

PART B OF THE SUPPORTING STATEMENT

1. SURVEY OBJECTIVES AND KEY VARIABLES

1(a) Survey Objectives

This survey is designed to collect background and treatment information from a small subset of the United States' drinking water treatment plants (DWTPs). These DWTPs will potentially be participating in a joint EPA/USGS research project to analyze source and finished drinking water for a suite of chemical and microbial contaminants. Survey responses will be used to select DWTPs that will participate in the sampling study, as well as provide operational information about the DWTP that will permit interpretation of the analytical results and comparison of locations.

1(b) Key Variables

The information collected from the DWTPs will be gathered in three segments: 1) a preliminary screening phone call, 2) the main questionnaire, and 3) a detailing of the physical/chemical properties of the water samples at the time of collection. For each of these activities, the key variables are:

- Screening Phone Call
 - Willingness to participate in the study
 - Ability to perform the required water sample collection activities
 - Abbreviated description of treatment process
- Questionnaire
 - Information about the watershed the DWTP draws from, including sources of wastewater and agricultural practices that may impact water quality and current hydraulic conditions
 - Broad scale information on the population the DWTP serves
 - Detailed information on the treatment process, including parameters such as pumpage at sampling, disinfectants used, and the distribution system
- Sample Collection sheet
 - Time and date of collection
 - Common water quality parameters (which the DWTPs are already required to monitor)

These variables serve to document the qualitative characteristics of each utility and will be used to better interpret the analytical data.

1(c) Statistical Approach

A statistical approach was not selected for this survey. There are over 160,000 entities in the United States that are subject to the Safe Drinking Water Act. In this study, we have the resources available to analyze samples from a maximum of 50 locations, or approximately 0.031 % of total number of water providers. As explained in the response to Collective Comment 5 in Part A of the Supporting Statement, the EPA can use the Unregulated Contaminant Monitoring Regulation (UCMR) to gather a statistically representative sampling of DWTPs; however, they can only monitor a maximum of 30 contaminants every five years. This study will be analyzing the water for over 200 contaminants. The water concentration data collected in this study may help the EPA's Office of Water choose the chemicals for consideration in future UCMRs.

Although this project has a limited number of samples and is intentionally biased towards those locations that have known or suspected wastewater contributions in the source water, we will maximize the diversity of the locations chosen to participate. A preliminary list of candidate DWTPs has been drafted and were selected to be diverse in terms of geography, treatment technology, DWTP size, and population served.

1(d) Feasibility

The questions asked of the DWTPs concerning the treatment performed at their utility will require very little effort to compile. For those questions concerning the source watershed that the DWTP may find slightly more difficult to answer, the questionnaire text prompts the utility to supply additional contacts that may be able to better answer the question.

If possible, the survey will be given to the DWTP and returned electronically; if hard copies are required to be sent and returned, the financial burden is minimal. The funds required for the analysis have already been acquired and committed.

The survey will have to be completed just prior to or concurrently with the water sampling at the DWTP. If a utility cannot commit to filing the paperwork at the time of sampling, they will not be included in the study.

2. SURVEY DESIGN

2(a) Target Population and Coverage

To assess the upper boundaries of concentrations of emerging contaminants in source and finished drinking water in the United States, we have targeted DWTPs that have known or suspected sources of wastewater in their source water catchment.

2(b) Sample Design

(i) Sampling Frame

The DWTPs selected for the study will be drawn from a master list of candidate facilities compiled by the EPA and USGS project leads. The master list was assembled from a variety of sources including: 1) a EPA document that lists communities with a high percentage of wastewater in their source water (EPA-600/2-80-044); 2) locations sampled in previous EPA and USGS studies known to contain contaminants; 3) nominations by USGS and EPA field and regional personnel; 4) DWTPs that heard about the project and volunteered; and 5) DWTPs mentioned in an Associated Press report that had no emerging contaminant data.

(ii) Sample Size

As currently planned and funded, a maximum of 50 DWTPs will be sampled in this study. The majority of the costs associated with this study will be spent on analyzing the water samples. Even though the sample design is biased towards locations that should have the chemicals we are interested in studying, the concentrations are still expected to be very low, typically in the parts-per-trillion range. To provide the most defensible data set possible, we chose to increase the number of quality control samples that will be collected as part of the project, at a cost of having fewer locations sampled. For this project, for every primary sample analyzed, a duplicate and a matrix spike sample will also be analyzed. Additionally, blank samples will be analyzed from every location to monitor sampling contamination. In all, over 70 % of the samples analyzed in this project will be for quality control purposes.

(iii) Stratification Variables

There are no stratification variables used for this project.

