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# United States Department of the Interior

U.S. GEOLOGICAL SURVEY

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Denver Federal Center

Denver, Colorado 80225

## NATIONAL WATER QUALITY LABORATORY TECHNICAL MEMORANDUM 97-05

February 28, 1997

To: Chief, Office of Water Quality  
Assistant Chief, Office of Water Quality  
Assistant Chief Hydrologist for Technical Support  
Regional Hydrologists  
Chief, NAWQA  
Chief, Office of Ground Water  
Assistant Chief, Office of Ground Water  
Area Hydrologists  
District Chiefs  
Regional Water Quality Specialists  
Assistant Regional Hydrologists for NAWQA  
District Water Quality Specialists  
Chiefs, NAWQA Study Units  
Chief, Quality Water Service Unit, Ocala  
Chief, Yucca Mountain Project  
QA Manager, Yucca Mountain Project  
Chief, Branch of Technical Development & Quality Systems  
Employees, National Water Quality Laboratory

From: Peter F. Rogerson, Chief  
National Water Quality Laboratory  
Branch of Analytical Services

Subject: Using the National Water Quality Laboratory for the analysis  
of drinking water samples

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Revision: None  
Supplemental: None

### INTRODUCTION

This memorandum provides guidance for Water Resources Division (WRD) District personnel in requesting National Water Quality Laboratory (NWQL) chemical analyses that meet the regulatory requirements of the U.S. Environmental Protection Agency's (USEPA) drinking-water program. These analyses are specific to drinking-water methodologies approved by USEPA Region 8 and the Colorado Department of Public Health and Environment (CDPHE). The use of these USEPA-approved methodologies is mandated by the Safe Drinking Water Act (SDWA), last revised in August 1996, and regulated in most cases by individual States through the USEPA.

## **SCOPE**

This NWQL Technical Memorandum includes a listing of NWQL lab codes, parameter codes, and schedules to be used when requesting analyses of chemicals in source or finished water, as well as corresponding USEPA method-number designations. It also provides guidance for the proper sample collection and preservation requirements and identifies required quality-assurance and quality-control (QA/QC) samples that must be collected and analyzed with the drinking-water samples. Instructions for completing the Analytical Services Request (ASR) form and shipping requirements are also included.

The NWQL cannot provide USEPA-certified drinking-water analyses unless the designated lab codes/schedules/parameter codes are requested. These lab codes/schedules/parameter codes may be used for samples other than drinking water, but it is suggested that the WRD project manager first contact the NWQL prior to sampling. This is especially true for regulatory projects or for those projects that may involve litigation.

## **NWQL CERTIFICATION**

The NWQL has been certified by the CDPHE for the constituents listed in this memorandum. This certification is valid in Colorado only and is effective until April 30, 1999. WRD personnel outside Colorado interested in drinking-water analyses should contact the appropriate State agency to determine if that State has reciprocity with Colorado. If the State does not have reciprocity, contact the appropriate State agency and the Quality Assurance Unit (QAU) at the NWQL to explore the steps needed to obtain this certification. All fees associated with NWQL certification for States other than Colorado are the responsibility of the District Office seeking the certification. Be aware that there may be State certification and analytical requirements that are not normal operating procedures used by the NWQL. In order for the NWQL to comply with such requirements, additional costs may be charged by the NWQL to the requesting WRD District. Because the NWQL is a secured facility, basic chain of custody is provided for all samples. To arrange for more stringent chain of custody security, contact the QAU. The NWQL regrets the complexity and costs associated with these processes and notes that there are several organizations, including the U.S. Geological Survey, working toward national standardized certification procedures.

## **DRINKING-WATER SCHEDULES AND LAB CODES FOR THE NWQL**

To maintain Safe Drinking Water Act certification, the NWQL has adopted a series of USEPA/CDPHE-approved analytical methodologies. The analytical methods adopted include most of the drinking-water chemical constituents regulated by the State of Colorado in 1996 (see tables 1 and 2). These lists of constituents may contain a partial or complete list of those compounds in which cooperators may be interested.

