Worksheet #10
Project Schedule

Routine monitoring is conducted on an on-going basis according to schedules established by each state program in accordance with EPA drinking water regulations. Violations, treatment milestones and enforcement actions are reported to the EPA New England drinking water program.

Worksheet #11
Performance Criteria

At the present time EPA has not set nationwide measurement performance criteria for drinking water analyses.

The project quality objective is to ensure to the extent possible that all drinking water compliance data will be of sufficient quality to evaluate compliance of public water supplies with federal and/or state regulations.

The states' drinking water programs require the use of approved methods of analysis. In turn, the EPA and state certification programs regularly audit their certified laboratories to make certain that they meet the performance criteria in the methods.

Worksheet #12a
Sampling Design and Rationale

Sampling locations and frequencies of sampling are set by EPA and/or state regulation. The attached sampling location table (SDWA Sampling Locations) includes appropriate references.

SDWA SAMPLING LOCATIONS* p. 1 of 6		
Parameter	Location**	Regulation
Coliform	141.21(a)(1)	Public water systems must collect total coliform samples at sites which are representative of water throughout the distribution system according to a written sample siting plan.
Coliform repeat monitoring	141.21(b)(2)	The system must collect at least one repeat sample from the sampling tap where the original total coliform-positive sample was taken, and at least one repeat sample at a tap within five service connections upstream and five service connections downstream of the original sampling site.
Turbidity	141.22(a)	Samples shall be taken by suppliers of water for both community and non-community water systems at a representative entry point(s) to the water distribution system at least once per day, for the purposes of making turbidity measurements to determine compliance with 141.13.
The following is to determine compliance with 141.62.		
Inorganics	141.23(a)(1)	Groundwater systems shall take a minimum of one sample at every entry point to the distribution system which is representative of each well after treatment (hereafter called a sampling point) beginning in the initial compliance period. The system shall take each sample at the same sampling point unless conditions make another sampling point more representative of each source or treatment plant.
Inorganics	141.23(a)(2)	Surface water systems shall take a minimum of one sample at every entry point to the distribution system after any applications of treatment of r in the distribution system at a point which is representative of each source after treatment (hereafter called a sampling point)...same language as above.
Inorganics	141.23(a)(3)	If a system draws water from more than one source and the sources are combined before distribution, the system must sample at an entry point to the distribution system during periods of normal operating conditions (i.e., when water is representative of all sources being used).
Asbestos	141.23(b)(5)	A system vulnerable to asbestos contamination due solely to corrosion of asbestos-cement pipe shall take one sample at a tap served by asbestos-cement pipe and under conditions where asbestos contamination is most likely to occur.
Asbestos	141.23(b)(6)	A system vulnerable to asbestos contamination due solely to source water shall monitor in accordance with the provision of paragraph (a) of this section. (See above)
Asbestos	141.23(b)(7)	A system vulnerable to asbestos contamination due both to its source water supply and corrosion of asbestos-cement pipe shall take one sample at a tap served by asbestos-cement pipe under conditions where asbestos contamination is most likely to occur.
VOCs: The following to determine compliance with 141.61(a) 1-21.		

SDWA SAMPLING LOCATIONS* p. 2 of 6		
Parameter	Location**	Regulation
VOCs	141.24(f)(1)	Groundwater systems shall take a minimum of one sample at every entry point to the distribution system which is representative of each well after treatment (hereafter called a sampling point). Each sample must be taken at the same sampling point unless conditions make another sampling point more representative of each source, treatment plant, or within the distribution system.
VOCs	141.24(f)(2)	Surface water systems (or combined surface/ground) shall take a minimum of one sample at points in the distribution system that are representative of each source or at each entry point to the distribution system after treatment (hereafter called a sampling point). Each sample must be taken at the same sampling point unless conditions make another sampling point more representative of each source, treatment plant, or within the distribution system.
VOCs	141.24(f)(3)	If the system draws water from more than one source and the sources are combined before distribution, the system must sample at an entry point to the distribution system during periods of normal operating conditions (i.e., when water representative of all sources is being used).
Vinyl chloride	141.24 (f)(11)(v)	"...A vinyl chloride sample shall be taken at each sampling point at which one or more of the two carbon organic compounds was detected..."
SOCs: The following to determine compliance with 141.61(c).		
SOCs	141.24(g)(1)	Groundwater systems shall take a minimum of one sample at every entry point to the distribution system which is representative of each well after treatment (hereafter called a sampling point). Each sample must be taken at the same sampling point unless conditions make another sampling point more representative of each source or treatment plant.
SOCs	141.24(g)(2)	Surface water systems shall take a minimum of one sample at points in the distribution system that are representative of each source or at each entry point to the distribution system after treatment (hereafter called a sampling point). Each sample must be taken at the same sampling point unless conditions make another sampling point more representative of each source or treatment plant. NOTE: For purposes of this paragraph, surface water systems include systems with a combination of surface and ground sources.
SOCs	141.24(g)(3)	If the system draws water from more than one source and the sources are combined before distribution, the system must sample at an entry point to the distribution system during periods of normal operating conditions (i.e., when water representative of all sources is being used).

