HAZARDOUS AIR POLLUTANT EMISSIONS FROM THE PRODUCTION OF FLEXIBLE POLYURETHANE FOAM

Basis and Purpose Document for Final Standards, Summary of Public Comments and Responses

Emission Standards Division

U.S. ENVIRONMENTAL PROTECTION AGENCY
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Office of Air Quality Planning and Standards
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1.0 SUMMARY

On December 27, 1996, the United States Environmental Protection Agency proposed National Emission Standards for Hazardous Air Pollutants (NESHAP) for hazardous air pollutant (HAP) emissions from the production of flexible polyurethane foam under Section 112(d) of the Act.

Public comments were requested on the proposed standard and comment letters were received from industry representatives and governmental entities. A total of 12 comment letters were received. Table 1-1 presents a listing of all persons that submitted written comments, their affiliation, and their docket item number. A public hearing was not requested.

The written comments that were submitted on the proposed rule have been summarized, and responses to the comments are included in the following sections. This summary of comments and responses serves as the basis for revisions made to the NESHAP between proposal and promulgation.

TABLE 1-1. LIST OF COMMENTERS ON PROPOSED NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS

Air Docket A-95-48 Item Number	Commenter and affiliation
IV-D-01	H. Harvey, Director, Human Resources & Environmental Management, Woodbridge Corporation, Troy, MI
IV-D-02	F.W. Lichtenberg, Polyurethane Division, Society of the Plastics Industry, New York, NY
IV-D-03	M.J. Wax, Deputy Director, Institute of Clean Air Companies, Washington, DC
IV-D-04	J.T. McIntyre, Counsel to PFA, McIntyre Law Firm, PLLC, Washington, DC
IV-D-05	W. O'Sullivan, P.E., Administrator, Air Quality Permitting Program, Department of Environmental Protection, State of New Jersey
IV-D-06	R. Paul, Manager, Environmental Health, American Automobile Manufacturers Association, Washington, DC
IV-D-07	J. Berner, Kodak Park Environmental Services, Health, Safety, and Environment, Eastman Kodak Company, Rochester, NY
IV-D-08	T. Burghardt, Director, Environmental Health and Safety, Foamex International, Inc., Linwood, PA
IV-D-09	A.W. Klimek, P.E., Division of Air Quality, State of North Carolina, Raleigh, NC
IV-D-10	P.E. Voytek, Ph.D., Executive Director, Halogenated Solvents Industry Alliance, Washington, DC
IV-D-11	D. Wefring, Regulatory Specialist, 3M Environmental Technology and Services, St. Paul, MN
IV-D-12	P. Leyden, Deputy Executive Officer, Stationary Source Compliance, South Coast Air Quality Management District, Diamond Bar, CA

2.0 SIGNIFICANT CHANGES SINCE PROPOSAL

In response to comments received on the proposed standards, several changes have been made to the final rule. A summary of the substantive changes made since the proposal in response to comments is provided in the following sections. Additional information on the final rule is contained in the docket for this rule (Docket A-95-48).

2.1 Federally Enforceable Limitation

The proposed regulation contained provisions for obtaining a federally enforceable limitation on potential to emit (PTE), which would allow sources to maintain emissions below the major source threshold amount. It also included recordkeeping and reporting requirements for sources obtaining the federally enforceable emission limitation. One commenter urged the EPA to identify the criteria for establishing area source status, while others objected to the requirements that an area source maintain supporting documentation, stating that facilities should not be required to keep records to prove they are not subject to the regulation.

The EPA agrees that criteria for area source status should be included within the regulation, rather than the general criteria in the proposed rule. Therefore, §63.1290(c) has been revised to add specific criteria for identifying slabstock sources with potential emissions below the major source threshold levels. Slabstock flexible polyurethane foam producers may elect to use a total of less than 5 tons of total HAP at the entire plant site, including uses as an auxiliary blowing agent, an equipment cleaner, and as an adhesive. The addition of these specific criteria will ease the administrative burden for both State and local agency regulators and sources by reducing the need for case-by-case determination of area or synthetic minor source status. This option is not available to slabstock processes located at plant sites that have HAP-using processes other than slabstock foam production and foam fabrication. Also, due to the large number of potential uses of HAP at molded foam facilities, such criteria are not included for molded foam facilities.

