



United States Department of the Interior

U.S. GEOLOGICAL SURVEY
National Water Quality Laboratory
P.O. Box 25585
Denver, CO 80225-0585

**NATIONAL WATER QUALITY LABORATORY
TECHNICAL MEMORANDUM 2011.01**

May 6, 2011

Subject: Requirements for the Proper Shipping of Samples to the
National Water Quality Laboratory

Effective

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Authors: Pat Alex 303-236-3181 (paalex@usgs.gov)

Phil Grano 303-236-3707 (pwgrano@usgs.gov)

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PURPOSE AND SCOPE

This memorandum addresses issues related to the shipment and submittal of samples to the National Water Quality Laboratory (NWQL) and provides instructions for completing Analytical Services Request (ASR) forms. This memorandum supersedes NWQL Technical Memorandum 02.04 and should now be used as the official reference for instructions pertaining to sample shipment and submittal.

A strong partnership between field operations and the NWQL is essential to ensure sample viability, personnel safety, quality, efficiency, and final delivery of an optimum product.

For purposes of this Technical Memorandum, bottles, solid solvent cartridges, vials, and other types of sample vessels that are used to collect water, sediment, or tissue samples will be referred to as "sample containers".

BACKGROUND

More than 35,000 samples consisting of over 240,000 sample containers are sent to the NWQL each year for analysis. Proper packing of samples is necessary to ensure that they

arrive intact and viable for analysis, to comply with Department of Transportation and other shipping regulations, and to protect the safety and health of laboratory personnel. The NWQL has requirements that Water Science Center (WSC) personnel are to follow when submitting samples to the laboratory. This NWQL Technical Memorandum is intended to provide instructions and answer questions that will eliminate problems associated with sample shipment and submittal.

I. PREPARING ANALYTICAL SERVICES REQUEST (ASRs) FORMS FOR SHIPMENT

The most recent version of the ASR (August 2010) is mandatory for all samples shipped to the NWQL. ASRs produced by the Personal Computer Field Form (PCFF) software also are acceptable if they are created from the most current version (6.1f or later). ASR forms are available on the NWQL Homepage at <http://www.nwql.cr.usgs.gov/USGS/dyn.shtml?ship-info>. A surcharge will be added to the cost of the sample when nonstandard ASRs are used.

Prior to shipping regulated soil samples please refer to the shipping information section at <http://www.nwql.cr.usgs.gov/USGS/rn.shtml?10-020>

ASRs must be typed or filled out using a pen with permanent, waterproof ink. DO NOT use felt-tip pens or pencils.

1. Mandatory Information Section

The following information is required on ASRs to complete the sample login process:

- User code
- 15-digit FBMS Project account number
- USGS station ID (Enter downstream order number, 15-digit latitude, longitude and sequence number or unique sample identifier)
- Begin date
- Begin time
- Medium code and sample type
- WSC contact and phone number
- WSC contact e-mail

The e-mail contact and phone number are essential information in the event of problems or questions.

2. Site/Sample/Special Project Information Section

Items marked with an asterisk (*) on the ASR are required for the National Water Information System (NWIS) data storage.

Enter the following fields when appropriate:

- Chain of Custody
- NWQL Proposal Number

Use the "Comments to NWQL" field of the ASR to communicate the following information, when appropriate:

- Sample volume filtered
- Alternate point of contact and phone number
- Laboratory or field spike information
- Chain of custody
- Any additional notes that you would like to send to the laboratory pertaining to your sample.

Use the hazard field on the ASR to note contaminated or potentially hazardous samples.

It is critical that WSC personnel identify all highly contaminated or potentially hazardous samples so proper precautions are taken. Prior contact with the NWQL for these special cases is required to protect personnel and avoid cross-contamination problems. Shipping personnel are encouraged to provide as much information as possible about the sample and the sample containers. For example, if samples are collected from a site previously known to require dilutions, include a comment providing this information.

Additional information for shipping hazardous samples can be found at <http://www.nwql.cr.usgs.gov/USGS/dyn.shtml?ship-info>

3. Analytical Work Requests: Schedules and Laboratory Codes Section

All schedules and lab codes for the sample containers that are shipped with the ASR must be listed on the ASR in the Analytical Work Requests section. Indicate whether the lab code is to be added or deleted. All schedules and lab codes must be current and valid. Schedules and lab codes can be verified from the NWQL catalog found at: <http://www.nwql.cr.usgs.gov/USGS/catalog/index.cfm>. Do not request analytical work by writing analytical request information on the sample containers.

