

1. Non-Quantifiable Health and Non-health Related Benefits

Although there are substantial monetized benefits that result from this

rule due to reduced rates of endemic cryptosporidiosis, other potentially significant benefits of this rule remain unquantified and non-monetized. The

unquantified benefits that result from this rule are summarized in Table VI-2 and are described in greater detail in the LT2ESWTR EA (USEPA 2003a).

TABLE VI-2.—SUMMARY OF NONQUANTIFIED BENEFITS

Benefit type	Potential effect on benefits	Comments
Reducing outbreak risks and response costs	Increase	Some outbreaks are caused by human or equipment failures that may occur even with the proposed new requirements; however, by adding barriers of protection for some systems, the rule will reduce the possibility of such failures leading to outbreaks.
Reducing averting behavior (e.g., boiling tap water or purchasing bottled water).	Increase / No Change	Averting behavior is associated with both out-of-pocket costs (e.g., purchase of bottled water) and opportunity costs (e.g., time requiring to boil water) to the consumer. Reductions in averting behavior are expected to have a positive impact on benefits from the rule.
Improving aesthetic water quality	Increase	Some technologies installed for this rule (e.g., ozone) are likely to reduce taste quality and odor problems.
Reducing risk from co-occurring and emerging pathogens.	Increase	Although focused on removal of <i>Cryptosporidium</i> from drinking water, systems that change treatment processes will also increase removal of pathogens that the rule does not specifically regulate. Additional benefits will accrue.
Increased source water monitoring	Increase	The greater understanding of source water quality that results from monitoring may enhance the ability of plants to optimize treatment operations in ways other than those addressed in this rule.
Reduced contamination due to covering on treating finished water storage facilities.	Increase	Although insufficient data were available to quantify benefits, the reduction of contaminants introduced through uncovered finished water storage facilities would produce positive public health benefits.

Source: Chapter 5 of the LT2ESWTR Economic Analysis (USEPA 2003a).

2. Quantifiable Health Benefits

EPA quantified benefits for the LT2ESWTR based on reductions in the risk of endemic cryptosporidiosis. Several categories of monetized benefits were considered in this analysis.

First, EPA estimated the number of cases expected to result in premature mortality (primarily for members of sensitive subpopulations such as AIDS patients). In order to estimate the benefits from deaths avoided as a result of the rule, EPA multiplied the estimates for number of illnesses avoided by a projected mortality rate. This mortality rate was developed using mortality data from the Milwaukee cryptosporidiosis outbreak of 1993 (described in section II), with adjustments to account for the subsequent decrease in the mortality rate among people with AIDS and for the difference between the 1993 Milwaukee AIDS rate and the current national rate. EPA estimated a mortality rate of 16.6 deaths per 100,000 illnesses for those served by unfiltered systems and a mortality rate of 10.6 deaths per 100,000 illnesses for those served by filtered systems. These different rates are associated with the incidence of AIDS in populations served by

unfiltered and filtered systems. A complete discussion on how EPA derived these rates can be found in subchapter 5.2 of the LT2ESWTR EA (USEPA 2003a).

Reductions in mortalities were monetized using EPA's standard methodology for monetizing mortality risk reduction. This methodology is based on a distribution of value of statistical life (VSL) estimates from 26 labor market and stated preference studies, with a mean VSL of \$6.3M in 2000, and a 5th to 95th percentile range of \$1.0 to \$14.5. A more detailed discussion of these studies and the VSL estimate can be found in EPA's Guidelines for Preparing Economic Analyses (USEPA 2000c). A real income growth factor was applied to these estimates of approximately 2.3% per year for the 20 year time span following implementation. Income elasticity for VSL was estimated as a triangular distribution that ranged from 0.08 to 1.00, with a mode of 0.40. VSL values for the 20 year span are shown in the LT2 EA in Exhibit C.13 (USEPA 2003a).

The substantial majority of cases are not expected to be fatal and the Agency separately estimated the value of non-fatal illnesses avoided that would result from the LT2ESWTR. For these, EPA

first divided projected cases into three categories, mild, moderate, and severe, and then calculated a monetized value per case avoided for each severity level. These were then combined into a weighted average value per case based on the relative frequency of each severity level. According to a study conducted by Corso *et al.* (2003), the majority of illness falls into the mild category (88 percent). Approximately 11 percent of illness falls into the moderate category, which is defined as those who seek medical treatment but are not hospitalized. The final one percent have severe symptoms that result in hospitalization. EPA estimated different medical expenses and time losses for each category.

Benefits for non-fatal cases were calculated using a cost-of-illness (COI) approach. Traditional COI valuations focus on medical costs and lost work time, and leave out significant categories of benefits, specifically the reduced utility from being sick (*i.e.*, lost personal or non-work time, including activities such as child care, homemaking, community service, time spent with family, and recreation), although some COI studies also include an estimate for unpaid labor (household production) valued at an estimated wage