample.
- Sample containers need to be clean and free from dust, dirt, chemical contaminants or residues. Pre-washing in a phosphate-free detergent, as recommended by the detergent manufacturer and rinsing well in high quality distilled or filtered water may reduce some surface contaminants, such as, phosphates on sample containers. Avoid using bleaches and strong detergents (If possible, rinse with a 10% hydrochloric acid (HCl) solution and rinse with deionized water). If sample is collected for regulatory purposes or projects funded through regulatory agencies, sample container blanks (an empty bottle without sample) may be required to determine potential surface contamination concentrations of bottles used in sample collection.
- Cleaned bottles should be capped and stored in container before sample collection. Sample equipment and cooler must also be cleaned after each round of sampling. Cross contaminants can further be reduced by keeping the sample container in Ziploc polyethylene bags when not in use.
- During sample collection, collect a small portion of the water to be collected in the sample container, replace the lid, and shake vigorously for a few seconds. Remove the cap and discard the contents away from the sampling area. This action will reduce possible contaminants in the container by coating all interior surfaces with water similar to that being collected. The inner side of the bottle and cap should not be touched with anything but the sample water. Remove caps only just before sampling and re-cap immediately.
- Once sample is collected it should be immediately stored in a cooler packed with ice or ice packs. Do not allow sample to warm. Conversely, do not let the sample freeze unless required as a special preservation procedure.
- Sample should be received by the laboratory in a minimal amount of time. Each analysis has a specific amount of time between sample collection and analysis (holding time) that should be met to ensure the most accurate analysis possible. Deviations past the holding time reduce the reliability of analyses. Always check the holding time requirements for all the analytes being performed and plan accordingly. For some parameters, such as, fecal coliform bacteria and BOD, the maximum holding time is 6 hours. Special delivery arrangements may be required for such parameters to ensure validity of test results. Otherwise, next day delivery or overnight delivery is highly recommended.

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- Sample collectors need to keep their hands clean. Wear latex gloves when possible and refrain from smoking, drinking or eating while sampling or near samples.
- Keep sparks, flames and excessive heat sources away from samples and sampling locations.

Sample Volume

If biochemical oxygen demand (BOD5) or total, dissolved, suspended or volatile solids (TS, TDS, TSS or VS respectively) analyses are required, collect a minimum of two (2) quarts or liters. If these analyses are not required, collect a one (1) quart or liter sample. When collecting a sample, collect a sufficient amount to minimize the air gap or headspace in the container.

Sample Collection Techniques

Two types of sample collection techniques are common when collecting water samples for analysis:

- A **grab sample or dip sample** is collected by allowing a container to fill after submerging the container just below the water surface at a randomly selected location. Minimal disturbance of the sediments on pond or stream bottoms is necessary or analytical results may be significantly influenced.
- **Composite samples** are obtained by combining equal volumes of multiple, discrete, randomly selected grab samples to estimate average water quality conditions.
- **Integrated (discharge-weighted) samples** are collected with a specific goal in mind by mixing grab samples collected from pre-determined locations, depths, widths, segments, etc., simultaneously in a water body.

River/stream/creek

Most samples taken from rivers, streams or creeks are grab samples taken near the surface at mid-stream rather than near shore. Avoid collecting surface scum and film. Whenever possible, samples should be collected facing upstream and upstream from your direction of travel to minimize introduction of contamination by disturbed sediments. Samples can also be collected from a boat, while on land or from the top of a bridge. A sampling container or dipper may be affixed to a long, sturdy pole and used to take the sample directly or to create a composite sample from addition of several smaller portions to the larger sample container. The choice of location, depth and frequency of sampling depends on the purpose of the investigation.

Effluent Stream

Representative samples are collected at points within the effluent stream where the effluents are well mixed, typically near the center of the stream where currents are strongest to avoid boundary effects that contribute to an over abundance of sediments or buoyant (floating) debris. Grab samples are more appropriate where the analytes of interest are not expected to vary significantly. Conversely, composite samples are more appropriate when analytes are expected to vary with time and location, in which case equal volumes of the individual samples making the composite samples are mixed.

Receiving water

A grab or composite sample may be collected from water flowing into a specific impoundment or system (crawfish pond, rice field, catfish pond, etc.) at a point where the effluents in the water are well mixed. Special consideration for such samples depends upon the analyte in question and the effect of effluents on the receiving water investigated.

Ambient waters

Ambient or surface water samples (runoff water) are collected using either grab or composite sampling techniques. Samples may be collected manually or by an automated sampling device. The sampling device used should be clean and ensure that cross contamination of the samples is avoided. Automated sampling devices used for composite samples over extended periods (weeks and months) should be cleaned and checked routinely to minimize algal growth, deposits, or crushed tubing. Holding times for composite samples begin when the last portion of the composite is deposited in the sample. The maximum recommended composite sampling period is 24 hours. Samples collected from distribution systems (tap water) flush the lines fully open for at least 2 to 3 minutes before sampling.

