

the facility to clarify the discharge destination of its process wastewater versus non-process wastewater. Once the facility's treatment system was classified into one of the technology options under consideration, the requirements for upgrading the system to comply with more stringent options were identified and costs were estimated for these upgrades using EPA's MPP Industry Cost Model (see Section III.B.4).

3. National Estimates Using Survey Weights

Instead of using "frequency factors" (see Section III.A.2) that were used as rough estimates for the proposal, EPA applied survey weights to the facility-specific estimates to derive national estimates of costs, pollutant removals, and economic impacts associated with the MPP rule. The survey weights incorporate the statistical probability that a particular facility was selected to receive the detailed questionnaire and are adjusted for any nonresponse. For example, a survey weight of 3 means that the facility represents itself and two others in the sample. Probability samples, which were used to select the facilities for the MPP surveys, allow inferences to be made to the sampling frame from which the sample was drawn. Numerous textbooks and technical journals describe a variety of ways of drawing valid probability samples and making inferences to the sampling frame from which the sample was selected. EPA determined the size (*i.e.*, number of facilities) of the probability samples by applying standard statistical equations. These samples provide an adequate database that can be used to estimate population characteristics.

Since the proposal, EPA has incorporated data from additional screener and detailed surveys into its analysis. Using this new information, EPA has revised the screener survey weights and calculated the detailed survey weights. To calculate the screener survey weights, EPA used standard survey statistics based upon the sample design and nonresponse. Appendix B of the proposal development document provides the equations used for these calculations. To calculate the detailed survey weights, EPA followed the general methodology described in Appendix B which first develops survey weights based upon the sample design, then adjusts them for nonresponse, and

finally calibrates them based upon the screener national estimates. DCN 115115 provides the values of the survey weights for the non-small direct discharge slaughtering facilities in Subcategories A–D and K. This section of the NODA provides more details about the calibration step used to calculate the final detailed survey weights.

By using data from either the screener questionnaire or the detailed questionnaire, EPA could categorize the survey data into one of 14 groups described below. The availability of overlapping information was an important consideration because the screener questionnaire collected data on only a few characteristics. However, because the screener has a larger sample size, it provides better estimates of the number of eligible facilities in the MPP population. Thus, EPA used the screener estimates to calibrate the detailed survey weights, as described below, so that the national estimates from the two questionnaires would result in the same values for those characteristics contained in both surveys.

As a first step in the calibration, EPA categorized facilities into groups using the facility meat type (red meat, poultry, or a mixture) and production type (first processing, further processing, first processing/further processing, first processing/rendering, further processing/rendering, first processing/further processing/rendering). In addition, EPA gathered independent renderers into one group. As a result of crossing three meat types by six different production types and adding rendering, EPA obtained 19 possible groups of facilities. EPA further split these groups into non-small and small based on total production. As a result, EPA obtained a total of 38 possible groups of facilities.

Within each of the 38 possible groups, EPA then compared the estimated number of facilities using the screener weights to the estimates using the detailed survey weights. Because the detailed questionnaire had data for only a few or no facilities within some groups, EPA determined that it was necessary to collapse some groups. If a group had less than five respondents to the detailed questionnaire or less than 10 respondents to the screener questionnaire, EPA collapsed it with another group. Also, if the estimates from the screener and the detailed questionnaire differed by more than a

factor of 2.5, then EPA collapsed that group with another to improve variance estimates. By collapsing groups, EPA obtained information about facilities with similar characteristics, and improved precision for its national estimates based upon data available only from the detailed questionnaire (*e.g.*, data about the wastewater treatment components). To perform this step, EPA determined that it was appropriate to collapse certain production types and sizes within meat type. For example, EPA collapsed the two groups for non-small red meat slaughters and non-small red meat slaughter/render into a single group. After collapsing the groups, EPA obtained the 14 groups shown in Table III.B–1.

Within each of the 14 groups, EPA then calibrated the detailed survey weights so that the national estimate of facilities using the detailed questionnaire database matched the national estimates based upon the screener data. To calibrate the survey weight, EPA used the ratio of the national estimates based upon the screener database and the detailed questionnaire database, respectively. For example, for a particular group (such as renderer), suppose that the national estimate based on the screener weights and the screener database is 30 facilities. Further suppose that 20 facilities is the national estimate based upon the detailed survey weights and the detailed questionnaire database. The ratio of the two estimates is 1.5. Thus, each detailed survey weight in the group would be multiplied by 1.5. Therefore, a detailed survey weight of 4 for a particular facility would be adjusted upward to a final survey weight of 6. Because facilities from different sampling strata could be assigned to the same group, it is possible to have facilities with different survey weights within a particular group.

Table III.B–1 provides the number of facilities in the screener database, the number of facilities in the detailed questionnaire database, and the national estimate of the number of facilities. Note the national estimates presented here include all MPP facilities (*e.g.*, direct dischargers, indirect dischargers, zero dischargers, and all facilities regardless of size) and is not the same as the national estimate of number of in-scope MPP facilities (*e.g.*, direct dischargers above the category-specific production thresholds).