All WRD personnel submitting water samples to the NWQL for analysis for SDWA-mandated analyses must adhere to the following procedures to maintain legal protocol:

Bottles and preservatives for drinking water samples should be supplied by the cooperator, with the exception of 1:1 HCl:H<sub>2</sub>O for NWQL Organic Schedule 2206; the 30-mL dropper vial must be purchased from the NWQL (email DENSUPPLY@usgs.gov). If neither the Quality of Water Supply Unit (Geomail OCALAMAN) nor the cooperator can supply the drinking-water bottles and preservatives, these materials can be purchased from a scientific supply company. The bottles must be precleaned by the supplier to meet USEPA specifications for the analyte class. Mercuric chloride (HgCl<sub>2</sub>) is not to be used as a preservative for organic methods 507, 508, and 515.1. USEPA Technical Notes on Drinking

Water Methods states "This Technical Note removes the requirement to use mercuric chloride, because concerns have been raised about the environmental hazards and costs associated with disposal of mercuric compounds." Maximum contaminant levels are as stated in the Colorado Primary Drinking Water Regulations, which became effective January 30, 1995.

Deletions from the inorganic schedule are permitted; deletions from organic schedules are not permitted. Additions to these drinking-water schedules are not permitted. If there are constituents of interest to cooperators which are not included in these schedules, contact the QAU at the NWQL.

Table 1 lists the drinking-water schedules and lab codes for the organic methods. It also lists the bottle and preservative requirements. (Please note that Table 1 requires the addition of sodium thiosulfate for the treatment of residual chlorine. It is assumed that sampling personnel will have enough knowledge of the treatment facility to know if residual chlorine is present. If the sampling personnel are uncertain whether residual chlorine is present, add the sodium thiosulfate. Ascorbic acid must be used to treat the VOC samples for residual chlorine.) The organic schedules require sample collection in duplicate for all semivolatile schedules and in triplicate for all volatile schedules. This ensures that the samples can still be analyzed if a bottle breaks in shipment or if there is sample loss because of a loose cap.

Table 2 lists the lab codes, parameter codes, schedules, and other information for the inorganic methods.

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 Table 1.- National Water Quality Laboratory organic chemistry analytes for Safe Drinking Water Act regulatory methods

[°C, degree Celsius; FRB, field reagent blank; < less than; L, liter; mL, milliliter; mg, milligram; MRL, Minimum Reporting Level; GC/ECD, Gas Chromatography/Electron Capture Detector; GC/NPD, Gas Chromatography/Nitrogen-Phosphorus Detector; GC/MS, Gas Chromatography/Mass Spectrometry; HPLC, High Performance Liquid Chromatography; NWQL, National Water Quality Laboratory; MCL, Maximum Contaminant Level; µg/L, microgram per liter; USEPA, U.S. Environmental Protection Agency; VOC, volatile organic compounds]

Chemical Compound	Lab code	Parameter code	MRL (µg/L)	MCL (µg/L)	Holding time*
Herbicides in drinking water by Gas Chromatography/Electron Capture Detector USEPA Method 515.1		NWQL Schedule	2201		14 days
		Bottle type:	ECC		
Dalapon	2200	30200A	5.0	200	
2,4-D	2201	39730C	1.0	70	
2,4,5-TP	2203	39760C	0.5	50	
Picloram	2204	39720B	0.6	500	

Chemical Compound	Lab code	Parameter code	MRL (µg/L)	MCL (µg/L)	Holding time*
Triazines in drinking water by Gas Chromatography/Nitrogen-Phosphorous Detector		NWQL Schedule	2202		14 days
		Bottle type:	ECC		

(GC/NPD)  
USEPA Method 507

Simazine	2209	39055B	0.1	4
Atrazine	2210	39630B	0.1	3
Alachlor	2211	77825D	0.1	2

Chemical Compound	Lab code	Parameter code	MRL (µg/L)	MCL (µg/L)	Holding time*
Organic [Base, Neutral, and Acid (BNA)] compounds in drinking water by Gas Chromatography/Mass Spectrometry (GC/MS)		NWQL Schedule	2203		7 days
		Bottle type:	EBC		