Sample Storage and Preservation

Preservation of samples includes refrigeration and/or chemical treatment. The treatment used depends on the analyses to be performed. Samples on which biological analyses (BOD5, dissolved oxygen, or any microbiological analysis) or tests of pH and electrical conductivity are performed should not be chemically treated. Doing so would drastically influence the analytical results of these analyses.

Aside from refrigeration, sample preservation using acids is not required nor recommended in the field if samples are received in the lab in a timely manner.

Immediately after sample collection, samples should be stored at 39°F in a cooler packed with ice or ice packs and transported to the lab. The samples should be received several hours before the minimum analyte holding time expires (check analytes for their holding times and select shipping methods accordingly). Not all analyses require acidification, while most do require refrigeration. Refer to Table-I for specific requirements. As a last resort, if delivery is not possible for several hours after sampling, divide samples with one portion acidified to a pH less than 2 with concentrated Sulfuric Acid (0.1mL/50mL of

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sample) while the other portion is refrigerated only. If preservatives are used, report any preservatives added to the samples to the laboratory personnel.

Documentation

After each sample is collected, note time and date samples were taken, assign an identifier (a number, phrase, condition of interest, location, etc.) to each sample. Also, note any extraordinary conditions, features or nearby activities that may influence the sample analytical results, such as, cattle crossing upstream, heavy boat traffic, evidence of tractor traffic in the field near sampling location, etc. When appropriate, the information recorded on the sample log for each sample taken should be transferred to a Sample Analysis Request form or a Chain of Custody form prior to packaging and shipping. Instructions are included with each document to assist sample collection people in completing the forms.

Sample Receiving at the Lab

When samples are delivered, the cooler is unpacked, the samples inventoried according to the sample identifiers and quantities indicated on the Sample Analysis Request form (or Chain of Custody form, if applicable) and are relinquished to laboratory personnel. The lab personnel will inspect the samples, record the date, time and sign the form acknowledging receipt of the samples. Samples are logged into the sample log-in sheet, labeled, preserved, and stored in the cold room or prepared for immediate analyses.

Sample Rejection and Acceptance Policy

Typically, it is not the policy of the laboratory management to reject samples for analysis but to advise clientele of shortcomings in the sampling, packaging and/or shipping procedures that may influence analyses results. If the client wishes analyses to proceed, the laboratory will do so and document the client's acknowledgement of laboratory concerns. However, under unusual circumstances, sample rejection may be necessary.

Sample Rejection

Some of the following circumstances may, at the discretion of laboratory management, be used to reject regulatory and non-regulatory samples for analyses.

- Sample shipping cooler temperature was excessively high in transport, (improper storage for shipping; no ice or ice packs).
- Samples were preserved incorrectly (using the wrong preservative).
- Use of an inappropriate sample container.
- Holding times were exceeded (fecal coliform bacteria, BOD, etc., samples with minimal holding times of less than one day).
- Insufficient sample volume is present for all analyses due to leaks in sample containers.

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- Inaccurate sample identification on two or more samples when compared with identifiers expressed on documentation.

You will be notified promptly if an unusual condition is observed at time of log-in that may be suspected of influencing analytical results.

Sample Acceptance and Required Information

Samples submitted must be accompanied with Sample Analysis Request form, a current LSU account number, personal check or money order. The Sample Analysis Request form will provide the lab with the analyses to be performed on all samples; the name of the client or contact person for result remittance; identifiers for all samples; the date and time of sampling (with the signature of the sampler); and any pertinent information about the sampling local and/or conditions that may influence sample analyses; including the type of water (sewage treatment outflow, ambient, stream, pond, animal waste settlement pond, etc.) the samples consist of. If a Chain of Custody is required, please contact the laboratory personnel to obtain the necessary documentation and to generate appropriate protocols as needed for proper sample handling, billing and analyses.

Sample Containers and Labeling

Samples must be collected in appropriate sample containers. Table-I identifies the appropriate size and type of container necessary for each parameter. Sample container integrity must be determined before samples are collected (not cracked, broken or leaking). Each container should have a label with an identifier matching that on the Sample Analysis Request/Chain of Custody form. Samples must be clearly labeled to include a unique identifier or field ID to which a unique laboratory identification number may be assigned. Labels should be water resistant. Use indelible ink.

Sample Holding Times

Samples must be delivered to the laboratory to allow sample analysis to be completed within sample hold time for all analyses requested. See Table-I for preservation and holding time requirements. Sample delivery constraints will apply to samples that need to be processed within 48 hours or less.

Sample Volume

Appropriate sample volume must be provided. An additional sample volume may be required for some tests to provide the laboratory with the sample volume required to perform required QC.

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Sample Custody Procedures

The samples must be delivered to the laboratory staff who will accept the samples using sample acceptance and rejection policy mentioned above and perform the following steps:

- Verify that correct containers were used.
- Verify that all samples listed on the form are accounted for.
- Verify that all containers are properly sealed.
- Accept the samples and sign the Analysis Request/Chain of Custody form.
- Log samples into the log sheet.
- Label the samples with a unique Lab ID.
- Verify that sample is properly labeled with Lab ID.
- Store samples in the cold room.
- Perform requested analyses.