SDWA SAMPLING LOCATIONS* p. 3 of 6		
Parameter	Location**	Regulation
Gross alpha particle activity, radium-226, radium-228	141.26(a)(3)(iii)	A community water system using two or more sources having different concentrations of radioactivity shall monitor source water, in addition to water from a free-flowing tap, when ordered by the State.
Man made radioactive contaminants		No monitoring location specified in regs.
Total THMs	141.30(b)(1)	For all community water systems utilizing surface water sources in whole or in part....At least 25 percent of the samples shall be taken at locations within the distribution system reflecting the maximum residence time of the water in the system. The remaining 75 percent shall be taken at representative locations in the distribution system, taking into account number of persons served, different sources of water and different treatment methods employed.....
Unregulated contaminants: For contaminants in 141.40(e).		
	141.40 (b)	Surface water systems shall sample at points in the distribution system representative of each water source or at entry points to the distribution system after any application of treatment....
	141.40 (c)	Ground water systems shall sample at points of entry to the distribution system representative of each well after any application of treatment....
For contaminants in 141.40(n)(11 + 12).		
	141.40(n)(5)	Groundwater systems shall take a minimum of one sample at every entry point to the distribution system which is representative of each well after treatment (hereafter called a sampling point). Each sample must be taken at the same sampling point unless conditions make another sampling point more representative of each source or treatment plant.
	141.40(n)(6)	Surface water systems shall take a minimum of one sample at points in the distribution system that are representative of each source or at each entry point to the distribution system after treatment (hereafter called a sampling point). Each sample must be taken at the same sampling point unless conditions make another sampling point more representative of each source or treatment plant.
Sodium	141.41(a)	Suppliers of water for community public water systems shall collect and analyze one sample per plant at the entry point of the distribution system...
Surface Water Treatment Rule		

SDWA SAMPLING LOCATIONS* p. 4 of 6		
Parameter	Location**	Regulation
Criteria for avoiding filtration	141.71(a)(1)	The fecal coliform concentration must be equal to or less than...in representative samples of the source water immediately prior to the first or only point of disinfectant application in at least 90%.....
Monitoring for systems without filtration 141.74(b)		
	141.74(b)(2)	Turbidity measurements as required by 141.71(a)(2) must be performed on representative grab samples of source water immediately prior to the first or only point of disinfectant application every four hours...A public water system may substitute continuous turbidity monitoring for grab sample monitoring if it validates the continuous measurement for accuracy on a regular basis using a protocol approved by the State.
CT calculations:		
	141.74(b)(3)(i)	The temperature of the disinfected water must be measured at least once per day at each residual disinfectant concentration sampling point.
	141.74(b)(3)(ii)	If the system uses chlorine, the pH of the disinfected water must be measured at least once per day at each chlorine residual disinfectant concentration sampling point.
	141.74(b)(3)(iv)	The residual disinfectant concentration(s) ("C") of the water before or at the first customer must be measured each day during peak hourly flow.
	141.74(b)(5)	The residual disinfectant concentration of the water entering the distribution system must be monitored continuously, and the lowest value must be recorded each day, except that if there is a failure in the continuous monitoring equipment, grab sampling every 4 hours may be conducted in lieu of continuous monitoring...
	141.74(b)(6)(i)	The residual disinfectant concentration must be measured at least at the same points in the distribution system and at the same time as total coliforms are sampled....except...to take disinfectant residual samples at points other than the total coliform sampling points other than the total coliform sampling points if the State determines that such points are more representative of treated (disinfected) water quality within the distribution system.
Filtered systems 141.74(c):		
	141.74(c)(1)	Turbidity measurements as required by 141.73 must be performed on representative samples of the system's filtered water every four hours...A public water system may substitute continuous turbidity monitoring for grab sample monitoring if it validates the continuous measurement...