USEPA Method 525.2

Bis(2-ethylhexyl) adipate	2216	77903A	1	400
Bis(2-ethylhexyl) phthalate	2217	39100B	1	6
Benzo[a]pyrene	2218	34247B	0.1	0.2

Chemical Compound	Lab code	Parameter code	MRL (µg/L)	MCL (µg/L)	Holding time*
Carbamate compounds in drinking water by High Performance Liquid Chromatography (HPLC)		NWQL Schedule	2204		28 days
		Bottle type:	ELV		

USEPA Method 531.1

Oxamyl	2225	38866C	5	200
Carbofuran	2226	49309C	5	40

Chemical Compound	Lab code	Parameter code	MRL (µg/L)	MCL (µg/L)	Holding time*
Diquat in drinking water by HPLC		NWQL Schedule	2205		7 days
		Bottle type:	EPC		

USEPA Method 549.1

Diquat	2229	04443A	1	20
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Chemical Compound	Lab code	Parameter code	MRL (µg/L)	MCL (µg/L)	Holding time*
Purgeables I [volatile organic compounds (VOC)] in drinking water by GC/MS		NWQL Schedule	2206		14 days
		Bottle type:	EOV		

USEPA Method 524.2

Vinyl chloride	2232	39175D	0.2	2
1,1-Dichloroethene	2233	34501D	0.2	7
Dichloromethane (methylene chloride)	2234	34423D	0.2	5
trans-1,2-Dichloroethene	2235	34546D	0.2	100
cis-1,2-Dichloroethene	2236	77093D	0.2	70
Chloroform	2237	32106D	0.2	100**
1,1,1-Trichloroethane	2238	34506D	0.2	200
Carbon tetrachloride	2239	32102D	0.2	5
Benzene	2240	34030D	0.2	5

1,2-Dichloroethane	2241	32103D	0.2	5
Trichloroethene	2242	39180D	0.2	5
1,2-Dichloropropane	2243	34541D	0.2	5
Bromodichloromethane	2244	32101D	0.2	100**
Toluene	2245	34010D	0.2	1000
1,1,2-Trichloroethane	2246	34511D	0.2	5
Tetrachloroethene	2247	34475D	0.2	5
Chlorodibromomethane	2248	32105D	0.2	100**
Monochlorobenzene (Chlorobenzene)	2249	34301D	0.2	100
Ethylbenzene	2250	34371D	0.2	700
m- & p- Xylenes	2251	85795C	0.2	10,000***
o-Xylene	2252	77135C	0.2	10,000***
Styrene	2253	77128D	0.2	100
Bromoform	2254	32104D	0.5	100**
1,4-Dichlorobenzene	2255	34571E	0.2	75
1,2-Dichlorobenzene	2256	34536E	0.2	600
1,2,4-Trichlorobenzene	2257	34551E	0.2	70

Chemical Compound	Lab code	Parameter code	MRL (µg/L)	MCL (µg/L)	Holding time*
Purgeables II [volatile organic compounds (VOC) in drinking water by GC/ECD USEPA Method 504.1		NWQL Schedule Bottle type:	2207 EDV		14 days

1,2 Dibromoethane (ethylene dibromide)	2262	77651F	0.05	0.05
1,2-Dibromo-3-chloropropane (DBCP)	2263	82625D	0.05	0.2

Chemical Compound	Lab code	Parameter code	MRL (µg/L)	MCL (µg/L)	Holding time*
Chlorinated pesticide compounds in drinking water by GC/ECD USEPA Method 508		NWQL Schedule Bottle type:	2208 ECC		7 days

Hexachlorobenzene	2267	39700B	0.2	1
Lindane (gamma-BHC)	2268	39340E	0.01	0.2
Heptachlor	2269	39410E	0.03	0.4
Heptachlor epoxide	2270	39420E	0.2	0.2
Chlordane (technical)	2271	39350E	0.1	2
Endrin	2272	39390E	0.06	2
Toxaphene	2273	39400E	2.0	3
Methoxychlor	2274	39480C	0.2	40

\*Holding time is the maximum total time from sample collection until sample extraction and preparation; for VOCs and carbamates, it also includes analysis time.