Submittal of Samples

It will be standard procedure for the laboratory to contact clients by phone or email to acknowledge receipt of samples. The Sample Analysis Request or Chain of Custody form should contain the appropriate phone number and/or email address of the contact person.

No samples for microbiological analyses will be accepted on Fridays unless prior arrangements are made with lab management.

Hand Carried

Unless special arrangements are made, samples should be submitted Monday through Friday between 8:00 a.m. and 4:30 p.m. and relinquished to the laboratory manager or his designee.

Overnight Courier or Package Delivery Service

Thermal preservation must be maintained by packing samples with a sufficient volume of ice (blue ice does not cool samples sufficiently). Unless special arrangements are made, overnight delivery needs to arrive Monday through Friday before 4:30 p.m. Samples sent by a package carrier are to be addressed to:

**W. A. Callegari Environmental Center
Water Quality Laboratory
1300 Dean Lee Drive
Baton Rouge, LA 70820
Ph: 225-765-5155
Fax: 225-765-5158**

Attn: Javed Iqbal;

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SAMPLE ANALYSIS REQUEST

The purpose of the Sample Analysis Request form, see Table 2, is to provide our lab with the correct contact information, sample information and requested analysis information necessary to complete the analyses. After samples are collected, they should be refrigerated (placed on ice in a cooler) during shipping to greatly reduce any activities of microorganisms that may influence sample analytical results. The cooler should be taped shut and unopened until it is received in the lab. This will ensure that there was no tampering with samples. In the event that the samples were not adequately cooled or that the cooler was opened en route to lab, a list of all persons who took custody of the cooler is needed so inquiries may be made. This protects us and the client. The following instructions should be used to help properly complete the Sample Analysis Request we have provided.

1. The Sample Analysis Request should be filled out at the time when samples are taken and must be properly completed. The first six (6) blocks in the upper left of the document provide the contact information for the person to whom the analytical results will be reported.
2. The upper center set of five (5) blocks provide information about the project (to help ensure that analytical results are accurate should more than one project receive analyses at one time), the person physically taking the samples, and the desired method requested for providing results (e-mail, fax, mail, etc.) and the format for e-mailed documents (Excel, Word, test, etc.).
3. To help us provide the best analysis possible, we need to know what kind of water sample is being taken because different sources of water (well, runoff, pond, etc.) will be expected to have drastically different levels of analytes. In the narrow block below the sampler and reporting information, please provide us with the type of sample(s) being collected. If one or more samples are from a different source, please provide the true source in the Notes column adjacent to the sample information (discussed below).
4. It is now time to fill out information about the samples being taken. The middle section of the Chain of Custody provides 17 rows containing sample information that must be correctly completed at the time samples are taken. Each row is divided into five (5) columns that contain sample information that must be filled out by the person taking the samples.
 - The first column is the sample identifier that provides the lab with your sample ID, farm, number, type, etc., that will allow lab personnel and you to accurately link samples with analytical results.
 - The date and time of sample collection are important for the laboratory personnel to ensure that sample holding times are not exceeded, possibly reducing the accuracy of results.

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- Under most circumstances you would only collect a single container of sample, unless you are splitting the samples and preserving the samples in the field, reducing the probability of less accurate results from analyses, or if you want to provide additional samples to be sure that the laboratory has adequate samples to perform all required analyses.
- The Notes section is provided so that any deviation from the normal sample collecting process that may influence results may be recorded. Some notable deviations that would influence results may be: use of a sample container that was not cleaned, water backing up into the channel where runoff water usually flows and where samples are collected, cattle movement in the direct vicinity of the sampling location, tilling or evidence of tractor activity in fields near the collection point, etc. Such information known about the sample may prove useful when unexpected analytical results are obtained.

5. There are twenty-seven (27) vertical boxes with alternating gray and white coloration located in the right upper section of the Sample Analysis Request under Requested Analyses where the codes for each current analysis or analysis package (refer to the Water Analysis Prices Sheet to determine the analyses corresponding to each code) are entered for your convenience. Choose the analyses or package you require for each sample, and place a check mark in the small block below the analysis and beside the sample information. Assume that each sample is separate and that each must have a list of Requested Analyses checked, even if all samples will receive the same analyses.

6. The shaded blocks at the bottom of the Sample Analysis Request sheet are to be filled out by laboratory personnel when samples are received in the laboratory.

7. At this point, the sampler must place the collected samples in a cooler partially filled with ice, and enclose the Sample Analysis Request in a separate water-tight container or bag. The cooler should be sealed well with tape to ensure that it will not open during shipping. The samples should be shipped with overnight or next day service when possible.