The Agency agrees with the commenters that recordkeeping requirements should be sufficiently detailed to ensure that PTE limits are practically enforceable; however, the EPA recognizes that State and local agencies should establish such recordkeeping requirements. In the consideration of these comments, the EPA determined that it is not appropriate for the rule to require specific records at facilities that are not subject to the regulation. Therefore, the rule only requires that records be kept to verify the HAP usage.

2.2 Monitoring of HAP ABA Level in Storage Vessels

If a facility is complying with the source-wide alternative for HAP ABA and HAP equipment cleaners, emissions are measured by conducting a monthly material balance at the HAP ABA storage vessel. An input to this determination is the amount of HAP ABA in the storage tank. The proposed rule at §63.1303(d) contained criteria for the devices that could be used to measure the level of HAP ABA in the vessel. Gauge glasses and simple floats would not have fit these criteria. At proposal, the EPA requested comment on the monitoring requirements and whether the use of gauge glasses, float systems, and other visually-read systems should be allowed.

All the commenters that provided input on this issue felt that visually-read level measurement systems, which are "standard" in the industry, should be allowed. They believed that visually-read measurement systems were sufficiently accurate, and that the competitive nature of the industry dictated that facilities eliminate raw material loss. Due to the need to manage chemical use, visually-read level measurement systems in conjunction with existing inventory controls provide necessary compliance records.

Upon reviewing these comments and collecting additional information on this issue, the EPA agreed that these visually-read devices should be allowed. Therefore, in the final rule, paragraph 63.1303(d) requires that devices that are used to measure the level in the storage vessel be calibrated initially and at least once per year. If the device produces an output signal, it must have either a digital or printed output. If the device is a visually-read device, it must have permanent graduated markings.

2.3 Prohibition on the use of HAP-based adhesives

The proposed rule prohibited the use of HAP-based adhesives for foam repair in molded foam production. Commenters reported that HAP-free adhesives have not been successful in all foam repair applications. One commenter recommended that the EPA defer consideration of HAP-based adhesives until development of the foam fabrication NESHAP.

The EPA acknowledges the commenters' concern that HAP-free adhesives may not be successful in all applications, and the same issues are common to the repair of molded foam and the fabrication of slabstock foam, which is being investigated under a separate regulatory effort. Therefore, the EPA agrees that consideration of HAP-based adhesives for molded foam repair should be combined considered along with the development of the NESHAP for the flexible polyurethane foam fabrication operations source category. The proposed provisions at 63.1300(c) prohibiting the use of HAP-based adhesives to repair foam products in a molded flexible polyurethane foam source have been removed.

2.4 Testing, Monitoring, and Recordkeeping for Foam Grades

The proposed rule required that the indentation force deflection (IFD) and density be tested for every foam grade of foam produced. It also required that the amount of polyol (polyether and polyester) used be monitored for every foam grade, and that records of this usage be maintained. A comment was received stating that there was no benefit to testing foams or monitoring and keeping records of the amount of polyol added for grades that do not have any ABA in the formulation.

For each specific grade, the allowable emissions are calculated using the formulation limitation (which is calculated using the IFD and density of the grade) and the amount of polyol used to produce the grade. The calculation of the allowable HAP ABA emissions is unrelated to the amount of HAP ABA added to the formulation for that grade. The amount of HAP ABA added represents the actual emissions. Therefore, if a facility produced a particular grade (Grade A) with a formulation limitation greater than zero, but used no HAP ABA, then emission "credits" would be generated. This "credit" would

then allow the owner or operator to use an amount of HAP ABA higher than the formulation limitation for another grade (Grade B). If no testing of Grade A occurred, or if records of polyol used were not kept for Grade A, then credits would not be generated to allow the production of Grade B with the desired amount. Therefore, the EPA sees considerable benefit in testing and keeping records for all grades that have formulation limitations greater than zero.