4. Shipping Information Section

Complete the information about the number and type of sample containers sent. Complete information on sample designations, containers, and preservatives are available in the NWQL catalog at the following address: <http://www.nwql.cr.usgs.gov/USGS/catalog/index.cfm>

The "NWQL Login Comments" field is reserved for internal NWQL use. The "Collected by" and "Phone No." fields are to be completed by the customer.

Sample containers and ASR information **MUST** match and be complete (station ID, date, time) in each shipping container.

5. Field Values Section

Include pH and specific conductance values for all inorganic environmental and blank samples. The NWQL will charge the appropriate account if the laboratory analysis requires a specific conductance value and none is provided on the ASR.

If a specific conductance value is not available from the field or NWQL determination, then analyses requiring a specific conductance value for determining dilutions may have the sample diluted unnecessarily. This dilution step will raise reporting levels proportional to the applied dilution for affected tests.

II. SHIPPING CONTAINERS

1. Unchilled samples may be shipped in standard containers.
2. Ship chilled sample containers in coolers packed with sufficient ice to maintain temperature at or below 4°C. Securely tape the outside of the shipping container to prevent leaking and to maintain sample integrity. If the cooler has a spigot, seal it with silicone or epoxy to prevent leakage. Damaged coolers will be discarded following WSC notification. In the interest of safety, do not ship coolers weighing more than 75 pounds.

Important note: Coolers should be inspected with regard to their condition before packing samples. Coolers with missing handles, loose fitting lids, cracks, etc., are not to be used.

3. Permanently mark the inside lid of the cooler with return address and telephone number.
4. If FedEx shipping tags are attached to the handles of coolers, ensure the shipping address is also on the cooler in case the handle is broken and the tag becomes separated.

III. PACKAGING OF SAMPLES

1. Mark each sample container sent to the NWQL with a permanent, waterproof marking pen or with a waterproof preprinted label securely attached to the sample container. If preprinted labels are used, take precautions to ensure that the label and the information on it remain intact and legible throughout the shipping process.

Avery Weatherproof Laser Address Labels (5520) work well.

2. All sample container labels must contain the following information:

- USGS Station ID
- Date of Collection
- Time of Collection
- Bottle Type
- Schedule and/or Lab Code

This information is critical because it serves as a link between the sample container and the ASR. If you are sending field matrix spikes and there is more than one bottle of the same type, it is very important to label each bottle with the intended schedule and lab code information to be used for each analysis.

3. Securely fasten the caps on the lids of the sample containers. Do not use tape or Para film on sample containers. Line all shipping containers with two (one bag inside of the other) heavyweight plastic bags. To isolate the samples from ice melt, place sample containers in heavy zip-lock bags. Place bagged sample containers and ice (if required) inside the plastic bags. Seal each bag with a knot, filament tape, or twist ties.
4. If multiple sample sets are shipped in a single shipping container, label each set of samples and the ASR(s) with a letter or number to assist the NWQL in grouping the samples. It is recommended that all sample containers from a sample set be placed in a sealable plastic bag or mesh bag. This simplifies the segregation of sample sets and improves the efficiency of sample receipt log-in operations. Sealable plastic bags should be folded over and taped.
5. Each shipping container should contain at least one ASR form and all sample containers associated with that ASR. Do not send samples in a shipping container without an ASR. Likewise, ASRs must not be sent without sample containers. If a sample set has sample containers that can be shipped separately (for example, chilled and unchilled), then each shipping container must have an ASR listing only the applicable schedules or lab codes with adds and deletes clearly indicated.
6. Place ASRs in sealed, ziplock bags. When shipping samples in coolers, the ASR packet should be taped to the inside lid of the cooler, along with **the return address label with street address and account number**. If the project account number is not provided the WSC default account number will be used for return shipping.
7. All sample containers for a particular lab schedule **MUST** be sent together. If a schedule contains chilled and unchilled sample containers, send all unchilled samples with the chilled sample containers in the same cooler. If not, WSC personnel must "delete" the schedules or lab codes for sample containers not

included in the shipment. These sample containers may be sent separately with an ASR that requests only the applicable schedules or lab codes.

