

Date: August 15, 2012

Subject: Summary of Public Comments on Chromium Electroplating and Steel Pickling Risk and Technology Review (RTR)

From: Phil Mulrine, EPA/OAQPS/SSPD

To: Docket

The purpose of this memorandum is to summarize and respond to comments received from the proposed National Emission Standards for Chromium Emissions from Hard and Decorative Chromium Electroplating and Chromium Anodizing Tanks (Chromium Electroplating NESHAP, 40 CFR 63, subpart N) and for the Steel Pickling – HCl Process Facilities and Hydrochloric Acid Regeneration Plants (Steel Pickling NESHAP, 40 CFR 63, subpart CCC) that were not presented in the Federal Register (FR) notice for this action. The other comments and responses are shown in the Federal Register notice.

I. List of Commenters

Table 1 summarizes the commenters who provided comments on the proposed Chromium Electroplating and Steel Pickling NESHAP.

Table 1. Chromium Electroplating, Anodizing and Steel Pickling Commenter List^a

Comment No. ^b	Association	Name
0259	Northrop Grumman Shipbuilding, Inc.	James R. Thornton
0260/0616	Clean Air Act Services Steering Committee (representing the Departments of the Navy, Air Force, and Army, other DoD).	Donald R. Schregardus
0272	Regional Air Pollution Control Agency (RAPCA)-Ohio	John Paul
0274/0618	New York State Department on Environmental Conservation Division of Air Resources	David J. Shaw/J. Jared Snyder
0275/0615	National Association of Clean Air Agencies (NACAA)	G. Vinson Hellwig Robert H. Colby
0277	Labyrinth Management Group, Inc (LMG), for The Electroplating Corporation of Ohio	Chuck Sisia
0278/0617	North Carolina Department of Environment and Natural Resources	Sheila Holman
0285/0296/0619	National Association for Surface Finishing (NASF)	Jeffery S. Hannapel
0290/0620	Sierra Club, Earthjustice, et al.	Emma Cheuse, James Pew, etc.
0291	Air Permitting Forum	Shannon S. Broome, Teresa A. Gorman, Charles

Comment No. ^b	Association	Name
		H. Knauss
0609	Indiana Department of Environmental Management	Phil Perry
0610	Small Business Administration Office of Advocacy	Winslow Sargeant, Sarah Bresolin Silver
0613	Alcoa Inc.	James D. Jones
0614	American Iron Oxide Company (Amrox)	Franz Mullings
0286	American Iron and Steel Institute	P. Pagano ^c
0295	Nucor Corporation	E. Hiser ^c
0614	American Iron Oxide Company	F. Mullins

^a Excludes form letter commenters.

^b Comments 0259 to 0296 apply to October 2010 proposal; Comments 0609 to 0620 apply to February 2012 supplemental proposal.

^c Comments 0286 and 0295 apply to October 2010 proposal.

II. Summary of Comments and Responses – Chromium Electroplating NESHAP

1. General RTR Approach

Comment: Commenter 0285/0296/0619 stated that EPA reversed the proper analysis of this rulemaking by first proposing unnecessarily strict standards based on the section 112(d)(6) technology review and, after proposing to set new standards under section 112(d)(6), determined whether those newly proposed standards should be further revised under CAA section 112(f). The commenter added that standards based on section 112(d)(6) were not warranted because EPA did not base the proposed lower emission standards on any new technology that has become available since the promulgation of the original rule. The commenter stated that EPA should have conducted the section 112(f) review of the existing standard first to determine if there was a residual risk of concern and should have moved on to the section 112(d)(6) review only if stricter standards were warranted based on the results of the section 112(f) review. The commenter stated that EPA has previously explained this approach in 69 Fed. Reg. 48351 and that, if EPA had first evaluated the existing standards under 112(f), it would have concluded that the existing standards were appropriately protective, as it did in October 2010.

Response: We disagree with the commenter's assertion that EPA should conduct a technology review under section 112(d)(6) only if EPA determines that additional controls are warranted based on the results of the risk review under section 112(f). This approach would appear to eliminate any independent role for section 112(d)(6) because it could not be invoked in the absence of a determination that additional controls are needed to address risk. Where evaluation of the various health and environmental factors supports adoption of additional controls, then section 112(f)(2) provides authority to adopt such requirements. Even if risk factors remain the same, changes in costs and performance, or in the availability of control technology may be sufficient to determine it is necessary to revise the existing section 112 standard pursuant to section 112(d)(6).

We note, however, that although we are not required to consider risk as part of the section 112(d)(6) review, and we are also not precluded from doing so. Under the CAA, we are required

to perform the risk review under CAA section 112(f)(2) only once, eight years after promulgation of the MACT standard. In comparison, we are required to perform the technology review under CAA section 112(d)(6) every eight years. Thus, even though we are not considering risk as part of the technology review at this stage, we may choose to consider risk as we conduct the second round of technology reviews 8 years after this initial round.

The commenter also states that a section 112(d)(6) revision is not warranted because no new technology has been developed since promulgation of the NESHAP. This reading of section 112(d)(6) is too narrow. Section 112(d)(6) provides that EPA shall revise section 112 standards “as necessary (taking into account developments in practices, processes and control technologies).” There is nothing in this provision that indicates that EPA is to consider only “new” technology that has become available since promulgation of the section 112 standard. Rather, it refers to “developments” which refers not only to new technologies, but also improvements in existing technologies. We believe “developments” includes new events that have resulted in a technology being more economically or technologically feasible. In addition, the language refers to practices and processes as well as technologies. Developments in practices and processes can include such things as improvements in the control efficiency of an existing technology or developments in how a technology is used so that greater reductions may be achieved. For example, at the time the NESHAP was promulgated, composite mesh pad systems were a new control technology. Since that time, manufacturers of composite mesh pads, as well as other types of controls used in the electroplating industry, have continued efforts to improve their products. Our analysis of the data indicate that these improvements in the control device design result in emissions that are substantially lower than those required at the time we established the MACT standards in 1995.

Comment: Commenter 0285/0296/0619 stated that EPA’s authority under CAA section 112(d)(6) is limited by the terms of the statute to only making “necessary” revisions to existing standards. The commenter added that the term “necessary” in section 112(d)(6) sets a very high standard for when changes may be made, and EPA has offered no basis for concluding that its proposed changes are “necessary.” The commenter acknowledged that EPA may impose additional controls based on the “ample margin of safety” or the 112(d)(6) technology review if it meets certain criteria. The commenter believes that with respect to these criteria, EPA has no basis to justify new controls for chromium electroplating and anodizing operations because EPA has not identified any additional HAPs since the promulgation of the original NESHAP, documented any significant improvement in performance for fume suppressants, mesh pads, scrubbers, identified any new cost-effective control technologies, and has not identified any co-benefits from the control of criteria pollutant emissions, in addition to chromium emissions.

Response: As explained in the previous response, section 112(d)(6) provides broad authority to EPA to review developments that could result in greater emission reductions of HAP. In reviewing section 112(d)(2) and (3) standards, and determining whether it is “necessary” to revise them under section 112(d)(6), the EPA must evaluate developments in practices, processes, and control technologies and in that evaluation, we consider the economic and technological feasibility of such developments. Section 112(d)(6) is a continuation of the technology-based section 112(d) standard-setting process, and determination is not controlled by risk-based considerations. Consequently, the EPA does not interpret CAA section 112 (d)(6) as

requiring that a standard is “necessary” only if justifiable based on public health/risk considerations. Although the decision whether to revise a section 112 standard pursuant to section 112(d)(6) is not primarily a public health-based determination as is the decision under section 112(f), we note that section 112(d)(6) does not preclude consideration of health and environmental factors. See *NRDC v. EPA*, 529 F. 3d 1077, 1084 (D.C. Cir. 2008). We also disagree with the comment that suggests that EPA may take action to revise a standard under section 112(d)(6) only if the Agency has identified additional HAP or co-benefits from the control of criteria pollutant emissions. While those are factors that might play a role in a decision whether it is necessary to revise the standard, they are not required conditions for establishing a revised standard under section 112(d)(6). As explained in the proposed rule and the preamble discussing our final decision, we have concluded that there have been improvements in the performance of some of the technologies currently in use to control emissions from chromium electroplating sources and we believe that these improvements will result in further emission reductions that can be achieved cost-effectively. Thus, we are revising the standard to reflect these further cost-effective emission reductions.

Comment: Commenter 0290/0620 suggested that EPA may not rely on the HON decision as justification not to perform the updated MACT floor analysis required by CAA section 112(d)(6) since the decision explained that its reasoning was based on the fact that petitioners had not identified any technological innovations that EPA had overlooked. The commenter made the argument that, in this case, there have been developments in practices, processes, and control technologies and EPA cannot rely on the HON case to evade its duty to satisfy section 112(d)(6). The commenter added that the HON case acknowledges in dicta that EPA must review existing floors under the section 112(d)(6) revision, and that using cost as the basis for setting section 112(d)(6) standards that reaffirmed existing standards was troublesome and contrary to cases holding that costs may not be considered in setting floors. The commenter suggested that, based on the record, EPA strengthen the existing MACT floor to ensure it meets section 112(d)(3).

The commenter stated that, for the chromium electroplating source category, EPA has recognized that there are significant new technologies that sources are using and that certain sources have achieved a level of actual emissions that is less than the allowable emissions under the MACT standard. Although the commenter questioned whether these emissions data are accurate, the commenter explained that, once EPA has such information, the Agency must factor this into the technology review under section 112(d)(6). The commenter noted in particular, that plants in California have achieved levels of emissions well below the current emissions limits and added that, if EPA had performed the required assessment and included all existing sources, including California sources, it is likely that the average emission limitation achieved by the best performing 12 percent of the existing sources would be significantly lower than the levels EPA chose for the proposed rule and that the limit for new sources in each subcategory also would likely be much lower. The commenter stated that EPA has not considered or addressed whether the existing MACT floor remains lawful in view of the greater levels of emission reductions that have been achieved. According to the commenter, the main thrust of section 112(d)(2) and (3) is to require technology-based standards that reflect the maximum achievable degree of emission reduction (42 U.S.C. section 7412(d)(2)). Then, section 112(d)(6) serves as an ongoing ratchet to continually require EPA to update standards to keep pace with new technology. The commenter

stated that all national emission standards for HAPs must satisfy the requirements of sections 112(d)(2) and (3), both when set initially and when they are revised and that EPA has no justification for failing to recalculate the MACT floors based on new technology and new emission reductions now achieved by the source category. The commenter concluded that EPA did not review or update the MACT floors for new or existing sources for the Chromium Electroplating and Anodizing source category pursuant to section 112(d)(3), but instead looked at new developments and performed a cost assessment that made cost (not achievability, as required) the central component of the analysis, which the commenter stated, is in violation of section 112(d)(6). The commenter recommended that EPA abide by section 112(d)(3) and set new MACT floors based on the emission reductions achieved and achievable using the new developments without consideration of cost. The commenter stated that because EPA failed to calculate a MACT floor, its proposal is unlawful and arbitrary, and it is unlawful for the agency to make cost the primary focus of its section 112(d)(6) determination.

On the other hand, Commenter 0285/0296/0619 agreed with EPA's conclusion that it would be inappropriate for the Agency to import the strict benchmarking required by section 112(d)(3) into the periodic section 112(d)(6) reviews, and that doing so would create a one way ratchet for MACT standards that would be in violation of the clear statutory mandate. The commenter noted that the D.C. Circuit has already rejected the argument that section 112(d)(6) requires EPA to "completely recalculate the maximum achievable control technology — in other words, to start from scratch." *NRDC v. EPA*, 529 F.3d 1077, 1084 (D.C. Cir. 2008). The commenter added that the setting of a MACT floor under section 112(d) is a one-time requirement.

Response: We disagree with the comments suggesting that the EPA must recalculate MACT floors under CAA section 112(d)(2)-(3) as part of the section 112(d)(6) review. As explained in a prior RTR rulemaking, the EPA does not read 112(d)(6) as requiring a reanalysis or recalculation of MACT floors. See *National Emission Standards for Coke Oven Batteries* (70 FR 19998-19999, April 15, 2005). We read section 112(d)(6) as providing the EPA with substantial latitude in weighing a variety of factors and arriving at an appropriate balance in considering revisions to standards promulgated under section 112(d)(2) & (3). Nothing in section 112(d)(6) expressly or implicitly requires that EPA recalculate the MACT floor as part of the section 112(d)(6) review. This position has been upheld by the court. *NRDC v. EPA*, 529 F.3d 1077, 1084 (D.C. Cir. 2008). We disagree with the commenters that the court's decision hinged on the fact that for the rulemaking at issue we had not identified any developments in practices, processes and control technologies under CAA section 112(d)(6). Rather, the court first states "[w]e do not think the words 'review and revise as necessary' can be construed reasonably as imposing" an obligation to completely recalculate maximum achievable control technology. *Id.* After concluding that the statute does not impose such an obligation, the court then says: "Even if the statute did impose such an obligation, petitioners have not identified any post-1994 technological innovations that EPA has overlooked."

Comment: Commenter 0290/0620 pointed out that EPA considered alternatives that would have achieved significantly greater emission reductions than what was proposed, but used cost effectiveness, and not achievability, as the determining factor to decide what emission limit to set among the regulatory options it considered. The commenter also pointed out that EPA's

analysis shows that the proposed rules will have very little economic impact on the industry. The commenter stated that EPA may not rationally decide that, to be cost effective a rule must have virtually no economic impact. The commenter also noted that, for small hard chromium electroplaters, EPA concluded that costs and the cost effectiveness are reasonable, but did not explain why additional cost to ensure additional emission reductions and additional cancer protection would not also be just as reasonable and necessary. The commenter added that EPA failed to address the achievability requirement of the statute and suggested that EPA's analysis is aimed at minimizing costs to the lowest level possible, while still requiring some emission reduction, and not setting rules that are truly cost effective. This method, the commenter states, is indefensible, arbitrary, and capricious. The commenter stated that EPA must satisfy section 112(d)(6), which incorporates section 112(d)(2)-(3), and finalize more stringent final standards than proposed. The commenter also stated that EPA is allowed to consider cost, but may only do so in considering what the maximum degree of reduction in emissions that is achievable.

Response: To the extent that the commenter is suggesting that the section 112(d)(6) review must be a new review under sections 112(d)(2) and (3), we disagree. The initial MACT standards established pursuant to sections 112(d)(2) and (3) did incorporate an "achievability" component. The commenter is incorrect that section 112(d)(6) incorporates the requirements of 112(d)(2) & (3) and the court has agreed with EPA's interpretation that section 112(d)(6) does not require a new analysis consistent with those provisions. *NRDC v. EPA*, 529 F.3d 1077, 1084 (D.C. Cir. 2008).

The EPA determined long ago that section 112 (d)(6) does not require MACT floors to be recalculated, and why EPA's interpretation that no further floor analysis is required was reasonable. See 70 FR at 20008 (April 15, 2005). EPA is not reopening that issue here, or otherwise reconsidering its interpretation. Contrary to the position taken by the commenter, the argument that we must reset the MACT floor under the section 112(d)(6) review was rejected by the D.C. Circuit in the HON opinion. See 529 F. 3d at 1084 ("It is argued that EPA was obliged to completely recalculate the maximum achievable control technology-in other words, to start from scratch. We do not think the words "review, and revise as necessary" can be construed reasonably as imposing any such obligation."). There is nothing to suggest that the HON Court's ruling that CAA section 112(d)(6) does not require re-calculation of MACT floors was limited to instances in which there have not been developments in practices, processes, or control technologies.

2. MACT Revisions

Comment: Commenter 0290/0620 stated that EPA unlawfully failed to perform the beyond-the-floor analysis required by section 112(d)(6) and section 112(d)(2), which applies to all emission standards promulgated under this subsection 112(d). The commenter acknowledged that EPA recognized that the industry has achieved significant emission reductions using new developments that it identified, but stated that EPA did not consider or determine the maximum degree of reduction in emissions now achievable using these developments or other additional requirements in the California standards. The commenter stated that, because so many sources have already achieved emission reductions well beyond those required by EPA's proposed rule, the proposed requirements are nowhere near the maximum achievable level, even considering cost (as EPA is allowed to do at the beyond-the-floor stage). The commenter added that it does

not appear EPA considered other factors listed in the statute, such as health and environmental impacts, as required. The commenter stated that EPA's failure to perform the required beyond-the-floor analysis is both unlawful and arbitrary. The commenter also suggested that the proposed more stringent surface tension limits should be considered at the "beyond-the-floor" stage of its analysis in part due to the non-air quality health and environmental impacts that EPA must consider under section 112(d)(2).

Response: As explained previously, the EPA does not read 112(d)(6) as requiring a reanalysis or recalculation of MACT floors nor does it require a "beyond the floor" analysis. It logically follows that if MACT floors are not recalculated, the subsequent beyond-the-floor analyses that are required when the EPA first establishes MACT standards, also are not required.

Comment: Commenter 0290/0620 stated that EPA has failed to justify setting standards for total chromium instead of pollutant-specific standards as required under sections 112(d)(6) and (f)(2). The commenter claimed that, under section 112(d), EPA is legally required to set a limit for each emitted pollutant. The commenter noted that EPA cannot lawfully avoid setting pollutant-specific limits for trivalent chromium and hexavalent chromium just because chromium compounds are listed under section 112(b)(1). The commenter explained that these hexavalent and trivalent chromium are different compounds, have different chemical makeup, and cause different health effects. The commenter also pointed out that California Air Resources Board (CARB) and South Coast Air Quality Management standards control hexavalent chromium directly, not just total chromium, and that EPA has failed to justify not similarly doing so in the NESHAP. The commenter noted that EPA has recognized hexavalent chromium is particularly responsible for increased cancer risk for this source category. The commenter stated that setting a total chromium standard (instead of pollutant-specific standards) will lead to a greater amount of risk at some sources, where hexavalent chromium may make up more of the emission stream, than at other sources, because of the type of process used.

Response: We agree with the commenter that we have the authority to establish different emissions standards for compounds containing hexavalent and trivalent chromium. We also agree that hexavalent and trivalent chromium are associated with different health effects and that hexavalent chromium is the more toxic species. However, because the emissions of total chromium are estimated to be 98 percent hexavalent chromium, a total chromium emissions limit is effectively a hexavalent chromium limit for these source categories. The NESHAP established emission limits in terms of total chromium, as measured by Methods 306 or 306A. Both of these methods measure the total amount of chromium present in the exhaust stream, regardless of the form of the emissions (hexavalent or trivalent chromium).

Comment: Commenter 0290/0620 claimed that EPA must assess and consider the potential for fugitive emissions and set numerical emission standards that reduce fugitive emissions, as well as emissions that are vented to a control device. The commenter explained that, in not doing so, EPA has failed to consider the potential for fugitive emissions from this source category and to satisfy sections 112(d)(6) and 112(f)(2). The commenter explained that, under section 112(f)(2), EPA must fully evaluate the public health and environmental risk associated with fugitive emissions, and determine whether standards are needed to provide an ample margin of safety. The commenter added that, under section 112(d)(2), EPA must consider

requiring that facilities enclose systems or processes to eliminate emissions, and must consider requirements to collect, capture or treat such pollutants when released from a process, stack, storage, or fugitive emissions point.

Response: In both the original MACT standard, and as part of the residual risk and technology review, we did consider fugitive emissions from the tanks regulated by the Chromium Electroplating NESHAP. We believe that it is not feasible to establish or enforce numerical emission standards for the fugitive emission sources associated with chromium electroplating and chromium anodizing tanks. Fugitive emissions arise largely from spills of chromium-laden liquid that dries and becomes airborne, or from chromium powder that becomes airborne. In either case, the frequency and magnitude of emissions are highly variable both within a plant on a day-to-day basis and from one plant to the next. Establishing a numerical emission limit would require either enclosing and ducting the entire tank area, which would be impractical because of worker and equipment movement, or measuring emissions at the building exhaust fan exit points. At those locations, the emissions would be highly variable, depending on the time and severity of spills, and thus any measurement of emissions would also be highly variable. Thus demonstrating compliance with those numerical emission limits would be impractical unless emissions were measured continuously. We believe requiring continuous monitoring of exhaust fan emissions would be cost-prohibitive. In addition, the NESHAP requires work practice standards to ensure the proper operation and maintenance of all emission control systems. When these systems are operating properly, fugitive emissions are minimized. As part of our residual risk and technology review, we reviewed whether fugitive emissions could be further addressed and we identified housekeeping measures to minimize fugitive emissions. In today's action, we are promulgating those housekeeping measures, which include such requirements as installation of splash guards and drip trays, prompt cleanup of spills, minimizing overspray, and storage and handling requirements for any substance that contains hexavalent chromium. The housekeeping measures being promulgated in this action are appropriate work practice standards designed specifically to achieve further reduction of fugitive chromium emissions from chromium electroplating processes.

Comment: Commenter 0290/0620 stated that Section 112 requires EPA to set an emission standard to control every emitted hazardous air pollutant. According to the commenter, a search of the California emissions inventory for the chromium electroplating and anodizing industry produced a list of additional pollutants (other than chromium compounds) that EPA did not address or regulate in this rulemaking. The commenter provided a list of the pollutants. The commenter added that EPA has recognized that many sources are using wetting agent/fume suppressants (WAFS), but believes EPA has not evaluated what other HAPs this may add into the emission stream. The commenter further explained that it is unclear why EPA has not proposed to set standards to reduce all of these pollutants, as section 112 requires and recommended EPA finalize standards for all emitted pollutants from this source category under section 112(d).

Response: Chromium compounds are the only HAP on the CAA section 112(b) list that are emitted from the chromium electroplating or chromium anodizing tanks, which are the emission sources regulated by the Chromium Electroplating NESHAP. Based on the list of pollutants provided by the commenter, we believe that the other HAPs referenced by the

commenter are from co-located sources and not from chromium electroplating and anodizing tanks, and there are other NESHAP that regulate emissions of those pollutants. For example, the Plating and Polishing NESHAP (40 CFR 63, subpart WWWW) addresses emissions of metal HAP including cadmium, chromium (non-electroplating sources), lead, manganese, and nickel. For facilities that perform halogenated solvent cleaning, 40 CFR 63, subpart T, regulates emissions of methylene chloride, perchloroethylene, trichloroethylene, 1,1,1-trichloroethane, carbon tetrachloride, and chloroform.

Regarding the use of WAFS, these chemicals are not included on the section 112(b) list of HAPs. Based on the material safety data sheets (MSDS) for the formulations of the most widely used WAFS, the chemicals do not contain materials listed as hazardous under OSHA Hazard Communication Standard (29 CFR 1910.1200). Therefore, we have no reason to believe WAFS add other HAPs to the emission stream. While our risk and technology review of the Chromium Electroplating NESHAP does not address HAP emissions from sources regulated under other NESHAP (and which emissions will be reviewed as part of the risk and technology review for those other standards), we did perform, as part of the supplemental proposal, a facility-wide risk analysis that considered these other HAP emissions, and the results of that analysis are summarized in the February 2012 supplemental proposal and are provided in the Residual Risk Assessment for the Chromic Acid Anodizing, Decorative Chromium Electroplating, and Hard Chromium Electroplating Source Categories, which is available in the rulemaking docket.

Comment: Commenter 0290/0620 stated that, if EPA uses total chromium as a surrogate, then it must meet the legal test to use a surrogate under section 112, and EPA has failed to do so in the supplemental proposal. The commenter claimed that a surrogate is reasonable only if it meets three conditions: (1) the target pollutant/s must invariably be present in the surrogate; (2) the control technology used to control the surrogate must indiscriminately capture both the surrogate and the target pollutant/s; and (3) control of the surrogate must be the only means by which facilities achieve reductions in the target pollutant(s). The commenter commented that EPA has not shown that this source meets each factor, particularly in view of the potential variety in raw materials (e.g., trivalent vs. hexavalent chromium) and control methods used in the past for different subcategories of this source category. The commenter requested the Agency investigate whether these factors lead to specific levels of hexavalent chromium emissions that are not always proportional to total chromium and fully analyze the reduction methods for hexavalent chromium. The commenter ultimately recommended that EPA set a HAP-specific, numerical emission standard that limits this (and each other emitted pollutant).

Response: Section 112(b) lists chromium compounds as the HAP which the EPA is required to regulate. Therefore, total chromium is not a surrogate pollutant and the commenter's argument is not applicable.

3. General Risk Methodology

Comment: Commenter 0290/0620 stated that the EPA must aggregate health risk for the source category and decide whether the total health risk from each pollutant or from all pollutants combined is unacceptable. The commenter observed that EPA listed each type of health risk, but treated them all separately. The commenter found this determination to be

incomplete and therefore arbitrary and capricious. The commenter also expressed concern that the EPA has not combined risks from multiple HAP, thus not assessing cumulative impacts and health risk appropriately. The commenter explained that EPA's risk assessment only considered hexavalent chromium and other chromium compounds and that EPA must assess the risk for all emitted pollutants. The commenter noted that the EPA should assess the synergistic, carcinogenic (and other) effects of different pollutants, and create a metric to assess the cumulative impact of all types of risks. The commenter emphasized that EPA's failure to assess and address cumulative health risks makes it difficult for the public to understand or evaluate how EPA reached the proposed acceptability determination. The commenter stated EPA must determine whether the risk from the individual or combined pollutants is unacceptable and, if so, what standards are needed to provide an ample margin of safety to protect public health.

The commenter recommended that the EPA aggregate health risk for each pollutant and each type of health risk to create a cumulative risk determination for the individual "most exposed" to the source category. The commenter also recommended that the EPA create a combined health risk metric that accounts for synergistic effects so that the Agency can make an acceptability determination that is based on the full picture of health risk and that can be compared to other source categories.

Response: Based on available information, chromium compounds are the only HAP emitted from the chromium electroplating and anodizing source categories. Historical data indicate that emissions from chromium electroplating sources are almost entirely comprised of hexavalent chromium, and we assumed that emissions from all chromium electroplating and anodizing sources consisted of 98 percent hexavalent chromium and 2 percent trivalent chromium based on these data. The actual speciation of chromium in exhaust streams may vary slightly from source to source. The commenter did not identify other pollutants they believe are emitted from sources in the chrome source categories. We have not identified any other HAP emitted from this source category.

The EPA disagrees that a combined risk metric is appropriate. Depending on whether a substance causes cancer and whether its dose-response curve is thought to have a threshold, EPA may use either of two approaches in a dose-response assessment. One approach produces a predictive estimate (e.g., inhalation cancer risk estimate), and the other produces a reference value (e.g., RfC). Historically, the use of a predictive estimate has been limited to cancer assessment. That is, dose-response assessments for cancer have been expressed as predictive cancer risk estimates based on an assumption that any amount of exposure poses some risk. Assessments of effects other than cancer usually have been expressed as reference values at or below which no harm is expected. Many substances have been assessed both ways because they are associated with both cancer and noncancer effects.

Although cancer and noncancer effects were not considered together with a combined risk metric, multiple pollutants causing the same effect or affecting the same target organ were combined. Because for carcinogens there is an assumption of a linear dose-response, the cancer risks predicted for individual chemicals were added to estimate cumulative cancer risk. This approach assumes that the risks associated with individual chemicals in a mixture are additive,

consistent with EPA's mixtures guidelines.^{1,2} In rare cases, the chemicals under assessment may be evaluated to determine whether effects from multiple chemicals are synergistic (greater than additive) or antagonistic (less than additive), although sufficient data for this evaluation are usually lacking. For the chrome source categories, hexavalent chromium is the only HAP emitted from the categories, so additivity is not relevant, but additivity was used for the facility-wide assessments because multiple carcinogens are emitted from some facilities.

In assessing noncancer hazard from chronic exposures, in cases where different pollutants cause adverse health effects via completely different modes of action, it may be inappropriate to aggregate individual pollutant hazard quotients (HQs). In consideration of these mode-of-action differences, the mixtures guidelines support aggregating effects of different substances in specific and limited ways. To conform to these guidelines, we aggregated noncancer HQs of HAPs that act by similar toxic modes of action, or (where this information is absent) that affect the same target organ. This process creates, for each target organ, a target-organ-specific hazard index (TOSHI), defined as the sum of hazard quotients for individual HAPs that affect the same organ or organ system. This approach was used in both the source category and facility-wide assessments of the chrome source categories.

Comment: Commenter 0290/0620 stated that Section 112(f)(2) requires EPA to consider all types of public health risk caused or contributed by a source category, but EPA did not assess acute health risk at all for the chromium emissions from this source category. The commenter noted EPA's statement that the acute HQ is "NA" or "not applicable" and that "there are no HAPs with an acute dose-response benchmark value. Therefore, the commenter stated the EPA did not perform a quantitative risk assessment for acute exposures to these pollutants." The commenter asserted that the lack of an acute dose-response benchmark value is not a valid excuse to fail to assess the acute impact for this source category. The commenter cited the 2008 ATSDR Toxicological Profile for Chromium in regard to acute exposure impacts. The commenter argued that because of the potential for acute impacts in communities that have a history of past exposure, the EPA may not lawfully treat the acute risk as zero.

Response: This issue was addressed by the EPA's Science Advisory Board (SAB) in their May 10, 2010 review of EPA's Risk and Technology Review (RTR) risk assessment methodologies.³ In that review, the SAB Panel recommended that, for HAPs that do not have dose-response values from the EPA's hierarchy list, the EPA should consider and utilize, as appropriate, additional sources for such values that have undergone adequate and rigorous scientific peer review. They further recommended that the inclusion of additional sources of dose-response values into the EPA's hierarchy should be adequately documented in a transparent manner in any residual risk assessment case study. We agree with this approach and have considered other sources of dose-response data when conducting our risk determinations under

¹ US EPA, 1986. Guidelines for the Health Risk Assessment of Chemical Mixtures. EPA-630-R-98-002. http://www.epa.gov/NCEA/raf/pdfs/chem_mix/chemmix_1986.pdf

² US EPA, 2000. Supplementary Guidance for Conducting Health Risk Assessment of Chemical Mixtures. EPA-630/R-00-002. http://www.epa.gov/ncea/raf/pdfs/chem_mix/chem_mix_08_2001.pdf.

³ US EPA, 2010. SAB's Response to EPA's RTR Risk Assessment Methodologies. [http://yosemite.epa.gov/sab/sabproduct.nsf/4AB3966E263D943A8525771F00668381/\\$File/EPA-SAB-10-007-unsigned.pdf](http://yosemite.epa.gov/sab/sabproduct.nsf/4AB3966E263D943A8525771F00668381/$File/EPA-SAB-10-007-unsigned.pdf)

the RTR. However, in some instances no sources of information in addition to the EPA's hierarchy are available.

While the 2008 ATSDR Draft Toxicological Profile for Chromium cited by the commenter does discuss a few limited studies of acute effects on humans and animals, that document concludes that, "data are not suitable for defining No Observed Adverse Effect Level (NOAEL) or Lowest Observed Adverse Effect Level (LOAEL) values for respiratory effects. Although longer duration inhalation studies show that the respiratory tract is a sensitive target of inhaled chromium (VI), the data are insufficient to determine acute-duration exposure levels that would produce respiratory tract, or other effects. In the absence of studies that could be used to identify the targets of low level exposure, an acute duration inhalation Minimal Risk Level (MRL) for hexavalent chromium was not derived."

The EPA agrees that we should ultimately develop toxicity values for all HAPs utilizing all credible and relevant toxicity information. The need to update assessments with newly available data as well as the need to complete toxicological assessments for all HAPs lacking dose-response assessments further increases the importance of Agency activities to streamline and fully utilize the EPA's already overloaded Integrated Risk Information System (IRIS) program. To that end, the EPA has always prioritized for future IRIS assessments those HAP without dose-response values but with the greatest potential for public exposure.

Comment: Commenter 0290/0620 stated that EPA provided no rational justification for its use of the supplementary risk analysis conducted for the October 2010 proposal. In the commenter's opinion, EPA used the supplementary analysis only to undermine the results of the initial conservative risk analysis, by suggesting that the high rate of cancer risk found for the maximum exposed individual in the conservative analysis matters less when compared to the estimated 365,100 people that would be exposed to a cancer risk of at least 1-in-1 million, as indicated by the supplementary analysis.

Response: As explained in the preamble for the supplemental proposal, we completely revised the risk assessment based on additional information collected on the industry and we are relying on that revised risk assessment for this final rule. The comment concerns a risk analysis performed for the initial proposal which we are not relying on for our final action and thus is not relevant to our final action.

Comment: Commenter 0285/0296/0619 did not agree with EPA's risk modeling procedures and suggested there are systematic errors in using dispersion modeling to predict resulting annual average concentrations at receptor sites. The commenter goes on to say that EPA's modeled or predicted concentrations appear to be 3 to 5 times higher relative to the actual monitoring results of the 2005 Urban Air Toxics Monitoring Program. The commenter believes EPA should, in the risk evaluation performed in this rulemaking, not rely on modeling that replicates the errors of the NATA modeling and should explain how the Agency's risk assessment has avoided these errors.

The commenter listed the following factors as possible reasons that may account for over-estimated hexavalent chromium concentrations: "worst case" assumptions for modeling

parameters (i.e., stack height, diameter, velocity, and temperature), failure to run HEM/AERMOD in a mode that accounts for rapid reduction/reactivity of hexavalent chromium or wet/dry deposition, running HEM/AERMOD in “rural” rather than “urban” mode, selecting a 30 meter default distance from facility stack to property fence line, and not considering the fairly rapid reduction of hexavalent chromium in electroplating mists that declines to 85 percent after one hour, and to 77 percent after three hours.

