

TABLE V-13.—BASELINE VALUES FOR SMALL SYSTEMS CATEGORIES AND AVAILABLE EXPENDITURE MARGIN FOR AFFORDABLE TECHNOLOGY DETERMINATIONS

System size category (pop. served)	Annual HH consumption (1000 gallons/yr)	Median HH income (\$)	2.5% median HH income(s)	Current annual water bills (\$/yr)	Available expenditure margin (\$/hh/year)
25–500	72	35,148	878	290	588
501–3,300	74	30,893	772	230	542
3,301–10,000	77	31,559	789	219	570

For each size category, the threshold value was determined by multiplying the median household income by 2.5 percent. The annual household water bills were subtracted from this value to obtain the available expenditure margin. Projected treatment costs were compared against the available expenditure margin to determine if there were affordable compliance technologies for each size category. The

available expenditure margin for the three size categories is presented in Table V-13.

The size categories specified in SDWA for affordable technology determinations are different from the size categories typically used by EPA in the Economic Analysis. A weighted average procedure was used to derive design and average flows for the 25–500 category using design and average flows

from the 25–100 and 101–500 categories. A similar approach was used to derive design and average flows from the 501–1000 and 1001–3300 categories for the 501–3300 category. The Variance Technology Findings document (USEPA 1998h) describes this procedure in more detail. Table V-14a lists the design and average flows for the three size categories.

TABLE V-14A.—DESIGN AND AVERAGE DAILY FLOWS USED FOR AFFORDABLE TECHNOLOGY DETERMINATIONS

System size category (population served)	Design flow (mgd)	Average flow (mgd)
25–500	0.058	0.015
501–3,300	0.50	0.17
3,301–10,000	1.8	0.70

Capital and operating and maintenance costs were derived for each treatment technology used in the compliance forecast for small systems using the flows listed previously and the cost equations in the Technology and Cost Document (USEPA 2003k). Capital costs were amortized using the 7 percent interest rate preferred by Office of Management and Budget (OMB) for benefit-cost analyses of government programs and regulations rather than a 3 percent interest rate.

The annual system treatment cost in dollars per year was converted into a rate increase using the average daily flow. The annual water consumption values listed in Table V-13 were multiplied by 1.15 to account for water lost due to leaks. Since the water lost to leaks is not billed, the water bills for the actual water used were adjusted to cover this lost water by increasing the household consumption. The rate increase in dollars per thousand gallons used was multiplied by the adjusted annual consumption to determine the annual cost increase for the household for each treatment technology.

With very few exceptions, the household costs for all predicted compliance technologies in Table V-12 are below the available expenditure margin. The only technology that was predicted to be used in the compliance

forecast for the Stage 2 DBPR and that costs slightly more than the available expenditure margin is GAC20 (240 day carbon replacement) with advanced disinfectants for systems serving 500 people or fewer. As shown in the Economic Analysis (USEPA 2003i), 13 systems (less than 1 percent) among systems serving fewer than 500 people are predicted to use GAC20 with advanced disinfection to comply with the proposed Stage 2 DBPR. However, alternate affordable technologies are available. Thus, EPA believes that compliance by these systems will be affordable. In some cases, the compliance data for these systems under the Stage 2 DBPR is the same as under the Stage 1 DBPR (because many systems serving fewer than 500 people will have the same single sampling site under both rules); these systems will have already installed the necessary compliance technology to comply with the Stage 1 DBPR. It is also possible that less costly technologies such as those for which percentage use caps were set in the decision tree may actually be used to achieve compliance (*e.g.*, chloramines, UV).

As shown in Table V-14b, the cost model (USEPA 2003i) predicts that households served by very small systems will experience household cost increases greater than the available

expenditure margins as a result of adding advanced technology for the Stage 2 DBPR. This prediction is probably overestimated because small systems have other compliance alternatives available to them besides adding treatment. For example, some of these systems currently may be operated on a part-time basis; therefore, they may be able to modify the current operational schedule or use excessive capacity to avoid installing a costly technology to comply with the Stage 2 DBPR. The system also may identify another water source that has lower TTHM and HAA5 precursor levels. Systems that can identify such an alternate water source may not have to treat that new source water as intensely as their current source, resulting in lower treatment costs. Systems may elect to connect to a neighboring water system. While connecting to another system may not be feasible for some remote systems, EPA estimates that more than 22 percent of all small water systems are located within metropolitan regions (USEPA 2000c) where distances between neighboring systems will not present a prohibitive barrier. More discussion of household cost increases is presented in a later section (Section VII) and the Economic Analysis (USEPA 2003i).