The following Sample Analysis Request must accompany samples to our laboratory with a valid LSU or Agricultural Center account number, or a check or money order made out to the LSU AgCenter for the correct fees. The document has been generated to provide the laboratory with necessary information to provide the client with the highest quality of service. Many analyses have very restrictive times between when samples are taken and the analyses begin, so it is highly recommended that samples be shipped overnight when possible. The samples must also be refrigerated during shipping or analytical results may not be accurate. It is imperative that the sample information provided on the Sample Analysis Request sheet is correct so we may provide results that correspond correctly with samples. Agricultural producers wishing to use our laboratory services should first contact their county agent for assistance in determining the appropriate sampling methods, analyses to perform and for assistance in filling out this document. In addition to the Sample Analysis Request

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sheet, we are also providing a list of the analyses and prices per analysis for future reference and to assist in filling out this document.

This form should be enclosed in the sample container when shipped because it contains reference to payments made or a check has been attached. If strict QA/QC adherence is required for regulatory compliance with governmental agencies, please contact the W. A. Callegari Environmental Center's personnel to obtain appropriate documentation and instructions on protocols.

CHAIN OF CUSTODY

Use of the Chain of Custody form (if necessary), see Table 3, assumes that strict QA/QC adherence is required for regulatory compliance with governmental agencies. Because this document must remain on the exterior of the sample packaging, all references to payment or accounts has been omitted from the document to reduce risk of tampering and potential theft. Please contact the W. A. Callegari Environmental Center prior to sample remittance to determine payment information, scheduling of sample remittance or other pertinent protocols required.

The following Chain of Custody must accompany samples to our laboratory. Many analyses have very restrictive times between when samples are taken and the analyses begin. It is imperative that the sample information provided on the Chain of Custody is correct. Farm or ranch producers wishing to use our laboratory services should first contact their county agent or personnel at the W. A. Callegari Environmental Center for assistance in determining the appropriate analyses to perform and for assistance in filling out this Chain of Custody.

The purpose of a Chain of Custody is to provide the laboratory and the client with a tool that provides all reporting, sampling, sample analysis and shipping information. The lab will have the contact, sample and requested analysis information necessary to complete the analyses and to troubleshoot the results if necessary. After samples are collected, they should be refrigerated (placed on ice in a cooler) during shipping to greatly reduce any activities of microorganisms that may influence sample analytical results. The cooler should be taped shut and unopened until it is received in the lab, to ensure that there was no tapering with samples. In the event that the samples were not adequately cooled or that the cooler was opened en route to lab, a list of all persons who took custody of the cooler is needed so inquiries can be made. This protects us and the client. Following instructions should be used to help properly complete the Chain of Custody we have provided.

1. The Chain of Custody should be filled out at the time when samples are taken and must be properly completed. The first six (6) blocks in the upper left of the document provide the contact information for the person to whom the analytical results will be reported.
2. The upper center set of five (5) blocks provide information about the project (if analyses are performed on samples from a specific funded project), the person physically taking the

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samples, and the desired method requested for providing results (e-mail, fax, mail, etc.) and the format for e-mailed documents (Excel, Word, test, etc.).

3. To help us provide the best analysis possible, we need to know what kind of water sample is being taken because different sources of water (well, runoff, pond, etc.) will be expected to have drastically different levels in analytical results. In the narrow block below the sampler and reporting information, please provide us with the type of sample(s) being collected. If one or more samples are from a different source, please provide the true source in the Notes column adjacent to the sample information (discussed below).

4. It is now time to fill out information about the samples being taken. The middle section of the Chain of Custody provides 15 rows containing sample information that must be correctly completed at the time samples are taken. Each row is divided into five (5) columns that contain sample information that must be filled out by the person taking the samples.

- The first column is the sample identifier that provides the lab with your sample ID, farm, number, type, etc., that will allow lab personnel and you to accurately link samples with analytical results.
- The date and time of sample collection are important for the laboratory personnel to ensure that sample holding times are not exceeded, possibly reducing the accuracy of results.
- Under most circumstances you would only collect a single container of sample, unless you are splitting the samples and preserving the samples in the field, reducing the probability of less accurate results from analyses, or if you want to provide additional samples to be sure that the laboratory has adequate samples to perform all required analyses.
- The Notes section is provided so that any deviation from the normal sample collecting process that may influence results may be recorded. Some notable deviations that would influence results may be: use of a sample container that was not cleaned, water backing up into the channel where runoff water usually flows and where samples are collected, cattle movement in the direct vicinity of the sampling location, tilling or evidence of tractor activity in fields near the collection point, etc. Such information known about the sample may prove useful when unexpected analytical results are obtained.

5. There are twenty-seven (27) vertical boxes with alternating gray and white coloration located in the right upper section of the Chain of Custody under Requested Analyses where the codes for each current analysis or analysis package (refer to the Water Analysis Prices Sheet to determine the analyses corresponding to each code) are entered for your convenience. Choose the analyses or package you require for each sample, and place a check mark in the small block below the analysis and beside the sample information.

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Assume that each sample is separate and that each must have a list of Requested Analyses checked, even if all samples will receive the same analyses.