SDWA SAMPLING LOCATIONS* p. 5 of 6		
Parameter	Location**	Regulation
	141.74(c)(2)	The residual disinfectant concentration of the water entering the distribution system must be monitored continuously and the lowest value must be recorded each day...
	141.74(c)(3)(i)	The residual disinfectant concentration must be measured at least at the same points in the distribution system and at the same time as total coliforms are sampled...except...to take disinfectant residual samples at points other than the total coliform sampling points other than the total coliform sampling points if the State determines that such points are more representative of treated (disinfected) water quality within the distribution system.
Lead and Copper Rule	141.86(a)(3)	The sampling sites selected for the community water system's sampling pool ("tier 1 sampling sites") shall consist of single family structures that: (i) contain copper pipes with lead solder installed after 1982 or contain lead pipes; and/or (ii) Are served by a lead service line. When multiple-family residences comprise at least 20 percent of the structures served by a water system, the system may include these types of structures in its sampling pool. (4) Any community water system with insufficient tier 1 sampling sites shall complete its sampling pool with "tier 2 sampling sites", consisting of buildings, including multiple-family residences that: (i) Contain copper pipes with lead solder installed after 1982 or contain lead pipes; and/or (ii) Are served by a lead service line. (5) Any community water system with insufficient tier 1 and tier 2 sampling sites shall complete its sampling pool with "tier 3 sampling sites", consisting of single family structures that contain copper pipes with lead solder installed before 1983.
NTNCs	141.86(a)(6+7) -	Same type of sampling sites.
	141.86(b)(3)	Each service line sample shall be one liter in volume and have stood motionless in the lead service line for at least six hours. Lead service line samples shall be collected in one of the following three ways: (i) At the tap after flushing the volume of water between the tap and the lead service line... (ii) Tapping directly into the lead service line; or (iii) If the sampling site is a building ....allowing the water to run until there is a significant change in temperature which would be indicative of water that has been standing in the lead service line.

SDWA SAMPLING LOCATIONS* p. 6 of 6		
Parameter	Location**	Regulation
Water quality parameters	141.87(a)(1)	Tap samples shall be representative of water quality throughout the distribution system taking into account the number of persons served, the different sources of water, the different treatment methods employed by the system, and seasonal variability....(Note: Systems may find it convenient to conduct tap sampling at sites used for coliform sampling under 141.21) (ii) - Samples collected at the entry point(s) to the distribution system shall be form locations representative of each source after treatment. If a system draws water from more than one source and the sources are combined before distribution, the system must sample at an entry point to the distribution system during periods of normal operating conditions (i.e., when water is representative of all sources being used).

* Courtesy of Mark Sceery, EPA New England.
** 40 CFR, 1995

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Worksheet #12b
Sampling Location, Sampling Method and Analytical Method

&

Worksheet #13
Sampling SOPs

With the exception of New Hampshire and Rhode Island all New England state drinking water programs use the sampling guidance found in *New England States' Sample Collection & Preservation Manual for Drinking Water,* Rev. 3, October 1, 2000.

New Hampshire uses the following guidance: *Sampling Manual for New Hampshire.**

Rhode Island uses individual "Sample Collection/Preservation Protocols" prepared by the RI DOH Division of Laboratories and Office of Drinking Water Quality. They are reformatted versions of the sampling protocols in the *New England States' Sample Collection & Preservation Manual for Drinking Water.**

* These documents were reviewed by the EPA New England Quality Assurance Unit and found to be satisfactory.

Worksheet # 14
Field Sampling Equipment Calibration

&

Worksheet # 15
Field Equipment Maintenance, Testing & Inspection

No field sampling equipment is used. Samples are collected as grab samples directly into sample containers.

Worksheet # 16
Sample Handling Flow Diagram

General sampling handling practices are included in the sampling manuals referenced above (for Worksheet 12b). State-specific practices for obtaining containers, scheduling analyses and delivering samples to the state principal labs are given in Chapter 3 of the *New England States' Sample Collection & Preservation Manual for Drinking Water,* Rev. 3, October 1, 2000.

Worksheet # 17
Field Analytical Method/SOP Reference
&
Worksheet # 18
Field Analytical Instrument Calibration
&
Worksheet # 19
Field Analytical Instrument/Equipment Maintenance, Testing and Inspection

No field analyses are performed.