(iv) Sampling Methods

This project is not designed to be representative of the DWTP community as a whole; it is intentionally biased to locations with known sources of wastewater in its source water, with the specific purpose of maximally characterizing potential wastewater impacts on source waters. Therefore, the nonrandom method of site selection is appropriate.

(v) Multi-Stage Sampling

This survey depends on the voluntary participation of DWTPs. Utilities contacted for the initial screening phone survey may choose not to participate in the full study, or we may discover information that would make them ineligible for this study. Therefore, this study will have two stages, 1) the screening phone survey and 2) the full questionnaire. For both stages, the sample design described above in sections 2.b.i through 2.b.iv will apply.

2(c) Precision Requirements

(i) Precision Targets

This project is not designed to provide a statistical projection to the population of DWTPs at large. Therefore, a target for precision is not appropriate.

(ii) Non-sampling Error

The responses gathered in this survey are specific to each DWTP. Since this project is not designed to provide information on the population as a whole, non-responses will not bias the results.

(iii) Questionnaire Design

The questionnaire used in this study is attached as Attachment C. The data to be collected fall into four different categories: Part A) utility contact information; Part B) utility geographic and demographic information; Part C) utility treatment information; and Part D) general water quality parameters already monitored by the utility at time of sampling. Parts B through D will be used to determine why some contaminants may be present in the source or finished water of one DWTP but not another. For example, the variation in detection could result from differences in the composition of waste sources in the source watershed, or differences in the treatment technologies used. The concentration of the analytes in this study can be influenced by the physical or chemical water quality parameters requested in Part D; this information is necessary to make meaningful comparisons between locations.

Most of the information supplied by the DWTPs will be very site specific. Therefore, the open-ended question format was an appropriate choice for the majority of the questions.

3 PRETESTS AND PILOT TESTS

This project is the second in a two phase project. In Phase I, conducted in 2007, nine DWTPs were sampled; all participants were given an earlier version of this questionnaire. Based on requests for clarification from the Phase I DWTPs, the text of the questions were modified. The layout was also redesigned to facilitate both electronic and hand-written responses.

4 COLLECTION METHODS AND FOLLOW-UP

4(a) Collection Methods

Collection of information from the DWTPs is expected to include both telephone interviews and completion of the questionnaire. The contact with the DWTPs is expected to follow the following scenario:

- A candidate DWTP will be called, and in a short (5 minute) conversation, the project will be briefly described. If the DWTP is interested in participating in the study, a contact e-mail or postal address will be requested so that a fact sheet about the project, a listing of the analytes that will be studied, and information about the methods to be used can be sent. An appointment for a more detailed call will also be made.
- In the second call, the entire EPA and USGS project team will participate. This call will give the DWTP an opportunity to ask specific questions about the project. It also gives the project team the ability to evaluate the capability of the DWTP to collect the requested samples, as well as find out general information about the utility (for example, what disinfectant is used, but not the dosage or anecdotal information about the

watershed). During this call, we will notify the DWTPs that while we intend to maintain the anonymity of each location during sampling, this project is a federal work product, and therefore subject to freedom of information act (FOIA) requests. At this point, both the DWTP and the project team will determine if a location will be included in the project. Information from both the first and second calls will be recorded on the Pre-questionnaire telephone survey, provided as Attachment D.

- The DWTP and project team will agree on a date for sample collection. The questionnaire will be sent to the utility in advance of the collection. Parts A through C can be completed in the week before sampling; Part D should be filled out on the day of sampling. The completed form will be submitted with the samples to the EPA.

4(b) Survey Response and Follow-up

Due to the site selection process used for this project, a 100 % response rate is expected. The completed questionnaire will be reviewed by the EPA and USGS project leads. If any of the responses are unclear, the DWTP will be contacted either by e-mail or telephone for clarification.

5 ANALYZING AND REPORTING SURVEY RESULTS

5(a) Data Preparation

Due to the small number of sites sampled, and the variety of expected answers, the questionnaires will be maintained as separate entities, and not entered into a database. However, an overview table will be compiled for use in data reports. This table will likely consolidate the following information: anonymous site identifier, source water type (surface or ground water), source water level at sampling (high, low or average), population served, pumpage at sampling maximum pumpage, disinfectant, disinfectant dose, disinfectant residual, overview of treatment steps and overall plant residence time.

5(b) Analysis

At the completion of the entire program, a joint USGS and EPA data report will be produced that summarizes all of the contaminant information collected in the study. Several manuscripts interpreting the results of the study will also be produced for publication in peer-reviewed scientific journals. These manuscripts may or may not use the utility information collected as a part of this request to assist in the data interpretation. The participating DWTPs will each receive a copy of the manuscripts, and will be permitted to provide comments prior to submission for publication.