6. There are five (5) columns at the bottom of the Chain of Custody under the headings of Time, Date, Relinquished by and Received by that are used to track shipment of the samples from sample collection to sample receipt at the laboratory. The sampler must correctly fill out the first row Time, Date and Relinquished by section at the time when he/she hands the samples to the next person in the sample delivery shipping sequence, and that person must fill out the first line of the Received by section. A copy of the document should be made of the Chain of Custody form for your records after the samples have been relinquished and the original affixed to the exterior of the cooler in a Ziploc bag taped to the top in a conspicuous location. The cooler should be sealed well with tape to ensure that it will not open during shipping. Instructions should be given to the next person in the delivery system about signing and dating the Relinquished by and received by sections and holding a copy of the document at the transfer of samples to a different entity in the shipping structure.

7. When samples are received in the laboratory, the lab personnel will sign the last block in the Received by section at the time and date when samples are relinquished by the last entity in the shipping structure. At that time he/she will assure that the cooler was not opened in shipping that the Chain of custody is properly filled out, that the samples were received on ice and will test the temperature in the cooler. This will be recorded at the very bottom of the Chain of Custody form.

Table-I: Required Containers, Preservation, Holding Times, and Sampling Method for water sample

Parameter	Test Method	Container	Sample Type	Storage (preserve only if necessary)	Maximum Hold-Time recommended	Max. Hold Time	Note
Nitrogen, Total Kjeldahl (TKN)	EPA 351.4	P, G	grab, composite	Cool, 4°C	7 days	28 d	If necessary, preserve with 0.1mL of conc. H ₂ SO ₄ /50mL, pH<2.
Total Phosphorus (colorimetric) (TP)	EPA 365.3	P, G	grab, composite	Cool, 4°C	48 hours	28 d	Lab needs prior notice. Deliver samples several hours before the max. Hold time. If necessary, preserve with 0.1mL of conc. H ₂ SO ₄ /50mL, pH<2.
Hydrolysable Phosphorus (colorimetric) (HP)	EPA 365.3	P, G	grab, composite	Cool, 4°C	48 h	28 d	Lab needs prior notice. Deliver samples several hours before the max. Hold time.
Ortho-Phosphorus (OP)	EPA 365.3	P, G	grab, composite	Cool, 4°C	48 hours	28 d	Lab needs prior notice. Deliver samples several hours before the max. Hold time.
Nitrate Nitrogen (Ion Chromatography)	EPA 300.0	PG	grab, composite	Cool, 4°C	48 hours	48 h	Lab needs prior notice. Deliver samples several hours before the max. Hold time. Do NOT acidify.
Sulfate (Ion Chromatography)	EPA 300.0	P, G	grab, composite	Cool, 4°C	28 d	28 d	
Chloride – (Ion Chromatography)	EPA 300.0	P, G	grab, composite	Cool, 4°C	28 days	28 d	
Fluorides (Ion Chromatography)	EPA 300.0	P, G	grab, composite	Cool, 4°C	28 days	28 d	
Bromides (Ion Chromatography)	EPA 300.0	P, G	grab, composite	Cool, 4°C	28d	28 d	
Nitrogen, Nitrite (Ion Chromatography)	EPA 300.0	P, G	grab, composite	Cool, 4°C	48 h	48 h	Lab needs prior notice. Deliver samples several hours before the max. Hold time. Do NOT acidify.
Phosphate (Ion Chromatography)	EPA 300.0	P, G	grab, composite	Cool, 4°C	48 h	48 h	Lab needs prior notice. Deliver samples several hours before the max. Hold time.
Solids - Total Volatile	EPA 160.4	P, G	grab, composite	Cool, 4°C	7 days	7 d	
Total Solids (TS)	EPA 160.3	P, G	grab, composite	Cool, 4°C	7 days	7 d	
Total Suspended Solids (TSS)	EPA 160.2	P, G	grab, composite	Cool, 4°C	7 days	7 d	
Total Dissolved Solids (TDS)	EPA 160.1	P, G	grab, composite	Cool, 4°C	7 days	7 d	
Biological Oxygen Demand 5-Day (BOD5)	SM5210B	P, G 2 L	grab, composite	Cool, 4°C	6 h	24 h	Lab needs prior notice for this parameter. Needs special arrangements to deliver the samples to the Lab within max. Hold time.

Chemical Oxygen Demand (COD)	EPA 410.4	P, G	grab, composite	Cool, 4°C	7 d	28 d	If necessary, preserve with 0.1mL of conc. H2SO4/50mL, pH<2.
Dissolved Oxygen (DO)	EPA 360.1	P, G	grab	none required	0.25 h	0.25 h	Analyze immediately.
Ammonia (NH3)	SM4500-NH ₃ -E	P, G	grab, composite	Cool, 4°C	7 d	28 d	If necessary, preserve with 0.1mL of conc. H2SO4/50mL, pH<2.
Acidity (H+)	SM 2310-B	P, G(B)	grab	Cool, 4°C	24 h	14 d	
Alkalinity (OH-)	SM 2320.B	P, G	grab	Cool, 4°C	24 h	14 d	
pH	EPA 150.1	P, G	grab	none required	0.25 h	0.25 h	Analyze immediately.
Specific Conductance (electrical conductivity) (EC)	SM 2510-B	P, G	grab, composite	Cool, 4°C	28 d	28 d	
Fecal Coliform (A1 medium) (Fecals)	SM 9221-E	P, G	grab, composite	Cool, 4°C	6 h	6 h	Lab needs prior notice for this parameter. Needs special arrangements to deliver the samples to the Lab within hold time.
E. Coli (E.coli)	SM 9221-F	P, G	grab, composite	Cool, 4°C	6 h	6 h	Lab needs prior notice for this parameter. Needs special arrangements to deliver the samples to the Lab within hold time.