However, the EPA does believe that the burden can be reduced by eliminating the requirements that IFD and density testing be conducted, that polyol usage be monitored, and that polyol usage records be kept, for grades where the formulation limitation is designated as zero. For any foam grade, the owner or operator can designate the HAP ABA formulation limitation as zero and be exempt from these testing, monitoring, and recordkeeping requirements. However, it should be noted that records of HAP ABA usage must be recorded for any grade where HAP ABA is added to the formulation, without regard to the HAP ABA formulation limitation.

2.5 HAP ABA Formulation Limitation Calculation

Commenters noted that the proposed HAP ABA formulation equation results in a negative (<0) value for the HAP ABA limitation in some cases. The EPA acknowledges that the equation indeed results in negative values for some combinations of density and IFD. The EPA did not intend for these negative values to be used in calculating allowable emissions. Rather, the intent was for the foam manufacturer to use zero if the calculated HAP ABA formulation limitation was negative. However, the proposed regulation did not state this intention, and the Agency recognizes that this situation would clearly lead to confusion. Therefore, the EPA has revised the regulation to clearly state that zero shall be the formulation limitation if the results of the formulation limitation equation are negative.

Comments were also received on the clarity of the new source HAP ABA formulation limitation requirements. In order to improve the clarity of these provisions, a table has been added to the final rule to explain the new source formulation limitation requirements.

2.6 Definition of Flexible Polyurethane Foam

One commenter noted that "while flexible polyurethane foam is defined within the rule, the definition does not address the degree of flexibility or rigidity associated with the foam." The EPA agrees that there is a need to clarify "flexible" as it is used in the definition of flexible polyurethane foam, and has added language to the definition provided in the rule.

2.7 State Delegation

One comment was received requesting clarification as to what authorities, if any, can be delegated to States. The commenter reported that in some instances, the EPA has specified within given Part 63 standards that certain authorities cannot be delegated to States. The EPA agrees that the regulations should specify which authorities can be and cannot be delegated to State and local permitting authorities, and the final rule has added §63.1308 to identify these authorities. The new provisions clarify that the authority to approve alternative monitoring plans and emission limitations shall be retained by the EPA Administrator and not transferred to a State or local permitting authority.

3.0 SUMMARY OF COMMENTS

3.1 Applicability

Comment: One comment was received from a State Agency regarding sources that request a federally enforceable emission limitation [§63.1306(c)(9)]. The commenter (IV-D-09) stated that "specification of an appropriate means for a facility to be treated as an area source within the regulation reduces the need for case-by-case review to establish consistent synthetic minor permit limitations and eases the administrative burden for both the permitting authority and the sources." The commenter stated however, that only those sources for which there is reasonable assurance that the major source thresholds will not be exceeded should be able to take advantage of such a mechanism. The commenter pointed to 40 CFR Part 63, Subpart JJ, the Wood Furniture Manufacturing NESHAP, as an example of the EPA providing criteria for area source status in a federal rule. According to the commenter, Subpart JJ clearly states the criteria for maintaining emissions below major source threshold levels, which identifies the synthetic minor permit limits.

Response: As a result of this comment, the EPA re-evaluated the proposed requirements for obtaining a federally enforceable emission limitation. First, the EPA recognizes that most States already have in place mechanisms for enforceable emission limitations that allow sources to limit their potential to emit (PTE) to below major source threshold levels. Given this fact, the EPA concluded that the general requirements for obtaining a federally enforceable emission limitation in the proposed rule were not needed.