\*\*Total concentration of all trihalomethanes must be less than 100 µg/L.

\*\*\*Total concentration of all xylenes must be less than 10,000 µg/L.

#### BOTTLE AND PRESERVATION REQUIREMENTS FOR TABLE 1

ECC (collect in duplicate).- 1-L glass amber bottles with Teflon cap liner; if residual chlorine is present, add 80 mg/L sodium thiosulfate; chill to 4 degrees Celsius.

EBC (collect in duplicate).- 1-L glass amber bottles with Teflon cap liner, first dechlorinate by adding 40-50 mg/L sodium sulfite to the sample water, then acidify with 6N HCl to pH < 2, and then chill to 4 degrees Celsius. Do NOT mix sodium sulfite and 6N HCl together without first dissolving the sodium sulfite in the sample water.

ELV (collect in duplicate).- 60-mL glass screw-cap vials with Teflon-faced silicone septum, add monochloroacetic acid buffer to pH3 (approximately 1.8 mL); if residual chlorine is present, add 80 mg sodium thiosulfate; chill to 4 degrees Celsius.

EPC (collect in duplicate).- 1-L amber high-density polyvinyl chloride (PVC) bottles, add 100 mg/L sodium thiosulfate, acidify with H2SO4\* to pH2, chill to 4 degrees Celsius.

\*Acidification step is required only if the sample is biologically active.

EOV (collect in triplicate).- 40-mL amber glass screw-cap vials with Teflon-lined septum. If residual chlorine is present, add 25 mg ascorbic acid; AFTER filling vial with sample water, add 2 drops 1:1 HCl:H2O supplied by NWQL; chill to 4 degrees Celsius. Do NOT mix the ascorbic acid and 1:1 HCl:H2O in the vial without first adding the sample water. Triplicate field reagent blanks (FRB) must also accompany each field sample set.\*\*

EDV (collect in triplicate).- 40-mL amber screw-cap glass vials with Teflon-lined septum; if residual chlorine is present, add 3 mg sodium thiosulfate; chill to 4 degrees Celsius. Triplicate FRB's must also accompany each field sample set.\*\*

\*\*USEPA defines a field sample set as samples collected from the same general sample site at approximately the same time.

Table 2.- National Water Quality Laboratory inorganic chemistry analytes for Safe Drinking Water Act regulatory methods

[MRL, Minimum Reporting Level; MCL, Maximum Contaminant Level; µg/L, microgram per liter; EPA, (U.S. implied) Environmental Protection Agency; GFAA, Graphite Furnace Atomic Absorption Spectrophotometry; ICP/AES, Inductively Coupled/Plasma Atomic Emission Spectrometry; CVM, Cold Vapor Mercury; ISE, Ion Selective Electrode; COLOR, colorimetry]

Analyte	Lab Code	Parameter Code	Analysis Type	Method	MRL (µg/L)	MCL (µg/L)	Bottle Type	Holding Time*	
Inorganic parameters					NWQL Schedule 2215				
USEPA digestion	2335	99447B	----	USEPA	200.2	----	----	ERA	----
Selenium	2336	1147C	GFAA	"	200.9	1	50	ERA	6 mos
Arsenic	2337	1002D	GFAA	"	200.9	1	50	ERA	6 mos
Antimony	2338	1097C	GFAA	"	200.9	1	6	ERA	6 mos
Cadmium	2339	1027G	GFAA	"	200.9	1	5	ERA	6 mos
Thallium	2340	1059D	GFAA	"	200.9	1	2	ERA	6 mos
Chromium	2341	1034F	GFAA	"	200.9	1	10	ERA	6 mos
Lead	2342	1051G	GFAA	"	200.9	1	15	ERA	6 mos
Nickel	2344	1067G	ICP/AES	"	200.7	50	100	ERA	6 mos
Barium	2345	1007B	ICP/AES	"	200.7	5	2,000	ERA	6 mos
Beryllium	2346	1012B	ICP/AES	"	200.7	2	4	ERA	6 mos
NO2	2347	615E	COLOR	"	353.2	20	1,000	ERC	48 hrs
NO2+NO3	2348	630D	COLOR	"	353.2	100	10,000	ERC	28 days

Fluoride	2349	951E	ISE Technicon**	200	4,000	ERU	1 mo
Mercury	2350	71900C	CVM USEPA 245.1	0.1	2	EAM	28 days

\*Holding time is the maximum total time from sample collection until analysis.