8. To prevent sample loss, ship all glass sample containers in foam sleeves, bubble packs, or in a foam box designed for shipping glass containers. Do not rely on ice to provide cushioning between glass sample containers.
9. Send samples for volatile analysis, bottle type GCV (40-milliliter glass septum vial, amber) in bubble packs, sealable bags, or in foam sleeves. Do not use tape on caps or vials as this can result in sample contamination.
10. Do not use "blue-ice" or other types of commercially available refreezeable ices because samples could become contaminated or may not maintain an adequate temperature.
11. Do not chill sample containers with dry ice or with other substances that have a freezing point below zero degrees Celsius because it can cause the sample containers to break. Specific samples such as chlorophyll and tissue samples, do require the use of dry ice to keep the contents of the shipping container frozen; therefore, these samples must be placed in a separate shipping container. Because of overpressure from carbon dioxide, the shipping container must be ventilated. Dry ice is considered a "dangerous good" for air transport. When shipping dry ice, follow guidelines provided by the shipping service being used. Contact the shipper's customer service group for specific instructions. Additional paperwork may be required.
12. Do not mix packing materials, such as Styrofoam peanuts, with ice.
13. Do not pack sample containers in vermiculite or biodegradable peanuts.
14. Do not ship radon samples in coolers.
15. Use sufficient amounts of ice to keep samples well chilled during transit. The volume of ice should be equal to or greater than the volume occupied by the samples. Use twice the volume of ice during warm months.

IV. SHIPPING SAMPLES TO THE NWQL

None of the package-carrier services will deliver leaking coolers or boxes. To ensure that samples are not discarded or set aside by the carrier, take special precautions to make certain that the coolers or boxes are not leaking, and, in the case of coolers, that they can remain leak-proof even after the ice has begun to melt.

Send chilled and time-dependent samples to the NWQL by the most expedient means possible. The temperature of the cooler will be measured during sample login and documented in the Laboratory Information Management System (LIMS). In general, ship all time-dependent samples by a reliable express delivery service, such as Federal

Express, Priority Overnight. Ship radon samples priority overnight using the "FedEx Pak" or medium box, which are available from Federal Express free of charge. Never ship radon samples to arrive at the NWQL on a Saturday. When shipping radon label the shipping container "TIME-SENSITIVE SAMPLES" to facilitate immediate identification and processing.

Federal Express is one shipping agent that provides dependable overnight delivery of samples. Samples shipped on Friday via Federal Express will be picked up once each Saturday by the NWQL. However, the samples are not logged in for analysis until Monday. Please indicate "Priority Overnight and Saturday Delivery" on the Federal Express air bill. The NWQL is closed on all Federal holidays; therefore, extremely time-dependent samples should not be shipped in conjunction with a holiday. Use the following address when shipping samples to the NWQL:

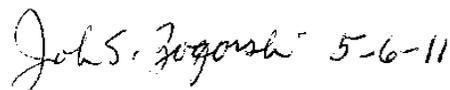
National Water Quality Laboratory
Building 95, Ent. E-3
Denver Federal Center
Denver, CO 80225-0046

Unchilled samples that are not time dependent may be sent the most economical means available. The U.S. Postal Service (USPS) first-class mail, United Parcel Service (UPS), and Federal Express Ground offer 3- to 5-day delivery of samples using ground transportation.

Chain-of-custody samples should be shipped according to the procedures outlined in NWQL Standard Operating Procedure QUAX0030.4, which can be found at the following web address: <http://www.nwql.cr.usgs.gov/USGS/dyn.shtml?ship-info>.

Custom and low-demand schedules and lab codes require an NWQL Custom Proposal prior to shipping samples. The approved proposal number must be entered in the NWQL Proposal Number field of the ASR. Requests for custom and low-demand analyses must be made in advance by contacting NWQL customer service at labhelp@usgs.gov.

By following the suggestions set forth in this memorandum, WSC personnel will greatly reduce the possibility for sample loss, error or delay in the analysis of their samples. Additional questions about sample shipment and submittal may be directed to Pat Alex (303) 236-3181 (paalex@usgs.gov). Inquiries regarding sample submittal, receipt, and login can be directed to lablogin@usgs.gov.



John S. Zogorski, Chief
National Water Quality Laboratory
Branch of Analytical Services

Supersedes: NWQL Technical Memorandum 02.04

Key Words: ASRs, Packaging, Samples, Sample Containers, Shipping

Distribution: E (All WRD employees; Field, and Project offices)

Impact on data base: None

Definitions:

Sample—Any medium that will be analyzed by the NWQL (includes water, sediment, tissue, and filters).

Sample container—Any sample vessel used to collect water, sediment, or tissue samples (includes bottles, cartridges, and vials).

Shipping container—Any container used to ship samples to the NWQL for analysis (includes cardboard boxes, coolers or ice chests, FedEx packages, or Styrofoam boxes).