

While the level of mercury emissions allowed by the Mercury NESHAP defines the potential-to-emit baseline, the sum of annual mercury emission releases from by-product hydrogen streams, end box ventilation system vents, and mercury thermal recovery vents, as estimated by mercury cell chlor-alkali plants, defines an annual actual baseline for vents of about 800 kg/yr (1,764 lb/yr). We estimate that the final rule will reduce industrywide mercury emissions for vents from this annual actual baseline to around 217 kg/yr (478 lb/yr), which is equivalent to about 73 percent reduction.

We estimate that secondary air pollution emissions will result from the production of electricity required to operate new control devices and new monitoring equipment assumed for plant vents. Assuming electricity production as based entirely on coal combustion for a worst-case scenario, we estimated plant-specific impacts for sulfur dioxide, nitrogen oxides, particulate matter, and carbon monoxide emissions. The total estimated secondary air impacts of the final requirements for point sources at the nine mercury cell chlor-alkali plants is around 2.12 mg/yr (4.67 tpy) for all pollutants combined.

We are unable to quantify the primary air emission impacts associated with the final work practice standards, so no mercury emission reduction is assumed for fugitive emission sources. However, we feel strongly that the new and more explicit requirements contained in the final standards will in fact result in mercury emission reductions beyond baseline levels. Relative to secondary impacts, we expect that secondary air pollution emissions will result from the production of electricity required to operate new monitoring equipment assumed for plant cell rooms. We estimate the secondary air impacts of the final rule for fugitive emission sources to be 0.112 mg/yr (0.124 tpy).

#### *B. What Are the Non-Air Health, Environmental, and Energy Impacts?*

We do not expect that there will be any significant adverse non-air health impacts associated with the final standards for mercury-cell chlor-alkali plants.

We estimate that an increase in the amount of mercury-containing waters will result from the heightened use of packed tower scrubbing assumed for several plant vents. The total estimated water pollution impact of the final rule for point sources is about 1.5 million liters (404 thousand gallons) of additional wastewater per year. We estimate that an increase in the amount

of mercury-containing solid wastes will result with the heightened use of carbon adsorption assumed for several plant vents. The total estimated solid waste impact of the final rule for point sources is about 8.8 mg/yr (9.7 tpy) of additional mercury-containing spent carbon.

We are unable to quantify non-air environmental impacts associated with the final work practice standards, so no wastewater and solid waste impacts are assumed for fugitive emission sources.

We estimate that the final requirements for point sources will result in increased energy consumption, specifically additional fan power in conveying gas streams through new carbon adsorbers and new packed scrubbers assumed for certain plant vents and additional power consumed by new vent monitoring equipment. The total estimated energy impacts of the final requirements for point sources is about 772 thousand kW-hr/yr.

We estimate that the final requirements for fugitive emission sources will result in increased energy consumption required to operate new monitoring equipment assumed for plant cell rooms. The total estimated energy impacts of the final requirements for fugitive emission sources is about 39 thousand kW-hr/yr.

#### *C. What Are the Cost and Economic Impacts?*

For projecting cost impacts of the final rule on the mercury cell chlor-alkali industry, we estimate that all nine plants will incur costs to meet the final work practice standards and the final monitoring, recordkeeping, and reporting requirements. We estimate that seven plants will incur costs to meet the final emission limits for by-product hydrogen streams and end box ventilation system vents, and two plants will incur costs to meet the final emission limits for mercury thermal recovery units. The total estimated capital cost of the final rule for the nine mercury cell chlor-alkali plants is around \$1.6 million, and the total estimated annual cost is about \$1.4 million per year. Plant-specific annual costs in our estimate range from about \$130,000 for the least-impacted plant to about \$260,000 for the worst-impacted plant.

The purpose of the economic impact analysis is to estimate the market response of chlor-alkali production facilities to the final standards and to determine the economic effects that may result due to the final NESHAP. Chlor-alkali production jointly creates both chlorine and caustic, usually sodium hydroxide, in fixed proportions. Being joint commodities, the economic

analysis considers the impacts of the final NESHAP on both the chlorine and sodium hydroxide markets.

The chlor-alkali production source category contains 43 facilities, but only nine facilities using mercury cells are directly affected by the final standards. These nine facilities are located at nine plants that are owned by seven companies.

Chlor-alkali production in mercury cells leads to potential mercury emissions from hydrogen streams, end box ventilation system vents, mercury thermal recovery units, and fugitive emission sources. The compliance costs for the final standards, therefore, relate to the purchase, installation, operation, and maintenance of pollution control equipment at the point sources, as well as the labor costs and overheads associated with observing work practices addressing fugitive emissions. The estimated total annual costs for the final NESHAP are \$1.8 million. This cost estimate represents about 0.30 percent of the 1997 chlorine sales revenue for the mercury cell chlor-alkali production facilities. Furthermore, the total annual costs represent less than 0.01 percent of the revenues of owning the directly affected mercury cell chlor-alkali plants.

The economic analysis predicts minimal changes in industry outputs and the market prices of chlorine and sodium hydroxide as a result of the estimated control costs. The new market equilibrium quantities of chlorine and sodium hydroxide decrease by less than 0.1 percent. Equilibrium prices of chlorine and sodium hydroxide both rise by less than 0.1 percent due to the final standards. Based on these estimates, we conclude that the final standards are not likely to have a significant economic impact on the chlorine production industry as a whole or on secondary markets such as the labor market and foreign trade.

We performed an economic analysis to determine facility- and company-specific impacts. These economic impacts are measured by calculating the ratio of the estimated annualized compliance costs of emissions control for each entity to its revenues (*i.e.*, cost-to-sales ratio). After the cost-to-sales ratio is calculated for each entity, it is then multiplied by 100 to convert the ratio into percentages. Actual revenues at the facility level are not available, therefore, estimated facility revenues received from the sale of chlorine are used. Some of these facilities also produce caustic as potassium hydroxide, but the revenues from the sale of this product are not estimated. The nine mercury cell chlor-alkali