\*\*This Technicon method is approved by USEPA.

Bottle and preservation requirements for Table 2:

- ERA.- 500-mL polyethylene bottle, acidify raw sample to pH < 2 with nitric acid (HNO3)
- ERU.- 250-mL polyethylene bottle, raw sample
- ERC.- 125-mL amber polyethylene bottle, raw sample, chill to 4 degrees Celsius
- EAM.- 250-mL glass bottle, acidify raw sample to pH < 2 with HNO3

The following constituents are regulated as primary contaminants by the State of Colorado as of 1996 but are not included in the certification of the NWQL:

- Endothall
- Hexachlorocyclopentadiene
- PCBs as Decachlorobiphenyl
- Dinoseb
- Pentachlorophenol

The quality-assurance (QA) samples for the organic schedules that must be collected in the field at the time of sampling are listed in Table 3. These QA samples must be shipped with the environmental samples. Note that there are no requirements for collecting inorganic QA samples in the field.

Table 3.- Minimum field quality-assurance sample requirements for the National Water Quality Laboratory drinking-water methods

Table 3 contains only QA samples mandated by USEPA

[GC/ECD, Gas Chromatography/Electron Capture Detector; GC/NPD, Gas Chromatography/Nitrogen-Phosphorus Detector; GC/MS, Gas Chromatography/Mass Spectrometry; HPLC, High Performance Liquid Chromatography; %, percent; NWQL, National Water Quality Laboratory; QA, quality assurance; USEPA, U.S. Environmental Protection Agency]

Organic Compound Class & Method & USEPA Method No.	Mandatory QA Samples		
	Field Collection	Spike Procedure	Replicate Procedure
Herbicides GC/ECD USEPA 515.1	Two matrix samples per shipment or 10% of samples, whichever is greater.*	One QA matrix sample will be spiked at the NWQL for every 10 routine samples.	One QA matrix sample will be analyzed as a replicate sample at the NWQL for every 10 routine samples.
Triazines GC/NPD USEPA 507	Two matrix samples per shipment or 10% of samples, whichever is greater.	One QA matrix sample will be spiked at the NWQL for every 10 routine samples.	One QA matrix sample will be analyzed as a replicate sample at the NWQL for every 10 routine samples.

Organic Compounds (BNAs)	Two matrix samples per shipment or 10% of samples, whichever is greater.*	One QA matrix sample will be spiked at the NWQL for every 10 routine samples.	One QA matrix sample will be analyzed as a replicate sample at the NWQL for every 10 routine samples.
GC/MS	One field reagent blank with each sample set.		
USEPA 525.2			
Carbamates	Two matrix samples per shipment or 10% of samples, whichever is greater.	One QA matrix sample will be spiked at the NWQL for every 10 routine samples.	One QA matrix sample will be analyzed as a replicate sample at the NWQL for every 10 routine samples.
HPLC			
USEPA 531.1			
Diquat	Two matrix samples per shipment or 10% of samples, whichever is greater.	One QA matrix sample will be spiked at the NWQL for every 10 routine samples.	One QA matrix sample will be analyzed as a replicate sample at the NWQL for every 10 routine samples.
HPLC			
USEPA 549.1			
Purgeables I	Collect all samples in triplicate. Two triplicate matrix samples per shipment or 10% of samples, whichever is greater.*	One QA matrix sample will be spiked at the NWQL for every 10 routine samples.	One QA matrix sample will be analyzed as a replicate sample at the NWQL for every 10 routine samples.
GC/MS	Triplicate field reagent blanks.		
USEPA 524.2			
Purgeables II	Collect all samples in triplicate. Two triplicate matrix samples per shipment or 10% of samples, whichever is greater.*	One QA matrix sample will be spiked at the NWQL for every 10 routine samples.	One QA matrix sample will be analyzed as a replicate sample at the NWQL for every 10 routine samples.
GC/ECD	Triplicate field reagent blanks.		
USEPA 504.1			
Chlorinated Pesticides	Two matrix samples per shipment or 10% of samples, whichever is greater.*	One QA matrix sample will be spiked at the NWQL for every 10 routine samples.	One QA matrix sample will be analyzed as a replicate sample at the NWQL for every 10 routine samples.
GC/ECD			
USEPA 508			