The commenter also stated that it is highly improbable that the concentrations of hexavalent chromium at MIR sites due to electroplating emissions alone could be higher than any observed actual ambient concentrations of hexavalent chromium, which reflect emissions from all source types, not just electroplating since surface finishing accounts for less than 1 percent of total national emissions of hexavalent chromium and chromic acid, as estimated in the 2005 NEI.

In contrast, other commenters (0274/0618, 0275, 0290/0620) stated that the residual risk assessments for the source categories were not conservative enough, especially considering the significant public health hazard that emissions from chromium electroplating facilities, including hexavalent chromium, can pose.

Response: The EPA believes the comparison of 2005 NATA estimates to 2005 ambient monitoring levels is not relevant to the supplemental proposed rule because the NATA estimates are based on different emissions data than were used in this rulemaking. The current data set relied on for the supplemental proposal is significantly better than the NATA data set and the data set we relied on for the 2010 proposal for a number of reasons. The current data set provides improved emissions estimates for many facilities, based on actual emissions test data; provides actual emissions data for a larger number of facilities than had been modeled for the 2010 proposal; includes an updated plant list that accounts for facilities that have opened recently and eliminates nearly 200 plants that have permanently closed or otherwise permanently stopped performing chromium electroplating; includes more plant-specific data on numbers and types of electroplating tanks, types of emissions controls, and control system operating parameters; and includes corrected geographic locations (latitudes, longitudes) for hundreds of chromium electroplating and anodizing facilities.

We agree that the modeling methodology we used for the chrome source categories for both the proposal and the supplemental proposal is similar to that used for NATA in that both used the HEM-3 exposure model, which utilizes EPA’s preferred dispersion model AERMOD. The modeling methodologies used in the risk assessments for the chrome source categories are discussed in detail in the risk document for the supplemental proposed rule.⁴ We disagree that such modeling results in significant overestimates or underestimates of concentrations and risks. Our dispersion model methodologies were reviewed by SAB as part of their overall review of RTR risk assessment methodologies, and their review stated that “...the dispersion modeling for primary HAPs used in risk assessments is well developed and appropriate.”⁵

⁴ US EPA. 2012. Draft Residual Risk Assessment for the Chromic Acid Anodizing, Decorative Chromium Electroplating, and Hard Chromium Electroplating Source Categories.
<http://www.regulations.gov/#!documentDetail;D=EPA-HQ-OAR-2010-0600-0179>

⁵ *Ibid.* 3.

We agree that accounting for dry deposition and depletion could result in lower estimated air concentrations because mass that is deposited is removed from the plume, resulting in lower estimated air concentrations. The impact of deposition for particulate emissions depends on multiple factors, including the distance from the source to the receptor, and particle properties. The impact on maximum estimated air concentrations and risks likely would be minimal because of the short distance between the sources and receptors. At longer distances, the impact would be greater, but the extent of that impact is difficult to estimate because we typically do not have sufficient particle property data (aerodynamic particle diameters, particle densities, and mass fractions) to model deposition. Also, deposited emissions can be resuspended in the air, and plume depletion does not account for that.

Regarding the reduction of hexavalent chromium in electroplating mists mentioned by the commenter, the impact of such reduction would be minimal on maximum estimated air concentrations because the plume would reach many nearby receptors in much less than an hour. Finally, the commenter's assertion that the 30-meter default distance from facility stack to presumed property fence line leads to overestimates of modeled concentrations is contrary to the purpose of that value. The 30-meter distance is used in HEM-3 to exclude census block receptors within that distance because such receptors are likely located within facility boundaries.

Regarding the comment that our risk assessments are not conservative enough considering that the pollutant of concern is hexavalent chromium, we used the RfC and URE values from IRIS, which were developed using a rigorous process that consists of the development of a draft toxicological review for a chemical; internal and external scientific reviews of the draft document; EPA responses to comments from the reviews; and development and posting of an IRIS Summary and final toxicological review to EPA's web site. The human health reference values (i.e., RfC and URE) that we used for the chromium compounds reflect their toxicity, and when used with modeled exposure concentrations, provide reasonable estimates of risk.

Comment: Commenter 0615 acknowledged that EPA used allowable emissions in parts of the rulemaking but is concerned EPA continues to use actual emissions in parts of its assessment. The commenter stated that a risk analysis based on actual emissions from a single point in time could underestimate the residual risk from a source category. The commenter believes that use of potential or allowable emissions is more appropriate in evaluating residual risk since facility emissions could increase over time for a variety of reasons and because major source hazardous air pollutant (HAP) thresholds and permits are based on potential-to-emit. The commenter stated that limiting the scope of a risk evaluation to actual emissions would be inconsistent with the applicability section of Part 63 rules and recommended EPA consider potential emissions, rather than actual emissions, as much as possible in evaluating residual risk.

Response: Consistent with previous risk assessments, the EPA considers both allowable and actual emissions in assessing chronic exposure and risk under section 112(f)(2). See, e.g., National Emission Standards for Coke Oven Batteries (70 FR 19998-19999, April 15, 2005); proposed and final National Emission Standards for Organic Hazardous Air Pollutants from the Synthetic Organic Chemical Manufacturing Industry (71 FR 34428, June 14, 2006, and 71 FR

76603, December 21, 2006). This approach is both reasonable and consistent with the flexibility inherent in the Benzene NESHAP framework for assessing ample margin of safety. As a general matter, modeling allowable emissions levels is inherently reasonable since this reflects the maximum level sources could emit and still comply with national emission standards. But it is also reasonable to consider actual emissions, where such data are available, in both steps of the risk analysis. See National Emission Standards for Coke Oven Batteries, 70 FR 19992, 19998 (April 15, 2005). The risk assessments for the chrome source categories were conducted using actual and allowable emissions, and the results of these assessments were considered in determining risk acceptability and ample margin of safety.

Comment: Commenter 0290/0620 stated EPA should consider background levels and/or emissions from other sources. The commenter stated that the EPA has failed to satisfy section 112(f)(2) and has failed to follow scientific recommendations or the best available science regarding the need to assess past background exposure as part of the health risk assessment. The commenter stated section 112(f) includes recognition of background levels, including background levels of past exposures and past pollution. The commenter reminded EPA that the SAB has urged EPA to incorporate cumulative risks into its residual risk analysis as section 112(f)(2) requires, including a full assessment of background and new risk. The commenter maintained that the EPA did not evaluate how long existing sources have emitted HAPs at their current locations, or the impact of past emissions on current health risk.

The commenter stated that EPA should be considering risk from all sources of contaminants, including co-located sources and all types of compounds. The commenter noted that EPA has data showing the frequent occurrence of this source category in highly populated, urban areas. The commenter stated that EPA has sufficient information to map the number of people who live within 50 km of more than one of these facilities, and who are thus subject to a double, or greater level of exposure, and a correspondingly greater risk level than EPA has found in its single-source exposure analysis. The commenter stated that it would be arbitrary and capricious for EPA to fail to fully assess the cumulative impacts faced by the communities it has found will experience disproportionate risks from this source category. The commenter stated that communities near chromium electroplating facilities are also subject to other types of additional harm not considered, including from fugitive emissions and other types of pollution. The commenter stated that the EPA should also consider environmental chemical stressors and other kinds of stressors that could exist in particular communities, such as poverty. The commenter stated that the risk from other sources of HAPs is not zero, for either cancer or non-cancer effects, and therefore must be accounted for in the risk assessment. The commenter stated that EPA must perform an aggregate analysis in order to assess the full emissions exposure and thus the full risk for the maximum exposed individual. The commenter stated that unless it does so, EPA has not considered this issue from the perspective of the individuals likely to have the maximum level of exposure to this particular type of source category, as required by §112(f)(2).

The commenter cited statements from the Mineral Wool Production and Wool Fiberglass manufacturing NESHAP and EPA's 2007 resource document on cumulative health risk assessment of multiple chemicals, exposures and effects.^{6,7} Although the commenter appreciated

⁶ Proposed Rule, 75 Fed. Reg. 65,068, 65,073 (Oct. 21, 2010).

that EPA has considered facility-wide risk in this rulemaking, the commenter believes that EPA's risk assessment is flawed and EPA's facility-wide risk assessment underestimates the total risk faced by the maximum exposed person. According to the commenter, EPA did not analyze full HAP exposure, including the baseline level of exposure that is present in the environment from sources outside of the source category and not collocated at the same facility.

The commenter suggested that the EPA should follow SAB recommendations to perform a sensitivity analysis to identify the major uncertainties in both the human health and ecological risk assessments. Further, the commenter recommended that the uncertainties require more conservative assessment and more protective action.

The commenter recommended that the EPA perform a cumulative impacts analysis by combining current baseline emissions, exposures, and health impacts in addition to those of the specific source category EPA is reviewing. As part of this analysis, the commenter added, the EPA should aggregate or add the emissions for the most-exposed communities coming from: (1) the source category (including all individual sources within it); (2) facility-wide risk from collocated sources outside of this category; and (3) all other sources of toxic air pollution in the area. The commenter suggested that the EPA aggregate the community's exposure and assess the full health threats faced by the affected community, including from the sources under review. The commenter stated that to perform this step, EPA must also draw on the OEHHA community assessment approach. The commenter observed that without a full cumulative risk and impacts assessment, EPA fails to gather the necessary information to determine whether stronger standards are needed for the Chromium Electroplating source category. The commenter stated that a full risk assessment is needed for EPA to be able to prevent unacceptable health risk and provide the legally required "ample margin of safety," 42 U.S.C. § 7412(f)(2).

Another commenter (0278/0617) stated that it is not clear how EPA's emission simulation method accounts for associated health risks to neighboring communities near plants in rural areas.

Response: As an initial matter, we disagree with the commenters to the extent they are suggesting that we are required to consider the total risk from all HAP to particular communities as part of our section 112(f) review. The focus of section 112(f)(2) is to review the risk posed by the emissions of HAP from the "source category" to determine whether it is necessary to revise the MACT standard for that source category to ensure an ample margin of safety. While it is true that a community-by-community assessment of total risk may be informative and could lead to a determination of the primary source of risks within specific communities, such an analysis is well beyond the scope of section 112(f)(2). Furthermore, the uncertainties associated with sources of emissions outside of the source category under review can be significant. The Act establishes a staged approach to performing the residual risk review for the source categories regulated under section 112 and we have yet to begin our residual risk review for many of those

⁷ U.S. EPA, Concepts, Methods and Data Sources for Cumulative Health Risk Assessment of Multiple Chemicals, Exposures and Effects: A Resource Document, at xxxii (2007), EPA/600/R-06/013F (defining a cumulative risk assessment as including "aggregate exposures by multiple pathways, media and routes over time, plus combined exposures to multiple contaminants from multiple sources").

source categories. Therefore, we do not even have preliminary inventories, much less more refined inventories yet for many source categories. In addition, even assuming we could determine the primary source of risks, if those risks are due to sources outside the source category being regulated in the immediate regulation or outside the scope of section 112, the immediate action would be unable to address those risks. Despite those concerns, however, we note that background risks or contributions to risk from other sources, where such information is available and reliable, can be one of the relevant factors considered in the AMOS determination, along with cost and economic factors, technological feasibility, and other factors. Thus, while we are not required (and, indeed, cannot) do a community-by-community analysis of total risk, we do consider available information as part of our AMOS analysis.

The EPA disagrees with the comments that we did not consider aggregate or cumulative risks. As discussed in detail in the risk document for the supplemental proposed rule,⁸ the assessments we conducted for the chrome source categories consider the cumulative cancer risks from all carcinogens and the cumulative noncancer hazard indices from all non-carcinogens (affecting the same target organ system) emitted from sources within each of the chrome electroplating and anodizing source categories and also collocated sources at the same facilities. However, the commenter is correct that the assessments did not include background risks or contributions to risk from sources outside the facilities.

We note that section 112(f)(2) of the CAA expressly preserves our use of the two-step process for developing standards to address residual risk and interpret “acceptable risk” and “ample margin of safety” as developed in the Benzene NESHAP. In the Benzene NESHAP, EPA rejected approaches that would have mandated consideration of background levels of pollution in assessing the acceptability of risk, concluding that “...comparison of acceptable risk should not be associated with levels in polluted urban air. With respect to considering other sources of risk from benzene exposure and determining the acceptable risk level for all exposures to benzene, EPA considers this inappropriate because only the risk associated with the emissions under consideration are relevant to the regulation being established and, consequently, the decision being made.” (54 FR 38044, 38061, September 14, 1989).

Although not appropriate for consideration in the determination of acceptable risk, we note that background risks or contributions to risk from sources outside the facilities under review could be one of the relevant factors considered in the AMOS determination, along with cost and economic factors, technological feasibility, and other factors. Background risks and contributions to risk from sources outside the facilities under review were not considered in the AMOS determination for these source categories, mainly because of the significant uncertainties associated with emissions estimates for such sources.

Comment: Commenter 0290/0620 recommended that the EPA address variability in the human response to toxic chemicals by using an additional factor to account for variability in chronic non-cancer risk. According to the commenter, the EPA must include this analysis to satisfy its responsibility to protect the “individual most exposed” from unacceptable health risk under section 112(f). The commenter noted that while the EPA uses an uncertainty factor approach to recognize variability, variability is different from uncertainty, and should be treated

⁸ *Ibid.* 4.

differently. The commenter pointed out that the NAS has determined that the difference between the median versus higher-end response for cancer may be a factor of 25.⁹

Response: Regarding noncancer effects, the uncertainty/variability factors that EPA uses in operationally deriving the RfD and RfC from experimental data are intended to account both for variability and uncertainty. These factors account for (1) variation in susceptibility among the members of the human population (i.e., inter-individual or intraspecies variability); (2) uncertainty in extrapolating animal data to humans (i.e., interspecies uncertainty); (3) uncertainty in extrapolating from data obtained in a study with less-than-lifetime exposure (i.e., extrapolating from subchronic to chronic exposure); (4) uncertainty in extrapolating from a LOAEL rather than from a NOAEL; and (5) uncertainty associated with extrapolation when the database is incomplete.¹⁰

Cancer unit risk estimates are derived under the approach that at low doses (i.e., below observed data) risk is linear with dose. We use this linear extrapolation as a default approach because it generally is considered to be health-protective.¹¹ The NAS document cited by the commenter presents several possible methods for dose-response analysis, including the one alluded to by the commenter. We disagree with the commenter's characterization of the document's statement regarding a factor of 25 ratio between a population median and upper 95th percentile as a NAS determination. The NAS committee did not "determin[e]" that a factor of 25 was the difference between the median versus higher-end response for cancer or any other endpoint, nor did the committee make any statements regarding hexavalent chromium. The NAS committee's use of a ratio is simply as an example default assumption in their description of one of three conceptual models provided as examples of "unified" approaches (i.e., approaches in which cancer and other effects might be assessed in similar manner) for EPA's consideration of such approaches.

⁹ S. Janssen et al., NRDC, Issue Paper, Strengthening Toxic Chemical Risk Assessments to Protect Human Health at 4 (Feb. 2012) (citing NAS, Science and Decisions: Advancing Risk Assessment (2009)).

¹⁰ A Review of the Reference Dose and Reference Concentration Process. U.S. Environmental Protection Agency. Risk Assessment Forum. EPA/630/P-02/002F. December 2002.
<http://www.epa.gov/raf/publications/pdfs/rfd-final.pdf>

¹¹ Guidelines for Carcinogen Risk Assessment. U.S. Environmental Protection Agency. Risk Assessment Forum. EPA/630/P-03/001F. March 2005.
http://www.epa.gov/raf/publications/pdfs/CANCER_GUIDELINES_FINAL_3-25-05.PDF

4. Risk Criteria

Comment: Commenter 0615 points out that in assessing the cancer risks related to the source category, EPA used long-term concentrations affecting the most highly exposed census block for each facility. The commenter believes this analysis dilutes the effect of sources' emissions by estimating the impact at the centroid of the census block instead of at the property line or wherever the maximum exposed individual is. The commenter further noted that even if the area near the property line is not developed, over time homes and businesses could locate closer to the facility. The commenter added that even if the population distribution is homogenous over a census block, this assumption is not necessarily accurate in considering the predicted impacts from the location of a source. The commenter believes that using HEM-3, EPA can identify the maximum individual risk at any point in a census block that is within a 50-kilometer radius from the center of the modeled facility. The commenter suggested EPA abandon its use of the predicted chronic exposures at the census block centroid and use the truly maximum individual risk, irrespective of its location in the census block, in its section 112(f)(2) risk assessments.

Response: As we have explained in previous RTRs, such as the SOCFI HON RTR (71 FR 76603, December 21, 2006), the EPA believes that, in a national-scale assessment of lifetime inhalation exposures and health risks from facilities in a source category, it is appropriate to identify exposure locations where it may be reasonably expected that an individual will spend a majority of his or her lifetime. Further, in determining chronic risks, the EPA believes that it is appropriate to use census block information on where people actually reside, rather than points on a fence-line, to locate the estimation of exposures and risks to individuals living near such facilities.

The commenter is correct that the HEM-3 model can estimate exposures at any location within the maximum modeling radius of 50-km recommended for the AERMOD dispersion model. However, because nationwide location data for all residences is not readily available, and because such data, if available, would result in millions of model receptors that would significantly increase model runtimes, we use census blocks as surrogate locations for where people reside. Census blocks are the finest resolution available as part of the nationwide population data (as developed by the US Census Bureau); each is typically comprised of approximately 40 people or about 10 households. In EPA risk assessments, the geographic centroid of each census block containing at least one person is used to represent the location where all the people in that census block live. The census block centroid with the highest estimated exposure then becomes the location of maximum exposure, and the entire population of that census block is assumed to experience the maximum individual risk. In some cases, because actual residence locations may be closer to or farther from facility emission points, this may result in an overestimate or underestimate of the actual annual concentrations (although there is no systematic bias for average levels). Given the relatively small dimensions of census blocks in densely-populated areas, there is little uncertainty introduced by using the census block centroids in lieu of actual residence locations. There is the potential for more uncertainty when census blocks are larger, although there is still no bias on average. The EPA concludes that the most appropriate locations at which to estimate chronic exposures and risks are the census block centroids because: 1) census blocks are the finest resolution available in the national census data, 2) facility fencelines do not typically represent locations where chronic exposures are likely, and

3) there is no bias introduced into the estimate of the MIR by using census block centroid locations.

Comment: Two commenters (0290/0620 and 0285/0296/0619) commented on EPA's criterion of 100-in-1 million for determining when more stringent standards are required. Commenter 0290/0620 stated EPA should update the acceptable maximum possible level of risk. The commenter stated that the 1988 benchmark of 100-in-1 million is out-dated and contravenes the purpose of §112(f)(2), which is to make regulatory changes based on what EPA, and the public, have learned from the implementation of the MACT standard. The commenter stated that the view that a presumptive level of risk of 100-in-1 million may be acceptable has changed because the world in which we live has changed. The commenter added that the CAA in 1990 was amended because risk of death from air pollution at that time was not thought to be acceptable. The commenter stated that the available technologies that can reduce health risk must be considered, regardless of cost. The commenter added that in the case of chromium electroplating, the state of California has already reduced emissions using available technologies. Thus, the commenter does not believe it to be acceptable to continue exposing a child today to a higher level of risk. The commenter added that, by urging EPA to continue to aspire to reach the 1-in-1 million level, the court in the HON case implicitly recognized that 100-in-1 million was a maximum that EPA should continue to reconsider over time and in context. The commenter stated that the EPA must reassess whether a level below 100-in-1 million and closer to the aspired goal of 1-in-1 million should be adopted as a more stringent, presumptive outward limit for what is considered acceptable. Further, the commenter stated that EPA did not explain why the 90-in-1 million cancer risk is acceptable for the chromium electroplating source category. Commenter 0274/0618 commented that the residual risk assessment conducted for chromium electroplaters is not as highly conservative as stated by the U.S. EPA. The commenter stated that the projected inhalation cancer risk of 70- to 90-in-1 million should not be characterized as low.

On the other hand, commenter 0285/0296/0619 agreed with EPA's conclusion that maximum individual risks as high as 100-in-1 million can be presumptively considered "safe" or "acceptable." In order to reach that conclusion, the commenter states that EPA correctly relied on the 1987 Vinyl Chloride decision (*NRDC, Inc. v. EPA*, 824 F.2d 1146 (D.C. Cir. 1987)), and the 1989 Benzene Rule (54 Fed. Reg. 38,044 (Sept. 14, 1989)), codified by statute under section 112(f)(2)(B). The commenter further stated that this approach to "residual risk" MACT rulemakings has been upheld by the D.C. Circuit, and EPA has been consistently applying it. *NRDC v. EPA*, 529 F3d. 1077 (D.C. Cir. 2008); 77 Fed. Reg. at 1270 – 1272.

Response: In 1990, Congress codified in section 112(f) of the CAA the approach we use for our residual risk analyses (i.e., the Benzene NESHAP, 54 FR 38044). Under that approach, the 100-in-1 million cancer risk is not a bright line indicating that risk is "acceptable," but rather we consider this health metric in conjunction with a variety of health factors to determine whether the risk is acceptable. Where we conclude that the risk is not acceptable, we cannot consider costs in requiring controls to bring risks down to an acceptable level. However, the analysis of whether risk is acceptable is not the endpoint. Once we determine that controls are sufficient to ensure risk is acceptable, we again review the health metrics in conjunction with considering the costs of controls to determine whether additional controls should be required to provide an ample margin of safety. The commenter does not provide support for its contention

that “the risk that was acceptable in the world of the 1980s is no longer acceptable in today’s world.” Nor does the commenter explain how science has evolved in a way that would undermine the codified framework for determining acceptability.

Comment: Commenter 0290/0620 stated that, although in the HON case the D.C. Circuit affirmed EPA’s use of certain elements of the Benzene NESHAP, it did not rubber stamp the Benzene Rule’s approach in full. The commenter stated that the HON court did not address some of the questions raised in this rulemaking. The commenter further stated that it also did not broadly hold that EPA can do in every future residual risk rulemaking precisely what it did at each step of the Benzene NESHAP.

Response: The commenter’s concerns regarding reliance on the Benzene NESHAP presumably refer to our actions under the section 112(f)(2) risk review. We note that section 112(f)(2)(B) specifically references the Benzene NESHAP as the benchmark for residual risk actions and the court in NRDC recognized that. We agree that the court in NRDC did not address how EPA should apply the tests in the benzene NESHAP in any future rulemaking actions under section 112(f)(2).

Comment: One commenter (0274/0618) stated that EPA’s supplemental risk assessment underestimated risk by not adjusting stack parameters, stack diameter, flow rates, and other parameters to represent the smaller ventilation systems modeled in the supplemental analysis. Instead the commenter stated, EPA modeled smaller sources with the exaggerated flow rates characteristic of the model plants, and those higher flow rates result in lower risk.

Response: This comment was submitted on the October 2010 proposed rule. As noted previously, for the supplemental proposal, we revised the data and parameters used in the risk assessment. The flow rates, stack diameters, plant locations, and other parameters used for the supplemental proposal analysis much better reflect the chromium electroplating and anodizing industry and take into account source size.

5. Specific Risk Assessment Procedures

Comment: Three commenters (0274/0618, 0275, and 0290/0620) noted that the emissions data used in the risk assessment are based on the assumptions that all facilities are in compliance with the MACT standard. The commenter stated that because most chromium electroplaters are small sources and may not be subject to regular inspections, it may be difficult to assume compliance without a comprehensive evaluation of compliance and enforcement information. Commenter 0290/0620 asked that the EPA consider the control efficiency for the control devices when assessing risk, in the case of the control equipment’s failure. The commenter provided an example, that in the case of failure of a control device with 99 percent efficiency, the resulting emissions will increase by a factor of 100. The commenter noted that the EPA has information in the record showing past non-compliance for this source category.¹² The commenter stated that EPA’s failing to account for additional risk due to malfunctions or violations is unlawful, arbitrary and capricious because it ignores the full risk to the “individual most exposed” to the emissions of this source category. Two of the commenters cited a study by California’s Air Resources Board that reported that many facilities violate provisions of the

¹² CARB Chrome Plating Rule Effectiveness Study, EPA-HQ-OAR-2010-0600-0069.

regulations. One of the commenters stated that, in order to consider the full risk associated with emissions from chromium electroplating, EPA must account for a higher potential level of emissions above what the MACT allows, including data for SSM emissions and data for emissions that exceed the standard. The commenter stated that as part of this, EPA should also evaluate how likely pure violations of the standard are. The commenter further stated that as a result of these omissions, the proposal is arbitrary and capricious and also fails to satisfy the requirement under section 112(f) that EPA address all “emissions from a source in the category or subcategory,” whether they are controlled or uncontrolled by the MACT. The commenter also stated that EPA has recognized significant uncertainty in the data used, and that EPA must perform a robust analysis of risk that starts with accurate, reliable data about the types of facilities and their emissions. One commenter stated that, because non-compliance is not factored into the analysis, the statement that the RTR results are a highly conservative assessment of risk is false.

Response: We disagree with the commenter that emissions associated with MACT standard violations, whether caused by malfunction events or not, should be considered as part of the risk analysis. The purpose of the risk review is to evaluate whether the emission limits should be made more stringent to reduce the risk posed after compliance with the underlying MACT standards. To the extent that a source is violating the underlying MACT standards, no tightening of the emission standard under the residual risk rule will avoid such violations. In other words, a source that is violating the MACT emissions standards promulgated under section 112(d) would not be any more likely to be able to avoid such violations and comply with presumably more stringent standards promulgated under section 112(f). Such events are violations and subject to enforcement by the EPA, the States, or citizens, and an action for injunctive relief is the most effective means to address violations (regardless of whether they are caused by malfunctions) if an emissions event poses a significant health or environmental risk.

Although we disagree that emissions resulting from MACT standards violation should be considered as part of the risk review, we believe malfunction events do not contribute significantly to cancer or chronic non-cancer risks for the source categories in this rulemaking because malfunction events are inherently short-term and infrequent relative to annual operations and emissions. The commenter did not supply any data to the contrary.

Comment: One commenter (0290/0620) recommended that EPA use the Community Health Air Pollution Information System (CHAPIS) for locations of chromium electroplating facilities throughout the state of California. The commenter included maps showing locations and clusters of facilities in southern California, drawn from CHAPIS data.

Response: Our current chromium electroplating database already includes the street address and/or geographic coordinates for most chromium electroplating and anodizing facilities. Because of the large number of facilities, it was not possible for us to verify that the geographic coordinates for each plant was correct. For those plants with incomplete or missing coordinates or for which the location was in question, we performed a search of online data databases, including EPA’s Envirofacts website, to verify the location and to fill in the missing data. For many plants that we believe had relatively high emissions or were high risk plants, we verified

the location using Google maps. We did not see the need to use other databases to further verify plant locations.

Comment: One commenter (0285/0296/0619) stated that EPA should use ambient chromium concentration estimates from data sources such as the National Air Toxics Assessment to address risks based, at minimum, on the research that has already occurred to assess cancer risk from toxic air pollution in urban communities nationwide.

Response: The National Air Toxics Assessment (NATA) is EPA's ongoing comprehensive evaluation of air toxics in the U.S. The EPA developed NATA as a screening tool for State/Local/Tribal Agencies to prioritize pollutants, emission sources and locations of interest for further study in order to gain a better understanding of risks. The NATA provides information about emissions, ambient air concentrations, exposures and risks across broad geographic areas (such as counties, States and the Nation) at a moment in time. As such, NATA helps regulatory agencies identify specific air toxics compounds, and specific source sectors (such as stationary sources or mobile sources) which generally produce the highest exposures and risks in the country. The NATA assessments are based on assumptions and methods that limit the range of questions that can be answered reliably. The results cannot be used to identify exposures and risks for specific individuals, or even to identify exposures and risks in small geographic regions such as a specific census block. Therefore, NATA estimates are not appropriate for use in RTR risk assessments.

Comment: Commenter 0274/0618 questioned EPA's treatment of building downwash and noted that EPA should not overlook the potential of downwash to produce higher offsite concentrations for facilities with short stacks or for densely urbanized areas around facilities. Commenter 0274/0618 stated that if EPA had accounted for downwash, the maximum risk would have occurred at 100 meters from the plant and would have been much higher.

Response: We agree that, in certain cases, building downwash can result in higher estimated air concentrations near buildings (typically up to five to ten building heights away), and that this is one area of uncertainty in our risk assessment. However, the impact of downwash on maximum estimated exposures and risks is unlikely to be that significant because the stacks (and associated plumes) are already emitted near ground level (stack heights less than 10 m). The effects of downwash are most significant with taller stacks because the higher plume is brought to the ground nearer the source, with much less space in which to disperse before reaching the ground than without downwash, leading to higher ground-level concentrations.

Comment: Commenter 0274/0618 and 0615 are concerned with EPA's socio-economic analysis including the removal of the 5 km radius. The commenters believe the sole use of a 50 km radius for a socio-economic analysis is inadequate because it does not consider risks greater than 1-in-1 million or consider impacts for individuals living within 5 km of a facility. Commenter 0615 added that the results of an analysis that encompasses a larger area can be diluted by including population not in the demographic groups most at risk; which is especially true at sources located in or next to minority or low-income populations. The commenters recommended EPA conduct an analysis at 5 km to assess facility impacts to nearby environmental justice communities.

Response: In the October 2010 proposed rule for the chrome source categories, we performed the demographic analyses using two approaches as examples of how such analyses might be developed, and invited public comment on the approaches used and the interpretations made from the results. In the first approach, we focused the analysis on the total populations residing within 5 km of each facility, regardless of their estimated risks, and examined the distributions across various demographic groups within those 5 km circles. That analysis was a “proximity” analysis in that it considered only the distance from the emission sources to surrounding populations, and not the estimated risks to those populations.

In the second approach, we focused the analysis on the populations within 5 km of any facility estimated to have exposures to HAP which result in cancer risks of 1-in-1 million or greater or non-cancer hazard indices of 1 or greater. We examined the distributions of those risks across various demographic groups. In each approach, we compared the percentages of particular demographic groups to the total number of people in those demographic groups nationwide. We stated in the proposed rule for the chrome source categories that in future rules we planned to extend the analyses to cover the entire modeled domain for a facility (50 km radius) to capture all individuals with risks of 1-in-1 million or greater or non-cancer hazard indices of 1 or greater. We also stated that generally we have found that using a 5 km radius in the analysis will capture more than 90 percent of the individuals with cancer risks above 1-in-1 million.

In the February 2012 supplemental proposal for the chrome source categories, our demographic analyses included populations within 50 km of each source (including those very near the sources) with risks of 1-in-1 million or greater. (77 FR 6628, Feb. 8, 2012). We did not include analyses using a 5 km radius in the supplemental proposal. We believe that, where a risk assessment has been performed, it is more informative to consider the demographics of all populations (including those beyond 5 km) with elevated risks than to limit the demographics analysis to populations located within 5 km of a facility. Where risk assessment has been performed, all populations with elevated risk are identified, regardless of their proximity to the facility. As discussed above, we have found that most exposure locations with the highest estimated risks are within 5 km of a facility, so extending the radius to 50 km has little impact on an analysis based on risks, but makes more sense because 50 km corresponds to the risk modeling radius and includes all populations with elevated risk estimates. Our evaluation of demographics did not affect our decisions about acceptability and ample margin of safety of the risks associated with these source categories.

Comment: Commenter 0285/0296/0619 stated that the Chromium Electroplating MACT standard has been effective in controlling chromium emissions. The commenter noted that over the past 15 years, the metal finishing industry has implemented engineering controls and management practices to reduce chromium emissions. The commenter explained that there has been a 99.9 percent reduction in emissions since the original promulgation of the Chromium Electroplating NESHAP. The commenter believes that as a result of these reductions, the risks posed by emissions from chromium electroplating and anodizing operations are miniscule. The commenter believes that EPA’s emission estimates are high and based on their own estimates few, if any, plants would have risk of 1-in-1-million. The commenter stated that the additional environmental safeguards provided by the phase-out of PFOS fume suppressants and

implementation of new housekeeping provisions (as clarified in other comments) indicate that no new controls are needed to protect the environment or human health from chromium emissions from chromium electroplating and anodizing operations.

Response: We agree with the commenter that nationwide emissions have decreased significantly since promulgation of the NESHAP. However, we based our decision to propose more stringent limits on the results of the technology and residual risk review and the amount of emission reductions already achieved by the industry is not pertinent to whether there is a remaining risk and whether there are developments in practices, processes and controls that indicate revisions to the standard are necessary. Our basis for determining that additional controls are warranted under CAA sections 112(d)(6) and (f)(2) is provided in the preamble to the final rule. As explained further in the preamble, we are promulgating lower limits for each of the source categories because we believe these lower limits reflect developments in practices, processes or control technologies. We are also promulgating these same limits under Section 112(f) because they will reduce risks and provide an ample margin of safety.

Comment: Commenter 0285/0296/0619 stated that, in 2010, EPA concluded that the risks posed by chromium electroplating and anodizing were acceptable and proposed to retain the existing emission standards. The commenter stated that the EPA changed its decision in the supplemental proposal by significantly reducing emissions limits in spite of EPA's conclusion that the "risks due to the estimates of actual emissions ... are considerably lower than those presented in the October 21, 2010 proposal FR notice for hard chromium and decorative chromium plants" and "about the same" for chrome anodizing. The commenter explained that, initially, EPA estimated that 14 million individuals were exposed to a cancer risk of greater than 1-in-1 million. The commenter noted that the EPA has significantly reduced its estimate to 180,000 individuals potentially exposed to a cancer risk of 1-in-1 million. The commenter indicated that EPA has been inconsistent in its interpretation of risk results and should not have reversed its decision to make no changes to the emission standards.