G = glass, G(A) = glass rinsed with 1+1 HNO₃, G(B) = borosilicate glass, P = plastic

Notes:

Collect 2-L sample in a clean glass or plastic bottle preferably with rubber or plastic-lined cap. Deliver samples to the lab as soon as possible.

Samples are preserved only at the lab if received within 6 hours (the least hold time for an analyte in the above table). However, samples can be acidified in the field if a delay is suspected in delivery.

Hold time is from the end of sample collection period for composite samples. Maximum composite time is 24 hours.

Chlorinated samples need to be collected in sample bottle containing .008% Na₂S₂O₃ (0.16 g for 2-L).

References:

Standard methods for the examination of water and waste water. 20th Edition, 1998. American Public Health Association

EPA Guidelines, 2000. *Water sampling*



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Chain of Custody

Make Checks Payable to the LSU AgCenter

Report To:				Project-name/location				Write name of requested analyses below (refer to price sheet for names)											
Name (or Company):				Sampler Signature															
Address:				Print Name															
City		State		Zip		Affiliation													
Phone		Fax		How would you like your results provided?				Write the code corresponding to the name of analysis below (refer to price sheet for codes)											
Email:				Account Number (if applicable)															
Matrix (water, solids, etc.):																			
Field ID	Date	Time	# of Containers	Notes				Place check mark below to indicate analyses requested on each sample listed											
Date	Time	Relinquished by:				Received by:													
		Printed Name		Signature		Affiliation		Printed Name		Signature		Affiliation							

Samples received on ice? yes no Cooler/sample secure? yes no Cooler temperature: _____



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Cost Center Price List 7/1/2010

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List of Analyses for General Public
& Research Community

Schedule A
Water Quality Lab Analyses
 Individual Analysis

Individual Analysis	Method	Analysis Code	Price
Acidity	SM 2310 B	100	\$8.00
Alkalinity	SM 2320 B	101	\$8.00
Ammonia-N	SM 4500-NH3-E	102	\$8.00
Anions (includes the following) <i>(Bromide, Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate)</i>	EPA 300.0 ---	103 ---	\$15.00 ---
BOD 5	SM 5210-B	104	\$20.00
Chem Oxygen Demand	EPA 410.4	105	\$12.00
Conductivity/salinity	SM 2510-B	106	\$8.00
Dissolved Oxygen	EPA 360.1	107	\$8.00
E.coli	SM 9221-F	108	\$20.00
Fecal Coliforms	SM 9221-E	109	\$15.00
Hydrolyzable Phosphorus	EPA 365.3	110	\$15.00
pH	EPA 150.1	111	\$8.00
Phosphorus- Ortho	EPA 365.3	112	\$15.00
Total Coliforms	SM 9221-B	113	\$30.00
Total Dissolved Solids	EPA 160.1	114	\$10.00
Total Heterotrophic Plate Count	SM 9215-A	115	\$15.00
Total Kjeldahl N	EPA 351.4	116	\$15.00
Total Petroleum Hydrocarbons	EPA 3511/8015	117	\$30.00
Total Phosphorus	EPA 365.3	118	\$15.00
Total Solids	EPA 160.3	119	\$10.00
Total Suspended Solids	EPA 160.2	120	\$10.00
Total Volatile Solids	EPA 160.4	121	\$10.00
Turbidity	EPA 180.1	122	\$8.00
Volatile Organic Chemicals (VOC)	EPA 3511/8015	123	\$30.00
Mercury (Cold vapor technique)	EPA 245.1	124	\$15.00
Metals and trace metals by ICP (no digest)	EPA 200.7	125	\$15.00
Metals and trace metals by ICP (with digestion)	EPA 200.7	126	\$15.00
Hardness	SM2340-B	127	\$15.00
Total Organic Carbon	EPA 9060A	128	\$10.00
Organohalide pesticides and PCB products	EPA 505	129	\$30.00
Purgeable organic compounds	EPA 524	130	\$30.00
Purgeable Halocarbons	EPA 601	131	\$30.00
Purgeable Aromatics	EPA 602	132	\$30.00
Acrolein and Acrylonitrile	EPA 603	133	\$30.00
Polynuclear Aromatic Hydrocarbons	EPA 610	134	\$30.00
Chlorinated herbicides	EPA 8151A	135	\$30.00
Organochlorine Pesticides	EPA 8081A	136	\$30.00
Organophosphorus Pesticides	EPA 8141A	137	\$30.00
Semivolatile Organic Compounds	EPA 8270C	138	\$30.00
Water Processing-Level 1	EPA	141	\$100.00
Water Processing-Level 2	EPA	142	\$250.00
Water Processing-Level 3	EPA	143	\$500.00