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 \*Two matrix samples for each shipment of 10 field samples. If there are fewer than 10 field samples, send two matrix samples.  
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## BOTTLES AND PRESERVATIVES

The bottles and preservatives for drinking-water samples must be of the types and concentrations specified by USEPA methodology. Refer to tables 1 and 2.

## FIELD-SAMPLING INSTRUCTIONS

Drinking-water samples must be collected using the following guidelines provided by the State of Colorado. If sampling outside of the State of Colorado, refer to the SDWA or the appropriate State agency concerning sampling procedures. The certified analytical methods are designated for samples collected from drinking water supply sources. The sample must be taken after the treatment points at the entry point to the distribution system.

Do not sample within the distribution system. If there are multiple water sources, each source must be sampled separately. If all or part of the water sources are blended before treatment, the blended water may be sampled after treatment at the entry point to the distribution system. If there is no sampling tap at the correct point, arrangements must be made to install one. A town hall or a house is not a proper sampling point for drinking-water supply sources. If a sample is collected at this type of sampling point, the certifying agency will require resampling at the correct source. **DO NOT** rinse sample bottles before filling with sample because rinsing will decrease the amount of preservative in the bottles.

The following sampling instructions apply to all sample types and bottles for domestic water-supply sources except lead-only samples (no other constituents to be analyzed) and VOC samples. For all other analytes, allow the water to run for 2 to 3 minutes before sampling. Fill each bottle separately from the source. Fill all bottles to the bottom of the neck, tighten the lid securely, and shake vigorously for 1 minute. The timing for the addition of preservatives is dependent on the bottle type. Some preservatives may be added to the bottle prior to sample collection; some preservatives must not be added until water is in the appropriate container. Refer to the cooperators for guidance in this matter. Do not mix contents of sample bottles together.

For lead-only samples collected at a domestic source, such as a kitchen faucet, take a first-draw sample without first flushing the pipes. Fill out a separate Analytical Services Request (ASR) form for lead-only water samples and submit a separate ERU bottle to accompany the lead-only sample. If a lead-only subsample is to accompany other sample types, use a different time on the lead-only ASR (perhaps alter the time by 1 minute). If any USGS schedule is requested from the same site requesting the same analyte(s), also alter the time to avoid overwriting the data in the NWQL and District data bases.

The following instructions apply to 40-mL VOC vials:

1. Allow the water to run for 10 minutes before collecting the samples.
2. For bottle type EO (Purgeables I), if residual chlorine is present, add 25 mg of ascorbic acid to the empty vial.  
For bottle type ED (Purgeables II), if residual chlorine is present, add 3 mg of sodium thiosulfate to the empty vial.
3. Fill vials to just overflowing, but do not flush out preservatives, if present.
4. For bottle type EO, add two drops of 1:1 HCl:H<sub>2</sub>O provided by the NWQL.  
(Acidification is only required for Purgeables I.)
5. Carefully secure the cap on the vial.
6. Invert the capped vial to observe if there is an air bubble in the vial. Shake the vial vigorously for 1 minute. Ensure that there is no bubble in the vial: if there is, discard the sample and repeat the collection procedure.

All samples for metals analysis (bottle type ERA--see table 1) must be acidified to a pH of < 2 with HNO<sub>3</sub>. The NWQL will verify that the pH of the sample is < 2 prior to analysis.

WRD personnel must be aware of, and comply with, federally mandated QA samples that may be specific to each USEPA Region or State; this information should be supplied by the cooperator. (See table 3 for mandatory organic QA samples for USEPA Region 8. There are no mandatory QA samples for inorganic constituents.)