However, the EPA agrees with the commenter that specific criteria for area source status should be included within the regulation. Therefore, the EPA developed the following equation, which has been added to §63.1290(c) of the final rule, to identify

sources with PTE below the major source threshold amounts. where,

HAP_{used} = amount of HAP used at the plant site for foam production and fabrication processes, tons per year
$VOL_{ABA,i}$ = volume of HAP ABA i used at the facility, gallons per year
$D_{ABA,i}$ = density of HAP ABA i, pounds per gallon
m = number of HAP ABAs used
$VOL_{clean,j}$ = volume of HAP used as an equipment cleaner, gallons per year
$D_{clean,j}$ = density of HAP equipment cleaner j, pounds per gallon
$WT_{HAPclean,k}$ = HAP content of equipment cleaner j, weight percent
n = number of HAP equipment cleaners used
$VOL_{adh,k}$ = volume of adhesive k, gallons per year
$D_{adh,k}$ = density of adhesive k, pounds per gallon
$WT_{HAPadh,k}$ = HAP content of adhesive k, weight percent
o = number of adhesives used

Facilities with HAP_{used} values less than five tons per year are exempt from the regulation.

Comment: Several comments were received regarding the supporting documentation required from facilities which are not subject to the proposed rule. The commenter (IV-D-02) requested clarification on the provision that requires exempt sources to "maintain supporting documentation of the applicable criteria" (§63.1290(c)). The commenter felt it was unclear what records the facilities would be required to keep. The commenter also stated that, "Facilities should not be required to keep records beyond normal business records to prove they are not subject to a regulation, and this should be made explicit in the final rule."

Two comments were received regarding the recordkeeping requirements for facilities choosing the federally enforceable emission limitation option (§63.1307(d)). The first commenter (IV-D-08) believed that requiring such facilities to keep monthly records of HAP emissions is redundant. The commenter stated that "The conditions of a synthetic minor permit already address this issue and specify any documentation to be maintained in the permit conditions. This requirement should be removed in its entirety."

The second commenter (IV-D-09), a State agency, felt that the proposed recordkeeping requirements in section 63.1307(d) are insufficient and that additional detail is needed. The commenter further explained their exclusionary rules that limit the potential emissions below major source thresholds for regulatory

applicability, along with the associated recordkeeping and reporting requirements.

Response: The EPA has reviewed the provisions in §63.1290(c) requiring exempt sources to maintain supporting documentation of applicable criteria. The Agency is concerned that requiring exempt sources to maintain specific records would in fact make the exempted source subject to the regulation, which was not the EPA's intent. State or local air pollution control agencies may require such recordkeeping to document minor source status, but it is not necessary for the purposes of this NESHAP. Therefore, the provisions in §63.1290(c) requiring documentation for fabrication processes and for research and development (R&D) facilities have been removed from the regulation.

The regulation no longer contains recordkeeping requirements for any sources that are exempt from the rule, with the exception of the requirement that sources exempted due to the usage of less than five tons of HAP are required to keep records of HAP usage. Specific recordkeeping requirements to prove that a facility is not subject to regulation would be determined by the State or local agency.

Area sources are inherently exempt from the regulation. However, some sources that would otherwise be subject to the regulation may elect to avoid the requirements by limiting emissions to levels below the major source threshold amounts. Such sources may obtain an enforceable limitation on potential to emit (PTE) to ensure synthetic minor source status. The Agency agrees with the commenter that recordkeeping requirements for synthetic minor sources should be sufficiently detailed to ensure that the PTE limits are practically enforceable. As stated above, the EPA does not believe that the rule should contain specific reporting and recordkeeping provisions for sources not subject to the rule. Therefore, the EPA believes that State and local agencies should establish such reporting and recordkeeping requirements. Thus, the Agency disagrees with the commenter that suggested that more detail was needed in the proposed reporting and recordkeeping requirements for area sources.

The proposed language in §§ 63.1306(c)(9), 63.1307(f)(3), and 63.1307(d) that contains other recordkeeping and reporting requirements for area sources and for sources obtaining a federally enforceable emission limitation has been removed from the final rule.

