

that EPA develop or finalize a threshold for a particular HAP in a certain manner. In fact, CAA section 112(c)(9)(B)(ii), the authority we are utilizing here, does not mention the term threshold (although the term is implied by the use of the phrase "a level which is adequate to protect public health with an ample margin of safety." The thresholds we have used for both HCl and chlorine are consistent with the statutory language in CAA section 112(c)(9)(B)(ii).

B. What Issues Were Raised Related to the Potential Overlap With the HCl Production NESHAP?

Comment: Four commenters supported EPA's decision to include direct synthesis HCl as a part of the non-mercury cell chlorine production process. However, a commenter requested that we clarify that chlorine and HCl emissions from the absorber vents and associated storage vessels and transfer racks of the direct synthesis HCl production units were included in the risk analyses. To clarify applicability to the HCl Production NESHAP (subpart NNNNN of 40 CFR part 63), a commenter suggested that EPA modify the applicability provisions of subpart NNNNN.

Two commenters requested that we reevaluate collocated chlorine and HCl production sources and provide guidance so that the facilities can easily determine to which source category they belong. According to the commenters, collocated chlorine and HCl production sources may share transfer operations and storage tanks, and where appropriate, we should remove all facilities from the HCl acid production source category that meet the logical test outlined in the proposed action. The commenters stated that they believe the collocated integrated chlorine and HCl acid production facilities should be placed in the non-mercury cell chlorine production source category and removed from the HCl production source category.

Response: The final rule for subpart NNNNN of 40 CFR part 63 (68 FR 19076, April 17, 2003) states, in § 63.8985(d), that an "HCl production facility is not subject to this subpart if it produces HCl through the direct synthesis of hydrogen and chlorine and is part of a chlor-alkali facility." The definition of "HCl production facility" in subpart NNNNN includes "all HCl storage tanks that contain liquid HCl product that is produced in the HCl production unit" (e.g., direct synthesis unit) as well as "all HCl transfer operations that load HCl product produced in the HCl production unit

into a tank truck, rail car, ship, or barge, along with the piping and other equipment in HCl service used to transfer liquid HCl product from the HCl production unit to the HCl storage tanks and/or HCl transfer operations." Therefore, we have clarified that chlorine and HCl emissions from the absorber vents of direct synthesis HCl production units at chlor-alkali facilities, as well as the associated storage tanks and transfer operations specified above, are included in the non-mercury cell chlorine production subcategory and are not regulated under subpart NNNNN.

The clarifications we made in subpart NNNNN provide guidance for sources to determine to which source category their operations belong. As stated above, all HCl production facilities at chlor-alkali plants that produce HCl through direct synthesis are part of the non-mercury cell chlorine production subcategory. All other HCl production facilities (e.g., those that produce HCl as a co-product of a chlorinated organic compound) at sites where chlor-alkali plants are located are part of the HCl Production source category and subject to subpart NNNNN. In the case of shared storage tanks and transfer operations, any storage tank that stores, and any transfer operation that loads, liquid HCl product which was produced in an HCl production facility that is subject to subpart NNNNN is subject to the provisions of that subpart.

C. What Issues Were Raised Regarding the Risk Assessment That Forms the Technical Basis for This Final Action?

Comment: In the analysis for the proposed action, we used the HCl RfC to determine the long-term health effects of chlorine emissions, since chlorine photolyzes very quickly to HCl in sunlight. Two comments supported that methodology and stated that our decision was based on sound scientific knowledge of the pollutants of concern.

In contrast, two other commenters did not agree with our use of the HCl RfC as a threshold level for chlorine. The commenters stated that not all of the annual chlorine emissions can be considered as HCl and, therefore, the chlorine exposure was underestimated. The commenters argued that chlorine emissions will not undergo photolysis to convert to HCl when there is not bright sunshine (i.e., at night or on cloudy days).

Response: The widely accepted fact that chlorine is photolyzed in sunlight formed the basis for the assumption in the original risk assessment that chronic exposure to chlorine would not occur. As a result of the comment, we re-

examined the literature on the atmospheric fate of chlorine in the atmosphere to validate our original assumption.

The additional information obtained from the literature confirmed our earlier information. There are several different pathways that molecular chlorine can take, including photolysis (reaction with light), reactions with hydroxyl radicals (OH), reactions with oxygen atoms (O), and reactions with water vapor (H₂O). Each pathway results in different amounts of Cl₂ being removed from the troposphere, and different pathways are predominant at different times of the day. However, photolysis is the primary pathway.

Therefore, this information did not fundamentally change the assumption made in the original risk assessment, which was that on a long-term basis, individuals will be exposed more to hydrochloric acid formed from the photolysis of chlorine than to chlorine. However, the commenters are correct that there will be situations where individuals will be exposed to chlorine. Therefore, in addition to the assessment where we considered only acute exposure to chlorine, we concluded that it was appropriate to consider the effects of chronic exposure to chlorine emissions from chlor-alkali plants. In order to provide an upper bound estimate of the chronic risks to compare with the lower bound estimates assuming that all chlorine was converted to HCl, we conducted modeling assuming that no chlorine is photolyzed.

In general, we consider an exposure concentration which is below the RfC concentration (what we call a hazard quotient of less than 1) to be safe. This is based on the definition of RfC. The RfC is a peer reviewed value defined as an estimate (with uncertainty spanning perhaps an order of magnitude) of a daily inhalation exposure to the human population (including sensitive subgroups) that is likely to be without appreciable risk of deleterious noncancer effects during a life time (i.e., 70 years).

We conducted additional modeling for all facilities within the subcategory using the same model used for the proposed action (ISCST3) to estimate chronic chlorine exposure using the assumption that no chlorine is photolyzed to HCl. The hazard quotients resulting from this additional modeling defined the upper bound of our risk assessment. The highest upper-bound hazard quotient estimated by the model is just over 0.3. (For more details regarding this revised risk assessment, refer to table 2 of the responses to