Worksheet # 20
Fixed Laboratory Analytical Method/SOP Reference

Drinking water samples for compliance monitoring must be analyzed by laboratories certified by the lab certification (accreditation) program of the state in which the sampled water utility is located. State principal laboratories analyzing such samples are certified by EPA New England. EPA-approved methods must be used. Laboratories may use only those methods for which they have been certified. All approved drinking water methods are listed in the *Code of Federal Regulations 40 CFR 141.*

Information about certified labs may be found by contacting the state laboratory certification (accreditation) programs. See Worksheet # 9d and its attachment for further information.

Worksheet # 21
Fixed Laboratory Instrument Maintenance and Calibration

The state principál laboratories calibrate and maintain their instruments as required by instructions given in the various EPA-approved analytical methods. EPA New England verifies during its periodic on-site evaluations of these laboratories that all method requirements are appropriately performed and documented.

Worksheet # 22a
Field Sampling QC

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Worksheet # 22b
Field Sampling SOP Precision and Accuracy

Routine sampling for compliance purposes is generally conducted by the department staff only in Rhode Island.

Sampling for enforcement actions and resampling (which is performed in response to a violation or an exceedance) is generally conducted by department staffs in all states but Vermont.

Sampling is performed according to the sampling manuals discussed in Worksheet 12b/13.

EPA New England has recommended to all labs that field duplicates be taken at a frequency of 5 to 10% or one per batch, whichever is more frequent.

Worksheet # 23a
Field Analytical QC Samples

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Worksheet # 23b
Field Analytical Method/SOP Precision and Accuracy

No field analyses are performed.

Worksheet # 24a
Fixed Laboratory Analytical QC Samples

&

Worksheet # 23b
Fixed Laboratory Method/SOP Precision and Accuracy

EPA-approved methods include mandatory quality control measures. EPA New England reviews and retains the state labs' acceptance limits for precision and accuracy (which are documented in its copies of their lab QA manuals and lab SOPs).

Worksheet # 25
Non-Direct Measurements Criteria and Limitations

Non-direct measurements are not utilized by the New England states' drinking water programs.

Worksheet # 26
Project Documents and Records

See Sections C3 (Analytical Data Review) and C4 (Filing System) in the combined Worksheets 8b and 9a for a discussion of the review of analytical data reports and record receipt and retention.

The state programs retain sample collection sheets, custody forms and all lab tracking, worksheet and other raw data. For a complete list of the records state programs must receive and retain, see "Records" on pp. 86 - 89 of this QAPP. (This list appears in 40 CFR 142.14.)

Worksheet # 27a
Assessment and Response Actions (Narrative)

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Worksheet # 27b
Project Assesments (Table)

&

Worksheet # 27c
Project Assessment Plan (for assessing specific event)

Reserved for future requirements.

Worksheet # 28
QA Management Reports (Table)

1. As required by law, each state must prepare and publish an Annual Compliance Report by July 1 of each year for the previous calendar year. The report addresses several key elements: violations, enforcement activities, inspections of water suppliers, funding, capacity development, status of source water assessment, status of regulations implementation and other state projects.

2. Every three months, each state program transmits to the Safe Drinking Water Information System – Federal database (SDWIS Fed) a list of violations and their types, enforcement activities and any changes to any of its water suppliers' inventories. Each program can either access SDWIS Fed by phone and download the error report for its state or it can ask the EPA regional office drinking water program staff to obtain the report for it. The programs submit revised data for the deficiencies identified in the error reports as they are addressed.

3. The EPA regional office conducts program implementation evaluation on an annual basis if deemed necessary. In addition, it performs program enforcement evaluation as needed (usually annually or triennially).

4. Once every few years, depending on the availability of funds, the EPA (headquarters) Office of Ground Water and Drinking Water authorizes a contractor to conduct "data validation" for selected regulations. These reviews are different from the data validation with which analysts and quality assurance personnel are familiar. They examine water suppliers' files kept by the state programs. They focus primarily on
   - compliance determination. (For example, did the state program make the right decision in accordance with EPA regulations?)
   - procedures used to process suppliers' data.
   - tracking systems. (How well does a program track its water systems, including maps of the distribution systems, sampling locations, emergency plans, etc.?)
   - reporting procedures. (Were all violations reported to EPA?)

Worksheet # 29a
Data Evaluation Process (Narrative)

&

Worksheet # 29b
Data Evaluation Summary (Table)

Data evaluation processes are described in Sec. 3.C of the narrative for combined Worksheets # 8b and # 9a.

(157)

Worksheet # 30
Data Usability Assessment

Data usability processes are described in Sec. C.3 of the narrative for combined Worksheets 8b and 9a.

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End!