Comment: One comment was received concerning the proposed exemption for processes dedicated exclusively to the fabrication of flexible polyurethane foam (§63.1290(c)(2)). The commenter (IV-D-06) felt that this made the regulation "appear unnecessary and irrelevant since it has exempted all processes to which it might be applicable." The commenter believed that "the intent was to exempt such processes only if the facility as a whole is not dedicated to the production of foam and only if the process itself is not a major source of HAPs." The commenter requested clarification in the final rule.

Response: The EPA believes that the commenter has misinterpreted the applicability of the proposed regulation. 40 CFR 63.1290-1307 will apply to flexible polyurethane foam **production** processes as defined in the regulations. These standards will not apply to flexible polyurethane foam **fabrication** processes.

The foam production rule applies to foam production processes located at plant sites that are major sources of HAP. As defined by the regulation, a flexible polyurethane foam production process is the equipment used to produce a flexible polyurethane foam product. It includes raw material storage; production equipment and associated piping and ductwork; and curing and storage areas.

Fabrication of flexible polyurethane foam was added as a category of sources of HAP emissions in a June 4, 1996 Federal Register Notice (61 FR 28197). The EPA is currently developing regulations for flexible polyurethane foam fabrication, which covers the bonding of foam pieces by glue or flame lamination. These regulations will be separate from the standards for flexible polyurethane foam production in 40 CFR 63.1290-1307.

Foam fabrication and foam production may occur at the same major source plant site. In such cases the plant site could be subject to both NESHAP. Some parts of the plant site would be covered by the foam production rule; others would be covered by the foam

fabrication rule. Whether the plant site as a whole is dedicated to either production or fabrication does not determine whether it would be subject to either rule.

The Agency agrees with the commenter that the exemption for foam fabrication processes in §63.1290(c)(2) should be clarified. A definition of foam fabrication processes has been added to §63.1292. This definition should clarify which processes are not covered under the regulation for foam production.

Comment: One comment was received which suggested an exemption for molded and rebond polyurethane foam processes. The commenter (IV-D-07) noted that for molded flexible polyurethane foam (§63.1300) and rebond foam (§63.1301), the proposed rule prohibited the use of HAPs and HAP-based products for cleaning, mold release agents, and adhesives. However, facilities are still required to submit initial and subsequent notification of compliance (§63.1306). The commenter felt that this imposes a reporting burden which provides no environmental benefit. Therefore, the commenter recommended that the EPA exempt from applicability of the proposed rule any molded or rebond processes which do not use HAP cleaning solvents, HAP-based mold release agents, and adhesives. The commenter proposed that additional paragraphs be added to §63.1290 to accommodate this recommendation.

Response: First, as discussed in sections 3.7.2 and 3.7.3 of this document, the prohibition on the use of HAP-based adhesives at molded foam facilities that was included in the proposed rule has not been maintained in the final rule. The final rule prohibits the use of HAP at molded and rebond facilities for two uses: (1) HAP solvents used as equipment cleaners and (2) HAP-based mold release agents. These are the only control requirements in the final rule for molded and rebond foam production facilities.

While the EPA appreciates the commenter's concern, the Agency believes that it is necessary that an owner or operator certifies that the molded or rebond foam production facility is in compliance with the provisions of the regulation, even if compliance is certified by stating that no HAP-based products are being used. Therefore,

the requirement to submit compliance certifications for molded and rebond foam facilities has been retained in the final rule.

3.2 Compliance Schedule

Comment: One comment was received in support of the proposed compliance date of 3 years from the effective date of the final rule (§63.1291). The commenter (IV-D-04) provided several examples of the time requirements that could be associated with facilities coming into compliance.

Response: The EPA agrees with the commenter that three years will be necessary to allow the industry sufficient time to come into compliance with the regulations. A compliance date of three years after the effective date of the regulations has been retained in the final rule.

