

changes that can reduce TTHM and HAA5 levels. Activities such as looping distribution systems and optimizing storage can minimize retention times and help to control DBP formation. Costs for these activities range from almost zero (modifying retention time) to more substantial costs for modifying distribution systems. In the absence of detailed information needed to make cost evaluations for situations such as these, EPA has included a discussion of possible effects where appropriate.

#### E. Expected System Treatment Changes

In order to quantify the effects of the Stage 2 DBPR, it is necessary to predict how plants will modify their treatment processes to meet the proposed requirements. To estimate the incremental impacts of the Stage 2 DBPR, relative to the Stage 1 DBPR, EPA compared predicted "ending technologies" (types of treatment in use after implementation of the Stage 2 DBPR) to the distribution of baseline technologies predicted to be in place after the implementation of the Stage 1 DBPR. This subsection outlines the process for deriving baseline and ending Stage 2 technology distributions that are the basis for the national cost estimates of today's proposed rule.

##### 1. Pre-Stage 2 DBPR Baseline Conditions

Development of the Pre-Stage 2 baseline (*i.e.*, conditions following the Stage 1 DBPR) consists of the following processes:

- Compiling an industry profile—identifying and collecting information on the segment(s) of the water supply industry subject to the Stage 2 DBPR;
- Characterizing influent water quality—summarizing the relevant characteristics of the raw water treated by the industry; and
- Characterizing treatment for the Stage 1 DBPR—predicting what the industry will do to comply with the provisions of the Stage 1 DBPR.

Section IV of this document details the data sources EPA used to

characterize water quality and treatment practices for the nation's public water systems. EPA also used information in the *Water Industry Baseline Handbook* (USEPA 2000j) to develop the industry profile. The Baseline Handbook uses data derived from the 1995 Community Water Systems Survey and the Safe Drinking Water Information System to characterize the U.S. drinking water systems. Another EPA study, *Geometries and Characteristics of Water Systems Report* (USEPA 2000k), also provided information for the industry profile.

EPA developed and used a model (SWAT) to characterize treatment following the Stage 1 DBPR and Stage 2 DBPR options considered. SWAT served as the primary tool to predict changes in treatment and DBP occurrence. The model used a series of algorithms and decision rules to predict the type of treatment a large surface water plant will use given a specific regulatory alternative and source water quality. Other tools were used to estimate practices at large ground water systems or any medium or small systems. A Delphi process (a detailed technical treatment characterization and DBP occurrence review by drinking water experts) was used to predict treatment changes for large ground water systems (those serving 10,000 or more people). The results of the SWAT analyses and the Delphi process were extrapolated to the medium surface water and ground water systems based on analysis of source water treatment characteristics and treatment decision trees. For the small surface and ground water systems analyses, a group of experts provided predictions for a pre-Stage 2 baseline and resulting treatment and water quality conditions under the Stage 2 DBPR regulatory alternatives. A detailed description of these analyses can be found in the *Economic Analysis for the Stage 2 DBPR* (USEPA 2003i).

##### 2. Predicted Technology Distributions Post-Stage 2 DBPR

The treatment compliance forecast for the Stage 2 DBPR has two components—1) the percent of plants that must add treatment to comply with Stage 2 DBPR requirements, and 2) the treatment technologies these plants are predicted to select. This information, coupled with the baseline data discussed before, provides an estimate of the total number of plants using specific technologies to meet the requirements of the proposed Stage 2 DBPR. National costs are then generated using technology unit cost information.

The four step process EPA used to develop a Stage 2 DBPR compliance forecast is summarized in table VII–10. The difference between the Stage 1 DBPR Technology Selections and Stage 2 DBPR Technology Selections (Step 4—Incremental Technology Selections) was used to develop national cost estimates for today's proposed rule. Tables VII–11 a and b (surface water) and VII–12 a and b (ground water) show the incremental technology selections shown as the percent change between Stage 1 and Stage 2 DBP rules.

TABLE VII–10.—STAGE 2 DBPR COMPLIANCE FORECAST SUMMARY

Step	Description of Step
1 .....	Model a pre-Stage 1 <i>baseline scenario</i> using Information Collection Rule data to allow consistent comparison between different rule alternatives.
2 .....	Model <i>technology selection</i> to meet Stage 1 DBPR requirements (Stage 1 DBPR Technology Selection).
3 .....	Model <i>technology selection</i> to meet Stage 2 DBPR requirements (Stage 2 DBPR Technology Selection).
4 .....	Subtract the results in Step 2 from Step 3 and adjust to obtain the <i>incremental impact of an alternative</i> (Stage 2 DBPR incremental technology selection).