Response: In both the initial proposal and the supplemental proposal, we proposed that the risks posed by this source category after implementation of the MACT standard were acceptable. However, for purposes of the second step of the risk analysis, in which we consider the cost of controls in addition to considering once again all of the health metrics, we proposed in the supplemental proposal that additional controls were needed to provide an ample margin of safety. We also proposed that it was necessary to revise the MACT to require these controls as part of the technology review, considering the cost effectiveness of the controls. As an initial matter, we note that based on updated emissions information and refined analyses, the results of our risk assessment for the supplemental proposal indicated that risk was lower than was indicated by our 2010 risk assessment, which was the basis for our October 2010 proposal. However, for purposes of the supplemental proposal we also considered updated information indicating that the existing controls were achieving greater emissions reductions than we had previously estimated and that it was feasible and cost-effective to lower the emissions limits and achieve further reductions. Thus, although we estimated lower risk from implementation of the existing MACT standard for the supplemental proposal, we concluded that increasing the stringency of the emission limits was warranted under our both our section 112(d)(6) review and the ample margin of safety analysis under section 112(f)(2). We set forth the rationale for our

proposed decision in the supplemental proposal and we maintain that rationale for the promulgated limits. Further explanation of the basis for the final standards is provided in the Federal Register Notice for this action.

Comment: Commenter 0285/0296/0619 stated that EPA cannot justify imposing any new controls for chromium electroplating and anodizing operations because it has concluded generally that the risks associated with this proposed rule are acceptable. Specifically the commenter noted, EPA has not identified any MIR cancer risks greater than 100-in-1 million, and very few greater than 10-in-1 million. The commenter added that the number of individuals exposed to a potential cancer risk of 1-in-1 million is 180,000 individuals based on EPA's estimate in the supplemental proposal, and the TOSHI for the rule is well below 1.0, and EPA has not identified any significant acute risks or any HAPs that may present multi-pathway risk concerns.

Response: The fact that we concluded that risks are acceptable addressed only the first step in the section 112(f)(2) risk review. Once we determine the additional reductions, if any, that are necessary to ensure risk is acceptable, where the MIR remains above 1-in-1-million, we then look again at the health factors we considered in the risk acceptability determination and consider the cost of controls in addition to any other relevant factors. Additionally, under CAA section 112(d)(6), we must review developments in practices, processes and control technologies to determine whether additional controls are necessary. Under that provision, we focus on whether there are developments that can be implemented cost-effectively.

Comment: Commenter 0290/0620 stated that EPA has failed to provide a reasoned explanation for its proposed determination that the current level of health risk for Chromium Electroplating is acceptable, and that the EPA should find health risk from this source category to be unacceptable under section 112(f)(2). The commenter noted that the EPA found cancer risk based on allowable emissions is high for each of the subcategories, but still found risk to be "acceptable."

Response: We explained in the supplemental proposal (77 FR 6648) our reasons for finding the risks acceptable. The preamble to the final rule also provides a detailed discussion on acceptability and ample margin of safety.

Comment: Commenter 0290/0620 noted that EPA did not determine what standards would "protect the greatest number of persons possible" from an MIR over 1-in-1 million, even though EPA has acknowledged that such a determination is required. The commenter noted that the EPA did not make a finding that it is not "possible" to protect more people from the risks calculated for this source category, but decided, instead, that it is just not cost-effective to do so. The commenter added that EPA's cost-effectiveness discussion in the preamble to the proposed rule considered only the tons per year (tons/yr) of emission reductions available from new technologies. The commenter also stated that EPA did not consider what "the greatest number of persons possible" to protect might be. Thus the commenter stated, EPA's analysis conflicts with its own interpretation of the term "ample margin of safety" and its commitment to meet this requirement.

Response: As stated in the Benzene NESHAP, in determining the need for residual risk standards, we strive to limit to no higher than approximately 1-in-10 thousand the estimated risk that a person living near a plant would have if he or she were exposed to the maximum pollutant concentrations for 70 years and, in the ample margin of safety decision, to protect the greatest number of persons possible to an individual lifetime risk level of no higher than approximately 1-in-1 million. However, in determining whether to require additional standards, these levels are not considered rigid lines, and we weigh the cancer risk values with a series of other health measures and factors in both the decision regarding risk acceptability and in the ample margin of safety determination. If we determine that the risk is unacceptable, we must impose additional requirements to reduce emissions without consideration of cost. However, as part of our determination of whether standards protect public health with an ample margin of safety, we do not look solely at whether technology is “feasible,” but also consider costs. Our ample margin of safety analyses are described in details in a response to another comment provided below and in the preamble for this final rule. We also consider cost as part of technology review under section 112(d)(6), which we are required to perform periodically. The preamble to the final rule includes a discussion on ample margin of safety and how population risk was considered.

Comment: Commenter 0274/0618 is concerned with the numeric disparity between the previous and current socioeconomic analysis for populations where cancer risks are estimated to be greater than 1-in-1 million. The commenter stated that neither the decrease in facilities considered in the current assessment or the use of 2010 Census data (versus 2000) can account for the 99% reduction in total population used in the assessment.

Response: The EPA agrees with the comment that the use of the 2010 (versus 2000) Census data and small changes in the number of sources were not the reason for the significant decrease in the number of people with estimated cancer risk greater than 1-in-1 million. The reason for the decrease is the significant decrease in estimated emissions based on updated and more accurate emissions information we received between the 2010 proposal and the supplemental proposal. We believe the current data set to be significantly better than the data set we relied on for the 2010 proposal for a number of reasons, as discussed elsewhere in this document and in the supplemental proposal FR Notice (77 FR 6648).

Comment: Commenters 0274/0618 and 0290/0620 suggested that the EPA, like California, set standards that require greater protection and specific action to occur when facilities are located near “sensitive receptors” such as schools and day care facilities. Commenter 0290/0620 claimed that EPA has not discussed setting standards that similarly consider the location of such receptors, despite the fact that chrome facilities are frequently located in city neighborhoods containing “sensitive receptors.” The commenter provided an example from Philadelphia, and emphasized that because of the greater health risk to children, EPA must consider requiring stricter limits for facilities located near such receptors.

Commenter 0274/0618 noted that the California Air Resources Board's (CARB) Chrome Plating Rule Effectiveness Study Report highlighted the issue that chromium electroplating operations are typically small facilities often located in low-income areas. The commenter stated that another CARB study found elevated cancer risk from a compliant chromium electroplater, and that fugitive dust laden with hexavalent chromium was an important source of emissions that

likely contributed to the elevated cancer risk. The commenter noted that the results of this study prompted CARB to update their regulations adding stricter controls for facilities in proximity to sensitive receptors. Based on CARB's recommendation to prohibit the siting of new chromium electroplaters within 1,000 feet of sensitive land uses, the commenter suggested that EPA evaluate impacts to sensitive receptors within 1,000 feet of chromium electroplating facilities. The commenter stated that the Agency should evaluate the use of distance to receptors as a parameter in all RTR assessments and consider the promulgation of additional pollution control requirements on facilities with impacts on these locations which exceed a 10-in-1 million cancer risk. Commenter 0290/0620 stated that, in its final rule, EPA should prohibit new sources from being sited within a specific distance, 150 meters or more, of a residence, school, or nursing home, or require additional controls and reporting for facilities that are located close to residences and vulnerable populations. The commenter stated that the EPA should also consider barring facilities within 1,000 feet of a sensitive receptor.

Response: The EPA believes that, in a national-scale assessment of lifetime inhalation exposures and health risks from facilities in a source category, it is appropriate to identify exposure locations where it may be reasonably expected that an individual will spend a majority of his or her lifetime. The EPA uses census block information on where people actually reside, rather than points on or near a fence line, to locate the estimation of exposures and risks to individuals living near such facilities. As noted by the commenter, chrome electroplating facilities are typically located in urban areas. In such areas of high population density, census blocks are typically small, so the centroid location that we use as a surrogate for the residences in the block would not be substantially distant from other locations in the block. Therefore, although we do not consider lifetime exposures at locations other than the census block centroids, the centroid locations would be very near the locations noted by the commenter (schools, nursing homes) where exposure durations would be much less than a lifetime.

Comment: One commenter (0290/0620) stated that costs alone are insufficient justification to preclude setting more stringent standards when the purpose of §112(f)(2) is to provide an "ample margin of safety." The commenter stated that in the "ample margin" analysis, in order to find whether a balance favors economics over human health, EPA must explain why a level of cost is too high when weighed against the reductions in cancer risk to an MIR of 6-in-1 million. The commenter stated that EPA's cost-based determination is irrational and unsupported on the record. The commenter noted that EPA's proposed rule under section 112(f)(2) just repeats EPA's proposal under section 112(d)(6) and that sections 112(d)(6) and (f)(2) set different tests and require different analyses. The commenter disagreed with EPA's reliance on an analysis under section 112(d)(6) to satisfy its section 112(f)(2) responsibility; the commenter stated that EPA must satisfy each statutory test in its own right. The commenter asked for information on how the EPA reached its ample margin of safety determination that addresses the section 112(f)(2) health-focused inquiry, instead of the EPA's relying on and repeating the cost-based analysis it used for its section 112(d)(6) rulemaking. According to the commenter, EPA's own cost-effectiveness analysis is unlawful and arbitrary and capricious because it ignores the achievements made in California, which show it is both cost-effective and necessary to require greater emission reductions than EPA has proposed. The commenter asserted that the EPA should, at minimum, follow the California example to ensure an additional "margin of safety" for

affected people who live or visit schools, day care centers, or other sensitive receptors that are located close to Chromium Electroplating or Anodizing sources.

The commenter further stated that the EPA failed to consider and make public health the primary focus as required by section 112(f)(2). The commenter claimed that the EPA used cost as the key factor to decide what standards to set. The commenter noted that to reach this conclusion, EPA cited the analysis performed under section 112(d)(6) in which it focused on the cost per pound of hexavalent chromium or chromium compounds reduction.¹³ The commenter asserted that the EPA's proposal does not provide an analysis of the ample margin of safety in terms of public health.

Response: In the ample margin of safety decision step under CAA section 112(f)(2), the agency again considers all of the health risks and other health information considered in the first step (acceptability determination). Beyond that information, additional factors relating to the appropriate level of control are considered, including costs and economic impacts of controls, technological feasibility, uncertainties and any other relevant factors.

In this rulemaking for the chromium electroplating and anodizing source categories, under our ample margin of safety analysis, we evaluated various options to reduce emissions and risks, and the costs, economic impacts and other factors associated with those options. In the supplemental proposal we presented the costs and economic impacts of various options and summarized the risk reductions that would be achieved with the proposed limits. Since proposal, we updated and revised the estimated costs and economic impacts of the various options (details are in the Revised Procedures for Determining Control Costs and Cost Effectiveness for Chromium Electroplating and Anodizing, which is available in the docket). As part of our AMOS analysis in the preamble to this final rule, we evaluated the costs, economic impacts and risk reductions that would be achieved for each option for each of the categories and subcategories (i.e., large hard chromium electroplating, small hard chromium electroplating, decorative electroplating and chromic acid anodizing). The results of this analysis and our conclusions are described in the preamble for this final rule.

Comment: Commenter 0290/0620 suggested that the EPA consider setting an absolute hexavalent chromium mass emission limit, not just concentration-based limits. The commenter observed that the proposed emission concentration-based limits do not set any absolute limit on the total amount of hexavalent chromium that can come from a given source; rather, the more tanks a source has, the more emissions it may release. The commenter argued that, under section 112(f)(2), the EPA must ensure against "unacceptable" risk and provide an "ample margin of safety to protect public health," and consider the greater amount of emissions that can occur from multiple tanks. The commenter recommended that the EPA set an absolute limit for each facility, in addition to a concentration-based limit, to ensure that no individual facility causes emissions that reach an extreme level that can cause grave harm and serious health risks to the local community. The commenter noted that California's mg/amp-hr standard is likely to be more protective than a concentration-based standard because it limits the source's overall hourly

¹³ 77 Fed. Reg. at 6648 (discussing "the controls, measures, and costs reviewed under the technology review"); *id.* (stating its proposal "after evaluating the costs and feasibility of possible options to reduce emissions in our technology review").

emissions from one tank or many, while EPA's concentration-based standard does not ensure absolute pollution control above any level.

Response: We note that based on the information we have gathered for chromium electroplating facilities over the past 20 years, there is nothing to suggest that any facility is adding multiple tanks and significantly increasing the level of absolute emissions or that new, large facilities are being constructed. Many of the existing facilities are located in areas that do not provide the space for the type of expansion the commenter speculates about. The commenter does not provide any examples where this has occurred. For that reason, we do not believe that setting an absolute limit on facilities is necessary to address risk under CAA section 112(f)(2).

Furthermore, we note that setting an absolute emission limit is not practical. Since risk is a function of emission rate, release height, meteorology and proximity to populations, establishing such an absolute emissions limit would require either a plant-specific emission limit for each facility based on that facilities emissions and distance to the surrounding population, or identifying the one facility that is located closest to populations or sensitive receptors and determining the maximum emission rate for that facility and applying that rate to all facilities in the source category. In either case, the circumstances could change from year-to-year

We disagree with the comment that a mg/amp-hr format would be more protective. When developing the NESHAP, we considered adopting the mg/amp-hr format. We concluded that such a format would be appropriate if emissions always tracked process rate (e.g., as process rate increased, emissions also increased). However, the data indicated that was not the case for certain types of emission controls and therefore, process rate (ampere hours) was not a reliable indicator of controlled emissions, and we decided that emission concentration was a more appropriate format for the standard.

Finally, we note that the mg/amp-hr format used in California also is not an absolute emission limit, but allows plants with more tanks to have higher emissions. If a plant added several more tanks, the facility's process rate would increase and thus, it would be allowed to increase emissions proportionally.

6. Environmental Justice

Comment: One commenter (0290/0620) stated that EPA should use the National Academy of Sciences current recommendations on how to appropriately address environmental justice. The commenter stated that the residual risk analysis requires a fresh look at whether there is a need for more stringent pollution controls to protect public health and the environment, including a current look at what the contemporary view of "acceptable" risk is, in relation to environmental pollution.

Response: Per the EPA's "Interim Guidance on Considering Environmental Justice During the Development of an Action," the agency is encouraging rule writers and policy makers to look at the whole range of relevant factors that impact communities and population groups when crafting rules. With regard to how the agency conducts its analysis, the EPA is continuing to discuss and pilot approaches that are consistent with the agency's responsibilities regarding environmental justice as outlined in EO 12898. For this rule, we performed a demographic

analysis to determine the potential impacts to different demographic groups, and that analysis is in the docket. While we analyzed the demographic makeup of the at-risk populations surrounding the facilities within the source category addressed by this rule making, we ultimately concluded the risks were acceptable for all population groups and that the proposed limits would protect public health with an ample margin of safety.

With regard to determining the acceptable levels of risk, first we note that in 1990 Congress codified in section 112(f) (2)(B) of the CAA the approach we use for our residual risk analyses. Under that approach, the 100-in-1 million cancer risk is not a bright line indicating that risk is “acceptable.” Rather, we consider this health metric in conjunction with a variety of health factors to determine whether the risk is acceptable. Where we conclude that the risk is not acceptable, we cannot and do not consider costs in requiring controls to bring risks down to an acceptable level. However, the analysis of whether risk is acceptable is not the endpoint. Once we determine that controls are sufficient to ensure that risk is acceptable, we again review the health metrics in conjunction with the costs of controls, technical feasibility, and other relevant factors, to determine whether additional controls should be required to provide an ample margin of safety, as described in more detail in responses provided above.

The EPA also does not accept that the language in the en banc Vinyl Chloride opinion regarding risks “acceptable in the world in which we live,” 824 F. 2d at 1165, dictates any particular quantitative result based on societal preference – especially when the court, in using this language, was indicating that risk-based standards for hazardous air pollutants did not need to be risk-free. Moreover, the commenter does not support its contention that people are now unwilling to accept a level of risk that was acceptable at the time the CAA was amended in 1990. Nor does the commenter support how science has evolved in a way that would undermine the statutorily codified framework for determining risk acceptability.

Comment: Commenter 0274/0618 is concerned with the failure of the assessment to identify enhanced safety measures (e.g., stricter controls) to address the disproportionate socio-economic impact found for both hard and decorative electroplaters. The commenter did not support the conclusion that the disproportionate impacts to populations at cancer risks above 1-in-1 million are acceptable, and requested that EPA’s Office of Environmental Justice participate in the evaluation of potential disproportionate impacts in some communities.

Response: The EPA’s Office of Environmental Justice has actively participated in the development of this rule. For the reasons provided in the preamble to the proposed and final rules, we have determined that the standards we have adopted provide an ample margin of safety for all proximate populations, including minority and low-income populations.

Comment: Three commenters (0272, 0274/0618, and 0290/0620) expressed concern that the residual risks identified by EPA are highly disproportionate to individuals who are minorities, below the poverty level, and/or do not have a high school diploma. Commenter 0290/0620 stated that urban and minority populations face a disproportionate risk from other pollution hazards and EPA should provide protections beyond the MACT. The same commenter stated that a community in good health with higher income that does not have numerous other polluting facilities might well be willing to tolerate an additional cancer case every 1.25 years

(i.e., every 15 months). According to Commenter 0290/0620, adding this risk of an extra cancer case into minority populations and urban communities, which are already at a serious pollution and health disadvantage, should be considered unacceptable. The commenter also stated that EPA does not incorporate into the risk assessment the significantly higher likelihood that minority communities are exposed to cancer risk from chromium electroplating sources. The commenter stated that EPA must consider the disproportionate impact on minority individuals and communities in deciding whether the likelihood of cancer risk to them is still acceptable. The commenter stated that to satisfy the requirements of the Clean Air Act and address the aims of EPA's Environmental Justice guidance, EPA should incorporate elements of the cumulative risk assessment methodology that it has already developed into its residual risk analysis, considering population groups exposed at average levels and those in the high-end portions of the risk distribution, the exposed population as a whole, and important subgroups or life stage strata of the population (e.g., children) or other highly susceptible groups. The commenter stated that EPA must incorporate into its risk analysis and its proposed rule both (1) the vulnerability of certain individuals to higher risk (such as due to age or early exposure, or due to multiple or cumulative exposures to the source category's emissions), and (2) the unacceptability of disparities in risk based on race or income level. The commenter stated that appropriate analysis of these factors will show that there is a higher overall level of risk that is likely to occur to the maximum exposed individual, and that this level of risk is not acceptable. The same commenter added that considering these factors and performing these analyses also must be part of the ample margin of safety inquiry and it is neither acceptable nor just to subject certain people, based on race or income level, to a disproportionate risk of cancer from air pollution caused by chromium electroplating emissions.

Response: We have responded to many of the concerns raised by this commenter in the preamble to the final rule or in this document, in particular those comments that suggest that we must analyze risk from all sources that affect individuals in communities in which chromium electroplating and anodizing facilities are located. It appears the commenter is suggesting that minority and low income individuals experience a disproportionate risk because these individuals are more likely to live in areas where they are exposed to pollutants from a variety of sources. As we have explained previously, section 112(f) requires EPA to review the risk posed from the source category at issue.

We acknowledge that population subgroups, including children, may have the potential for risk greater than the general population due to greater relative exposure and/or greater susceptibility to the toxicant. As we have noted elsewhere in the record for this action, as part of the 112(f) review, we do account for such vulnerabilities and we also consider the risk posed due to multiple or cumulative exposures where multiple sources within the source category may impact the same geographic area. For the dose-response component of HAP assessments for RTR, we use exposure reference concentrations and unit risk estimates (UREs) that are expressly derived with the objective of protecting sensitive populations and lifestages, including children.¹⁴

7. Emission Data Quality and Completeness

Comment: Several commenters (0274/0618, 0275/0615, 0278/0617, 0285/0296/0619, and 0290/0620) took issue with EPA's approach to estimate actual emissions for the October

¹⁴ *Ibid.* 10.

2010 proposal. Three commenters disagreed specifically on the model plant approach to modeling risk. Two commenters stated that the default assumptions used by EPA in modeling its estimates to predict inhalation cancer risk underestimated the risk, and that EPA should re-evaluate the risk assessment using accurate emissions data and source parameter information. One commenter stated that this underestimation occurred because the analysis relied on a default model plant to assign the necessary stack parameters to conduct the modeling analysis. The commenter stated that the use of model plant parameters for the chromium electroplating facilities clearly limited EPA's ability to accurately estimate the risk associated with hexavalent chromium emissions. The commenter believed the conservative approach (that that EPA requested comment on), which assigned emission rates of 9.26 lbs/yr (lbs/yr) for hard chromium electroplaters, 2.26 lbs/yr for decorative chromium electroplaters, and 0.44 lbs/yr for chromium anodizing, is probably a more accurate determination of the risks faced by communities exposed to hexavalent chromium emissions from chromium electroplaters in compliance with the NESHAP.

One commenter stated that EPA overestimated chromium emissions by at least one order of magnitude. The commenter stated that if EPA corrected the average per-plant chromium emissions estimate to 0.5 lbs/yr, very few facilities would be expected to have an MIR above 1-in-1 million, and the number of individuals subject to risk associated with chromium emissions would be more than an order of magnitude less than EPA's estimate of 14 million. The commenter believes that the number of individuals exposed to a risk of 1-in-1 million could be considerably less than 400,000. Finally, the commenter noted that, as part of the proposed rulemaking, EPA acknowledged that the residual risk from chromium emissions from chromium electroplating and anodizing operations appears to be acceptable. The commenter noted that EPA requested comments on its more conservative risk modeling approach with 14 million individuals potentially exposed to a cancer risk of 1-in-1 million from chromium emissions. The commenter stated that this conservative approach does not appear to be realistic or supported by the available data and analysis.

One commenter remarked that the estimates of 9.26 lbs/yr of chromium emissions for hard chromium electroplating operations and 2.65 lbs/yr for decorative electroplating operations are substantially higher than all but a handful of the largest facilities. The commenter noted that EPA attributed the 9.26 lb/yr emission rate to any facility that performs hard chromium electroplating, even if the hard chromium electroplating operation was a small percentage of the overall chromium electroplating or anodizing operations at the facility. The commenter also noted that EPA attributed the highest emissions rate of 9.26 lbs/yr to any facility for which it did not have complete information. The commenter stated that, based on these assumptions, EPA inflated the number of facilities with hard chromium electroplating operations to over 1,200 of the 1,634 facilities, instead of a more realistic estimate of less than 800 facilities. The commenter further stated that EPA compounded its errors, resulting in a substantial over-estimate of chromium emissions and the associated risk. The commenter recommended that EPA use estimates of 0.5 lbs/yr of chromium emissions as a conservative estimate of average annual facility emissions, resulting in a national estimate of 0.409 tons/yr of chromium emissions.

One commenter stated that EPA's conclusions in regard to the emission factor data used for the "conservative" analysis are not supported by EPA's own data in the record that shows

that the Agency has actual, higher emission data for certain facilities and that it believes potential emissions per facility could run even higher. The commenter provided the example of a large plant, which was determined to have the potential to emit 23.6 lbs/yr for the sake of the initial analysis, although EPA had previously concluded for the original MACT that this could be as high as 35.3 lbs/yr, and, according to the model plant data memorandum, the largest facility's emissions number is 31.2 lbs/yr. The commenter provided other examples of apparent inconsistencies in the analysis data, including using a lower emission factor for the majority of facilities for which it had no emission data, including for large facilities. The commenter stated that, in its supplementary analysis, EPA created different, smaller emission factors for a modeled data set of facilities for which it has no actual emission data. The commenter stated that the emissions are underestimated because, for the weighted average that EPA uses, the number of small plants overwhelms the larger plants, causing the emission factor used for all hard chromium electroplaters in this analysis to dramatically underestimate the emissions from larger plants, and thus the health risk. A commenter recommended that EPA revise the risk assessment based on actual source and emissions data rather than using "model plant" data.

One commenter stated that EPA's estimates that were used as the basis for the 2010 proposal do not reflect the effective controls and management practices that the industry has implemented to reduce chromium emissions. The commenter stated that chromium emissions data reported from individual facilities are significantly lower than EPA's estimated emissions and the emissions for the model plants. Further, the commenter argued that, based on CARB's estimates for total chromium emissions in California, and assuming that metal finishing operations in California represent more than 10 percent of the national chromium electroplating and anodizing production in the U.S., national chromium emissions from the metal finishing industry would be significantly less than 0.5 tons/yr. The commenter noted that EPA labeled 19 facilities located in California as "highest risk," and indicated those plants account for over 180 pounds of chromium emissions each year. The commenter stated that this estimate for these facilities is significantly more than CARB's estimate of 4 lbs/yr of chromium emissions from all electroplating and anodizing operations in California.

Response: These comments primarily concern the emission estimates that we developed for the October 2010 proposed rule. As explained in more detail in the February 2012 supplemental proposal, we obtained a substantial amount of improved emissions data after the 2010 proposal and recalculated the emissions estimates because of concerns about their accuracy. See 77 FR 6632. Much of the information we relied on at the time of the October 2010 proposal was emissions information that was available at the time we initially promulgated the NESHAP and thus the emissions data did not reflect reductions required by the existing MACT standard. The Simulation of Actual and Allowable Emissions for Chromium Electroplating document explains in detail the analysis we performed for the February 2012 supplemental proposal. The data used and the analyses performed to estimate nationwide emissions for the February 2012 supplemental proposal more accurately reflect emissions following promulgation of the NESHAP because it uses actual post-MACT data. In addition, it accounts for variations in the parameters that determine annual emissions rates. Instead of relying upon model plants as we did for the October 2010 proposal, we used a Monte Carlo approach to simulate actual emissions. The simulation model used the pool of available data on actual emissions concentrations, exhaust flow rates, and annual operating hours for each process type (hard

chromium electroplating, decorative chromium electroplating, and chromium anodizing). We believe that the resulting emissions estimates simulated by the model relied on for the February 2012 supplemental proposal are much more representative of actual emissions on average and also are more representative of the variability of emissions from plant to plant.

To the extent that the commenters are suggesting that we use actual data for all facilities, we note that is not feasible or realistic. We estimate that there are over 1,300 sources subject to the NESHAP nationwide and the large majority are small businesses that do not have the capability, and many facilities are not required, to estimate annual emission levels.

Comment: Commenter 0274/0618 stated that EPA should better illustrate where the California facilities fit within EPA's determination of emission limits for each source category. The commenter believes that California plants could be included into the analysis in "Procedures for Determining Control Costs and Cost Effectiveness for Chromium Electroplating Supplemental Proposal" by using default stack parameters to convert California's production based emissions into concentration based emissions. The commenter stated that by not including California plants EPA is not considering 25 percent of American chromium electroplating facilities.

On the other hand, Commenter 0285/0296/0619 supported EPA's decision to exclude California facilities from the analysis because they are not representative of chromium electroplating and anodizing facilities nationwide.

Response: Regarding the suggestion by Commenter 0274/0618, we point out that emissions data in the mg/A-hr format cannot be converted directly to concentration format (mg/dscm) without making several assumptions about production rates. Electroplating and anodizing exhaust or ventilation systems are generally sized according to tank surface area, and there is no correlation between surface area and production rate. Furthermore, there are large variations in rectifier capacity (amperes) and throughput (ampere-hours) for each process type. Although we can make informed assumptions about exhaust flow rate for a specified size of tank (surface area), we believe that any assumptions made about production rates would render the emissions conversions (from mg/A-hr to mg/dscm) uncertain. As supported by Commenter 0285/0296/0619, we maintain that the data for facilities located in California are not representative of plants located in other States with respect to modeling emissions from facilities located outside of California. Nevertheless, available information indicates that the emissions and emissions concentrations are generally quite lower on average at the California facilities compared to facilities in other States. There are more than 150 facilities in California. Based on available information, we believe that all facilities in California already have emissions concentrations well below the limits being promulgated in today's action and will need no additional controls to meet the promulgated limits in this rule. This fact provides further support that the limits we are promulgating in today's action are feasible and achievable for plants in other States.

Comment: Commenter 0285/0296/0619 points out that EPA stated that it did not include California facilities as part of the analysis for estimating allowable emissions, but yet the facilities with the highest MIRs for allowable emissions for decorative and anodizing were

nearly all in California. The commenter believes allowable emissions in California should be significantly lower due to stringent state air emission limits for hexavalent chromium.

Response: We recognize that the State regulations in California are generally more stringent than in other States. However, for purposes of allowable emissions, we consider the emissions allowed based on implementation of the NESHAP in order to determine whether the NESHAP should be tightened. As to whether we considered allowable emissions for plants in California, the commenter misinterpreted EPA's statement; we did evaluate allowable emissions as well as the MIR for such plants based on the allowable emissions.

For purposes of calculating allowable emissions for plants in California, we did not have adequate data to perform simulations of emissions similar to the simulations we performed for plants in other States. That is, we did not have data on emissions concentrations, exhaust flow rates, annual hours of operation, or mass emission rates; for the most part, we had data only on annual production (ampere-hours per year) and emissions as a function of rectifier output (milligrams per ampere hour). We decided instead to use the mean of the simulated allowable emissions for the non-California plants to represent allowable emissions for the plants located in California. We believed this approach would provide estimates that are conservatively high for plants in California (considering state controls), but obviously not as high as allowable emissions for many plants. We agree with the commenter that many of the highest MIR values based on allowable emissions were for decorative chromium electroplating and chromium anodizing plants in California. The MIR values are not simply a measure of emissions, but are significantly influenced by the location of populations relative to emission sources. Many of the plants in California are located in more urban settings than those in other States. For example, approximately 18 of the decorative chromium plants located outside of California had higher emissions than the value used for decorative chromium plants located in California (0.93 lb/yr), yet only two of those plants had MIR values among the highest 25, whereas 19 of the highest 25 MIR values were associated with plants in California. Proximity to populations is the reason why so many plants in California had high MIR values.

Comment: Commenter 0290/0620 noted that EPA did not provide emission concentration information for California in the record and found this to be a problematic omission that undermines the ability for meaningful notice-and-comment under 42 U.S.C. §7607(d). The commenter acknowledged that EPA provided annual average total emissions for California facilities which they believe show that California plants have achieved levels of emissions well below the levels outside of California.

Response: The state-imposed emissions limits in California are expressed in units of mg/A-hr and the facilities report their emissions in those units. Although we have some emission test reports that also report emissions in units of concentration, most of the emission data for California are reported as mg/A-hr. The concentration data we have for California plants are included in the individual docket files received from South Coast Air Quality Management District (AQMD) and the Bay Area AQMD, but we did not compile the data into a single table.

Comment: One commenter (0290/0620) stated that EPA has used actual emission data (not measured data, but based on emission factor estimates) that suggest that numerous facilities

are not currently emitting at the full level allowed under the existing MACT standard, but at a lower level, presumably because they are using technologies or practices that allow them to reduce emissions further. However the commenter noted that, EPA predicts that requiring retrofits with HEPA filters would still impact over half of the industry. The commenter thinks that EPA's conclusion about the number of facilities that would be impacted by a requirement to install HEPA filters is inconsistent with EPA's data on actual emissions and the data on facilities operating in California, many of which have already installed such controls.

Response: Based on the data collected following the October 2010 proposal, we agree with the commenter that many facilities are operating well below the current emission limits and, in many cases, more than 10 times below that limit. In addition, those data have enabled us to better estimate the number of plants in the U.S. that use HEPA filters, as well as other types of controls such as composite mesh pads (CMPs), to comply with the NESHAP. Our updated estimates of the impacts of the amendments to the NESHAP indicate that far fewer plants, if any, would be required to install HEPA filters to comply with the more stringent emission limits.

Comment: One commenter (0290/0620) questioned EPA's definition of MACT-allowable emissions, stating that EPA's definition does not ensure a complete picture of the true maximum potential emissions. The commenter stated that EPA actually did not use the truly allowable or maximum potential of which EPA is aware, and the proposal preamble does not make clear whether the maximum potential includes the level of emission that was allowed under the old version of the MACT (which exempted malfunctions from the standard) or under the new version of the MACT (under which malfunctions will violate the standard). The commenter asked that EPA address this question in the final rule. The commenter also stated that EPA did not use the maximum allowable emission levels for large or medium sources, attributing instead a median modeled level for medium sized plants to both large and medium plants. The commenter stated that EPA fails to explain how this emissions factor could allow EPA to address the risk of the maximum exposed individual, when EPA is aware of at least five facilities that actually emit more than this factor.

The same commenter stated that EPA underestimated the facility emissions factor that EPA used to assess risk and to estimate a 90-in-1 million maximum lifetime individual cancer risk for the hard chromium electroplating category.

Response: The revised risk assessment relied on for the supplemental proposal includes a separate data set to model MACT allowable emissions. That data set was developed by scaling up actual emissions data, where available, to the corresponding emission limit. For example, if actual data showed that a large hard chromium electroplating plant was operating at 0.0075 mg/dscm (i.e., at one-half the emission limit), the MACT allowable emissions for that specific plant was estimated by doubling the actual annual emissions for the plant. For those plants for which we did not have actual emissions data, we used a Monte Carlo approach to simulate allowable emissions. For that approach, we used the pool of actual emissions data, substituted actual emissions concentrations with the emissions limits, and then simulated allowable emissions (see Revised Simulation of Actual and Allowable Emissions for Chromium Electroplating Facilities, which can be found in the docket for this rulemaking). We believe this approach provides representative estimates for allowable emissions nationwide. The final

amendments eliminate the exemption for malfunctions. Therefore, emissions exceedances that occur during periods of malfunction are considered to be violations and our assessment of allowable emissions do not include emissions during malfunctions, which are not allowed under the MACT standard.

