

distribution of regulatory benefits, such as characteristics of the receiving water body and the size of population that may benefit from reduced pollutant discharges. As a result, the traditional sampling approach likely yields benefit estimates that are less accurate than those that could be obtained by using a sampling framework that accounts for such benefit-receptor characteristics.

EPA recognizes that using a traditional extrapolation method to estimate national level benefits may lead to a large degree of uncertainty in benefits estimates. Therefore, in addition to the traditional extrapolation method used in the proposed rule (*see* 66 FR 424), EPA has estimated national level benefits for the final rule using an alternative extrapolation method as discussed in the NODA (*see* 67 FR 38752).

In this alternative extrapolation method, post-stratification sample weighting, EPA adjusted the original sample weights using two variables that are likely to affect the occurrence and size of benefits associated with reduced discharges from sample MP&M facilities: (1) receiving water body type and size; and (2) the size of the population residing in the vicinity of the sample facility. The Agency utilized a commonly used post-stratification method calling "raking" to adjust original sample weights to reflect these benefit pathway characteristics. EPA used data from three data sources—EPA's Permit Compliance System database (PCS), EPA's Reach File 1, and Census Data—to develop the adjusted weights. Because of data limitations, EPA restricted the re-weighting effort only to direct dischargers and excluded indirect dischargers. Therefore, EPA performed this alternative analysis for only the selected option.

EPA used the alternative benefit estimate to validate general conclusions that EPA drew from its main analysis based on the traditional extrapolation method. Appendix G of the EEBA provides detailed discussion of this alternative extrapolation method.

In the NODA, EPA also sought public comment on a proposed second alternative extrapolation method. In this extrapolation method, EPA proposed the extrapolation of the Ohio case study results to the national level based on three key factors that affect the occurrence and magnitude of benefits: (1) The estimated change in MP&M pollutant loadings; (2) the level of recreational activities on the reaches affected by MP&M discharges; and (3) income of the affected population. The Agency recognizes that this method is not rigorous for extrapolation to the

national level. Therefore, EPA used this method only as a sensitivity analysis.

Sections IX.B through IX.E of this preamble present national level benefits that are estimated based on both sample facility weights used in the engineering and economic impact analysis (traditional extrapolation method) and sample facility weights adjusted by water body and population (post-stratification extrapolation). National level benefits estimated from the Ohio case study analysis are not presented in today's final rule. These estimates can be found in Appendix G of the EEBA report.

B. Reduced Human Health Risk

EPA estimates that the final rule will prevent discharge of 18 pounds per year of carcinogens and 119 pounds per year of lead. Also, the final rule will prevent discharge of an additional 6,900 pounds of 76 pollutants of concern that are known to cause adverse non-cancer human health effects. These reduced pollutant discharges from MP&M facilities generate human health benefits in a number of ways. The most important human health benefits stem from reduced risk of illness from consumption of contaminated fish, shellfish, and water.

EPA analyzed the following measures of human health-related benefits: reduced cancer risk from fish and water consumption; reduced risk of non-cancer adverse health effects from fish and water consumption; reduced lead-related adverse health effects in children and adults; and reduced occurrence of in-waterway pollutant concentrations in excess of levels of concern. The levels of concern include human health-based ambient water quality criteria (AWQC) or documented toxic effect levels for those chemicals not covered by AWQC. The Agency monetized only two of these health benefits: (1) Changes in the incidence of cancer resulting from reduced exposure to carcinogens in fish and drinking water and (2) changes in adverse non-cancer health effects in children and adults resulting from reduced exposure to lead in fish. EPA monetized human health benefits by estimating the change in the expected number of individuals experiencing adverse human health effects in the populations exposed to MP&M discharges. For carcinogens that have linear dose-response relationships, it is feasible to estimate the incremental cancer incidence in a population from the estimate of mean individual risk for the population and the number of individuals in the population. However, for health effects with non-linear dose-response relationships and thresholds

(*e.g.*, non-cancer health effects), estimating population risk is computationally more complex and was not proposed (*see* Table IX-1).

The national-level analysis of human health benefits finds negligible monetized benefits from the final rule. However, because of significant simplifications in the national level analysis, this finding should be recognized as potentially having substantial error and should therefore be interpreted with caution. In particular, the national-level analysis: (1) Is based only on limited information on MP&M facilities at the national level; (2) accounts in only a very limited way for the presence and effect of joint discharges on the same reach; (3) omits data on non-MP&M discharges in the baseline and post compliance; and (4) omits consideration of the downstream effects of pollutant discharges.

In contrast to the national-level analysis, and as discussed in section IX.A. of today's final rule and Chapter 21 of the EEBA report, the methods and data used for the Ohio case study address a number of these analytic weaknesses. This more site-specific and detailed analysis finds that the final regulation would achieve \$0.5 million (2001\$) in health-related benefits in the State of Ohio alone. EPA estimates that this analysis provides a more accurate, albeit lower-bound, estimate of health-related benefits than indicated by the simpler national-level analysis. Moreover, given (1) that Ohio represents only about 6 percent of the total MP&M facility population and (2) that a substantial share of the total MP&M facility population is located in other States with similar water body and population characteristics (*e.g.*, the States of Illinois, Indiana, Michigan, Pennsylvania), it is reasonable to expect that additional human health benefits would be estimated for the remainder of the country if EPA were able to apply this more rigorous approach at the national level. Accordingly, EPA judges that the final rule's human health benefits are higher than its social costs.

1. Benefits From Reduced Incidence of Cancer

EPA assessed changes in the incidence of cancer cases from consumption of MP&M pollutants in fish tissue and drinking water. The Agency valued changes in incidence of cancer cases using a willingness-to-pay (WTP) of \$6.5 million (2001\$) for avoiding premature mortality. This estimate of the value of a statistical life saved is recommended in EPA's Guidelines for Preparing Economic Analysis. This estimate does not include