## **LABELING AND SHIPPING INSTRUCTIONS**

Enter the following information on the label of each sample bottle with a waterproof marker; also, be sure not to use additional tape to secure the label or cap to VOC vials or any other organic sample because it will contaminate the sample.

1. Location (station ID) where the sample was taken.
2. Date sampled.
3. Time sampled.
4. Schedule(s) or lab code(s) for analysis of the sample.
5. Name of WRD person collecting the sample or WRD contact personnel.

Complete the ASR form and make sure that it is in the shipping container in a waterproof bag before the container is sealed. Add ice for samples that must be shipped chilled. Due to possible regulatory and/or litigation issues, it is strongly recommended that a temperature indicator be included in every chilled container for assurance that the samples have not warmed in transit to the NWQL. Drinking-water samples must be shipped separately from other environmental samples to avoid contamination. It is suggested that nutrient samples be shipped separately from metals samples because of possible contamination from the HNO<sub>3</sub> preservative in the metals samples. To comply with USEPA and CDPHE requirements to identify the samples as drinking-water samples, affix a fluorescent orange sticker to each bottle and the ASR form, and check the "drinking-water" field on the ASR. Place the stickers on the shoulder of each bottle and on the top center of the ASR, being careful not to obscure any pertinent information. Fluorescent orange stickers are available from DENSUPPL at the NWQL or OCALAMAN at the Quality of Water Supply Unit in Ocala, Florida. The "drinking-water" field on the lower portion of the ASR must be marked so that the NWQL automated logic check for results greater than the Maximum Contaminant Level (MCL) will be performed.

Safe Drinking Water analytical regulations state that all samples requiring analysis of nitrite (NO<sub>2</sub>) be received by the NWQL within 1 day of sampling. This will allow the NWQL to analyze for NO<sub>2</sub>, if requested, within 48 hours from the time of sampling. Be aware of holidays and weekends--samples received by the NWQL on Saturdays, Sundays, and Mondays may have already exceeded the holding times for NO<sub>2</sub>. Send all other samples as soon as possible. Notify the NWQL by Geomail at least 24 hours before shipment of drinking-water samples to ensure that holding times are met. Send Geomail notification to DENINORG, DENORG, and DENLOGIN. All ERA samples received for metals analysis will be digested prior to analysis, and the cost for the digestion will be included in the overall cost of the sample analysis.

For organic schedules, the holding time also includes extraction time and analysis time for VOCs and carbamates. To ensure timely receipt at the NWQL, ship the samples by an overnight delivery service to the following address:

National Water Quality Laboratory  
5293 Ward Road  
Arvada, CO 80002

Samples taken or shipped improperly may need to be resampled causing unnecessary delays and expense. The following problems may cause sample rejection for some or all of the requested constituents:

1. Headspace (air pocket caused by incomplete filling) in 40-mL VOA vials.
2. Leaking or broken sample bottles.
3. Sample types designated as chilled, which are received unchilled. See tables 1 and 2.
4. Improperly preserved samples.
5. VOC or compliance samples not received by the NWQL within required holding times.
6. Tape on any organic sample bottle (see NWQL Technical Memorandum 96.01, "Guidelines for Labeling 40-mL Volatiles Sample Vials").

If a sample has exceeded the holding time for VOCs (Schedules 2206 and 2207) or if the sample was to be analyzed for compliance purposes, then resampling must occur. In other cases, District personnel listed on the ASR will be contacted for direction on whether to proceed with the analyses or to stop, in which case a "District delete" code (D - delete) will be entered for those constituents.

### **DATA HANDLING AND RETRIEVAL**

Upon completion of sample analysis, the data are automatically evaluated by the NWQL quality-control program, which includes a comparison of the data to the USEPA drinking-water MCLs. If a constituent exceeds its MCL, the NWQL data reviewer will request priority reanalysis or verification if reanalysis is not possible. When reanalysis confirms that the results exceed the MCL, the contact identified on the ASR will be notified by phone, with a follow-up by Geomail. Results will be electronically transmitted to the District. The USEPA-mandated QA/QC data are available on request by separate memorandum for a custom analysis fee. For any questions regarding drinking water analyses, contact the Quality Assurance Unit at the NWQL.

### **References:**

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