Comment: Commenter 0278/0617 reviewed the data on 12 hard chrome and decorative electroplating permitted facilities in North Carolina and found that two facilities would not meet the revised emissions or surface tension limits. The commenter explained that one of the two facilities uses a wet scrubber and the other uses a packed bed mist eliminator, but both facilities would have to replace existing controls in order to comply. The commenter is concerned that the proposed emission limits are based on a small amount of actual data that could result in an unrepresentative distribution of technically feasible options for affected facilities and could lead to infeasible and burdensome requirements for facilities whose emissions are higher than the proposed limits. The commenter noted that EPA used actual emissions and process data for only two of the thirteen facilities in NC for which risk was assessed and that 80 percent of the data used to calculate the revised emission limits was simulated. The commenter requested that EPA re-examine the methodology employed to simulate emissions and use a larger data set based on actual emission performance of different types of controls.

Response: As an initial matter, we note that it is difficult to address the situation presented by the comments because the commenter provided limited facts. However, the concern raised – that some sources may not be able to meet the emission limit through existing controls - is not inconsistent with our determination that not all facilities will be able to comply based on existing processes. However, that does not mean that sources with existing controls would need to replace such controls.

These findings are consistent with our overall analysis that over 80 percent of facilities already meet the lower emissions limits and will need no additional controls and no additional reductions to meet the lower emissions limits. With regard to the two facilities in North Carolina that apparently do not currently meet the limits, they can reduce their emissions and comply with the lower limits either through improving their add-on controls or by adding fume suppressants. For example, our data indicate that about 15 percent of chromium electroplating tanks are controlled with a combination of add-on controls, such as packed bed scrubbers, and fume suppressants and that the purpose of the fume suppressant is to further reduce emissions to ensure compliance and to improve indoor air for the workers. Consequently, we believe that many existing plants that could not meet the proposed emission limits solely through the use of add-on controls, could do so through the addition of fume suppressants without having to replace their primary add-on control device.

Regarding the data set used as the basis for the supplemental proposal, the analysis and decision to propose more stringent emissions and surface tension limits were based on the available data. We agree that having additional data is desirable, but we do not believe that the outcome of our analysis would have been significantly different. Regarding the more stringent emissions limits, we believe we had enough data on hard chromium electroplating sources (75 data points for large hard chromium, 38 data points for new small hard chromium, and 35 data points for existing small hard chromium) to characterize the industry with reasonable certainty.

The data also were consistent with respect to the percentage of plants that would meet the more stringent emission limits. The data are from sources located in 19 states and we believe they represent a random sampling. We had fewer data points for decorative chromium electroplating and only one data point for chromium anodizing, but those data also consistently showed that the majority of sources would meet the more stringent emissions limits. Additional chromium anodizing data we have collected since the supplemental proposal also support this conclusion. We also point out that the proposed emission limits were not based on simulated emissions, as suggested by the commenter; the simulated emissions data were used only to assess nationwide risk associated with emissions from chromium electroplating and chromium anodizing sources.

Regarding the more stringent surface tension limits, the proposed limits were based on data from 15 plants and were relatively consistent. We have no reason to believe additional data would have materially changed the outcome of our analysis.

Comment: Commenter 0285/0296/0619 stated that, after spot checking the operating hours EPA used to estimate actual annual emissions for 170 non-California facilities, they found several errors in the data. The commenter checked EPA's data on operating hours specifically for the anodizing and decorative chrome facilities for which EPA claims to have used information on the facility's operating hours in estimating a facility's actual emissions and concluded that EPA's data on operating hours appeared to be inaccurate/wrong for 16 among these 21 facilities. The commenter believes the net result of these errors overstated these facilities' operating hours, actual emissions, and in turn results in over-estimating emissions for the remaining 1,149 non-CA facilities comprising the remainder of the industry.

Response: We have reviewed the data identified by the commenter and compared it with information submitted by the commenter. Most of the errors concern operating hours that did not account for the percentage of time the rectifiers were energized. We have made corrections to the data to ensure that the operating hours for each plant accounts for rectifier operation. We also have used the revisions to operating hours and other changes to the available data, as discussed in the responses to other comments on data issues, to re-simulate emissions for those facilities for which actual data were not available.

Comment: Two commenters (0274/0618, and 0275) stated that EPA based its risk assessment on source data for only 166 facilities out of approximately 1,770 covered by the MACT standard, which is an insufficient number. Commenter 0278/0617 agreed and stated that basing risk estimates for the Chromium Electroplating source categories on a small database of actual data increases the uncertainty in those risk estimates.

Response: First, we note that gathering actual emissions data for sources in this source category is difficult because they are primarily small businesses and they are not subject to routine testing of emission levels. Furthermore, because the plants in question are area sources, they are not required to submit annual emissions inventory reports. As a result, most emissions information must be obtained directly from state agency permit files, which is a time-consuming process. We agree with the commenters that the data set used to model risk for the October 2010 proposal was limited. Prior to issuing the supplemental proposal, we conducted extensive data gathering to acquire data that were more accurate and to develop a data set that is more

representative of the chromium electroplating industry. At the time of the supplemental proposal, we had actual source data from 198 facilities out of 1,454 plants, and for purposes of the final rule we have obtained emissions data for 25 additional plants. Moreover, many plants have closed, so the total number of facilities is now estimated to be about 1,350 plants. Therefore, we now have data for about 223 facilities out of 1,350 plants, and the data we have now are more representative than the data we had in 2010. While there will always be uncertainties in any risk analysis that we perform, we believe that we have relied on the best information available to the Agency and thus have minimized the uncertainties to the extent feasible at this time.

Comment: One commenter (0290/0620) stated that, when EPA has so little data about the industry, it is arbitrary and capricious for EPA to assume that any one of the facilities for which it has data is the largest or worst-performing facility. The commenter stated that EPA does not have enough data to conclude that any of the facilities that the Agency has data for is the largest and worst-performing. The commenter stated that a further indicator of uncertainty is that EPA has stated that the largest facility that it has actual data for is reported to be closed, and EPA is considering removal of that facility from its risk assessment. The commenter noted that if this is a large facility of “allowable” emissions, it represents a data point that EPA must take into consideration in its residual risk analysis as part of the maximum potential emissions to which an individual person is exposed. The commenter stated that ignoring a facility that closes during the course of a rulemaking could allow industry to cook the risk numbers by engaging in a temporary shut-down, and then reopening a badly performing facility after EPA’s rulemaking is complete in order to evade stronger standards.

Response: This comment was received shortly after the 2010 proposal. As explained previously, since the October 2010 proposal, we collected data on several hundred additional facilities. For each of those facilities, we estimated annual emissions to be at least several pounds less than the facility that we believe has the greatest emissions, so none of those data leads us to believe that there are facilities in operation with greater emissions. However, the approach used to simulate emissions for purposes of the supplemental proposal did result in comparable annual emissions (approximately 10 lbs/yr) for two plants and greater annual emissions for three other plants, and we used those greater emission rates in our risk modeling. Given that the simulation approach accounts for the variability in emissions, and that one of the data points used in the analysis was for the plant we believe to have the highest emissions, it is expected that at least one plant would be simulated as having even greater emissions, which was the case. Therefore, we believe the results of our risk assessment account for other plants that could have greater emissions than the plant we have identified as being the largest emitter in the industry.

We understand the commenter’s concern regarding facilities that may close down temporarily. We have not excluded any facilities from our analysis unless we have concluded that they have permanently shut down.

Comment: Commenter 0285/0296/0619 recognized that EPA has gathered more facility data since the 2010 proposal, but is still concerned with the quality of the data EPA used in the rulemaking, adding that much of the data is more than 15 years old and generated prior to the amendments to the NESHAP and changes to OSHA’s workplace exposure standard for hexavalent chromium. The commenter stated that there are a number of inconsistencies in the

data and that EPA has not only relied upon limited and flawed data, but has also chosen to “stretch” the data beyond its logical and reasonable limits. The commenter believes imposing new regulatory standards based on unreliable data creates an unnecessary and unwarranted burden on an industry that serves several critical supply chains (such as military, aerospace and automotive) and is experiencing significant economic challenges. Commenter 0285/0296/0619 believes that the major reason why EPA has insufficient information is the Agency’s failure to conduct a recent Information Collection Request (ICR) or industry survey. The commenter stated that EPA’s failure to collect the data necessary to support this rulemaking, and nonetheless proposing to impose stricter standards even after it concluded that emissions were lower than previously estimated, is an arbitrary and capricious exercise of the Agency’s authority. Commenter 0290/0620 stated that EPA needs to use the section 114 information collection process to provide more accurate data and to fill in the data gaps for this source category.

Response: We agree with the commenter that conducting industry-wide ICRs is an effective method for obtaining detailed information on an industry, and we did consider an ICR for the chromium electroplating source categories. However, we decided against taking such action for two reasons: we believed that doing so would have put a significant burden on hundreds of small facilities, and we believed our approach of requesting the needed data from permitting agencies in States with the largest numbers of facilities would provide adequate data. As noted in the preamble to the supplemental proposal, we contacted 26 State and local agencies for information. Although not all of the contacted agencies provided data, those that did respond provided us with information which they believed was representative of the industry. We agree that some of the emissions test data are more than 15 years old. However, since the NESHAP requires only a one-time performance test, those data are likely the only data available for many of those facilities. Furthermore, the fact that the data are old does not necessarily mean that the data are not representative. We recognize that the OSHA standard for worker exposure has been revised since some the data were compiled, but it is our understanding that changes in the OSHA rule were largely addressed through better room ventilation and improved housekeeping and not by making changes to electroplating tank control systems. Finally, we disagree with the comment that we have stretched the data beyond the logical and reasonable limits. The procedures we have used to represent the operation and emissions for chromium electroplating plants and estimate emissions are no different than the methodologies and statistical procedures we have used for several other industries to fill data gaps.

Comment: One commenter (0290/0620) stated that, because chromium electroplating facilities are not subject to monitoring requirements under the MACT, the NEI data appear to be generated purely using emission factors, rather than actual measurement of emissions. The commenter stated that this makes the data even less reliable, and EPA may not rationally use them as the sole basis for its assessment of emissions during the residual risk assessment. The commenter added that, both for the “conservative” and “supplementary” analyses in the 2010 proposal, EPA relied in part on 2005 NEI data, which are industry-generated and not verified in many states. The commenter stated that for the residual risk review, it is arbitrary and capricious for EPA to rely solely on industry-reported unverified emissions. The commenter also noted that EPA’s own Office of the Inspector General has reviewed the NEI data and found not only problems with accuracy, but also that there are significant data gaps.

Response: This comment concerned the October 2010 proposal. As a general matter, we disagree with the commenter. The commenter provided no basis for the statement that the NEI data for these source categories are generated using emission factors, and we do not believe that is generally the case. While we agree that the NEI data do have some problems with accuracy, we believe that is true with any database of emissions data. While we relied on the NEI database as the starting point for residual risk analyses, we also made great efforts to check and verify the data to the extent possible by trying to collect additional information and independently confirm any data that does not appear to be reasonable. In addition, we disagree with the suggestion that industry-generated data are not reliable. In many cases, the industry is the only sources for the relevant information. Again, however, experts within the Agency review the data prior to our relying on it for our analyses. For example, emissions greater than about 6 lbs/yr for hard chromium electroplating plants, and emissions greater than about 4 lbs/yr for other types of plants are scrutinized because few plants emit more than these amounts. On the other end of the scale, it is common for plants to electroplate infrequently, and data points for emissions significantly less than 0.1 lb/yr are common and reasonable. As the starting point, the revised risk assessment used for the supplemental proposal also relied upon NEI data, and industry-generated data for actual emissions. We then enhanced the data set with data obtained from State and local agencies as described in the responses above. Where actual emissions test data were available, we calculated annual emissions based on measured concentrations and exhaust flow rates. Where we used NEI data to supplement the actual data set, we reviewed those data to determine if they are reasonable when compared to data from other similar plants. We rejected any such data that did not appear to be representative. For those facilities for which actual data were not available, we used a Monte Carlo approach, which utilized actual data on emissions concentrations and exhaust flow rates to simulate emissions.

Comment: Commenter 0285/0296/0619 stated they were unable to find all of the supporting documentation in the docket for facility emissions estimates that EPA noted as coming from state and local regulatory agencies. The commenter identified three specific plants that were spot-checked for supporting documentation in the rulemaking docket. The commenter believes that if these data were estimated or were not directly provided by local agencies the EPA should not claim the data to be a facility-specific estimate of annual emissions provided by a State or local agency.

Response: Regarding the three facilities identified by the commenter, emission estimates for two plants (Jobsite, Inc. and Starrett Company), were taken from the NEI database. The estimates for these plants are indicated “as reported” in the Industry Profile Memorandum. Prior to being included in the analysis, these and other NEI data were screened to determine if they were reasonable, and it was concluded that 2.7 lbs/yr for a large hard chromium plant (Jobsite) and 4.0 lbs/yr for a decorative chromium plant were reasonable. Regarding the third facility (Dover Industrial Chrome) identified by the commenter, the basis for the estimated emissions of 4.76 lbs/yr is provided in three documents included in the docket for the October 2010 proposal: Document Nos. EPA-HQ-OAR-2010-0600-0096, EPA-HQ-OAR-2010-0600 -0115, and the attachment to EPA-HQ-OAR-2010-0600-0115, which are the operating permit, emission test summary, and the plant’s permit renewal application, respectively.

8. Facility-Specific Data

Comment: One commenter (0274/0618) stated that an example of potential underestimation involves a large hard chromium electroplater in New York that was identified as an unknown electroplater in the August 27, 2010, analysis and assigned an emission rate of 1.1 lbs/yr. The commenter stated that this facility has emissions of 10.0 lbs/yr at the MACT allowable emissions rate for large chromium electroplaters. The commenter noted that this value is actually higher than the 2.24 lbs/yr assigned to known hard chromium electroplaters. The commenter stated that this source has installed redundant air pollution controls (a packed bed scrubber followed by a composite mesh pad system) to achieve the MACT allowable emission rate of 0.015 mg/dscm. The commenter stated that the modeling of this facility at the unrealistic low emission rate (1.1 lbs/yr) and large flow rate (962.8 dscm/minute) results in extremely low risk in a very densely populated urban area. The commenter's risk evaluation of the facility indicated an 8-in-1 million maximum individual cancer risk at the property line, calling into question the results in the draft residual risk assessment.

Response: The commenter did not provide specific information about which chromium electroplater in New York they were concerned about. In response to this comment, EPA contacted the New York Department of Environmental Conservation for information about facilities in the State. The agency provided additional information for several plants in the State, but it was not possible to identify the plant in question. However, for the supplemental proposal, we simulated allowable emissions for two facilities in New York who have emissions greater than 10 lbs/yr, with an MIR value of 40-in-1 million for one of the facilities. Therefore, we believe that our revised risk assessment addresses the commenter's concern that we underestimated emissions and risk.

Comment: Three commenters (0259, 0278/0617, 0285/0296/0619) provided data on specific facilities to update EPA's list of plants in operation and the type of chromium electroplating performed. In addition, Commenter 0285/0296/0619 provided updated emission estimates for several facilities that EPA had identified as being high risk. Commenter 0259 provided test results for chromium electroplating process operations at the commenter's facility. The commenter also provided production rates of hard and decorative chromium electroplating conducted by the commenter over the eight-year period from 2003 through 2010, which is representative of normal operation. The commenter also provided other information about the facility's chromium electroplating operation. Another commenter (0278/0617) pointed out that reliable data for the facilities in North Carolina can be found in the state's emissions inventory.

Response: To the extent possible, we used all of the data provided by the commenters in the revised risk assessment and impacts analyses that was performed for the supplemental proposal and in finalizing the amendments to the NESHAP. We also performed an extensive data gathering effort in which we requested State agencies to provide data on actual emissions and facility design and operation. Altogether, 28 State and local agencies were contacted, and 24 agencies provided data. Data were collected on a total of 346 plants and, where there were adequate data, actual emissions were calculated. The resulting data set represents a significant improvement over the data set used as the basis for the October 2010 proposal.

Comment: Commenter 0278/0617 stated that according to the NCDAQ database, there are 30 facilities in NC subject to the Chromium Electroplating NESHAP; 10 of which match EPA's list of 17 facilities in NC that are subject to the rule.

Response: The 17 facilities are based on the plant list provided by DENR in Feb 2011. We subsequently contacted NC DENR and spoke to the contact listed in the comment. He could not provide any more information on the number of NC facilities. Based on our information, we believe our list of 17 facilities is valid. We subsequently contacted NC DENR and spoke to the contact listed in the comment. He was not aware of any other chromium electroplating facilities operating in North Carolina.

Comment: Commenter 0285/0296/0619 reviewed EPA's annual actual emissions for Chrome Crankshaft Co. of Illinois, which was based on stack flow, operating hours, and average emissions concentration from a stack test report. The commenter noted issues with the age of the test report, the calculation of the stack flow and emission concentrations, and the "stress test" operating conditions during the test. The commenter also speculated that the facility may have changed their process and control equipment since that time. The commenter believes EPA's calculations over-estimate this facility's current actual annual emissions.

Response: The approach used by EPA in estimating actual emissions for any facility was to use the available data and make reasonable assumptions to fill in any data gaps needed to complete the estimate. In this case, the basis for the emission estimate is a series of tests conducted in 2001 and documented in an emissions test summary provided by the State agency. Since chromium electroplating plants are required to perform a one-time test, the 2001 tests were the only test data available. If the plant had changed process and control equipment, as suggested by the commenter, the plant would have been required to perform new emission tests and the results of those tests would have been provided by the State agency. Since the test summary did not include exhaust flow rates, a representative rate of 11,090 dry standard cubic feet per minute (DSCFM) was used. This flow rate is based on the available data for small hard chromium plants. The commenter is correct that estimating emissions on a flow-weighted average would be more representative, but as noted above, flow rate data were not available. The annual operating hours also were based on average hours for small hard chromium electroplating plants. The commenter stated that the operating conditions during the test might not have been representative of normal operating conditions. However, it is common practice for performance tests to be conducted with sources operating at high production rates to help ensure compliance with emission standards at all times, and the results of such testing reflect the best available data for estimating emissions.

The commenter raised general concerns about the accuracy of the data we relied on and developed, but provided no different data that it claims should be used instead. We continue to believe that the emissions estimate for the Chrome Crankshaft facility was made using the best available data.

9. Emissions Simulations

Comment: Commenter 0285/0296/0619 suggested that EPA used imputed, inaccurate "facility-specific" data to calculate emissions estimates for the remaining 1,149 facilities for

which the Agency had no site-specific information. In addition, the commenter points out that for many of these facilities, EPA has no information on their size or on the plating processes that they conduct. The commenter stated that due to confusing and sometimes conflicting documentation in the record, it is difficult to understand and then comment on how EPA performed the “extrapolation” of emissions.

Response: The purpose of the emissions simulations was to provide a reasonable estimate of nationwide emissions and an estimate of the nationwide distribution of those emissions for evaluating nationwide risk. The emissions simulated for a specific plant are not meant to be an accurate estimate of emissions for that specific plant. Rather, the simulated values are to be considered in the aggregate. We agree with the commenter that we did not have site-specific data on plant size and process for many of the plants and that is precisely why we decided to use an emissions simulations approach to estimate emissions. The emissions simulations use data on the parameters that determine emissions (exhaust flow rate, emissions concentration, and hours of operation) that span the range of typical values for those parameters. Values for the parameters are then randomly assigned to plants to determine an estimated emission rate for a plant.

As for the accuracy of the data, we have taken into account specific comments we have received regarding the data and have performed additional risk modeling based on the revised input data. It is true that we used average (“imputed”) values for some parameters, but doing so is a common practice and we fail to see how that would render the data unrepresentative. We reject the commenter’s suggestion that we had no site-specific information for all of the plants for which emissions were simulated. For many of these plants, we had data on the process and we incorporated that information into the simulations. The Simulation of Actual and Allowable Emissions for Chromium Electroplating Facilities document, which can be found in the rulemaking docket, explains the procedures and data used for the emissions simulations.

Comment: Commenter 0278/0617 agreed that the random sampling methods used for simulating emissions data was appropriate, but believes the technical support documentation should include discussions of confidence intervals, uncertainty, or limitations. The commenter explained that it is unclear whether these simulated emissions are representative of actual emissions or produce a conservative estimate of risk. The commenter encourages EPA to provide more detail to the technical support document that would lend validity to the random sampling methods use, the representativeness of the emissions, and the risk calculated.

Response: We have revised the supporting memorandum that describes the methodology used and have included the statistical parameters (e.g., confidence intervals) mentioned by the commenter (see Revised Simulation of Actual and Allowable Emissions for Chromium Electroplating Facilities in the docket for this rulemaking). We believe the revised memorandum addresses the commenter’s suggestions.

Comment: Commenter 0278/0617 pointed out that the random sampling method used to simulate emissions does not distinguish between facilities that use control devices and those that use fume suppressants. The commenter encourages EPA to provide additional information on the

number of facilities that use control devices and the type of control devices, as well as, data on which type of control devices are likely to meet the revised emission limit of 0.015 mg/dscm.

Response: The purpose of the emissions simulations was to estimate annual emissions for those plants for which actual emissions data were unavailable. Thus, the simulated emissions are not associated with any specific type of emission control method or device. Regarding the types of control devices used, the commenter is referred to the Profile of Chromium Electroplating Processes and Emissions document (Profile), which can be found in the rulemaking document. Tables 10 through 12 of the Profile provide information on the types and numbers of emission controls used. Tables 1 through 4 of the Profile show the available emission concentration data and the control methods used when each source was tested. These data indicate the emissions concentrations achieved in practice by most types of emission controls.

Comment: Commenter 0285/0296/0619 believes that EPA's methodology for estimating emissions for the non-California facilities demonstrates lack of knowledge about the specific chromium electroplating and anodizing operations and provides no useful information or any reasonable simulation or prediction of actual emissions from facilities. As a result, the commenter believes the results from this process cannot be used reliably to impose additional regulatory controls on chromium electroplating and anodizing operations and that EPA could have produced more reliable results if it had focused on other more relevant variables such as facility size and chromium processes for the Monte Carlo analysis.

Response: The commenter misunderstands the purpose of the Monte Carlo analysis. The analysis was used to estimate nationwide emissions and to assess nationwide risk. The emissions simulations derived using the Monte Carlo analysis was not used to develop the more stringent emissions and surface tension limits. Instead, we used the available emissions data on chromium electroplating facilities to develop the proposed emissions limits, and we used the available data on concurrent measurements of surface tension and emissions to develop the proposed surface tension limits. Contrary to the commenter's statements, the Monte Carlo analysis and the analyses used to develop the proposed emissions and surface tension limits actually did account for facility size and chromium processes.

Comment: Commenter 0285/0296/0619 stated that EPA appears to have used Monte Carlo procedures only to estimate what the "n" emission values would be if there were "n" plants in a subcategory (hard chrome/large, hard chrome/small, etc.). The commenter stated that EPA used the Monte Carlo analysis for a less important uncertainty in the analysis, and did not use it on the major uncertainty which is what subcategory an unknown plant really is in. The commenter is also concerned with the alphabetical approach by which emissions estimates were assigned but recognized that the "alphabetical" process does not necessarily bias the overall emissions estimates high or low.

Response: Contrary to what the commenter states, a key step in the methodology used to simulate emissions using the Monte Carlo approach was to assign a process type to each of the unknown plants, while ensuring that the total number of plants in each subcategory matched our best estimate of the number of plants nationwide. This step is shown in Figure 1 of the Simulation of Actual and Allowable Emissions for Chromium Electroplating Facilities

document, which can be found in the rulemaking docket. In addition, Attachment 1 to Simulation document shows the process assignments for each plant that was simulated.

The commenter is incorrect that emissions were assigned to plants in alphabetical order. On the other hand, the commenter is correct that assigning emissions to plants alphabetically does not bias the overall emissions.

Comment: Commenter 0285/0296/0619 believes that EPA may have identified most of the facilities in the “unknown” categories as hard chromium and that since the highest emissions are expected from hard chromium processes, EPA’s apparent assumptions for “unknown” facilities would tend to over-estimate emissions significantly.

Response: The commenter is incorrect in stating that the majority of the unknown facilities were assumed to be hard chromium electroplating plants in the analysis. Of the unknown plants, approximately 13 percent were modeled as chromium anodizing, 41 percent as decorative chromium electroplating, 14 percent as large hard chromium electroplating, and 31 percent as small hard chromium electroplating plants.

10. Surface Tension Data Analysis

Comment: Commenter 0285/0296/0619 stated that EPA has limited data on the use of fume suppressants to reduce emissions. The commenter believes that EPA attempted to correlate the surface tension levels observed with the emissions limits measured with very limited and flawed data. The commenter also noted that too much of the data is based on single facilities or on facilities that contain a secondary control device in addition to a fume suppressant. Commenter 0285/0296/0619 added that there is no quantitative data that show how much emissions reduction could be expected from the use of a specific amount of fume suppressants.

Response: We disagree that the data used to develop the revised surface tension limits were inadequate or flawed. The analysis was performed using data for multiple tanks at 15 different facilities. We believe that the resulting data set was adequate to develop revised limits. We also note that our analysis accounted for the level of uncertainty in the data as a function of the number of data points. Thus, even if we had fewer data points to analyze, we believe the methodology used would have provided a valid result. We acknowledge that we used multiple data points for some facilities. However, we fail to see how that nullifies the outcome of the analysis. Regarding the comment that some of the data are based on tanks with a secondary control device, the commenter did not specifically identify any such facilities. We note that in those cases, the tests were performed upstream of the additional control and did not impact emissions.

Comment: Commenter 0290/0620 suggested that there are uncertainties in the methodology EPA has used to try to translate the proposed concentration-based emission limits into surface tension limits. The commenter noted that EPA’s analysis concludes that emissions are a function of the surface tension, regardless of the specific chemicals used, but emphasizes that there was no data available for chromium anodizing. Commenter 0290/0620 also pointed out that EPA has analyzed how effectively the use of surface tension limits can translate to a particular concentration of emissions; but has not demonstrated that they can achieve that

concentration with the same degree of certainty as an emission limit subject to monitoring and testing requirements. Commenter 0290/0620 believes that EPA's lack of data and the multiple assumptions used to turn the emission concentration-based limit into a surface tension limit added significant uncertainty that may lead to a surface tension limit that does not actually control emissions to the same extent as a concentration-based limit. The commenter stated that if EPA sets surface tension limits they must be at least equivalent to or more protective than the concentration based limits.

Response: We agree with the commenter that there are uncertainties in the analysis used to develop the revised surface tension limits just as there are uncertainties inherent in any such analysis of data. We disagree with the commenter's assertion that we tried to translate concentration-based limits into surface tension limits. What our analysis did was to compare concurrently measured emissions concentration and surface tension data and determine the emissions concentration that corresponds to specific surface tension values, taking into account the uncertainties in the data. We acknowledge that the dataset used for the analysis did not include data on chromium anodizing. Although the bath formulation is not exactly the same for chromium anodizing as for chromium electroplating, the principle bath constituent is the same, namely chromic acid. Furthermore, the mechanism, by which reduced surface tension results in lower emissions, should not be significantly affected by the type of bath. Reducing the surface tension results in smaller gas bubbles, which rise to the surface more slowly and burst with less energy, thereby generating less chromic acid mist. With respect to monitoring, the NESHAP already requires periodic monitoring of surface tension by any facility that elects to comply with the surface tension limits. We believe the monitoring requirements provide adequate assurance that surface tension levels are maintained below the limits specified in the NESHAP. We agree that the surface tension limits must be equivalent to or more protective than the emission limits and we believe our analysis shows that the surface tension limits will maintain emissions below the emissions concentration limits.

11. Compliance Provisions

Comment: Commenter 0609 remarked on the requirements of §63.343(c) for establishing operating limits for pressure drop across control devices. The commenter explained that the NESHAP allows for facilities to conduct a single compliance test or multiple performance tests. The commenter stated that, if a single performance test is performed, the compliant range is based on the average pressure drop measured during the test \pm 1 or 2 inches of water column, depending on the type of control device. The commenter added that, for cases when the plant performs multiple performance tests, the NESHAP specifies the compliant range to be equal to the range demonstrated by the performance tests. The commenter believes that the \pm 1 or 2 inches of water column provision should also apply in these cases. Commenter 0609 also suggested adding a requirement that the pressure drop across control devices be greater than zero inches of water column because a pressure drop of zero indicates no resistance and is therefore unacceptable.

Response: This comment is on a section of the rule which was not part of the proposal or supplemental proposal. The provision referenced by the commenter was established as part of the initial MACT rule. We did not propose to revise this provision in either the 2010 proposal or the 2012 supplemental proposal. The purpose of the provision is to allow for the typical variability in

pressure drop measurements without causing an exceedance of the operating limit. The commenter does not state a substantive basis for suggesting that we revise the existing rule to apply the ± 1 or 2 inches of water column provision where multiple performance tests are performed. We disagree on the need to specify that the pressure drop must be greater than zero because any add-on control that reduces chromium electroplating emissions would have a pressure drop greater than zero.

Comment: Commenter 0613 stated that the proposed amendments fail to address how plants that use emission elimination devices (EEDs) to control emissions from affected sources can comply with the emissions limits and what type of monitoring is required for such sources. The commenter noted that, despite EPA's statement to the contrary in the October 2010 proposal, EEDs are in use at chromium electroplating facilities, as evidenced by the multiple Regional Office approvals for alternative test procedures for EEDs. Another commenter (0272) stated that one facility in commenter's jurisdiction is currently using EEDs on several sources to comply with Subpart N and the EEDs appear effective in controlling chromium emissions. Commenter 0613 noted that, although the supplemental proposal addresses revised emission limits and compliance options, no provisions for EEDs were proposed. The commenter recommended that EPA amend the NESHAP to specify compliance provisions that address the unique characteristics of EEDs and added that doing so would reduce the administrative burdens on state and local agencies associated with evaluating case-by-case requests for approval of EEDs.

Response: Although we did not propose amending the NESHAP to address EEDs, we did request comment on their use. Emission elimination devices are membrane covers that are impervious to chromium mist and essentially eliminate emissions when in place (i.e., when the tank is covered). Currently, the NESHAP does not specify provisions for demonstrating compliance, or monitoring emissions, when EEDs are used. We acknowledge that EEDs are still in use by some chromium electroplating sources. However, our understanding is that the use of these devices is minimal, has not significantly increased in recent years, and there is no reason to believe that their use will increase. As the commenters recognize, the NESHAP currently allows facilities who would like to install EEDs the option of applying for approval on a case-by-case basis. We believe that, given the relatively low numbers of EEDs that are installed on an annual basis, it is not necessary to add special provisions to the NESHAP to accommodate their use.

Comment: Commenter 0285/0296/0619 stated that the supplemental proposal does not identify any new procedures for demonstrating ongoing compliance with the NESHAP emissions limits using a combination of add-on control device and fume suppressants. The commenter noted that if facilities can continue to demonstrate compliance by maintaining the pressure drop across the control equipment within the specific range, then the use of fume suppressants to achieve compliance would be irrelevant. Similarly the commenter noted that, if EPA requires facilities that use fume suppressants with control equipment to achieve the new proposed emissions limits to measure surface tension, then the emissions limits would be irrelevant. The commenter believes this demonstrates that EPA's proposed emission limits and technology options to achieve them are not feasible and note the new standards present an implementation and enforcement nightmare for facilities and regulatory officials to measure compliance. The

commenter recommended that before proceeding with this rulemaking, EPA address these enforcement and implementation issues and provides a reasonable and workable solution.

Response: Monitoring requirements for sources that comply with the emissions limits using a combination of one or more add-on control device and fume suppressants are already addressed in §63.343(c)(7). This paragraph of the NESHAP clearly states that, in such cases, the monitoring requirements for the add-on control device specified in §63.343(c)(1) through (4) and the monitoring requirements for fume suppressants specified in §63.343(c)(5) and (6) both apply. Therefore, no changes to the NESHAP are needed to address these types of control system combinations. As noted previously, using a combination of one or more add-on control devices and fume suppressants to meet the emissions limits is a relatively common practice and we are unaware of any implementation or enforcement issues that have arisen to date.

Comment: Commenter 0260/0616 remarked that facilities should not be required to keep records of every occurrence or action taken to demonstrate compliance with the proposed housekeeping practices. The commenter stated that the requirement to clean surfaces and clean up spills should be included in the Operation and Maintenance Plan, but recordkeeping should not be imposed for these actions. The commenter added that the recordkeeping burden would be excessive if operators had to create a record for every drop of any chromium containing substances that is spilled at an affected facility. To address housekeeping issues, the commenter recommended the following changes to the proposed rule text:

Revise paragraph §63.342(f)(3)(i)(F) as follows:

"(F) The plan shall include the housekeeping procedures specified in Table 2 of this section. ** add the new text: Owners or operators must incorporate these measures into their standard operating procedures but are not required to keep detailed records.**"

Revise paragraph §63.342(f)(3)(i) as follows:

* * *

(A) The plan shall specify the operation and maintenance criteria for the affected source, the add-on air pollution control device (if such a device is used to comply with the emission limits), and the process and control system monitoring equipment, and shall include a standardized checklist to document the operation and maintenance, ** add new text: excluding housekeeping measures**, of this equipment.