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Cost Center Price List 7/1/2010

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List of Analyses for General Public
& Research Community

Schedule A
Water Quality Lab Analyses
Analysis Packages

Phosphorus Speciation (151)			
Analysis:	Method	Code	Price
Hydrolyzable Phosphorus	EPA 365.3	151	\$43.00
Phosphorus- Ortho			
Total Phosphorus			
Nitrogen Speciation (152)			
Ammonia-N	SM 4500-NH3-E	152	\$36.00
Anions	EPA 300.0		
Total Kjeldahl N	EPA 351.4		
Solids Package (153)			
Total Dissolved Solids	EPA 160.1	153	\$38.00
Total Solids	EPA 160.3		
Total Suspended Solids	EPA 160.2		
Total Volatile Solids	EPA 160.4		
Animal Feeding Operation Runoff (154)			
Anions	EPA 300.0	154	\$72.00
BOD 5	SM 5210-B		
Fecal Coliforms	SM 9221-E		
Total Phosphorus	EPA 365.3		
Total Solids	EPA 160.3		
Confined Animal Feeding Operation Waste Treatment Water (155)			
Ammonia-N	SM 4500-NH3-E	155	\$95.00
Anions	EPA 300.0		
Chem Oxygen Demand	EPA 410.4		
Fecal Coliforms	SM 9221-E		
Total Dissolved Solids	EPA 160.1		
Total Kjeldahl N	EPA 351.4		
Total Phosphorus	EPA 365.3		
Total Suspended Solids	EPA 160.2		
Agricultural Runoff (156)			
Anions	EPA 300.0	156	\$67.00
BOD 5	SM 5210-B		
Total Phosphorus	EPA 365.3		
Total Solids	EPA 160.3		
Total Suspended Solids	EPA 160.2		
Hydrocarbon package (157)			
Total petroleum hydrocarbons	EPA 3511/8015	157	\$57.00
Volatile organic compounds	EPA 3511/8015		
Well water package (158)			
Anions	EPA 300.0	158	\$108.00
Electrical conductivity/salinity	SM 2510-B		
Turbidity	SM 2130-B		
Ammonia-N	SM 4500-NH3-E		
Metals and trace metals by ICP (no digest)	EPA 200.7		
Total Coliform test	SM 9221-B		
Volatile organic compounds	EPA 3511/8015		
Minimum post sterilization testing (chlorine sterilants only) (159)			
Anions	EPA 300.0	159	\$86.00
Total Coliforms	SM 9221-B		
Total heterotrophic bacteria plate counts	SM 9215-A		
Hardness	SM 2340-B		
Metals and trace metals by ICP (no digest)	EPA 200.7		
General Environmental Water and Wastewater Package (160)			
Anions	EPA 300.0	160	\$168.00
Biochemical oxygen command (BOD5)	SM 5210-B		
Mercury (Cold vapor technique)	EPA 245.1		
Metals and trace metals (with digestion)	EPA 200.7		
Total Dissolved Solids	EPA 160.1		
Total Solids	EPA 160.3		
Total Suspended Solids	EPA 160.2		
Total Organic Carbon	EPA 9060A		
Chem Oxygen Demand	EPA 410.4		
Total coliform bacteria	SM 9221-B		
Total Kjeldahl nitrogen	EPA 351.4		
Total phosphorus	EPA 365.3		



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List of Analyses for General Public
 & Research Community

Schedule B

Composting & Compost Analyses

Individual Analysis:

Individual Analysis	Method	Analysis Code	Price
Man Made Inert Removal and Classification	TMECC 02.02-C	200	\$15.00
Total Solids and Moisture At 70±5°C	TMECC 03.09-A	201	\$10.00
Total Nitrogen	TMECC 04.02-D	202	\$10.00
Organic C	TMECC 04.01-A and 05.02-A	203	\$10.00
Total Hydrogen	CHN Analyzer	204	\$10.00
Electrical Conductivity	TMECC 04.10-A	205	\$10.00
pH	TMECC 04.11-A	206	\$10.00
Bioassay (seedling emergence and seedling vigor)	TMECC 05.05-A	207	\$20.00
Organic Matter (Loss on ignition)	TMECC 05.07-A	208	\$10.00
Respirometry (CO2 evolution)	TMECC 05.08-B	209	\$20.00
ICP-AES/ICP-MS analysis for Metals	TMECC 04.14-A with digestion 04.12-B	210	\$20.00
Cold Vapor AA for Mercury	TMECC 04.13-A with digestion 04.12-A	211	\$25.00
Total Coliform Bacteria	TMECC 07.01-A	212	\$30.00
Ash (milled with inerts removal)	TMECC 03.02-B	213	\$10.00
Bulk Density, porosity, free air space and water holding capacity	TMECC 03.01-A	214	\$10.00
Sample sieving for aggregate size classification	TMECC 02.02-B	215	\$10.00
Nitrate by IC	TMECC 04.02-B	216	\$15.00
Ammonium (ion selective electrode)	TMECC 04.02-C	217	\$10.00
Water soluble P and K	TMECC 04.12-B, TMECC 04.03-B, TMECC 04.04-B	218	\$20.00
Specific oxygen uptake rate (SOUR)	TMECC 05.08-A	219	\$15.00
Heterotrophic microorganisms	APHA 9215-A, 9250-B and 9610-B	220	\$15.00
Total Petroleum Hydrocarbons (TPH)	EPA 3550-B and 8015-B	221	\$30.00
Volatile organic chemicals (VOC)	EPA 3550-B and 8015-B	222	\$30.00
Sample handling charge (splitting, mixing, milling and grinding)	TMECC 02.02-A, TMECC 02.02-D	223	\$15.00
Chlorinated herbicides	TMECC 06.01, EPA 8151A	224	\$30.00
Organochlorine Pesticides	TMECC 06.03, EPA 8081A	225	\$30.00
Organophosphorus Pesticides	TMECC 06.04, EPA 8141A	226	\$30.00
Semivolatile Organic Compounds	TMECC 06.046, EPA 8270C	227	\$30.00
Compost Processing-Level 1	USCC	241	\$100.00
Compost Processing-Level 2	USCC	242	\$250.00
Compost Processing-Level 3	USCC	243	\$500.00

Group Analysis Pricing:

Analysis	Method	Code	Price
Sample sieving for aggregate size classification	TMECC 02.02-B	401	\$200.00
Total Solids and Moisture at 70±5°C	TMECC 03.09-A		
Total Nitrogen	TMECC 04.02-D		
Organic C	TMECC 04.01-A and 05.02-A		
Total Hydrogen	CHN Analyzer		
Electrical Conductivity	TMECC 04.10-A		
pH	TMECC 04.11-A		
Bioassay (seedling emergence and seedling vigor)	TMECC 05.05-A		
Organic Matter (Loss on ignition)	TMECC 05.07-A		
Respirometry (CO2 evolution)	TMECC 05.08-B		
ICP-AES Analysis for Metals	TMECC 04.14-A with digestion 04.12-B		
Cold Vapor AA for Mercury	TMECC 04.13-A with digestion 04.12-A		
Total Coliform Bacteria	TMECC 07.01-A		
Sample Prep (splitting, mixing, milling and grinding)	TMECC 02.02-A, TMECC 02.02-D		



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List of Analyses for General Public
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Schedule C

BioDiesel Quality Control Lab Analyses (B100)

Individual Analysis:

Analysis	Method	Analyses Code	Price
Free and Total Glycerine	ASTM 6584	501	\$25.00
Fatty Acid Methyl/Ethyl Esters (FAME/FAEE)	GC FID	502	\$30.00
Fatty Acids (FA)	GC FID	503	\$30.00
Elements by ICP-OES including Phosphorus, Sulfur, Ca, and Mg	ASTM D4951-02	504	\$20.00
Flash point Test	ASTM D93-02a	505	\$15.00
Kinematic viscosity, 40C	ASTM D445-04	506	\$15.00
Sulfated Ash	ASTM D 874	507	\$15.00
Acid Number	ASTM D664	508	\$15.00
Phosphorus Content by ICP	ASTM D4951-02	509	\$20.00
Oxidative Stability Index	Rancimat, ASTM D2274	510	\$20.00
Moisture Contents	Karl Fisher Titration	511	\$20.00
Water & sediments by centrifugation	ASTM D2709	512	\$15.00
Cloud Point	ASTM D-2500-05	513	\$15.00
Carbon Residue 100% sample	ASTM D4530	514	\$15.00
Biodiesel, B100	Price per gallon	515	\$1.50
Deposit for 55 gallon drum	Price per drum	516	\$25.00
Biodiesel Processing-Level 1	ASTM	541	\$100.00
Biodiesel Processing-Level 2	ASTM	542	\$250.00
Biodiesel Processing-Level 3	ASTM	543	\$500.00

Group Analysis Pricing (Biodiesel ASTM D6751 Package):

Analysis	Method	Analyses Code	Price
Free and Total Glycerine	ASTM 6584	550	\$162.00
Elements by ICP-OES including Phosphorus, Sulfur, Ca, and Mg	ASTM D4951-02		
Flash point Test	ASTM D93-02a		
Kinematic viscosity, 40C	ASTM D445-04		
Sulfated Ash	ASTM D 874		
Acid Number	ASTM D664		
Oxidative Stability Index	Rancimat, ASTM D2274		
Water & sediments by centrifugation	ASTM D2709		
Cloud Point	ASTM D-2500-05		
Carbon Residue 100% sample	ASTM D4530		