Revise §63.346(b)(2) as follows:

(2) Records of all maintenance, ** add the new text: excluding housekeeping measures**, performed on the affected source, the add-on air pollution control device, and monitoring equipment;

Response: We agree with the commenter that the requirements to clean surfaces and clean up spills should be included in the Operation and Maintenance Plan, as was proposed. We also agree that is unnecessary to maintain records of routine housekeeping procedures. As a

result, we have revised §63.346(b)(2) in the final rule to exempt routine housekeeping practices from recordkeeping..

12. Cost Methodology

Comment: Commenter 0285/0296/0619 believes that EPA's conclusion that controls (based primarily on the use of fume suppressants) with a cost effectiveness of \$18,000 per pound are reasonable contradicts the October 2010 proposal that concluded a cost effectiveness of \$18,000 per pound for HEPA filters would not reduce risks at reasonable costs. Additionally, the commenter noted that although EPA reported the cost effectiveness of \$18,000 per pound in the 2010 proposal, it should have been \$9,000 per pound instead. The commenter further explained that EPA failed to incorporate the cost of new control devices and retro fit equipment appropriately in the cost analysis of the supplemental proposal and noted that EPA has already determined in the October 2010 proposal that such add-on controls and retrofits were not cost effective, and there is no evidence in the record to support a change in EPA's position.

Response: In determining whether a regulatory alternative is reasonable, we consider several metrics, including cost effectiveness, total capital cost, total annualized costs, emissions reductions, and number of plants impacted, especially for the chromium electroplating and anodizing source categories since many are small businesses. For the 2010 proposal, we evaluated the costs of installing only HEPA filters throughout the entire industry. For the 2012 supplemental proposal, we conducted a new analysis that estimated the actual number of plants that would meet the proposed emission and surface tension limits, the number of plants that would have to improve their controls, and the likely methods those plants would use to comply with the moderately more stringent standards. As a result, we estimated that a far fewer number of plants would be impacted. Although the cost effectiveness may have been comparable to the results for the 2010 proposal, the capital costs, total annualized costs and number of plants potentially impacted were significantly less for the proposed requirements in the supplemental proposal, and the requirements in the final rule. For example, a comparison of total capital costs is shown in the following table. Furthermore, we recently reevaluated the costs of requiring HEPA filters for all hard chromium electroplating sources. Based on this analysis we believe we underestimated the cost-effectiveness in the 2010 proposal for requiring HEPA filters for all such plants. We now estimate the cost-effectiveness would be at least \$27,000 per pound.

Type of Facility	Table A.7 2010 Proposal Capital Cost HEPA Retrofit (\$ Millions)	Table 7 Supplemental Proposal Capital Cost Proposed Options (\$ Millions)
Large Hard Chromium Electroplating	35.1	1.8
Small Hard Chromium Electroplating	66.0	1.4
Decorative Chromium Electroplating	109.0	0.18
Chromium Anodizing	43.9	0.25

Comment: Commenter 0290/0620 disagreed with EPA's cost effectiveness analysis of different regulatory options and believes EPA failed to provide a reasoned explanation for choosing different acceptable levels of cost-effectiveness and levels of emission reduction for each subcategory. The commenter gave an example by comparing the option selected for large hard chromium electroplating, with a cost effectiveness of \$18,100/lb, to the option selected for small hard chromium electroplating, with a cost effectiveness of \$15,800/lb for the example of the options. The commenter claimed that EPA's proposal fails to satisfy the required statutory test of maximum achievability, it also does not appear to be based on any other intelligible, objective, rational standard by which it would be possible to understand or assess the agency's decision required by Section 112(d).

Response: While it is true that the proposed emissions limits differ in terms of cost effectiveness, we selected the options by considering other factors, such as capital costs, emissions reductions, and number of facilities impacted. We also note that, from a practical perspective, regulatory options do not realistically represent a continuum of emissions limits and cost effectiveness. Thus, there may not be an option for one source category (e.g., large hard chromium electroplating) that is an exact match with respect to same cost effectiveness and emissions reductions values for a different source category (e.g., small hard chromium electroplating). We believe the selected options are comparable in terms of cost effectiveness, even if they are not exactly the same value.

Regarding the commenter's statement about maximum achievability, the initial MACT standards established pursuant to sections 112(d)(2) and (3) did incorporate an "achievability" component. As explained elsewhere in this document, Section 112(d)(6) does not require us to repeat our section 112(d)(2) & (3) review.

Comment: Commenter 0285/0296/0619 disagreed with EPA's estimates of stack testing costs. The commenter stated that EPA has calculated the annualized costs of stack testing by assuming that a stack test is good for 15 years, so the costs were amortized over 15 years at an interest rate of 7 percent. The commenter believes the cost of stack tests would be 30 percent higher for a period of 10 years and 130 percent higher for a period of 5 years. The commenter also disagreed with EPA's estimates of facilities that need stack tests pursuant to the proposed rule. The commenter stated that there are approximately 700 to 950 hard chromium facilities and that, to demonstrate compliance with the new proposed limits, many more facilities would appear to need a new stack test than have been estimated by EPA.

Response: The commenter is correct that stack tests costs would be higher if annualized over a 10-year or 5-year period. However, the chromium electroplating NESHAP requires a one-time emission test, rather than periodic testing at 10 or 5 year intervals, as assumed by the commenter. We decided to annualize the cost over a 15-year period because we believe that period represents the lifetime of an electroplating source and/or control system.

Regarding the number of facilities that would have to conduct performance tests, the commenter appears to assume that most, if not all, hard chromium electroplating tanks would have to be tested. However, the proposed amendments include a waiver for any source test that was performed after January 25, 1995 (the original promulgation date for the NESHAP),

provided that the source uses the same emissions controls and is operated as during the initial performance date. Thus, we estimate that the majority of facilities would not have to conduct a performance test.

Comment: Commenter 0274/0618 questioned the analysis for the nationwide costs and cost effectiveness of the regulatory control options for chromium electroplating facilities. The commenter requested an explanation of whether the cost analysis is for onetime cost for facilities, or if it considers the recurring cost associated with HEPA filters. The commenter stated that a more realistic approach would be a cost analysis that evaluates the potential cost to a facility rather than the cost per reduction of HAP emissions.

Response: The costs estimates developed for both the October 2010 proposal and for the supplemental proposal include capital (one-time costs) and annualized costs. Annualized costs include recurring costs, such as the costs for operation and maintenance, and the annualized capital costs of new emissions controls that would be needed to comply with the proposed requirements.

Comment: Commenter 0274/0618 recommended that EPA should consider using the cost per pound rather than cost per ton for HAPs to obtain a more realistic cost figure.

Response: For the February 2012 supplemental proposal, the cost-effectiveness for each regulatory option considered is presented in units of cost per pound.

13. Costs and Economic Impacts

Comment: Commenter 0285/0296/0619 stated that EPA did not conduct a Small Business Regulatory Enforcement Fairness Act (SBREFA) panel pursuant to its obligations under the Regulatory Flexibility Act. The commenter stated that in preparation for the supplemental proposal, and the new revisions to surface tension levels and emission limits, the commenter urged EPA to conduct a SBREFA panel to review EPA's data and to assess the potential impacts of the proposed changes on small business. The commenter added that EPA began the administrative process for convening a SBREFA panel, but at the "eleventh hour" reversed course, concluding that the supplemental proposal would not have a significant impact on a substantial number of small entities, and declined to convene a SBREFA panel. The commenter believes EPA's justification for the decision was partly due to time constraints and the Agency's failure to adhere to its own rulemaking schedule and deadlines. The commenter stated that The Small Business Administration (SBA), Office of Advocacy, along with NASF, opposed EPA's decision not to convene a SBREFA panel.

Commenter 0610 believes that EPA's statement that the proposed amendments would not have a significant impact on a substantial number of small entities lacks a factual basis. The commenter explained that, in order to meet the requirements of the Regulatory Flexibility Act (RFA), the certification must include a description of the affected entities, as well as the anticipated impacts that clearly justify a finding of "no significant impact" and EPA has not done so.

One commenter (0277) stated that the costs to implement the proposed housekeeping requirements would trigger the Regulatory Flexibility Act (RFA) because it would have a significant economic impact on a substantial number of small entities. Another commenter (0285/0296/0619) stated that any requirement to install additional controls on chromium electroplating facilities would trigger the RFA. The commenter added that requirements to install control equipment would not be necessary, practical, or economically feasible.

Response: Given the compressed rule development schedule, EPA initiated the SBREFA panel early to ensure sufficient time to conduct and complete the panel. Shortly after initiating the panel, EPA performed a screening analysis for impacts on all affected small entities by comparing compliance costs to average sales revenues by employment size category. From the screening analysis, the Agency estimated that under the main options being considered for the proposal that approximately 96% of all affected facilities would have a cost-to-sales ratio less than 1 percent. Based on the screening analysis, the Agency concluded that the proposal would not have a significant economic impact on a substantial number of small entities and determined that the SBREFA panel was not needed. Additional details on our analysis of the economic impacts of the final rule amendments on small entities can be found in the Economic Impact Analysis for Risk and Technology Review: Chromium Electroplating and Chromic Acid Anodizing Source Categories, which is available in the docket. It should be noted that we did include the costs associated with the final housekeeping requirements in our economic impacts analysis. Regarding the assertion by Commenter 0277 that the proposed housekeeping measure would have a significant economic impact on a substantial number of small entities, the commenter did not provide any support for their claims that substantively addresses the determination that EPA made that the proposed requirements would not have a significant effect on a substantial number of small businesses.

Comment: Commenter 0290/0620 acknowledged that it may be valid to recognize that plants that have already achieved greater reductions should incur no cost under EPA's new rules, but it is not lawful or rational for EPA to ignore the fact that hundreds of facilities have achieved those reductions when it is making a decision what standards to set nationally. The commenter believes that in performing its cost-based analysis for other plants, EPA did not consider the California experience. The commenter claimed that it was arbitrary and capricious for EPA to fail to consider the record of success in California, what the cost actually was for California facilities to comply, whether the California rules that have now been implemented were cost effective, whether facilities were able to comply, and the overall success in implementing the California rules.

Response: EPA recognizes the limits set forth in California and analyzed comparable standards when evaluating and setting limits for this rulemaking. However, EPA does not have adequate information on the cost or cost effectiveness for facilities in California to comply with the California standards and is not aware of any cost studies related to the California standards. Nevertheless, EPA did evaluate the costs of requiring HEPA filters on all hard chromium facilities, which would be similar to California requirements and based on that analysis, EPA estimates the cost effectiveness would be at least \$27,000 per pound.

Comment: Commenter 0290/0620 disagreed with EPA's conclusion that requiring plants to retrofit HEPA filters would not be cost effective. The commenter indicated that California determined that only 40 percent of the industry there (89 of 226 facilities) would incur significant capital costs from its rule, because so many were already in substantial compliance.

Response: The analysis used to estimate the costs associated with the supplemental proposal, took into account the estimated number of existing facilities that currently would meet the revised emission limits, as well as the estimated number of plants that would have to install new controls or otherwise reduce emissions, and the likely emission control method adopted by those plants. As part of the cost analysis, we assumed that some facilities that require additional control would install HEPA filters. However, we believe that most facilities that would need to reduce emissions to comply with the more stringent emissions limits could do so through the use of fume suppressants or by retrofitting CMPs. As described elsewhere in this document and in the cost analysis technical document (i.e., Revised Procedures for Determining Control Costs and Cost Effectiveness for Chromium Electroplating and Anodizing, which is available in the docket), we estimate that requiring HEPA filters for all hard chromium plants would have costs effectiveness of at least \$27,000 per pound.

Comment: Two commenters (0274/0618, 0290/0620) disagreed with EPA's cost analysis for HEPA filters, and provided several reasons to argue that the use of HEPA filters are cost effective. Both commenters cited the economic analysis conducted by CARB in their "Proposed Amendments to the Hexavalent Chromium Airborne Toxic Control Measure for Chrome Plating and Chromic Acid Anodizing Operations" report. Commenter 0274/0618 stated that the CARB assessment looked at the cost of installing HEPA filters, but their analysis considered the expected first year, capital and annual recurring costs. The commenter provided example costs for small and large hard chromium electroplaters. The commenter stated that in CARB's assessment, the costs reflect actual purchasing cost for a facility. Additionally the commenter noted that CARB acknowledged that not all facilities would be required to install HEPA filters if other control methods are effective. The commenter stated that CARB's assessment concludes that HEPA filters are cost effective, yet the EPA's assessment concluded otherwise. Commenter 0290/0620 stated that EPA concluded that the cost-to-sales ratio change that would occur if it required HEPA filters would be 8 to 22 percent for more than half of the facilities. By contrast the commenter noted, California found that the profitability decline could be as low as 3 percent. The commenter stated that the significant range in these numbers suggests variability from the differences for a small number of outlier facilities, which means that a few facilities that may well not be profitable or efficient already are likely distorting the cost-to-sales ratio analysis. The commenter recommended that EPA perform an analysis of businesses that would incur substantial costs if it intends to rely on costs in this manner and determine if there would be any significant impact on employment; business creation, elimination or expansion; or business competitiveness.

Response: These comments were made on the October 2010 proposal. At that time, we estimated the costs for installing HEPA filters across the board on all plants. Based on the high capital costs and other factors, we rejected that option. For our revised cost analysis for the final rule, we used an approach that is more discriminating in terms of the type of emission control that a specific plant would likely need to comply with the more stringent emissions limits that

were proposed in the February 2012 supplemental proposal. That is, we looked at the available data, and, instead of assuming that all plants would need to retrofit additional controls, we determined whether each existing source for which we had data could meet the more stringent emission limits with its current control system, assuming a margin of compliance. If so, we did not estimate additional control costs for those sources. Based on available data, we estimate that more than 85 percent of existing plants that choose to comply with the rule by meeting the concentration based emissions limits already meet the lower emissions limits and will need no additional emissions reductions. If we determined a source would need additional control, we considered how close the source operated to the more stringent emission limit. If the source operated slightly above the more stringent limit, we assumed, for sources other than large hard chromium electroplating tanks, that most sources (80 to 90 percent) could use fume suppressants to achieve slightly lower emissions to comply with the emissions limits. For large hard chromium electroplating sources, we estimate that over 85% of existing large hard chromium plants already meet the limit and therefore would not need additional controls. For the other 15 percent (or less) of large hard chromium plants that may need to reduce their emissions to meet the lower emissions limit, we assumed that 10 percent of these plants could meet the final limits using fume suppressants and that approximately 80 percent of these sources would install a CMP and the remaining sources would install a HEPA filter. This is similar to CARB's conclusion that not all sources would need to install a HEPA filter to comply with the CARB ATCM. In addition, we did conclude that HEPA filters would be a cost-effective option to comply with the emission limits incorporated in the final rule for the small subset of large hard chromium electroplating plants that may need a HEPA filter to achieve the limits. Finally, our economic impact analysis, which is summarized in Economic Impact Analysis for Risk and Technology Review: Chromium Electroplating and Chromic Acid Anodizing Source Categories and is available in the docket, describes our assessment of the impacts on affected businesses.

Comment: Commenter 0285/0296/0619 stated that the proposed new source emissions limits could be problematic for facilities, particularly hard chromium facilities and is concerned that the stringent new source emissions limits will discourage new production and job creation for chromium electroplating and anodizing operations

Response: We disagree that the new source emission limits will discourage new production and job creation. For the 148 hard chromium electroplating sources for which EPA has emissions data, 58% of the sources already meet the 0.006 mg/dscm new source limit. These data clearly indicate that the new source emission limit is quite achievable. Additionally, it is less expensive to install add-on controls on a new system than to retrofit controls on an existing system, and therefore the cost impacts for new facilities are lower.

Comment: One commenter (0285/0296/0619) stated that national chromium emissions have been reduced because of the recent economic downturn and increased global competition. Over the past decade, approximately 20 to 30 percent of metal finishing facilities have been forced to close. The commenter stated that fewer facilities generate fewer total chromium emissions. The commenter concluded that these factors have effectively reduced chromium emissions from electroplating and anodizing operations to well below 0.5 tons/yr.

Response: We agree that economic factors have affected the chromium electroplating industry. To the extent that we know of facilities that have permanently closed, we did not include them in our analysis. We updated our emissions data set considering closures and other information. Nevertheless, we assess both actual and allowable emissions in the RTR. Our evaluation of both actual and allowable emissions helps ensure that we appropriately evaluate the health risks from the industry over the long term rather than looking at just how the industry may be affected at a particular moment in time.

Comment: One commenter (0290/0620) asked EPA to recognize and address the environmental harm these chromium electroplating and anodizing sources pose. The commenter stated that as part of considering adverse environmental effects, EPA must consult with the Fish and Wildlife Service (FWS) and the National Marine Fisheries Service (NMFS) under 16 U.S.C. 1536(a)(2) because emissions from these source categories could affect endangered and threatened species.

Response: For the steel pickling, chromium electroplating and chromium anodizing source categories, EPA considered effects to the environment separately from human health risk in order to determine whether it is necessary to set a more stringent standard to prevent an adverse environmental effect. The results of our analyses are presented below.

For steel pickling, in considering effects to the environment, the EPA first determined that some HAPs of potential concern with respect to the environment are emitted from sources in this category. We call these eco HAPs, and the eco HAPs that are emitted from steel pickling are hydrogen chloride (HCl) and chlorine (Cl₂). Other eco HAPs, such as certain persistent, bioaccumulative HAP (PB-HAP) and hydrogen fluoride (HF) are not emitted from steel pickling operations. We included HCl and Cl₂ in our environmental analysis because we determined that they have the potential to cause adverse environmental effects. These pollutants are very reactive and, therefore, have the potential to cause adverse effect to ecological receptors by direct contact. The Agency also determined that there was at least some potential for exposures to environmental receptors, because the presence of such receptors around the sources in this category cannot be ruled out. The EPA then looked at emissions of the eco HAPs, including the highest-emitting facility for each HAP and the total emissions of each HAP from the source category. The results are presented in the table below:

Emissions of Eco HAPs from the Steel Pickling Source Category (post-RTR)*

Pollutant	Category emissions (tpy)	Number of facilities in category reporting emissions	Emissions for highest-emitting facility (tpy)
HCl	248	75	24
Cl ₂	2.8	5	0.9

*For the baseline risk assessment, which is described in the Residual Risk Assessment for the Steel Pickling Source Category document, we estimated total emissions to be 247 tpy of HCl and 18 tpy of chlorine. However, given the amendments promulgated in today's action, which will achieve a 15 tpy reduction of chlorine emissions, the post RTR chlorine emissions are estimated to be 2.8 tpy.

Based on the emission estimates shown above, the EPA determined that the emission levels of these pollutants are low. For instance, compared to the 2008 NEI for point sources, estimates of nationwide HCl emissions from this source category are about 0.17 percent of the total. For Cl₂, this source category accounts for about 0.18 percent of the nationwide emission totals. Based on the low emissions from the steel pickling source category, the Agency would not expect an environmental effect to occur.¹⁵ Finally, even though the Agency does not expect an environmental effect to occur, we evaluated requiring additional controls to reduce these HAP emissions, but we did not identify any additional technology that could reduce emissions.

For the chromium electroplating and anodizing source categories, the EPA examined the potential for emissions of eco HAPs. As mentioned earlier, those eco HAPs include certain PB-HAP and acid gases. Data show that none of the 14 PB-HAP are emitted. In addition, precursors of HF, HCl, and chlorine (acid gases) are not introduced in the chromium electroplating process, which is a process that uses highly refined materials of known composition. Because these precursors are not present in the process and must be present for the acid gases to be emitted, it is reasonable to conclude that HF, HCl, and chlorine cannot be emitted from these sources. Because of the absence of HAP that present ecological concerns, the EPA determined that the standards for the chromium electroplating source categories would have no effect on the environment.

In addition, the Agency does not have information, nor did the commenter provide information to support the position that emissions of chromium from chromium electroplaters would result in environmental effects. With regard to the environment, the limited available information on the persistence and bioaccumulation of hexavalent chromium suggests that there is no indication of the biomagnifications of hexavalent chromium along the aquatic food chain, and that chromium has low mobility for translocation from roots to above ground parts of plants. (ATSDRs Tox profile 2008 <http://www.atsdr.cdc.gov/toxprofiles/tp7.pdf>).

Because our analyses show no environmental effect from these source categories, we disagree with the commenter's statement that the EPA must consult with the FWS and the NMFS under 16 U.S.C. 1536(a)(2).

Comment: Commenter 0285/0296/0619 suggested EPA has under-estimated compliance costs by underestimating the number of facilities that do not meet the proposed limits by assuming that only facilities exceeding 85 percent of the proposed new emissions limits would need to reduce emissions or make adjustments to meet the new proposed emission limits. The commenter stated EPA provided no data in the record to support the 85 percent value for estimating compliance and that EPA's assumption fails to take into account the variability over time regarding a facility's emissions concentration. Based on this variability, the commenter recommended EPA should set a compliance margin of 50 percent based on typical variability in stack test results or provide some evidence to support this narrow compliance margin.

¹⁵ However, we do note that the EPA's current ability to evaluate the potential for ecological effects is limited, and we are working to improve the Agency's capacity in this regard. The results of our effort to improve these capabilities will be particularly important for source categories where emissions of eco HAPs are at a level that may be of concern.

Response: We agree with the commenter that a plant owner or operator may want to operate with a larger compliance margin than at 85 percent of the emission limit. However, the 85 percent value used in the analysis is not a compliance margin, as inferred by the commenter. This value simply was used to estimate additional existing plants that might decide to, or be required to, install additional controls. Under the proposed amendments, plants could use the results of their previous performance tests to demonstrate compliance with the more stringent limits (with a few exceptions). Thus, even a plant whose previous performance test indicated that the plant was operating at 95 percent of the more stringent limit would not be required to install additional controls, provided they were still operating the source and were using the same emission controls as during the performance test. Furthermore, even for sources that do need to test, the rule only requires a one-time test. So, as long as the performance test is no higher than the emissions limit, all the source needs to do after that test to remain in compliance is to do the basic control device monitoring (such as take pressure drop readings).

Comment: Commenter 0285/0296/0619 did not agree with EPA's calculation of emissions reductions. The commenter stated that EPA estimate is off by at least an order of magnitude, and should be 18 lbs/yr instead of the 208 lbs/yr estimated by EPA. The commenter estimated that this change would revise the cost effectiveness to approximately \$180,000 per pound. For the facilities used as the basis for estimating the impacts for the supplemental proposal, the commenter estimated total nationwide emissions reductions to be 91 lbs/yr, compared to EPA's estimated reductions of 208 lbs/yr. The commenter added that baseline emissions should be actually be 228 lbs/yr, rather than the 1,138 lbs/yr estimated by EPA, and if the same percent reduction is applied to a baseline of 228 lbs/yr, total reductions would be only 18 lbs/yr. With respect to emissions reductions achieved by reducing the surface tension in tanks using fume suppressants, the commenter stated that reduction in surface tension does not equate to a linear reduction in emissions, but assumed a linear relationship to calculate emissions reduction of 5.7 to 11.1 percent. Assuming these percent reductions applied to all of the affected decorative chromium electroplating and chromium anodizing plants, the commenter stated that the emissions reductions would be 24 lbs/yr for decorative and 6 lbs/yr for chromium anodizing plants. For all hard chromium electroplating plants, the commenter assumed the same percent reduction (i.e., 5.7 to 11.1 percent) for all sources regardless of the type of control device or method (i.e., for tanks that would be controlled with fume suppressants and for tanks that would retrofit add-on controls). After applying these percent reductions to the average emission rates, the commenter estimated emissions reductions to be 31 lbs/yr for large hard chromium and 30 lbs/yr for small hard chromium electroplating plants based on EPA's estimated baseline of 1,138 lbs/yr.

The commenter's estimate of baseline emissions (208 lbs/yr) is based on a combination of estimates, which, according to the commenter are 80 percent less than EPA's estimated baseline emissions. Specific factors considered by the commenter in making this estimate were: estimated number of facilities that have closed, estimated number of facilities that do not use hexavalent chromium, and revised emissions estimates.

Response: After reviewing the commenter's emissions reductions estimates, we have concluded that there is no basis for the assumptions and methodology used by the commenter. Regarding estimated baseline emissions, we disagree with how the commenter used the data

collected by the commenter. We do not question the data indicating that several plants that have closed and several other plants that do not perform chromium electroplating or anodizing, and we have revised our database and baseline emissions to account for these changes by removing those plants and their associated emissions. However, we do not agree that the percentages of closed plants and of plants that do not perform chromium electroplating or anodizing determined by the commenter can be applied across the board to all plants nationwide. It is unclear how the commenter determined which plants to contact and whether there was any bias in that selection. Furthermore, although we recognize that the chromium electroplating industry has not shown much, if any growth in several years, it is not appropriate to assume that no new plants have opened during that period, as assumed by the commenter.

Regarding the emissions reductions achieved by lowering the surface tension, the commenter first states that the relationship is not linear, yet then assumes a linear relationship to estimate reductions. Our methodology for estimating emissions reductions achieved from reducing the surface tension is based on the data presented in the Development of Revised Surface Tension Limits for Chromium Electroplating and Anodizing Tanks Controlled with Wetting Agent Fume Suppressants document, which is available in the docket for this rulemaking. Those data indicate that reducing surface tension to the proposed levels would achieve a 15 percent reduction in emissions. With respect to the estimated emissions reductions for hard chromium electroplating plants with add-on control devices, there is no basis for the commenter's assumption that the emissions reductions achieved using add-on controls can be estimated using the percent change in surface tension for sources that are controlled with fume suppressants. The assumptions used in our analysis to estimate emissions reductions are provided in the Revised Procedures for Determining Control Costs and Cost Effectiveness for Chromium Electroplating Supplemental Proposal document, which is available in the docket for this rulemaking. As explained in that document, we estimated emissions reductions based on the incremental increase in control efficiency of additional controls over existing emission controls. We continue to believe that using incremental control efficiencies is an appropriate method for estimating emissions reductions.

Regarding the revised emissions data provided by the commenter, we have developed a revised database to account for the revisions that were documented or that we were otherwise able to verify. We note that, for several plants, the commenter assumed that actual emissions were either exactly 10 percent or exactly 33 percent of our estimated emissions, which suggests that the commenter did not receive actual data from the facilities regarding their emissions but estimated emissions by applying an arbitrary factor to our estimates. We further note that for most of these plants, the emissions used for the supplemental proposal were simulated and not actual measured emissions. Since the simulated emissions were developed for estimating nationwide risk and impacts, rather than plant-specific estimates, applying an arbitrary 10 percent or 33 percent factor to simulated emissions further calls into question the estimates provided by the commenter.

Finally, as explained previously, we have performed an emissions simulations using some of the data provided by the commenter (as described in the previous paragraph) and other information obtained since the supplemental proposal. Based on those results and data, we estimate baseline emissions for the chromium electroplating and anodizing industry to be 955

lbs/yr. Documentation for this revised estimate of baseline emissions can be found in the Revised Procedures for Determining Control Costs and Cost Effectiveness for Chromium Electroplating and Revised Simulation of Actual and Allowable Emissions for Chromium Electroplating Facilities, which are available in the docket for this rulemaking.

Comment: Commenter 0285/0296/0619 believes reduction of surface tension levels may not reduce emissions at all and will yield little, if any environmental benefit or risk reductions, particularly with the use of non-PFOS fume suppressants. The commenter stated that, while most facilities should be able to meet the new levels with PFOS-based fume suppressants, several facilities have expressed concerns that the lower surface tension levels will provide no environmental benefit or risk reduction and will eliminate a much-needed margin of compliance. The commenter goes on to say that to maintain the same margin of compliance, facilities may have to add more fume suppressants. The commenter stated that the added costs to ensure continued compliance with a sufficient buffer does not appear to be warranted given the minimal environmental benefits or risk reductions, if any that are expected from this change. The commenter believes that EPA has not provided any documentation or data in the record to demonstrate that the proposed changes to the surface tension levels will provide any measurable benefits (i.e., emissions reductions).

Commenter 0610 stated that EPA did not collect adequate data on the costs of non-PFOS WAFS and how quickly non-PFOS WAFS are depleted in chromium electroplating tanks. The commenter recommended that EPA delay further action on the NESHAP until the Agency can complete a full review of the feasibility of, and costs to small businesses associated with using non-PFOS WAFS to meet the proposed surface tension limits. Commenter 0285/0296/0619 similarly believes that non-PFOS WAFS are significantly more expensive to use than EPA claims.

Response: We based our decision to propose lower surface tension limits on an analysis of actual surface tension and emissions data. The data show that reducing surface tension from the current levels of 45 dynes/cm (stalagmometer data) or 35 dynes/cm (tensiometer data) to 40 dynes/cm (with stalagmometer) or 33 dynes/cm (with tensiometer), will achieve an emissions reduction of approximately 15 percent and that is the value we used in our estimates of emissions reductions and cost effectiveness. The commenter provides no substantive information to refute that analysis but merely makes general statements of disagreement. We agree with the commenter that additional fume suppressant will be needed to maintain the lower surface tension levels and we have accounted for the additional fume suppressant use in our cost estimates. Finally, we disagree with the commenter that we have not provided documentation on the emissions reductions that are expected from the reduced surface tension levels. The rulemaking docket includes memoranda that provide data on emissions, costs, and reductions associated with the proposed limits. (See Development of Revised Surface Tension Limits for Chromium Electroplating and Anodizing Tanks Controlled with Wetting Agent Fume Suppressants and Procedures for Determining Control Costs and Cost Effectiveness for Chromium Electroplating Supplemental Proposal in the docket for this rulemaking.)

Following the supplemental proposal, we collected additional information on several chromium electroplating plants located in Minnesota that have been using non-PFOS fume

suppressants for several years. The facilities have reported no significant problems in switching from PFOS-based to non-PFOS-based fume suppressants and also reported no significant difference in costs between the two types of fume suppressants. In addition, none of the facilities reported significant problems related to depletion of non-PFOS chemicals in electroplating baths. Therefore, we believe the data are adequate and support our conclusion that requiring non-PFOS fume suppressants will not create a significant impact on a substantial number of small entities. Additional details on the use of non-PFOS fume suppressants in Minnesota can be found in the Information on non-PFOS Fume Suppressants in Minnesota Chromium Electroplating Facilities document in the docket for this rulemaking.

14. Compliance Options

Comment: Commenter 0285/0296/0619 stated that contrary to EPA's assumptions, all facilities would need to use add-on controls or retrofit existing controls to meet the new proposed emissions limits because add-on controls are a critical component for meeting the current NESHAP standards (particularly for hard chromium facilities), and would also be a critical component for meeting the new proposed emissions limits. The commenter recommended that EPA include the additional costs of add-on controls and retrofits in its cost analysis for all facilities that need to reduce emissions or make adjustments to meet the proposed emissions limits. The commenter believes that when these costs are included, the analysis will demonstrate that EPA technology options are not cost effective.

Response: We disagree with the commenter's assertion that all facilities will need to install additional controls to meet the proposed emission limits. Our analysis of the data indicates that most facilities already meet the proposed limits. Our cost analysis clearly includes additional costs for those facilities that we expect will be unable to meet the revised emission limits without additional control measures, such as retrofitting add-on controls or introducing the use of fume suppressants. The commenter provides no substantive information that refutes our analysis.

Comment: One commenter (0285/0296/0619) stated that HEPA filters are not cost-effective and additional add-on controls are not feasible because many facilities control chromium emissions effectively through the use of mist suppressants without the need for control equipment. The commenter further stated that since the promulgation of the 1995 Chromium Electroplating MACT standard and the 2004 amendments, no new control technologies have been developed or identified to control chromium emissions.

Response: We agree with the commenter that no "new" types of controls have been identified for chromium electroplating sources since promulgation of the MACT standard. However, as we have discussed in previous responses, for purposes of the residual risk and technology reviews, we look at developments in processes, process and controls since promulgation of the MACT and are not limited to reviewing "new control technologies. We disagree with the commenter's conclusion that add-on controls, are not cost-effective. Our analysis indicates that retrofitting add-on controls is not unreasonably expensive for existing plants that currently use only WAFS for controlling emissions from chromium electroplating tanks. In addition, our analysis also indicates that many plants that currently use WAFS can meet the more stringent emission limits without additional controls. (See Revised Procedures for

Determining Control Costs and Cost Effectiveness for Chromium Electroplating and Anodizing, which can be found in the docket for this rulemaking.)

Comment: Commenter 0285/0296/0619 stated that non-PFOS fume suppressants are still a technology in transition and are not a simple “drop-in” replacement for PFOS fume suppressants.

Response: The EPA contacted several facilities in Minnesota that have switched from a PFOS-based fume suppressant to a non-PFOS fume suppressant and asked them to describe the transition and any problems they experienced. All the facilities that responded performed a slide conversion in order to transition to a non-PFOS fume suppressant. In the slide conversion method, a facility stops adding PFOS-based fume suppressant and begins adding non-PFOS fume suppressant. This method allows the PFOS concentration in the solution to reduce over time without having to empty and replace the contents of the tank. The facilities worked closely with the fume suppressant suppliers during the conversion. None of the plants that responded had any downtime due to the conversion and overall stated the slide conversion was a simple adjustment.

Comment: Commenter 0285/0296/0619 believes non-PFOS fume suppressants do not perform in the same manner as PFOS fume suppressants, particularly with respect to reducing emissions. The commenter provided a case study of a Texas facility that observed a significant decline in controlling emissions with the use of non-PFOS fume suppressants. The commenter suggested that the results from this case study are consistent with the anecdotal information that NASF has received regarding benchmarking trials with non-PFOS fume suppressants within the industry. The commenter also listed one closed facility in Minnesota that used a non-PFOS fume suppressant and had average surface tension levels of about 30 dynes/cm but also had a few surface tension measurements above the proposed limit of 33 dynes/cm.

Response: The Texas facility in the case study uses high hardness dense chromium and a low-temperature (136°F to 140°F), multi-state surface finishing process. EPA believes this process is not typical or representative of most hard chromium electroplating operations. Nevertheless, all facilities will have the option to use add-on control devices or WAFs or a combination of the two approaches to limit emissions. Also, for those facilities that choose to use WAFS, facilities will have 3 years to determine an effective non-PFOS fume suppressant, and can petition for an additional year. EPA acknowledges that some facilities may need additional time to test and refine the use of non-PFOS fume suppressants and such facilities could request an additional year for compliance pursuant to CAA section 112(h)(3)(B). Additionally, it may be that fume suppressants will not work for a limited set of facilities and such facilities may need to use add-on controls.

With regard to the Minnesota facility, the commenter does not identify why the facility in Minnesota that closed had a few surface tension measurements above the levels in the 33 dynes/cm. Nevertheless, most of the facility’s measurements were below 33 dynes/cm and the facility maintained an average surface tension of about 30 dynes/cm. We again note that we have contacted several other facilities in Minnesota, none of which has had issues in switching to a non-PFOS fume suppressant or in controlling surface tension levels. We also reviewed and

analyzed two recent studies (i.e., a German study and Danish study) that evaluated the effectiveness of non-PFOS based WAFS compared to PFOS-based WAFS. The Danish study results indicate that the non-PFOS based WAFS performed as well or better than the PFOS based WAFS at reducing chromium emissions. The results of the German study were less clear. For example, a new experimental product that is not commercially available seemed to actually increase emissions. However, with regard to the commercially available products, the authors concluded that the PFOS and non-PFOS products both reduced emissions by more than 95 percent (see the technical memo Comparison of Studies on Non-PFOS Fume Suppressant Performance, which is available in the docket for more information).

Comment: Commenter 0285/0296/0619 stated that EPA offers no proof to support claims that the new source emissions limit can be achieved for decorative and anodizing by maintaining the new surface tension level. The commenter stated that EPA has not provided any data in the record to demonstrate that the proposed limit is feasible for new hard chromium facilities. The commenters focused on EPA's need to reassess its claims regarding the use of non-PFOS fume suppressants and stated EPA has not provided any evidence in the record that non-PFOS fume suppressant can effectively reduce emissions to meet the new proposed emissions limits. The commenter feels that as a result, non-PFOS fume suppressants are not a technologically or economically feasible option for ensuring compliance with the new proposed emissions limits.

Response: First, any new source has the option to comply with the rule by either maintaining the surface tension levels or by meeting the emissions limits. The data from Minnesota and from the chemical companies (e.g., Atotech) indicate that surface tension levels of 33 dynes/cm (as measured with a tensiometer) are achievable. Regarding those plants that choose to comply by meeting the emissions limits, based on the data we have, facilities can meet the emissions limits with readily available control devices (such as CMPs or HEPA filters). Our analysis of the available data on surface tension indicates that maintaining surface tension below 40 dynes per centimeter (when measured using a stalagmometer) or 33 dynes/cm (when measured using a tensiometer) will ensure emissions remain below 0.0055 mg/dscm, which is below the revised emission limit of 0.006 mg/dscm. The analysis and results are documented in Development of Revised Surface Tension Limits for Chromium Electroplating and Anodizing Tanks Controlled with Wetting Agent Fume Suppressants, which can be found in the rulemaking docket.

Comment: Commenter 0290/0620 pointed out that, if, as EPA states, surface tension limits lead to emission control that is equivalent to that of the emission concentration-based limits, then there is no need to set an alternative limit for surface tension. The commenter added that although EPA should require actual measurement of emissions coming from the sources to ensure compliance, EPA could also consider using surface tension as one method of assessing compliance with the concentration-based limits (as long as it is actually equivalent). The commenter suggested that, since some sources may need to use WAFS and other controls to achieve the emission standards, then EPA should require surface tension limits in addition to those standards. The commenter noted that then instead of a potential loophole that does not satisfy section 112, surface tension limits could serve as an important additional protection and backstop to the core emission standards (but not the only compliance option).”

Response: While we have phrased the regulation as establishing surface tension limits as an “alternative to” the emission limit, as we have provided above, compliance with the surface tension limits will ensure compliance with the emission limits and it is appropriate to consider the surface tension limits as a means of demonstrating compliance with the emission limit. We do not believe it is necessary, however, to revise the long-standing structure of the MACT rule to define it as a required compliance method in addition to complying with the emissions limit rather than as an alternative to meeting the emissions limit. We are unclear what point the commenter is making in the last sentence. To the extent some sources need both WAFS and control equipment to meet the emission limit, there is no need to establish a surface tension limit for such sources. Rather, where emission control equipment is used as the sole or partial means of complying with the MACT rule, the source must demonstrate compliance by meeting the applicable emission limit. Surface tension limits were developed as an alternative means for complying with the MACT rule when they are the sole means of compliance.

Comment: Commenter 0285/0296/0619 stated that with respect to the hard chromium facilities that would need to reduce emissions or make adjustments to meet the proposed emission limits, EPA “assumes” that most facilities “would achieve these extra reductions with the addition of fume suppressants.” Commenter 0285/0296/0619 points out that some facilities cannot use fume suppressants because of operational considerations such as the size of tanks, configuration of tanks, and the mechanics of the plating process and that some plants are not currently using fume suppressants because of operational, product quality or cost considerations. The commenter stated that EPA has continued to acknowledge this limitation on the use of fume suppressants, but appears to ignore it as it insists that fume suppressants, which are not a new technology, are the answer for all facilities to meet the proposed limits. The commenter concludes that facilities that can use fume suppressants beneficially in their operations are currently using them and believes EPA’s solution to start using fume suppressants or using more fume suppressants is misguided and without merit, and is not supported by evidence in the record.

Response: Based on available data, more than 85 percent of existing large hard chromium plants already meet the limit of 0.011 mg/dscm and therefore will not need to add WAFS or retrofit controls. Those 85 percent (or more) plants will have no additional control costs. For the 15 percent (or less) of plants that will need to achieve reductions, we have revised our costs analysis using the assumption that all of the existing large hard chromium electroplating plants that cannot currently meet the revised emission limit of 0.011 mg/dscm will have to retrofit add-on controls.

For small hard chromium electroplating plants we also estimate that more than 85 percent of existing plants already meet the limit and will need no additional controls. For the 15 percent (or less) of plants that will need to achieve reductions, we have assumed that 20 percent of affected existing facilities will have to retrofit add-on controls. We believe this assumption accounts for facilities that may not be able to use fume suppressants. The available data indicates that approximately 15 percent of plants outside of California currently use fume suppressants in combination with add-on controls, and, in California, the percentage is believed to be greater than 15 percent. On the other hand, the commenter provides no data to support the statement that

any plant that can use fume suppressants is already using fume suppressants. To the contrary, our data show that all types of plants (hard chromium electroplating, decorative chromium electroplating, and chromium anodizing) use fume suppressants to complement the reductions achieved by add-on controls. In addition, several of the plants that would marginally exceed the more stringent emission limits are not using fume suppressants currently. Therefore, there is no reason to assume that none of these plants could introduce fume suppressants to the electroplating tanks, as stated by the commenter.

15. Housekeeping Requirements

Comment: Commenters 0277 and 0285/0296/0619 commented on the burden associated with some of the specific housekeeping practices proposed. Regarding Item No. 1 of proposed Table 2 to §63.342, which would require storing substances containing hexavalent chromium in an enclosed area, Commenter 0277 stated that, if cabinets are required, the facility would incur costs of approximately \$4,500 for cabinets with sufficient capacity to contain the maximum amount of inventory that could potentially be onsite. In addition the commenter stated that, the use of such cabinets would then limit the amount of inventory that the facility could purchase and would take up valuable floor space in an already limited amount of storage area. The commenter added that the real costs and operational disruption that would result from the use of storage cabinets would be unacceptable in light of there being no apparent advantage over placement of containers inside a containment area within a building. Commenter 0285/0296/0619 stated that, if the proposed measure required storage of all such substances in cabinets, there would be considerable costs to retrofit a facility or to purchase and install such drum storage cabinets, and that EPA has not taken such costs into consideration. The commenter added that such additional controls and costs are unnecessary.

Regarding requirement No. 2, for minimizing spills from dragout, Commenter 0277 stated that neither of the proposed compliance options is feasible at the commenter's facility without capital investment of more than \$100,000. The commenter suggested allowing a third compliance option to collect and treat dragout in an onsite wastewater treatment plant and/or dispose of solution that drips or drains from parts as they are being removed from tanks. According to the commenter, this option would be far less burdensome.

Regarding requirement No. 5, to clean surfaces on a weekly basis, Commenter 0277 stated that cleaning elevated surfaces would require specialized equipment (lifts, booms, etc) and require an estimated 12 man-hours per week. The commenter stated that weekly cleaning of the wastewater collection pits would only be feasible if the use of a hose is permitted, and could be accomplished with an acceptable number of man hours. However the commenter stated that, hosing out the pits would generate approximately 1,000 gallons of additional wastewater that would need to be processed by the wastewater treatment operation (and its associated operator). In the event that hosing was not allowed the commenter noted that, cleaning the pits would entail removal of several hundred linear of feet of floor grates and a confined space entry. The commenter further stated that this work could only be conducted on the weekend when the facility is not staffed, due to the safety hazard that would be created by removing the floor grates. The commenter stated that the additional labor and operating costs associated with a broad interpretation of this requirement could range from \$24,000 to \$50,000 per year at his plant.

Regarding requirement No. 6, to install a physical barrier to separate buffing, grinding, and polishing operations from chromium electroplating or anodizing operations, the same commenter (0277) stated that, if the intent was to totally enclose these operations, the proposed rule does not address the capital costs for meeting this requirement. The commenter stated that, at his facility, these capital costs could exceed \$250,000 in construction of new areas and physical barriers (i.e., walls).

Three commenters (0260/0616, 0277, and 0285/0296/0619) commented about the proposed housekeeping practices specified in Table 2 to §63.342. All three commenters stated that the proposed requirements needed clarification to ensure that they are not interpreted too broadly and are not overly burdensome. Commenter 0260/0616 remarked that the proposed housekeeping measures are unnecessary and should be eliminated. Commenter 0277 stated that the proposed measures are ambiguous and will result in actions that, although beyond the intended scope of the rule, will be necessary for mitigating the potential for enforcement or litigation. The commenter added that the proposed requirements will result in regulatory burdens and costs not properly considered by EPA. The commenter offered several suggestions for reducing the burden associated with implementing the proposed measures. Commenter 0285/0296/0619 stated that, although the proposed requirements appear generally to be consistent with good management practices for chromium electroplating and anodizing operations, several clarifications are needed to ensure that facilities can implement the housekeeping practices effectively without overly broad and unnecessarily strict interpretations of the requirements.

Response: The final rule includes several changes to the housekeeping requirements that we believe address the commenters' concerns. Regarding Item No. 1, the final rule allows chromium-containing substances to be stored in an enclosed container, an enclosed storage area, or a building; thus, it will not be necessary to store the substances in a cabinet. Regarding Item No. 2, the final rule allows collection and treatment in an onsite wastewater treatment plant. Regarding Item No. 5, the final rule clarifies and limits which surfaces must be cleaned; that is, only surfaces contaminated with hexavalent chromium from materials used in an affected tank. The final rule also allows rinsing surfaces and collecting the liquid in a wastewater collection system. Regarding Item No. 6, the requirement has been clarified to apply only for buffing or polishing operations located in the same room as an affected tank and clarifies that a plastic strip curtain is acceptable; the rule does not require construction of enclosed walls or other types of enclosures. Additionally, in response to these and other comments on the proposed amendments we have made several changes to clarify and simplify the housekeeping measures incorporated in the final rule. The specific changes are described in our responses to the specific comments on each of the housekeeping measures, as described in the following paragraphs.

Comment: One commenter (0260/0616) questioned the need to establish housekeeping requirements if the purpose is to minimize fugitive emissions, as stated in the preamble to the proposed amendments. The commenter pointed out that fugitive emissions are already minimized by efforts implemented to minimize occupational exposures regulated by 29 CFR 1910 and the hazardous waste management requirements of 40 CFR 262. For this reason the commenter believes, EPA should not impose measures that are adequately addressed by other regulations. The commenter added that, if occupational exposures in the shop are regulated to an

acceptable level, it is not clear how the level of fugitive emissions that migrate out of the shop would present an unacceptable risk to the public.

Response: We understand that occupational exposures to chromium at chromium electroplating plants are addressed under 29 CFR 1910, and that §1910.1026(j) specifies housekeeping requirements. We have not determined that fugitive emissions present an unacceptable risk to public health. Rather we proposed and are finalizing the housekeeping requirements under the technology review provision of section 112(d)(6) because these procedures are cost effective and will result in emission reductions.

Comment: Three commenters (0260/0616, 0277, and 0285/0296/0619) requested clarification of the term "enclosed storage area" as it related to the requirement in item No. 1 of Table 2 to §63.342 for storing substances that contain hexavalent chromium. Commenters 0277 and 0285/0296/0619 stated that a common practice is to store such materials in a building with secondary spill containment or other spill and release prevention measures, but it is unclear if such a practice would satisfy the proposed requirement. Commenter 0260/0616 stated that, while electroplating operations are underway, such substances often are placed temporarily in or around the shop and that the building surrounding the electroplating processes should qualify as an enclosed storage area.

Commenter 0260/0616 remarked that the proposed storage requirement should be revised to clarify that it is limited to substances used in chromium electroplating and anodizing tanks, and should not apply to other substances such as surface coatings, solvents, sealers, adhesives, and greases. Otherwise the commenter noted, the requirement could lead to inappropriate enforcement actions. The same commenter also commented that the phrase "at all times" is too narrow as this requirement could not be met while transferring material to and from the container. The commenter provided the following revised text to the storage requirements specified in Item 1 of Table 2 to §63.342:

For	You must:	At this minimum frequency
1. Any substance <u>used in an affected chromium electroplating or anodizing tank</u> that contains hexavalent chromium.	(a) Store the substance in a closed container in an enclosed storage area <u>or building</u> ; AND	At all times <u>except when transferring the substance to and from the container.</u>
	(b) Use a closed container when transporting the substance from <u>or within</u> the enclosed storage area <u>or building.</u>	Whenever transporting substance, <u>except when transferring the substance to and from the container.</u>

Response: We agree with the commenters that buildings with secondary containment or other spill and release prevention measures would satisfy the proposed requirement and we have revised the requirement accordingly. We do not agree with Commenter 0260/0616 that the building surrounding the electroplating processes could serve as the enclosed storage area. The final housekeeping requirements continue to require storage of such materials except when transferring the substance to and from the container. We agree with the suggested changes by

Commenter 0260/0616 to clarify that the storage requirements would not apply when transferring substances containing hexavalent chromium. We also agree with the commenter concerning the clarification that the proposed storage requirements apply only to substances used in chromium electroplating or anodizing processes, and we have revised the requirements accordingly.

Comment: Commenters 0260/0616, 0277, and 0285/0296/0619 pointed out that the proposed requirement specified in Item No. 2 of Table 2 to §63.342, which would require minimizing spills from dragout by installing drip trays or collecting and returning dripped or spilled tank solution to the tank, are not practical at many facilities. The commenter stated that in many cases, drip trays cannot be installed due to the positioning of the electrical bus and V-blocks on the tank structure; drip trays also can interfere with the workers' ability to move racks into and out of tanks. Commenters 0277 and 0285/0296/0619 suggested that the final rule provide facilities the option of collecting dragout in pits and sumps surrounding tanks that contain hexavalent chromium, and then periodically pumping out the sump contents and processing it through the facility's wastewater treatment operation. Commenter 0260/0616 remarked that the proposed requirement is not necessary because facilities already have a substantial economic incentive to minimize dragout due to the cost of the tank chemicals. All three commenters noted that the option of collecting and returning dripped solution to the tank is not recommended in many situations due to the possibility of contamination. Commenter 0260/0616 suggested that a process engineer or operator be allowed to determine whether any dragout should be returned to the tank or handled as a waste to avoid contaminating the entire chromium electroplating or anodizing bath. Commenter 0277 added that the requirement to reuse the solution after it has been captured appears to be arbitrary and does not present any reduced likelihood of the creation of fugitive dust, as is the stated intention of the proposed housekeeping requirements. One commenter (0260/0616) provided the following revised text to the requirements specified in Item 2 of Table 2 to §63.342:

For	You must:	At this minimum frequency
2. Each affected tank, to minimize spills of bath solution that result from dragout. <u>Note: This measure does not require the return of contaminated bath solution to the tank. This requirement only applies “as the parts are removed from the tank.”</u> <u>Once away from the tank area, any spilled solution would be handled in accordance with housekeeping measure.</u>	(a) Install drip trays that collect and return to the tank any bath solution that drips or drains from parts as the parts are removed from the tank; OR	Prior to operating the tank.
	(b) Contain and return to the tank all solution that drains or drips from parts as the parts are removed from the tank.	Whenever removing parts from an affected tank.

Response: We agree with the commenters that the proposed requirement should allow for situations where drip trays are not practical and we have revised the proposed requirements to allow facilities to collect dragout using other methods, such as by using pits and sumps. We also

agree with the commenters that the proposed practice should not require returning dragout liquids to the electroplating or anodizing tank and have revised the requirement to allow other options. We also agree with the other clarifications suggested by Commenter 0260/0616 regarding when the requirement would apply and how spilled solution should be handled and we have incorporated the suggested changes into the final housekeeping practices.

Comment: Commenter 0260/0616 commented that the proposed requirement specified in Item No. 3 of Table 2 to §63.342, which would require installing splash guards to minimize overspray, should be revised to ensure that splash guards are only required when spraying parts to remove excess chromic acid. The commenter added that the requirement should also recognize that a splash guard may not be 100 percent effective and that it is not feasible to require “any...liquid” be returned to the tank. In addition, the commenter stated that the proposed requirement should be revised to ensure that it does not prevent a facility from performing spray operations over rinse tanks located near the electroplating or anodizing tanks. The commenter included the following recommended changes to this requirement:

For	You must:	At this minimum frequency
3. Each spraying operation for removing excess chromic acid from parts removed from <u>and occurring over an affected chromium electroplating or anodizing tank.</u> <u>Note: this measure does not require facilities to perform spraying operations but rather specifies a practice to follow during spraying operations.</u>	Install a splash guard to minimize overspray <u>during spraying operations</u> and to ensure that any hexavalent chromium laden liquid <u>captured by the splash guard</u> is returned to the <u>affected chromium electroplating or anodizing tank.</u>	Prior to any such spraying operation.

Response: We agree with the commenter and have revised the housekeeping practices related to spraying to clarify that it applies only to spraying operations over an affected tank and that the liquid captured by the splash guard must be returned to the affected tank.

Comment: Commenter 0260/0616 commented on the requirement specified in Item No. 4 of Table 2 to §63.342, which would require affected facilities to clean up or contain all spills of hexavalent chromium substances within 1 hour. The commenter stated that, to meet a similar requirement under California's ATCM for Chromium Plating and Chromic Acid Anodizing Facilities, a facility had to cover all surfaces with metallic silver barrier paper to ensure that all drips are contained and cleaned up within the specified time period. The commenter stated that the proposed requirement does not specify what amount constitutes a spill, which locations are covered by the requirement, and does not define the terms “cleaned up,” “contained,” and “spill.” According to the commenter, the proposed requirement could result in a violation if a facility spills a drop of deionized water, coffee, or soda. The commenter pointed out that facilities already have a substantial economic incentive to clean up spills and minimize fugitive emissions to prevent workers from being exposed to chromium laden dust caused by poor housekeeping. The commenter suggested that the proposed language be clarified to limit it to substances used in

chromium electroplating and anodizing tanks. The commenter also stated that drippings that fall into a basement, secondary containment, or other collection device should meet the obligation to contain spills, and these containment areas should not need to be cleaned within 1 hour. The commenter pointed out that it may not be safe to send employees into the subfloor areas to clean up spills while the chromium electroplating process tanks are in operation. The commenter noted that if EPA were to extend this measure to the subfloor areas, the time limit should be revised to require cleanup upon completion of the electroplating or anodizing operation, or at the end of the shift, whichever comes first. The commenter provided the following revised text to the requirements specified in Item 4 of Table 2 to §63.342:

For	You must:	At this minimum frequency
4. Each operation that involves the handling or use of any substance <u>used in an affected chromium electroplating or anodizing tank</u> that contains hexavalent chromium.	<u>Begin</u> clean up, or otherwise contain, all spills of the substance. <u>Note: substances that fall or flow into drip trays, pans, sumps or other containment areas are not considered spills.</u>	Within 1 hour of the spill.

Commenter 0285/0296/0619 suggested that the proposed requirement be revised to “Initiate clean up or containment of all spills of the substance within one hour of discovering the spill.” According to the commenter, this modest change can ensure that spills are promptly cleaned and contained without imposing an impractical burden on facilities.

Response: Based on the commenters' comments, we have revised the proposed housekeeping practice to clarify that it applies only to substances used in an affected chromium electroplating or anodizing tank; that it does not include material that is caught or collected by a drip pan, sump, or other containment or collection structure or device designed to collect electroplating tank liquid, and that the cleanup must be initiated within 1 hour of the spill.

Comment: Three commenters (0260/0616, 0277, and 0285/0296/0619) submitted comments on the proposed requirement specified in Item No. 5 of Table 2 to §63.342, which would require weekly cleaning of all surfaces on which hexavalent chromium dust could potentially accumulate. The commenters stated that, as proposed, the requirement could apply to any surface within the facility; they requested that the final rule clarify and limit the surfaces to which the requirement would apply. Commenter 0277 suggested the requirement be limited to surfaces that can be cleaned with reasonable effort and for which there is a reasonable expectation that the dust would be disturbed. The commenter stated that would exclude light fixtures, duct work, or any surfaces associated with a building's structural components. Commenter 0285/0296/0619 added that cleaning such remote and elevated surfaces would require specialized equipment (e.g., lifts, booms, etc.) and require significant compliance costs that have not been accounted for by EPA. Commenter 0260/0616 stated that surfaces inside of the tank, the rim, ventilation duct work, and ancillary equipment connected to the electroplating tank are not feasible to clean. Commenter 0285/0296/0619 requested that the requirement be limited to “all surfaces within the storage areas, open floor space, walkways around affected tanks, or readily accessible surfaces contaminated with hexavalent chromium dust.”

Commenters 0260/0616 and 0285/0296/0619 commented on the proposed cleaning methods for surfaces with accumulated hexavalent chromium dust. Commenter 0260/0616 stated that an additional method for cleaning potentially contaminated surfaces under 5.(a) should be a washdown of the surfaces with potable water. The commenter stated that many facilities are designed and constructed to collect, store, and/or treat washdown water potentially contaminated with hexavalent chromium. The commenter noted that washdown of potentially contaminated surfaces until no discoloration of the washdown water is visible should provide a level of fugitive dust control equal to wet mopping. Commenter 0285/0296/0619 stated that, while facilities should implement these cleaning methods effectively, this requirement should not be interpreted to include a strict performance standard such as no visible signs of any chromium. For example the commenter noted, it is not practical to remove all “chrome staining” in areas around the electroplating tanks (not to mention the fact that such stains do not pose any environmental or health concerns). The commenter requested that EPA clarify this provision so that compliance can be achieved through reasonable and practical good management practices.

Commenter 0260/0616 remarked that some facilities conduct chromium electroplating or anodizing on an infrequent basis, with the majority of their electroplating operations involving the electrodeposition of other metals, such as copper and nickel. The commenter stated that these “job shop” type facilities should not be subject to the weekly cleaning requirement for calendar weeks in which no chromium electroplating or anodizing operation have taken place at the affected source. Additionally the commenter stated that, it may be appropriate to provide an alternative requirement to perform the cleaning after a specified period of operation of one or more chromium electroplating or anodizing tanks. The commenter provided the following revised text to address all of his concerns with the proposed requirements specified in Item 5 of Table 2 to §63.342:

For	You must:	At this minimum frequency
5. All s Surfaces within the enclosed storage area, open floor area, walkways around affected tanks, or any surface potentially contaminated with hexavalent chromium from <u>materials used in an affected chromium electroplating or anodizing tank that accumulates or potentially accumulates dust.</u>	(a) Clean the surfaces using one or more of the following methods: (i) HEPA vacuuming; (ii) Hand-wiping with a damp cloth; (iii) Wet mopping; (iv) <u>Hose down or rinse with potable water into a wastewater collection system;</u> (v) Other cleaning method approved by the permitting agency; OR	At least once every 7 days <u>if one or more chromium plating or anodizing tanks were used, or at least after every 40 hours of operating time of one or more affected chromium plating or anodizing tanks, whichever interval is later.</u>
	(b) Apply a non-toxic chemical dust suppressant to the surfaces.	According to manufacturer’s recommendations.

Response: We agree with the clarifications suggested by Commenter 0260/0616 and believe those clarifications also address the concern of Commenter 0285/0296/0619 regarding weekly cleaning of surfaces. We have revised the proposed housekeeping requirement, as suggested by Commenter 0260/0616.

Comment: Two commenters (0277 and 0285/0296/0619) commented on the proposed requirement specified in Item No. 6 of Table 2 to §63.342, which would require installing a physical barrier to separate buffing, grinding, and polishing operations from chromium electroplating or anodizing operations. Both commenters stated that such barriers would obstruct workers' ability to move parts into and out of the buffing and polishing areas. Commenter 0277 added that the proposed requirement would present a safety hazard by impairing visibility, particularly when moving large parts or equipment through the polishing and buffing area. The commenter noted that, although the polishing and buffing operations at his facility are not surrounded on all sides by a barrier, there is no line of sight between those operations and the chromium electroplating and anodizing operations. The commenter believes that having no line of sight between these operations should be adequate for reducing the likelihood of contamination associated with these operations. Commenter 0285/0296/0619 requested that EPA clarify the definition of "physical barrier" in the context of this requirement with the following regulatory language: "separate the operation from any affected electroplating or anodizing operation by a reasonable distance or other measure from the buffing, grinding, or polishing operations, or by installing a physical barrier such as plastic strip curtains."

Response: We agree with the commenters' remarks regarding physical barriers, and we have revised the proposed housekeeping practice to require a physical barrier if the polishing or buffing operations are located in the same room as chromium electroplating or anodizing tanks.

16. Restriction on Use of PFOS to Meet the MACT

Comment: One commenter (0285/0296/0619) suggested that EPA eliminate or revise the provisions pertaining to the use of fume suppressants that contain perfluoro-octyl sulfonates (PFOS). The commenter explained that because PFOS is not listed under Section 112 of the CAA as a HAP, it would be more appropriate to regulate the production and use of PFOS under the Toxic Substances Control Act.

Response: The commenter is correct that PFOS-based fume suppressants are not listed as HAP under section 112(b); however, we did not propose to regulate PFOS as a section 112(b) HAP. Rather, as proposed, under Section 112(d)(6) of the CAA we are restricting the use of PFOS-based fume suppressants as a means for complying with the MACT rule requirements because of the adverse non-air quality health and environmental impacts. In the years since promulgation of the original rule, non-PFOS-based fume suppressants have emerged as a cost-effective alternative to PFOS-based fume suppressants. The available data, described previously and documented in the rulemaking docket, indicate that the current generation of non-PFOS fume suppressants is comparable to PFOS-based fume suppressants in terms of cost and performance. We consider these improvements to non-PFOS-based fume suppressants to be the type of development that can be considered under section 112(d)(6). In light of the adverse impacts associated with PFOS-based fume suppressants, and that non-PFOS fume suppressants are available and cost effective, we believe restricting their use as a means of complying with the

MACT is necessary pursuant to section 112(d)(6).

Comment: One commenter (0285/0296/0619) stated that if PFOS is regulated under the Clean Air Act, EPA should revise the proposed rule language to allow the continued use of unexpired PFOS-based fume suppressants that have already been purchased: To reduce the ultimate ecosystem loading of the PBT chemical, production and introduction into commerce must be restricted, rather than require that usable PFOS-based fume suppressants be managed as waste after some future arbitrary date. The commenter suggested the following changes:

63.342(c)(1) * * *

(iv) After [Insert date 3 years ~~from~~ after the date of publication of the final rule amendments in the Federal Register], the owner or operator of an affected open surface hard chromium electroplating tank shall not add PFOS-based fume suppressants purchased after [Insert date of publication of the final rule amendments in the Federal Register] to any affected open surface hard chromium electroplating tank.

* * * * *

(2) * * *

(vi) After [Insert date 3 years ~~from~~ after the date of publication of the final rule amendments in the Federal Register], the owner or operator of an affected enclosed hard chromium electroplating tank shall not add PFOS-based fume suppressants purchased after [Insert date of publication of the final rule amendments in the Federal Register] to any affected enclosed hard chromium electroplating tank.

* * * * *

(d) * * *

(3) After [Insert date 3 years ~~from~~ after the date of publication of the final rule amendments in the Federal Register], the owner or operator of an affected decorative chromium electroplating tank or an affected chromium anodizing tank shall not add PFOS-based fume suppressants purchased after [Insert date of publication of the final rule amendments in the Federal Register] to any affected decorative chromium electroplating tank or chromium anodizing tank.

(e) * * *

(2) After [Insert date 3 years ~~from~~ after the date of publication of the final rule amendments in the Federal Register], the owner or operator of an affected decorative chromium electroplating tank using a trivalent chromium bath shall not add PFOS-based fume suppressants purchased after [Insert date of publication of the final rule amendments in the Federal Register] to any affected decorative chromium electroplating tank.

Response: EPA believes the 3 year compliance period is more than enough time to use existing stocks of PFOS-based fume suppressants that a facility may have. We disagree with the revisions the commenter has suggested as it may encourage facilities to purchase extra new PFOS-based fume suppressant for immediate use and hold on to existing stocks of PFOS-based fume suppressant for use after the 3 year compliance period.

Comment: Several commenters (0272, 0285/0296/0619) supported EPA's proposal to eliminate PFOS-based wetting agents due to its persistence, bioaccumulation, and toxic

characteristics, and noting that the proposed phase-out of PFOS fume suppressants is a reasonable requirement that is protective of the environment and human health.

Response: We acknowledge the commenters' support.

17. Other Comments

Comment: Commenter 0290/0620 claimed surface tension limits appear to lead to stronger protection for workers inside a facility, by keeping emissions in the tanks, instead of having them escape into a building. The commenter believes EPA should evaluate the impacts on workers' health of using surface tension limits, in addition to emission concentration-based limits. The commenter believes if requiring WAFS, measured through surface tension, would better protect workers' health, this provides further reason to require surface tension limits in addition to emission limits.

Response: We agree with the commenter that the use of WAFS can provide additional worker protection as a co-benefit along with reducing emissions. However, the commenter appears to be suggesting that EPA's regulations address worker safety and health. Those issues are within the jurisdiction of OSHA, not EPA.

Comment: Commenter 0278/0617 noted that a new affected source would have the added expense of possibly using an add-on control device to meet the 0.006 mg/dscm limit, but a new affected source also has the option of using a fume suppressant containing a wetting agent. The commenter recommended that EPA define a minimum control technology requirement for new sources that would limit the need for stack testing.

Response: We do not believe it is appropriate to require a specific control technology in place of an emission limit. We believe it is important that sources ensure emissions are below specified levels and we cannot be assured that use of a specific control technology would achieve that. We further note control technologies are a "one-size-fits-all" approach and some new sources could incur higher costs by installing a mandated control technology than they would incur if they could choose a different method of compliance.

Comment: One commenter (0272) recommended amending Method 306B by incorporating the surface tension measurement procedure for stalagmometers specified by Appendix 8 of the California's ATCM for Chromium Plating and Chromic Acid Anodizing Facilities.

Response: Both the October 2010 proposal and the supplemental proposal were written to incorporate the procedure referenced by the commenter into the revisions to Method 306B as recommended by the commenter and we are finalizing those provisions as proposed.

Comment: Commenter 0609 suggested revising the definitions of existing affected sources and new affected source in §63.341(a). The commenter noted that rectifiers and ancillary equipment are integral to the process and should be included in the definitions.

Response: EPA did not propose changes to the definition of existing and new affected sources and does not agree with the commenter's suggested revisions.

Comment: Commenter 0285/0296/0619 recognized EPA's court-ordered deadline for the issuance of the final rule and EPA's consideration of additional information (provided it is submitted within a reasonable time period after the close of the comment period), but does not agree with EPA's denial of NASF's request for an extension of the comment period. The commenter believes additional time to review and evaluate the data in the record would have provided EPA with more effective feedback on the technical support for the proposed revisions. The commenter also stated they did not have enough time to review and evaluate all the data and analysis provided by EPA and that they will continue to work with EPA officials to identify issues with the data, analysis, and methodologies used.

Response: As explained in our response to the commenter's request, the deadline to conduct the additional analyses and finalize the amendments, as required by our Consent Decree deadline, prevented us from extending the comment period. However, we considered the information received after the March 26, 2012 comment period deadline, to the extent possible.

Comment: One commenter (0278/0617) recommended that EPA submit an inventory for the state to review prior to making any policy decisions regarding this source category.

Response: As described previously, we contacted 26 states and local agencies to request additional information on the industry. Those requests were sent to the states with the largest numbers of chromium electroplating plants, and we included in those requests an inventory of plants in each state. Therefore, for the majority of plants in the U.S. we did send an inventory to the respective state agency and specifically requested that they review the list. In addition, for both the October 2010 proposal and the supplemental proposal, we included a complete list of plants. For the October 2010 proposal, we specifically requested comments on the plant list. Thus, each state agency had the opportunity to review those lists and inventories.

Comment: More than 10,000 commenters submitted their comments through a mass comment campaign sponsored by Earth Justice, and an additional 63 citizens expressed general concern over emissions from the chromium electroplating industry. See Appendix A for the summary of citizen and mass comment campaign commenters. The commenters believe that evaluating health impacts on a healthy adult is insufficient and unrealistic and recommend that EPA evaluate health impacts on children, the elderly, and other vulnerable populations. The commenters stated that EPA must consider the cumulative impacts of exposure to toxic air pollution on the people with low-income and minority individuals that live in denser urban areas, where chromium electroplaters and other sources are overburdening them with toxic air pollution. The commenters support the removal of the malfunction exemption, but believe that the affirmative defense approach leaves a major loophole in the deterrent effect and value of the standard. The commenters recommended that EPA strengthen the final standard.

Response: The EPA acknowledges the general concerns of the commenters regarding the results of the RTR review and the proposed amendments to the Chromium Electroplating NESHAP, and responses to comments elsewhere in this document respond to those concerns.

III. Summary of Comments and Responses – Steel Pickling NESHAP

1. **Startup, Shutdown, and Malfunction**

Comment: Commenter 0286 stated that EPA is proposing to change longstanding provisions without any justification of its authority to make the changes and without apparent factual analysis of the statutory criteria for standard-setting. The commenter also asserts that EPA does not have the authority to impose more stringent requirements (by requiring that emission limits apply during times of SSM). The commenter stated:

“While EPA does not make the distinction clearly in the proposed rule, the proposed SSM provisions, unlike the remainder of the proposed rule, are changes to existing MACT standards that EPA promulgated previously pursuant to CAA section 112 (d)(2)-(3) for the six NESHAP categories. The Clean Air Act does not contemplate, however, EPA returning to previously issued MACT standards to improve them or bring them up-to-date...EPA did not invoke its section 112(d)(6) authority to support the proposed SSM provisions (see, e.g., 75 Fed. Reg. at 65,074 cols. 1-2), but even if it had, section 112 (d)(6) does not provide broad authority to reconsider aspects of previously issued MACT standards unrelated to “developments in practices, processes, and control technologies.” Thus, EPA cannot simply change its mind about what standards are required to comply with CAA section 112 (d)(2)-(3), nor can it recalculate a MACT floor based on subsequent performance. *Cf. NRDC v. EPA*, 529 F.3d 1077, __ (D.C. Cir. 2008) (rejecting contention that CAA section 112(f) requires EPA to “start from scratch” and develop new MACT standards).

Commenter 0286 further asserts that imposing more stringent requirements to existing NESHAPs based on the previous MACT floor would not only be inconsistent with the technology review and residual risk authority cited above, but “also with Congress’s desire for finality evident in the judicial review provisions of CAA section 307(b). Challenges to MACT standards needed to be raised within 60 days of their promulgation.” The commenter notes that regulated facilities have made capital investments and developed operating procedures to meet the existing MACT standards, and that “the CAA does not allow EPA simply to revisit the analysis and decisions involved in developing emission standards that meet the requirements of CAA section 112(d)(2)-(3)”.

Commenter 0295 stated that extending the MACT standards to periods of startup, shutdown, and malfunction violates the CAA because the original standards expressly excluded SSM and EPA’s database and analyses excluded periods of SSM, and EPA has not conducted a new 112 (d) analysis to support standards during periods of SSM. Commenter 0295 also stated that they oppose EPA’s repeal, without meaningful discussion, of the flexibility previously granted to vary from the manufacturer’s recommendations.

Response: In *Medical Waste Institute v. EPA*, 645 F. 3d 420, 425-27 (D.C. Cir. 2011), the D.C. Circuit held that EPA may permissibly amend improper MACT determinations, including amendments to improperly promulgated floor determinations, using its authority under

section 112 (d) (2) and (3). The absence of standards for these HAP is not proper. *National Lime*, 233 F. 3d at 633-34; see also *Medical Waste Incinerator*, 645 F. 3d at 426 (resetting MACT floor, based on post-compliance data, permissible when originally-established floor was improperly established, and permissibility of EPA's action does not turn on whether the prior standard was remanded or vacated).

Similarly, the D.C. Circuit's December 9, 2011 decision in *Portland Cement Ass'n v. EPA* (D.C. Cir. No. 10-1358) confirms that EPA is not constrained by section 112 (d)(6) and it may reassess its standards more often, including revising existing floors if need be. Slip op. p. 17. The commenters are thus incorrect that section 112 (d)(6) provides the exclusive authority to address standards that apply during SSM events.

Comment: Commenter 0295 stated that extending the MACT standards to periods of startup, shutdown, and malfunction violates the CAA because the original standards expressly excluded SSM and EPA's database and analyses excluded periods of SSM, and EPA has not conducted a new 112 (d) analysis to support standards during periods of SSM. Commenter 0295 also stated that they oppose EPA's repeal, without meaningful discussion, of the flexibility previously granted to vary from the manufacturer's recommendations.

Response: Under CAA section 112(d)(2), the EPA must promulgate technology-based standards that reflect the maximum degree of emission reductions of HAP achievable (after considering cost, energy requirements, and non-air quality health and environmental impacts). Nothing in the CAA or its legislative history suggests that EPA is prohibited from reviewing and revising MACT standards, except as part of the CAA section 112(d)(6) or CAA section 112(f) reviews. Where we identify emission points that were erroneously not previously regulated under a MACT rule, we may identify MACT floor and beyond-the-floor control options for existing and new sources. An agency generally remains free to revise improperly promulgated or otherwise unsupportable rules, even in the absence of a remand from a Court. *United Gas Improvement Co. v. Callery Props., Inc.*, 382 U.S. 223, 229 (1966) (“An agency, like a court, can undo what is wrongfully done by virtue of its order.”); *Macktal v. Chao*, 286 F.3d 822, 825–26 (5th Cir. 2002) (“[I]t is generally accepted that in the absence of a specific statutory limitation, an administrative agency has the inherent authority to reconsider its decisions.”). Agencies have particularly broad authority to revise their regulations to correct their errors. *Last Best Beef, LLC v. Dudas*, 506 F.3d 333, 340 (4th Cir. 2007); *Friends of the Boundary Water Wilderness v. Bosworth*, 437 F.3d 815, 823 (8th Cir. 2006) (“It is widely accepted that an agency may, on its own initiative, reconsider its interim or even final decisions, regardless of whether the applicable statute and agency regulations expressly provide for such review.”) (citations omitted). Moreover, an agency may reconsider its methodologies and application of its statutory requirements and may even completely reverse course, regardless of whether a court has determined that its original regulation is flawed, so long as the agency explains its bases for doing so. *Motor Vehicle Mfrs. Ass'n v. State Farm Mutual Auto Ins. Co.*, 463 U.S. 29, 42 (1983); *FCC v. Fox Television Stations, Inc.*, 129 S. Ct. 1800, 1810 (2009); *Nat'l Cable & Telecomms. Ass'n v. Brand X Internet Servs.*, 545 U.S. 967, 981–82 (2005) (internal citations omitted): (“An initial agency interpretation is not instantly carved in stone. On the contrary, the agency must consider varying interpretations and the wisdom of its policy on a continuing basis,”

Chevron, *supra* at 863–864, for example, in response to changed factual circumstances, or a change in administration. That is, no doubt, why in *Chevron* itself, this Court deferred to an agency interpretation that was a recent reversal of agency policy.’’)

Comment: Two commenters (0286 and 0295) argued that the EPA does not have continuous section 112-compliant standards. Commenters 0286 and 0295 stated that under CAA section 112(d)(2), MACT standards must be “achievable”; a limit that applies during SSM events has not been demonstrated to be achievable by the best-performing 12% of units in the source category. Commenter 0295 argued that *Sierra Club v. EPA* holds that “Congress has required that there must be continuous section 112-compliant standards.” *Sierra Club*, slip op. at 15, but that the EPA does not have continuous section 112-complaint standards.

Commenter 0295 asserts that the proposal to extend the existing standards to periods of startup and shutdown potentially invalidates the existing standards, as these periods should have been included in determining the “best performing” source for purposes of determining the MACT floor and then MACT. The commenter observes that the existing standards were not developed with consideration of SSM, and these standards are acceptable if they apply continuously, except during SSM. The commenter stated that extending the standards to cover startup and shutdown extends the existing standards without compliance with the applicable Clean Air Act section 112(d) requirements.

According to commenter 0295, under the rationale used in the *Sierra Club* decision, extending the Steel Pickling MACT standards to cover SSM periods constitutes a reopening of the Steel Pickling MACT standards. The commenter asserted that once reopening occurs, the existing standards are subject to invalidation for failing to meet the “continuous” requirement established by the court in *Sierra Club* as that standard applies to startup, shutdown and malfunction, which have never been addressed. Further, EPA has no reasonable prospect of saving these standards should it proceed because all of the emissions data available to EPA excludes SSM emissions, due to the requirements of 40 C.F.R. § 63.7(e)(1). The commenter recommends that the EPA withdraw this rule, gather the information necessary to establish SSM limits under Section 112(d) or (h), and then re-propose a rule aimed exclusively at addressing SSM periods.

As incorporated by reference, commenter 0295 adopted the comments in docket EPA-HQ-OAR-2009-0559-0091.1, and summarized in EPA-HQ-OAR-2009-0559-0171 as follows:

One commenter (91.1) recommended that EPA conduct stack testing during startup and shutdown events, but also acknowledged that emissions testing during startup and shutdown will not be an option in all cases. The commenter (91.1) stated that if the Proposed Regulations are adopted, EPA should be able to use continuous monitoring data to set alternative emission standards that apply during startup and shutdown, or conclude that sources with the identified control technology will be able to meet emission limitations established for normal operations during startup and shutdown periods, as well. The commenter (91.1) suggested that continuous monitoring data during some SSM events should be possible for the next review of emission standards, from those facilities that opt to use the continuous emission monitor option in the Proposed Rule, since the Proposed Rule would require such facilities to operate and report data

from continuous monitors even during SSM events other than during monitor malfunction or downtime. The commenter (91.1) also suggested that EPA could study facilities' operational logs to determine an averaging time for an emission standard sufficiently long that typical startups and shutdowns would not cause an exceedance of the standard. The commenter (91.1) further suggested that EPA might determine, based on infeasibility of collecting representative data during startup and shutdown events, that it is necessary and appropriate to promulgate a design, equipment, work practice, or operational standard, pursuant to CAA section 111(h) and/or section 302(k), in lieu of deriving limitations on the mass or concentration of pollutants emitted during startup or shutdown.

One commenter (91.1) recommended EPA revise the proposed standards to account better for SSM events, rather than rely on an affirmative defense to make up for its failure to do so.

Commenter 0295 finds that the EPA's definition of a malfunction does not match the definition of process interruptions that would be excluded during a stack testing program. The commenter stated that the EPA cannot exclude non-optimal periods in setting the standards if the standards will apply to those periods unless it exempts them from the standards, which it has refused to do for any interruption that does not qualify as a "malfunction." The commenter asks that the EPA address how its approach, which collects data only from "normal" operations exclusive of SSM or process interruption, can be reconciled with the requirements of Clean Air Act section 112(d) that the data be "achieved," demonstrated in practice, and from the best performing source(s).

Response: The United States Court of Appeals for the District of Columbia Circuit vacated portions of two provisions in the EPA's CAA section 112 regulations governing the emissions of HAP during periods of startup, shutdown, and malfunction (SSM). Sierra Club v. EPA, 551 F.3d 1019 (D.C. Cir. 2008), cert. denied, 130 S. Ct. 1735 (2010). Specifically, the Court vacated the SSM exemption contained in 40 CFR 63.6(f)(1) and 40 CFR 63.6(h)(1), that was part of a regulation, commonly referred to as the "General Provisions Rule," that the EPA promulgated under CAA section 112. When incorporated into CAA section 112(d) regulations for specific source categories, these two provisions exempted sources from the requirement to comply with the otherwise applicable CAA section 112(d) emission standard during periods of SSM.

We have eliminated the SSM exemption for Steel Pickling facilities in this rule. Consistent with Sierra Club v. EPA, the EPA has established standards in this rule for all periods of operation. We have also revised Table 1 to subpart CCC (the General Provisions table) in several respects. For example, we have eliminated the incorporation of the General Provisions' requirement that the source develop an SSM plan. We have also eliminated or revised certain recordkeeping and reporting that related to the SSM exemption. The EPA has attempted to ensure that we have not included in the regulatory language any provisions that are inappropriate, unnecessary, or redundant in the absence of the SSM exemption.

In establishing the standards in this rule, the EPA has taken into account startup and shutdown periods and we are not promulgating separate emission standards for periods of startup

and shutdown for the Steel Pickling source categories in this rule because we believe compliance with the standards is achievable during these periods.

Information on periods of startup and shutdown in the industry indicate that emissions during these periods do not increase. Furthermore, all processes are controlled and these controls would not typically be affected by startup or shutdown. Therefore, the EPA is not adopting separate standards for periods of startup and shutdown.

Periods of startup, normal operations, and shutdown are all predictable and routine aspects of a source's operations. However, by contrast, malfunction is defined as a "sudden, infrequent, and not reasonably preventable failure of air pollution control and monitoring equipment, process equipment or a process to operate in a normal or usual manner..." (40 CFR 63.2). The EPA has determined that CAA section 112 does not require that emissions that occur during periods of malfunction be factored into development of CAA section 112 standards. Under section 112, emissions standards for new sources must be no less stringent than the level "achieved" by the best controlled similar source and for existing sources generally must be no less stringent than the average emission limitation "achieved" by the best performing 12 percent of sources in the category. There is nothing in section 112 that directs the agency to consider malfunctions in determining the level "achieved" by the best performing or best controlled sources when setting emission standards. Moreover, while the EPA accounts for variability in setting emissions standards consistent with the section 112 case law, nothing in that case law requires the agency to consider malfunctions as part of that analysis. Section 112 uses the concept of "best controlled" and "best performing" unit in defining the level of stringency that section 112 performance standards must meet. Applying the concept of "best controlled" or "best performing" to a unit that is malfunctioning presents significant difficulties, as malfunctions are sudden and unexpected events.

Further, accounting for malfunctions would be difficult, if not impossible, given the myriad different types of malfunctions that can occur across all sources in the category and given the difficulties associated with predicting or accounting for the frequency, degree, and duration of various malfunctions that might occur. As such, the performance of units that are malfunctioning is not "reasonably" foreseeable. See, e.g., Sierra Club v EPA, 167 F. 3d 658, 662 (D.C.Cir. 1999) (EPA typically has wide latitude in determining the extent of data-gathering necessary to solve a problem.) We generally defer to an agency's decision to proceed on the basis of imperfect scientific information, rather than to "invest the resources to conduct the perfect study". See also, Weyerhaeuser v Costle, 590 F.2d 1011, 1058 (D.C. Cir. 1978) ("In the nature of things, no general limit, individual permit, or even any upset provision can anticipate all upset situations. After a certain point, the transgression of regulatory limits caused by 'uncontrollable acts of third parties,' such as strikes, sabotage, operator intoxication or insanity, and a variety of other eventualities, must be a matter for the administrative exercise of case-by-case enforcement discretion, not for specification in advance by regulation."). In addition, the goal of a best controlled or best performing source is to operate in such a way as to avoid malfunctions of the source and accounting for malfunctions could lead to standards that are significantly less stringent than levels that are achieved by a well-performing non-malfunctioning source. The EPA's approach to malfunctions is consistent with CAA section 112 and is a reasonable interpretation of the statute. In a separate response to comment, we respond to comments that

emissions during malfunctions should be accounted for in assessing risk pursuant to CAA section 112 (f)(2).

In the event that a source fails to comply with the applicable CAA section 112(d) standards as a result of a malfunction event, the EPA would determine an appropriate response based on, among other things, the good faith efforts of the source to minimize emissions during malfunction periods, including preventative and corrective actions, as well as root cause analyses to ascertain and rectify excess emissions. The EPA would also consider whether the source's failure to comply with the CAA section 112(d) standard was, in fact, "sudden, infrequent, not reasonably preventable" and was not instead "caused in part by poor maintenance or careless operation." 40 CFR 63.2 (definition of malfunction).

Finally, the EPA recognizes that even equipment that is properly designed and maintained can sometimes fail and that such failure can sometimes cause an exceedance of the relevant emission standard. (See, e.g., State Implementation Plans: Policy Regarding Excessive Emissions During Malfunctions, Startup, and Shutdown (September 20, 1999); Policy on Excess Emissions During Startup, Shutdown, Maintenance, and Malfunctions (February 15, 1983).) The EPA is therefore adding to the final rule an affirmative defense to civil penalties for exceedances of emission limits that are caused by malfunctions. See 40 CFR 63.542 (defining "affirmative defense" to mean, in the context of an enforcement proceeding, a response or defense put forward by a defendant, regarding which the defendant has the burden of proof, and the merits of which are independently and objectively evaluated in a judicial or administrative proceeding). We also have added other regulatory provisions to specify the elements that are necessary to establish this affirmative defense; the source must prove by a preponderance of the evidence that it has met all of the elements set forth in 63.552 (see 40 CFR 22.24). The criteria ensure that the affirmative defense is available only where the event that causes an exceedance of the emission limit meets the narrow definition of malfunction in 40 CFR 63.2 (sudden, infrequent, not reasonable preventable and not caused by poor maintenance and or careless operation). For example, to successfully assert the affirmative defense, the source must prove by a preponderance of the evidence that excess emissions "[w]ere caused by a sudden, infrequent, and unavoidable failure of air pollution control and monitoring equipment, process equipment, or a process to operate in a normal or usual manner...." The criteria also are designed to ensure that steps are taken to correct the malfunction, to minimize emissions in accordance with 40 CFR 63.552 and to prevent future malfunctions. For example, the source must prove by a preponderance of the evidence that "[r]epairs were made as expeditiously as possible when the applicable emission limitations were being exceeded..." and that "[a]ll possible steps were taken to minimize the impact of the excess emissions on ambient air quality, the environment and human health...." In any judicial or administrative proceeding, the Administrator may challenge the assertion of the affirmative defense and, if the respondent has not met its burden of proving all of the requirements in the affirmative defense, appropriate penalties may be assessed in accordance with CAA section 113 (see also 40 CFR 22.27).

The EPA is including an affirmative defense in the final rule in an attempt to balance a tension, inherent in many types of air regulations, to ensure adequate compliance while simultaneously recognizing that despite the most diligent of efforts, emission limits may be exceeded under circumstances beyond the control of the source. The EPA must establish

emission standards that “limit the quantity, rate, or concentration of emissions of air pollutants on a continuous basis” 42 U.S.C. §7602(k)(defining “emission limitation and emission standard”). See generally Sierra Club v. EPA, 551 F.3d 1019, 1021 (D.C. Cir. 2008). Thus, the EPA is required to ensure that section 112 emissions limitations are continuous. The affirmative defense for malfunction events meets this requirement by ensuring that even where there is a malfunction, the emission limitation is still enforceable through injunctive relief. While “continuous” limitations, on the one hand, are required, there is also case law indicating that in many situations it is appropriate for the EPA to account for the practical realities of technology. For example, in Essex Chemical v. Ruckelshaus, 486 F.2d 427, 433 (D.C. Cir. 1973), the D.C. Circuit acknowledged that in setting standards under CAA section 111 “variant provisions” such as provisions allowing for upsets during startup, shutdown and equipment malfunction “appear necessary to preserve the reasonableness of the standards as a whole and that the record does not support the ‘never to be exceeded’ standard currently in force.” See also, Portland Cement Association v. Ruckelshaus, 486 F.2d 375 (D.C.Cir. 1973). Though intervening case law such as Sierra Club v. EPA and the CAA 1977 amendments undermine the relevance of these cases today, they support the EPA’s view that a system that incorporates some level of flexibility is reasonable. The affirmative defense simply provides for a defense to civil penalties for excess emissions that are proven to be beyond the control of the source. By incorporating an affirmative defense, the EPA has formalized its approach to upset events. In a Clean Water Act setting, the Ninth Circuit required this type of formalized approach when regulating “upsets beyond the control of the permit holder.” Marathon Oil Co. v. EPA, 564 F.2d 1253, 1272-73 (9th Cir. 1977). But see Weyerhaeuser Co. v. Costle, 590 F.2d 1011, 1057-58 (D.C. Cir. 1978) (holding that an informal approach is adequate). The affirmative defense provisions give the EPA the flexibility to both ensure that its emission limitations are “continuous” as required by 42 U.S.C. §7602(k) and account for unplanned upsets and thus support the reasonableness of the standard as a whole.

Comment: Commenter 0286 stated that the proposed rule takes an unreasonable approach concerning the obligations of the source during periods of SSM. The commenter noted,

“For example, the existing MACT standards in part 63 subpart U contain numerous provisions that are different from what EPA proposes to replace them with. The statement that ‘the owner or operator shall implement, to the extent reasonably available, measures to prevent or minimize excess emissions to the extent practical’ would be eliminated, and in its place would be a condition for the affirmative defense that the ‘frequency, amount, and duration of the excess emissions (including any bypass) were minimized to the maximum extent practicable during periods of such emissions.’ Compare 40 C.F.R. §63.480(j)(4) with proposed section 63.480(j)(4)(i)(C). A provision prohibiting a source from shutting down control equipment under certain circumstances (proposed section 63.480(j)(3)) would no longer be qualified, as it is in the current rule, that this prohibition does not apply if the compliance equipment is shut down ‘to avoid damage due to a contemporaneous start-up, shutdown, or malfunction of the affected source or portion thereof’ or to avoid damage to monitoring equipment. See 40 C.F.R. § 63.480(j)(3). It is not clear whether EPA means by these changes to say, for example, that control equipment must not be shut down even when continued operation will damage it, or whether the

differences are unintended.”

Commenter 0286 argued that EPA must demonstrate how the revised standards reflect the performance actually achieved by the best-performing sources, or meet the criteria for beyond-the-floor standards. Commenter 286 also notes that EPA has several options for setting MACT standards for SSM periods, including establishing work practice standards under CAA section 112(h).

Response: With respect to the commenter’s suggestion to establish work practice standards for malfunctions, EPA’s approach to malfunctions is the same irrespective of the form of the standard at issue. See response provided above regarding malfunctions.

The EPA recognizes that even equipment that is properly designed and maintained can fail and that such failure can cause a violation of the relevant emission standard. The EPA is including an affirmative defense in the final rule as we have in other recent section 111, section 112, and section 129 rules so as to balance the tension, inherent in many types of air regulation, to ensure adequate compliance while simultaneously recognizing that despite the most diligent of efforts, emission limits may be exceeded under circumstances beyond the control of the source. The EPA must establish emission standards that “limit the quantity, rate, or concentration of emissions of air pollutants on a continuous basis.” 42 U.S.C. § 7602(k) (defining “emission limitation and emission standard”). See generally *Sierra Club v. EPA*, 551 F.3d 1019, 1021 (D.C. Cir. 2008) (emissions limitations under both must continuously apply and meet minimum stringency requirements, even during periods of startup, shutdown and malfunction). Thus, the EPA is required to ensure that emissions limitations are continuous. The affirmative defense for malfunction events meets this requirement by ensuring that even where there is a malfunction, the emission limitation is still enforceable through injunctive relief.

While “continuous” limitations, on the one hand, are required, there is also case law indicating that in some situations it is appropriate for the EPA to account for the practical realities of technology. For example, in *Essex Chemical v. Ruckelshaus*, 486 F.2d 427, 433 (D.C. Cir. 1973), the D.C. Circuit acknowledged that in setting standards under CAA section 111 “variant provisions” such as provisions allowing for upsets during startup, shutdown and equipment malfunction “appear necessary to preserve the reasonableness of the standards as a whole and that the record does not support the ‘never to be exceeded’ standard currently in force.” See also, *Portland Cement Association v. Ruckelshaus*, 486 F.2d 375 (D.C.Cir. 1973). Though intervening case law such as *Sierra Club v. EPA* and the CAA 1977 amendments calls into question the relevance of these cases today, they support the EPA’s view that a system that incorporates some level of flexibility is reasonable. The affirmative defense simply provides for a defense to civil penalties for excess emissions that are proven to be beyond the control of the source. By incorporating an affirmative defense, the EPA has formalized its approach to upset events. In a Clean Water Act setting, the Ninth Circuit required this type of formalized approach when regulating “upsets beyond the control of the permit holder.” *Marathon Oil Co. v. EPA*, 564 F.2d 1253, 1272-73 (9th Cir. 1977). But see, *Weyerhaeuser Co. v. Costle*, 590 F.2d 1011, 1057-58 (D.C. Cir. 1978) (holding that an informal approach is adequate). The affirmative defense provisions give the EPA the flexibility to both ensure that its emission limitations are

“continuous” as required by 42 U.S.C. § 7602(k), and account for unplanned upsets and thus support the reasonableness of the standard as a whole.

Moreover, even if malfunctions were considered a distinct operating mode, we believe it would be impracticable to take malfunctions into account in setting CAA section 112 standards. As noted above, by definition, malfunctions are sudden and unexpected events, and it would be difficult to set a standard that takes into account the myriad different types of malfunctions that can occur across all sources in the category. Moreover, malfunctions can vary in frequency, degree, and duration, further complicating standard setting.

Comment: Commenters 0295 and 0286 assert that the EPA does not discuss startup and shutdown and whether the standards are achieved in practice, as required by Clean Air Act section 112(d)(2) (for floor), or are “achievable,” as required by section 112(d)(1) (for above the floor determinations).

Commenter 0295 disagrees with the EPA’s assertion that, “any emissions that occur during malfunctions do not need to be factored into the development of CAA section 112(d) standards, which, once promulgated, apply at all times.” 75 Fed. Reg. at 65074.

The commenter notes that the EPA has a statutory requirement to consider “the emission control that is achieved in practice by the best controlled similar source.” The commenter argues that the EPA’s interpretation of “best performing” leads to the absurd result that a source with a very high level of control that functions only a small percent of the time, and fails to function well the rest of the time, establishes the level of control. The commenter states that this turns the concept of “demonstrated in practice” and “achieved” or “achievable” on its head. As incorporated by reference, commenter 0295 adopted the comments in docket EPA-HQ-OAR-2009-0559-0091.1, and summarized in EPA-HQ-OAR-2009-0559-0171 as follows:

One commenter (91.1) argued, by virtue of the variability analysis itself, the Proposed Standards are representative of emissions achieved during normal (very stable) operations and are not representative of emissions during SSM events (which can be highly variable). The commenter (91.1) stated that the variability EPA used in setting the Proposed Standard reflects at most only the normal variation in emissions experienced during normal operations because the analysis was performed on emissions data from performance tests, when the source is being operated at normal levels and when efforts are being made to maintain steady-state conditions. The commenter (91.1) purported that since performance test data are not collected during SSM events, the variability factors EPA derived to establish the Proposed Standards could not possibly incorporate emissions variability experienced during SSM events. Commenter (91.1) stated that for these same reasons, EPA’s attempt to consider variability in setting emission standards does not eliminate the need for different standards that apply during malfunctions.

Response: We acknowledge the commenters for their suggestion on further data gathering. We know of no facilities in this source category that currently conduct continuous emissions monitoring. For the reasons explained above, EPA is not promulgating a separate emission standard for the source category that applies during periods of startup and shutdown. With regard to malfunctions, see response provided above.

In today's rule, the EPA is finalizing the proposed affirmative defense language for exceedances of the numerical emission limits that are caused by malfunctions. As explained at proposal, the EPA recognizes that even equipment that is properly designed and maintained can fail and that such failure can cause an exceedance of the relevant emission standard. The EPA is including an affirmative defense in the final rule as we have in other recent section 112 and section 129 rules so as to balance the tension, inherent in many types of air regulation, to ensure adequate compliance while simultaneously recognizing that despite the most diligent of efforts, emission limits may be exceeded under circumstances beyond the control of the source. The EPA must establish emission standards that "limit the quantity, rate, or concentration of emissions of air pollutants on a continuous basis." 42 U.S.C. § 7602(k)(defining "emission limitation and emission standard"). See generally *Sierra Club v. EPA*, 551 F.3d 1019, 1021 (D.C. Cir. 2008) (emissions limitations under CAA section 112 must both continuously apply and meet section 112's minimum stringency requirements, even during periods of startup, shutdown and malfunction). Thus, the EPA is required to ensure that section 112 emissions limitations are continuous. The affirmative defense for malfunction events meets this requirement by ensuring that even where there is a malfunction, the emission limitation is still enforceable through injunctive relief. While "continuous" limitations, on the one hand, are required, there is also case law indicating that in some situations it is appropriate for the EPA to account for the practical realities of technology. For example, in *Essex Chemical v. Ruckelshaus*, 486 F.2d 427, 433 (D.C. Cir. 1973), the D.C. Circuit acknowledged that in setting standards under CAA section 111 "variant provisions" such as provisions allowing for upsets during startup, shutdown and equipment malfunction "appear necessary to preserve the reasonableness of the standards as a whole and that the record does not support the 'never to be exceeded' standard currently in force." See also, *Portland Cement Association v. Ruckelshaus*, 486 F.2d 375 (D.C. Cir. 1973). Though intervening case law such as *Sierra Club v. EPA* and the CAA 1977 amendments calls into question the relevance of these cases today, they support the EPA's view that a system that incorporates some level of flexibility is reasonable. The affirmative defense simply provides for a defense to civil penalties for excess emissions that are proven to be beyond the control of the source. By incorporating an affirmative defense, the EPA has formalized its approach to upset events. In a Clean Water Act setting, the Ninth Circuit required this type of formalized approach when regulating "upsets beyond the control of the permit holder." *Marathon Oil Co. v. EPA*, 564 F.2d 1253, 1272-73 (9th Cir. 1977). See also, *Mont. Sulphur & Chem. Co. v. United States EPA*, 2012 U.S. App. LEXIS 1056 (Jan 19, 2012)(rejecting industry argument that reliance on the affirmative defense was not adequate). But see, *Weyerhaeuser Co. v. Costle*, 590 F.2d 1011, 1057-58 (D.C. Cir. 1978) (holding that an informal approach is adequate). The affirmative defense provisions give the EPA the flexibility to both ensure that its emission limitations are "continuous" as required by 42 U.S.C. §7602(k), and account for unplanned upsets and thus support the reasonableness of the standard as a whole.

As also explained at proposal, EPA has determined that CAA section 112 does not require that emissions that occur during periods of malfunction be factored into development of CAA section 112 standards. As the EPA further explained, accounting for malfunctions would be difficult, if not impossible, given the myriad different types of malfunctions that can occur across all sources in the category and given the difficulties associated with predicting or accounting for the frequency, degree, and duration of various malfunctions that might occur. The

EPA's rationale for its approach to malfunctions is not based on the criteria that must be met to justify a work practice standard under CAA section 112(h). Section 112 (h) (2) provides that such a finding must be based on a determination that "a hazardous air pollutant or pollutants cannot be emitted through a conveyance designed and constructed to emit or capture such pollutant, or that any requirement for, or use of, such a conveyance would be inconsistent with any Federal, State or local law" or "the application of measurement methodology to a particular class of sources is not practicable due to technological and economic limitations." Thus, section 112(h) "allows EPA to substitute work practice standards for emission floors only if measuring emission levels is technologically or economically infeasible." *Sierra Club v. EPA*, 479 F. 2d 875, 880 (D.C. Cir. 2007). Further, setting work practice standards under section 112 presents the same issues as setting numerical emission limits given the varied nature of malfunctions. In any event, the commenter has not provided support for its assertion that it would not be technically feasible to accurately measure emissions and impracticable to enforce numeric emissions limits during malfunction and breakdown. Sources in this category can and do operate multiple measurement systems that measure different parameters at different points in their production processes and on affected sources and control equipment. While direct measurement of some factors may or may not take place during certain malfunctions, the EPA is not persuaded that sources could be left with no means whatsoever to determine whether they stayed in compliance during a malfunction. Sources may use other available means (including engineering judgment) or information to demonstrate that the source complied with the standard.

Comment: As incorporated by reference, commenter 0295 adopted the comments in docket EPA-HQ-OAR-2009-0559-0091.1, and summarized in EPA-HQ-OAR-2009-0559-0171 as follows. Commenter 0286 also presented these views.

One commenter (91.1) argued that EPA provides no explanation of how it determined that malfunctions are not a distinct operating mode; and EPA offers no explanation of how it determined that, even though it believes malfunctions are not a distinct operating mode, emissions during malfunctions should not be used to characterize the source's operating mode. The commenter (91.1) agreed with EPA's conclusion that the factual complexity of differing processes and of the severity, frequency, and duration of malfunctions makes standard-setting difficult. The commenter (91.1) stated that it is often impossible to gather emission data during malfunctions (either for standard-setting or for compliance demonstration purposes). The commenter (91.1) stated that malfunctions are by definition unexpected, so it is not possible to plan to have test equipment in place to measure emissions when one occurs; and even if test or monitoring equipment is in place, emissions during malfunctions often are not routed to a stack where they can be measured, and upsets during stack testing invalidate the test results under EPA's approved test methods.

One commenter (91.1) asserted that EPA is going beyond the MACT floor without making the demonstrations that the statute and case law require EPA to make in order to impose beyond-the-floor MACT standards. The commenter (91.1) stated that this is especially obvious when one considers the multitude of conditions EPA proposes to impose on sources during malfunctions, in order to be excused from civil penalties: EPA makes no attempt to justify those conditions as reasonable, taking into consideration the cost of achieving such emission reduction,

and any non-air quality health and environmental impacts and energy requirements (referenced CAA section 129(a)(2)).

Response: EPA is not setting a beyond-the-floor standard. For the reasons described in the above responses, EPA's approach to malfunctions is consistent with section 112 and is a reasonable interpretation of the statute. Even if malfunctions were considered a distinct operating mode, we believe it would be impracticable to take malfunctions into account in setting CAA section 112 standards. As noted above, by definition, malfunctions are sudden and unexpected events, and it would be difficult to set a standard that takes into account the myriad different types of malfunctions that can occur across all sources in the category. Moreover, malfunctions can vary in frequency, degree, and duration, further complicating standard setting. In light of the Sierra Club decision, EPA proposed to require that sources be in continuous compliance with emissions limits at all times, even during SSM and are finalizing in this action.

Comment: As incorporated by reference, commenter 0295 adopted the comments in docket EPA-HQ-OAR-2009-0559-0091.1, and summarized in EPA-HQ-OAR-2009-0559-0171 as follows. Commenter 0286 provided these arguments as well.

One commenter (91.1) provided examples where courts have recognized that a technology based standard discards its fundamental premise when it ignores the limits inherent in technology (NRDC v. EPA, 859 F.2d 156, 208 (D.C. Cir. 1988)). The commenter (91.1) stated that the D.C. Circuit recognized, in Portland Cement Ass'n v. Ruckelshaus, 486 F.2d 375, 398 (D.C. Cir. 1973), a decision reviewing standards under CAA section 111, that startup and upset conditions due to plant or emission device malfunction, is an inescapable aspect of industrial life and that allowance must be made for such factors in the standards that are promulgated (Id. at 399). Similarly, the commenter (91.1) mentioned Essex Chem. Corp. v. Ruckelshaus, 486 F.2d 427, 432 (D.C. Cir. 1973), cert. denied, 416 U.S. 969 (1974), another section 111 case, the court held that SSM provisions are necessary to preserve the reasonableness of the standards as a whole (Id. at 433). The commenter (91.1) also mentioned National Lime Ass'n v. EPA, 627 F.2d 416 (D.C. Cir. 1980), another case reviewing emission standards promulgated under CAA section 111, the court held CAA technology-based standards must be capable of being met under most adverse circumstances which can reasonably be expected to recur, such as during periods of SSM (627 F.2d at 431 n.46).

Commenter 0286 made similar comments and also provided additional examples. The commenter cited the Clean Water Act requirements that EPA establish technology-based effluent limitations based on the best available control technology. The commenter stated that knowing that there would be periods where a discharger, even with "exemplary use of" the identified best technology, would exceed the effluent limitations because of conditions "beyond the control of the permit holder," EPA violated the Clean Water Act by failing to provide an "upset provision" to address those periods. *Marathon Oil Co. v. EPA*, 564 F.2d 1253, 1273-74 (9th Cir. 1977). Commenter 2086 also cites e.g., *NRDC v. EPA*, 859 F.2d at 207 (distinguishing between technology-based effluent limitations, where some provision for "upsets" is required, and water-quality-based effluent limitations, which are tied to achieving water quality standards rather than based on available technology, and therefore need not include an upset provision).

Response: There is nothing in the plain language of the statute or in case law addressing section 112 that directs the Agency to consider malfunctions in determining the level achieved by the best performing sources for purposes of setting standards under section 112. As explained in the preamble and elsewhere in this response to comment document, EPA's approach to malfunctions is a reasonable interpretation of the requirements of section 112. The relevance of *Portland Cement and Essex Chem Corp.* is questionable in light of subsequent case law and the 1977 amendments to the Clean Air Act's definition of emission standard requiring that such standards be continuous. Further, the NRDC case interprets provisions of the Clean Water Act that are different in nature than provisions governing standards under section 112 of the Clean Air Act.

In any event, even if those cases are relevant, EPA's overall approach to malfunction events in this rule, including the promulgation of an affirmative defense, is consistent with the approach set forth in EPA's 1972 proposed rules cited favorably in *Portland Cement and Essex Chemical* in that both EPA's approach today and in 1972 impart a construction of "reasonableness" to the standards as a whole and adopts a more flexible system of regulation than can be had by a system devoid of "give." (*Portland Cement* at 399). *Portland Cement and Essex* criticized EPA regulations that contained no specific provisions to address malfunctions and EPA's assertion that malfunctions would be dealt with by the informal exercise of discretion in the Agency's enforcement activities. Those decisions did not require exemptions or less stringent standards for malfunction events as the commenter suggests. EPA's approach to malfunctions goes further than reliance on the informal exercise of enforcement discretion in that it includes regulatory provisions establishing an affirmative defense to civil penalties for exceedances of emission limits that are caused by malfunctions.

As noted above, the *NRDC v EPA*, 859 F. 2d 156, 207(D.C. Cir. 1988) case cited by the commenter is not on point and the discussion of technology-based standards is dicta. Nevertheless, EPA's approach to malfunctions is consistent with the NRDC decision. The NRDC decision does not require exemptions or less stringent standards for malfunctions either. Further, the regulatory affirmative defense included in today's final rule is consistent with the case cited in the NRDC decision; *Marathon Oil Co. v. EPA*, 564 F.2d 1253, 1272 (9th Cir. 1977). The court in *Marathon Oil* held that EPA must formalize its approach to upsets under the Clean Water Act. The affirmative defense does so. But see, *Weyerhaeuser v Costle*, 590 F.2d 1011, 1057-58 (D.C. Cir. 1978) (holding that an informal approach is adequate).

At proposal we explained that the D.C. Court had recently vacated the SSM exemption contained in 40 C.F.R. § 63.6(f)(1) and § 63.6(h)(1) that are part of the section 112 regulations commonly referred to as the General Provisions (GP) rule. *Sierra Club v. EPA*, 551 F.3d 1019 (D.C. Cir. 2008) cert. denied, 130 S. Ct 1735 (2010). We further explained that when incorporated into section 112(d) regulations for specific source categories, these two provisions exempt sources from the requirement to comply with otherwise applicable MACT standards during periods of SSM. We also explained that because the Steel Pickling NESHAP relied on the GP rule for SSM provisions (40 C.F.R. §§ 63.1194 and 63.1386(c), respectively) we were proposing to set standards that applied during SS periods for these source categories. (76 Fed. Reg. at 72775). EPA does not claim that the *Sierra Club* case constrains its authority to prescribe

unique standards for SSM periods. Rather EPA's view is that this decision calls into question the legality of source category-specific SSM exemptions in rules promulgated pursuant to section 112.

One commenter asserted that in *National Lime Ass'n v. EPA*, 627 F.2d 416 (D.C. Cir. 1980), (the commenter asserted that) the court held that "CAA technology-based standards must be capable of being met under most adverse circumstances which can reasonably be expected to recur, such as during periods of SSM (627 F.2d at 431 n.46)." The EPA disagrees that periods of SSM were referenced in that context, noting that the commenter added the phrase "such as during periods of SSM" where the phrase was not present in the opinion. Further, the EPA disagrees that such periods were contemplated by the court in that context.

Taken in the appropriate context, the language cited by the commenter supports the EPA's view that MACT standards adopted with an appropriate level of leeway for variation in normal operations is sufficient to meet the requirement of the CAA that standards be "... based on the emission levels achieved through the application of MACT floor technologies and account for variation in the process and in the air pollution control device effectiveness." 64 Fed. Reg. 31,916 (June 14, 1999) (quoting *Sierra*, [167 F.3d at 665](#)),

Comment: As incorporated by reference, commenter 0295 adopted the comments in docket EPA-HQ-OAR-2009-0559-0091.1, and summarized in EPA-HQ-OAR-2009-0559-0171 as follows:

Commenter 0091 questions the EPA's legal authority in the CAA to shift the burden to the regulated community of proving (or disproving) essential elements of an alleged violation. The commenter believes that the statute is silent as to the issue and "the ordinary default rule [is] that plaintiffs bear the risk of failing to prove their claims." *Shaeffer v. Weast*, 546 U.S. 49 (2005), quoting *McCormick on Evidence* §337, at 412. ("The burdens of pleading and proof with regard to most facts have and should be assigned to the plaintiff who generally seeks to change the present state of affairs and who therefore naturally should be expected to bear the risk of failure or proof or persuasion"); C. Mueller & L. Kirkpatrick, *Evidence* § 3.1, p. 104 (3d ed. 2003) ("Perhaps the broadest and most accepted idea is that the person who seeks court action should justify the request, which means that the plaintiffs bear the burdens on the elements in their claims").

The commenter notes that while the Supreme Court has recognized exceptions such as affirmative defenses, the commenter asserts that courts retain the authority to establish such rules unless Congress acts to delegate that authority. In this instance, according to the commenter, the EPA has not provided any statutory authority, nor any real justification, for requiring a source to prove its innocence; moreover, to fully demonstrate its innocence within 30 days of the event, without even being charged. The commenter stated that if the EPA adopts an approach along the lines of the proposed affirmative defense, it should be stated instead in terms that, once a source has claimed that its excess emissions were related to a malfunction, it will not be considered to be in violation of the standards unless the enforcement authority demonstrates that the source is not entitled to claim the malfunction.

Commenter 0286 also provided these comments, and noted that the preamble to the proposed rule does not give any explanation for why the affirmative defense would not apply to injunctive relief

Commenter 0286 believes that the proposed changes inappropriately shift the burden to the source to disprove alleged violations during malfunctions, and the limitations and requirements in the proposed rule are unreasonable and impracticable.

Response: The EPA disagrees with comments that criticize the affirmative defense for shifting the burden of proof. The affirmative defense does not require a facility to prove its innocence rather than requiring an enforcement authority to prove a violation of the CAA or change the burden of proof with respect to establishing a violation. The affirmative defense applies to penalties and thus is only utilized where a violation has been established. The burden of proof remains with the plaintiff in an enforcement action. See, e.g., 40 C.F.R. 22.24. If a violation has been established and a source wishes to assert the affirmative defense with respect to penalties, the source does bear the burden of establishing that the elements of the affirmative defense have been met. This burden-shifting is appropriate because the source is in a better position to determine the facts required to establish the defense. See, e.g., *Arizona Pub. Serv. Co. v. EPA*, 562 F.3d 1116, 1120, 1129-30 (10th Cir. 2009) (rejecting industry challenge to the EPA's use of an affirmative defense to address excess emissions during malfunction events).

Comment: As incorporated by reference, commenter 0295 adopted the comments in docket EPA-HQ-OAR-2009-0559-0091.1, and summarized in EPA-HQ-OAR-2009-0559-0171 as follows. Commenter 0286 reiterated these comments. The commenter (91.1) disagreed with EPA's affirmative defense option and argued that inclusion of the affirmative defense does not cure EPA's failure to set emission standards that are achievable during SSM events. The commenter (91.1) urged EPA to promulgate an emission standard that eliminates the situation where a source sometimes will be unable to comply with the Proposed Standards because of malfunctions, even if their equipment is properly designed and maintained, through no fault of the source. The commenter (91.1) recommended that sources be subject to differentiated requirements, achievable with the identified best technology, during SSM events. The commenter (91.1) argued that the proposed affirmative defense shifts the burden to the source to prove that a myriad number of criteria are met and actions were taken by the source (which bear no direct relation to the statutory factors for performance standards under CAA sections 111 and 129), in order to avoid civil penalties.

Commenter 0295 stated that EPA should extend the affirmative defense to injunctive relief. The commenter argues that the EPA provides no rationale for its decision to exclude injunctive relief. The commenter notes that costs to a defendant of defending an injunctive relief action are equal to those to a penalty action. According to the commenter, if a defendant acted properly to claim the affirmative defense, it is unclear, under the balancing of equities test employed in equity, that injunctive relief could be granted.

Commenter 0295 recommends that the EPA clarify that the affirmative defense covers all enforcement and citizen suit actions, regardless of what entity brings the action. The commenter proposed that claims for statutory penalties of whatever type should be covered by the

affirmative defense. The commenter asks that the EPA reword the affirmative defense to state that a source is “not in violation” if it meets the requirements of the affirmative defense.

Commenter 0295 also stated that the EPA’s policy of placing sources continuously out-of-compliance, and using “enforcement discretion,” violates fundamental concepts of due process. The commenter asks that the EPA explain why it is not bound to “anticipate all upset situations” which may be dealt with by “enforcement discretion.” The commenter objects to the use of enforcement discretion, stating that it allows the EPA to be entitled to exercise a prerogative that is denied to every other agency and instrumentality of government in the United States.

As incorporated by reference, commenter 0295 adopted the comments in docket EPA-HQ-OAR-2009-0559-0091.1, and summarized in EPA-HQ-OAR-2009-0559-0171 as follows. Commenter 0286 also provided these comments.

One commenter (91.1) stated that it is not clear what the affirmative defense covers. In the Proposed Rule, EPA stated that the affirmative defense is “to a claim for civil penalties for exceedances of such standards that are caused by malfunction, as defined in section 60.2.” The commenter (91.1) asked whether the term “civil penalties,” which is not defined in the Proposed Rule, is intended to apply as well to a “civil administrative penalty” imposed by EPA under CAA section 113(d) (the term “civil penalty” in other contexts means only penalties imposed by a court). The commenter (91.1) also asked whether the affirmative defense apply to “noncompliance penalties” under CAA section 120 (which apply, inter alia, to noncompliance with a section 111 NSPS). The commenter (91.1) stated that to meet the purported purpose of the affirmative defense, which is to provide relief from emission limitations that cannot be met at times even with equipment that is properly designed and maintained (see 75 Fed. Reg. 63,283 col. 2), the affirmative defense would need to apply to civil and administrative penalties, including noncompliance penalties.

Commenter (91.1) also pointed out that the preamble to the Proposed Rule does not give any explanation for why the affirmative defense would not apply to injunctive relief. The commenter (91.1) added that if in fact the excess emissions associated with the equipment or process failure are not reasonably preventable, then there is no apparent reason why injunctive relief should not be available either. The commenter (91.1) stated, as a matter of law, injunctive relief may not be available in cases where a civil penalty cannot be imposed (See *Sierra Club v. Otter Tail Power Co.*, 615 F.3d 1008 (8th Cir. 2010)); under concurrent remedy doctrine, injunctive relief for a CAA violation is barred when civil penalty is barred by statute of limitations. The commenter (91.1) argued that maintaining liability for injunctive relief renders the affirmative defense particularly ineffective with respect to citizen suits. The commenter (91.1) stated that if the source is even potentially subject to injunctive relief, and therefore could be required to pay the citizen-plaintiff’s attorneys fees even if the source successfully demonstrated that it otherwise qualified for the affirmative defense, then the affirmative defense would not accomplish EPA’s stated objective of providing relief in situations where the emission limitations cannot be met despite proper design and operation of process and control equipment. Moreover, the commenter (91.1) contended that EPA has provided no analysis that would supersede its previous and long-standing determination that it is not desirable to rely on

enforcement, rather than regulatory language, to address the inability to comply with section 111 performance standards during SSM events (referenced 37 Fed. Reg. 17,214, 17,214 (Aug. 25, 1972). See also *Marathon Oil Co. v. EPA*, 564 F.2d at 1273).

The commenter (91.1) recommended EPA, at a minimum, state that the affirmative defense applies to civil penalties, civil administrative penalties, noncompliance penalties, and injunctive relief. The commenter (91.1) also recommended that EPA reword the “affirmative defense,” so that it stated that a source “will not be deemed in violation of” the Part LLLL or Part MMMM standards for excess emissions unless the event, and the source’s response to the event, do not meet the criteria spelled out in the regulations (referenced Cf. 40 CFR §80.613); configured in that way, this provision for malfunction should be called something other than an “affirmative defense,” such as an “alternative standard for SSM events”. The commenter (91.1) stated that if EPA refuses to set alternative emission standards that apply during SSM periods and continues to rely instead on the proposed affirmative defense, the affirmative defense must be substantially modified for it to provide any significant relief. The commenter (91.1) stated that the affirmative defense needs to state clearly that a source that qualifies for the affirmative defense shall not be deemed to have violated the applicable standards during that time; if EPA does that, it may be unnecessary to state also that the affirmative defense relieves the source from liability for all types of penalties and injunctive relief (save criminal penalties), but that should be the clear effect of qualifying for the affirmative defense.

Response: With respect to malfunctions, as explained in the proposed and final rules and in more detail elsewhere in this response to comment document, EPA has determined that CAA section 112 does not require that emissions that occur at such times be factored into development of CAA section 112 standards and that it is reasonable not to do so.

The EPA also disagrees with comments that criticize the affirmative defense for shifting the burden of proof. The affirmative defense does not require a facility to prove its innocence rather than requiring an enforcement authority to prove a violation of the CAA or change the burden of proof with respect to establishing a violation. The affirmative defense applies to penalties and thus is only utilized where a violation has been established. The burden of proof remains with the plaintiff in an enforcement action. See, e.g., 40 C.F.R. 22.24. If a violation has been established and a source wishes to assert the affirmative defense with respect to penalties, the source does bear the burden of establishing that the elements of the affirmative defense have been met. This burden-shifting is appropriate because the source is in a better position to determine the facts required to establish the defense. See, e.g., *Arizona Pub. Serv. Co. v. EPA*, 562 F.3d 1116, 1120, 1129-30 (10th Cir. 2009) (rejecting industry challenge to the EPA’s use of an affirmative defense to address excess emissions during malfunction events).

The affirmative defense applies to civil penalties, including civil administrative penalties and penalties under section 120, but does not apply to injunctive relief or criminal penalties. The affirmative defense is available in any civil action to enforce the standards set forth in this rule, whether such action is brought by EPA, a state or local authority or a citizen. EPA agrees that in some cases, injunctive relief may not be appropriate if all the criteria of the affirmative defense have been satisfied. In such cases, liability for attorney’s fees is not a real issue. However, some form of injunctive relief may be appropriate. The *Sierra Club v. Otter Tail Power Co* case cited

by commenters is not on point and does not undermine EPA's ability to limit the affirmative defense to penalty claims. The concurrent remedy doctrine provides that where a party's legal remedies are time-barred a party's concurrent equitable claims generally are barred. The affirmative defense is not a time-bar to civil penalties. EPA does not intend to provide an affirmative defense to criminal charges as the very nature of criminal charges is that there is alleged to be a knowing violation (CAA Section 113(c)(1-3), or a knowing or negligence release that threatens imminent danger to persons (CAA Section 113(c)(4) and (5)). In these circumstances, it is likely that the source did not do all that could be done to prevent the excess emissions. However, if there are circumstances that justify a knowing release as is suggested by the commenter, such circumstances can be raised in any enforcement action and may be the basis for a defense.

Further, the EPA's view is that the affirmative defense is consistent with CAA sections 113(e) and 304. Section 304 gives district court's jurisdiction "to apply appropriate civil penalties." Section 113(e)(1) identifies the factors that the Administrator or a court shall take into consideration in determining the amount of a penalty to be assessed only after it has been determined that a penalty is appropriate. The affirmative defense regulatory provision is not relevant to the amount of any penalty to be assessed under section 113(e) because if a court determines that the affirmative defense elements have been established, then a penalty is not appropriate and penalty assessment pursuant to the section 113(e)(1) factors does not occur. In exercising its authority under section 112 to establish emission standards (at a level that meets the stringency requirements of section 112), the EPA necessarily defines conduct that constitutes a violation. The EPA's view is that the affirmative defense is part of the emission standard and defines two categories of violation. If there is a violation of the emission standard and the source demonstrates that all the elements of the affirmative defense are met, only injunctive relief is available. All other violations of the emission standard are subject to injunctive relief and penalties. The CAA does not require that all violations be treated equally. Further, a citizen suit claim under section 304 allows citizens to commence a civil action against any person alleged to be in violation of "an emission standard or limitation under this chapter." The CAA, however, allows the EPA to establish such "enforceable emission limitations." Thus, the citizen suit provision clearly contemplates enforcement of the standards that are defined by the EPA. As a result, where the EPA defines its emissions limitations and enforcement measures to allow a source the opportunity to prove its entitlement to a lesser degree of violation (not subject to penalties) in narrow, specified circumstances, as the EPA did here, penalties are not "appropriate" under section 304. The EPA's view is that an affirmative defense to civil penalties for exceedances of applicable emission standards during periods of malfunction appropriately balances competing concerns. On the one hand, citizen enforcers are concerned about additional complications in their enforcement actions. On the other hand, industrial sources are concerned about being penalized for violations caused by malfunctions that could not have prevented and were otherwise appropriately handled (as reflected in the affirmative defense criteria). The EPA has utilized its Section 301(a)(1) authority to issue regulations necessary to carry out the Act in a manner that appropriately balances these competing concerns.

The affirmative defense is available in any action to enforce the standards set forth in this rule, whether such action is brought by EPA, a state or local authority or a citizen. Although the preamble's reference to the —Administrator|| may have caused some confusion, there is nothing

in the language of the regulatory text establishing the affirmative defense that suggests that the affirmative defense is limited to EPA enforcement actions.

Comment: As incorporated by reference, commenter 0295 adopted the comments in docket EPA-HQ-OAR-2009-0559-0091.1, and summarized in EPA-HQ-OAR-2009-0559-0171 as follows. Commenter 0286 reiterated these comments. One commenter (91.1) stated that it is unclear how the affirmative defense would apply to enforcement actions by state and local governments, or to private citizen enforcement actions under CAA section 304. The commenter (91.1) stated that the preamble to the Proposed Rule, for example, speaks only in terms of application of the affirmative defense in an EPA enforcement action (See, e.g., 75 Fed. Reg. at 63,283 co. 2). The commenter (91.1) recommended that an affirmative defense should clearly state that it is applicable to enforcement actions by states or citizen-suit plaintiffs, as well.

Response: The affirmative defense is available in any action to enforce the standards set forth in this rule, whether such action is brought by EPA, a state or local authority or a citizen. Although the preamble's reference to the —Administrator may have caused some confusion, there is nothing in the language of the regulatory text establishing the affirmative defense that suggests that the affirmative defense is limited to EPA enforcement actions.

Comment: As incorporated by reference, commenter 0295 adopted the comments in docket EPA-HQ-OAR-2009-0559-0091.1, and summarized in EPA-HQ-OAR-2009-0559-0171 as follows. Commenter 0296 also provided these comments.

One commenter (91.1) said that EPA needs to substantially revise and streamline the proposed affirmative defense for it to be of practical value, and argued that many aspects of the affirmative defense would make it unavailable as a practical matter for many, if not most malfunctions. The commenter (91.1) stated that many of these limitations on the affirmative defense also are not directly related to the question of whether an exceedance of the emission limitations due to a malfunction should be excused. One commenter (91.1) stated that several of the conditions for establishing an affirmative defense use phrases that are subject to a wide range of interpretations, and that on their face do not recognize any need for reasonableness or cost-effectiveness. The commenter asked how will the enforcement authority, or a judge, determine whether “proper design” or “better operation and maintenance practices” could have prevented a malfunction whether a recurring malfunction is a result of “inadequate design” whether repairs were made “as expeditiously as possible” whether the source took “all possible steps” to minimize the impact of the excess emissions and whether emissions control systems “were kept in operation if at all possible” The commenter (91.1) argued that at a minimum, the vague and unqualified descriptors in the criteria for demonstrating the affirmative defense will inevitably lead to varying conclusions as to whether a violation has occurred, resulting in inconsistency from one jurisdiction to the next.

Response: EPA does not agree that the affirmative defense criteria are overly vague and will result in varying interpretations. Courts are well equipped and often do evaluate and apply criteria that are subject to differing interpretations. Many of the conditions were modeled after the conditions of the affirmative defense in EPA's SIP SSM policy, which several states have adopted into their SIPs.

We do not have any indication that parties to enforcement proceedings have had any significant difficulties applying the terms of these SIP affirmative defenses. (See, e.g., State Implementation Plans: Policy Regarding Excessive Emissions During Malfunctions, Startup, and Shutdown (Sept. 20, 1999); Policy on Excess Emissions During Startup, Shutdown, Maintenance, and Malfunctions (Feb. 15, 1983)). Other conditions are modeled after a Federal Implementation promulgated by EPA. (40 C.F.R. 50.1312). EPA's view is that use of consistent terms in establishing affirmative defense regulations and policies across various CAA programs will promote consistent implementation of those rules and policies. However, EPA agrees that some of the terms or phrases in the regulatory text establishing the affirmative can be revised or streamlined to some extent. Such revisions are discussed elsewhere in this response to comment document.

Comment: Commenter 0295, noting that the data set EPA has used to set the Steel Pickling MACT standards does not include startup and shutdown emissions, suggests that the EPA should extend an affirmative defense for unavoidable startups and shutdowns where the facility owner or operator has taken all reasonable and prudent steps to minimize emissions in accordance with good air pollution control practice.

As incorporated by reference, commenter 0295 adopted the comments in docket EPA-HQ-OAR-2009-0559-0091.1, and summarized in EPA-HQ-OAR-2009-0559-0171 as follows. Commenter 0286 also provided this comment.

One commenter (91.1) stated that EPA's rationale for excluding startup and shutdown events from the proposed affirmative defense is unclear. The commenter (91.1) argued that if EPA persists in its proposal not to provide separate emission limitations for startup and shutdown, and if in fact excess emissions from a source cannot reasonably be avoided during a startup or shutdown, not because of failure of a process or equipment but because of the nature of conditions while starting up or shutting down the source, there is no apparent reason why EPA would not provide the same kind of affirmative defense that it proposes to provide for malfunctions.

Response: EPA is promulgating the affirmative defense for malfunctions only, not for periods of startup and shutdown. As explained earlier in this document, EPA believes that malfunction events should be treated differently than periods of startup and shutdown, which are predictable and routine aspects of a source's operations. In contrast, EPA does not view malfunctions as a distinct operating mode. Because startup and shutdown periods are part of a source's normal operations, the same approach to compliance with, and enforcement of, applicable emissions standards during those periods should apply as otherwise applies during a source's operations. Further, as explained above, periods of startup and shutdown – but not malfunctions -- are taken into account when establishing section 112 emissions standards. For these reasons, EPA does not believe it is appropriate to apply the affirmative defense provision to startup and shutdown periods.

Finally, the EPA does not consider affirmative defense an appropriate means to regulate emissions during startup and shutdown. If any source in this category had submitted valid data

demonstrating that because “...of the nature of conditions while starting up or shutting down...” compliance with the normal operating standards during startup or shutdown was impracticable, the EPA would have considered proposing standards applicable to startup, shutdown, or both.

Comment: As incorporated by reference, commenter 0295 adopted the comments in docket EPA-HQ-OAR-2009-0559-0091.1, and summarized in EPA-HQ-OAR-2009-0559-0171 as follows. Commenter 0286 also provided these comments.

One commenter (91.1) said the requirement in the proposed rule (75 FR 65068) to notify the Administrator by telephone or fax as soon as possible, but no later than two business days after the malfunction begins, and then to submit a written report within 30 days of the initial occurrence of the malfunction that demonstrates, “with all necessary supporting documentation,” that the source met all of the multitude of criteria for the affirmative defense, is unreasonable and unnecessary. The commenter (91.1) stated that it is novel at best for a person to be determined to have acted unlawfully unless the person has submitted his entire defense before he is even notified of a potential enforcement action. The commenter (91.1) stated that in many cases, it would be obvious to the enforcement authority (not “the Administrator”), based on the kind of short malfunction or deviation report that sources already submit under many air programs, that an exceedance of the Proposed Standards resulted from an unforeseen and unavoidable equipment failure or process upset. The commenter (91.1) contended that it is extremely inefficient and burdensome for both sources and regulators to require a complete justification of the affirmative defense before the enforcement authority has indicated any need for further investigation. Additionally, the commenter (91.1) stated that allowing only 30 days to provide the kind of extensive documentation required by the affirmative defense as currently written, including a completed root cause analysis, is unreasonable. The commenter (91.1) recommended ninety days as the minimum time that should be allowed, unless EPA substantially streamlines the criteria for the affirmative defense.

Response: The requirement to notify the Administrator of an exceedance during a malfunction is reasonable and consistent with many other upset and malfunction notification requirements that have been applied without significant difficulty. (See, e.g. 40 CFR 63.6(e)(3)(iv)).

Comment: Commenter 0286 stated that EPA’s claim that the proposed rule would reduce the reporting burden associated with SSM events is misleading. The commenter notes that while the proposed rule would eliminate application of certain recordkeeping and reporting requirements in the NESHAPs General Provisions related to SSM, they will be replaced by a much more onerous reporting requirement for any source wishing to claim an affirmative defense. The commenter claimed that both the overly broad set of conditions that must be demonstrated in a report documenting eligibility for the affirmative defense, and the requirement that all of the information be submitted before any enforcement action has been commenced would greatly expand reporting and recordkeeping associated with SSM events. Thus, commenter 0286 stated that EPA needs to prepare an Information Collection Request for the SSM portion of the proposed rule and otherwise comply with the Paperwork Reduction Act.

Response: The rule reduced the reporting burden related to SSM because the owner operator is no longer required to have an SSM plan, and the decision to assert affirmative defense is at the discretion of the source. To assert affirmative defense is not a requirement for compliance. As stated previously, the affirmative defense applies to penalties and thus is only utilized where a violation has been established. The burden of proof remains with the plaintiff in an enforcement action. See, e.g., 40 C.F.R. 22.24. If a violation has been established and a source wishes to assert the affirmative defense with respect to penalties, the source does bear the burden of establishing that the elements of the affirmative defense have been met. This burden-shifting is appropriate because the source is in a better position to determine the facts required to establish the defense. See, e.g., *Arizona Pub. Serv. Co. v. EPA*, 562 F.3d 1116, 1120, 1129-30 (10th Cir. 2009) (rejecting industry challenge to the EPA's use of an affirmative defense to address excess emissions during malfunction events). Thus, the overall reporting for SSM events will be reduced under the rule.

2. Residual Risk

Comment: Commenters 0286 and 0295 support EPA's conclusions based on the residual risk and technology review. The commenters concur that the existing standards adequately minimize risk and no revisions to the existing standards are needed.

Response: We agree with the commenters that the existing standards for Steel Pickling – HCl Process Facilities and Hydrochloric Acid Regeneration Plants do not need to be revised for the purposes of reducing risks under Section 112(f).

Comment: Commenter 0290/0620 stated that each of the problems discussed in regard to Chrome Plating apply to EPA's residual risk assessment and risk determination for the Steel Pickling source category. The commenter stated that EPA failed to fully assess the health risk, its determination that risk is "acceptable" and that no revisions are needed to provide an "ample margin of safety to protect public health is unlawful, arbitrary, and capricious..

Response: The responses to the commenter's problems with EPA's Steel Pickling residual risk assessment are the same as the responses to the commenter's problems in regard to the Chrome Plating residual risk assessment as discussed in this document.

Appendix A Summary of Citizen and Mass Comment Campaign Commenters

Chromium Electroplating Commenter List^a

Comment No. ^b	Name
0266	Anonymous
0267	Anonymous
0268	Anonymous
0269	Anonymous
0270	C. Lish
0282	Anonymous public comment
0299	Mass Comment Campaign sponsored by Earthjustice (10,294)
0302	A. Leary
0303	J. Lang
0304	T. B. Griswold
0305	R. Miller
0306	L. Jobe
0307	A. Byrne
0308	J. Boone
0309	W. Lachman
0310	M. Breton
0311	Dr. C. Leman
0312	K. Shimata
0313	V. Harris
0314	D. Aikins
0315	T. Imajo
0316	P. Crouser
0317	A. Kay
0318	L. Koelle
0319	S. Sanders
0320	M. Fogg
0321	B. Browing
0322	G. Sferra
0323	K. B. Russell
0324	J. Gau
0325	N. Gladfelter
0326	K. Van Dame
0327	S. Kauffman
0328	P. B. La Point
0329	C. O. Dietrich

Comment No.^b	Name
0330	E. Zenker
0331	M. Reid
0332	C. Schmalz
0333	S. Chickman
0334	S. Tims
0335	R. Bixby
0336	C. Woodcock
0337	M. Nola
0338	Dr. R. Philbrick
0339	A. Saga
0340	L. Thompson
0341	H. Curtler III
0342	S. and D. Anthes
0343	K. Rowlett
0344	S. McKee
0345	Dr. D. Johnson
0346	C. A. Morey, Jr.
0347	G. and F. Alderson
0348	J. Unruh
0349	Z. Daluz
0351	J. Mortensen
0352	N. Brothers
0353	J. Robinson
0354	D. Briscoe
0355	R. Rodarte
0356	J. Harmer
0357	C. Mead
0358	R. Ruggles

^a Includes form letter commenters.

^b Comments 0266 to 0358 apply to October 2010 proposal.