3.3 Definitions

Comment: One comment was received regarding the adjective "flexible" in the term "flexible polyurethane foam". The commenter (IV-D-07) noted that while "flexible polyurethane foam" is defined in the rule, the definition does not address "the degree of flexibility or rigidity associated with the foam." The commenter believes that their "foam-in-place" operation is intended to be included within the scope of the proposed rule. However, the foam, which is sprayed into boxes to provide a protective cushioning layer for shipment of products, is "quite rigid in nature". The commenter therefore recommends that the EPA provide either a definition of "flexible", or clarification of the meaning of "flexible" in the preamble to the final rule.

Response: The EPA agrees that there is a need to clarify "flexible" as it is used in the definition of flexible polyurethane foam, and has added language to the definition provided in the rule, as follows:

"Flexible polyurethane foam means a flexible cellular polymer containing urea and carbamate linkages in the chain backbone produced by reacting a diisocyanate, polyol, and water. Flexible polyurethane foams are open-celled, permit the passage of air through the foam, and possess the strength and flexibility to allow repeated

distortion or compression under stress with essentially complete recovery upon removal of the stress."

By comparison, rigid polyurethane foams are closed-celled, do not allow the passage of air through the foam, and do not distort or compress under stress until there is sufficient stress to crush the foam. Rigid foams which have been crushed do not recover to their original shape.

Based on information provided by the commenter, the EPA is unable to definitively determine if the foam produced is flexible polyurethane foam and if the commenter's process is subject to the rule. However, it is believed that the "foam in place" process described is a molded foam process and would be subject to the rule, if the foam produced meets the revised definition of flexible polyurethane foam cited above.

Comment: One comment was received regarding the definition of foam. The commenter (IV-D-06) noted that in the proposed rule, water was included as a reactant in the definition of flexible polyurethane foam. The commenter explained that they produce foam which meets the definition, except that water is not listed as a constituent, nor is water added to the process. The commenter requested clarification of the definition, as they believe that "the intent of the rule was not to allow for an exemption dependent on whether water is a constituent."

Response: In the production of flexible polyurethane foam, a polyol is reacted with an isocyanate to produce polyurethane polymer. Water (H_2O) must also be present to react with the isocyanate (NCO). This reaction serves two purposes. The reaction between H_2O and NCO produces carbon dioxide (CO_2) to blow the polymer into a foam. In addition, the H_2O/NCO reaction produces urea linkages which are part of the polymer structure. Flexible polyurethane foam can theoretically be produced without water, but to do so the polyol/isocyanate mixture must be mechanically agitated and frothed into a foam. The EPA has not encountered any manufacturers that rely on mechanical agitation as opposed to the H_2O/NCO reaction.

In further contact with the commenter, the EPA determined that the commenter is using a premixed "A/B" system to produce foam. Such systems consist of two

mixtures, "A" and "B", which are combined to produce foam. The mixtures are supplied containing the necessary components in the correct proportions to produce foam with the desired properties. Generally, the "A" mixture contains isocyanate and perhaps a tin catalyst. The "B" mixture typically consists of polyol, water, surfactant, and catalyst. The supplier may not list water as a component in the mixture because water is not always required to be listed on a Material Safety Data Sheet (MSDS).

In conclusion, while a flexible polyurethane foam could theoretically be produced without water, the EPA believes that to remove water from the definition would create unnecessary confusion among the foam industry regarding this definition. Therefore, the EPA did not change the definition of flexible polyurethane foam in response to the comment.

Comment: One comment was received requesting a change in the definition of research and development (R&D) process. The commenter (IV-D-11) noted that the definition of R&D process in the proposed rule is inconsistent with the definitions of R&D in the Clean Air Act and other NESHAPs. The significant difference relates to the sale of products manufactured at R&D facilities. The proposed rule defines "research and development process" as "a laboratory or pilot plant operation whose primary purpose is to conduct research and development into new processes and products, where the operations are under the close supervision of technically trained personnel, and which is not engaged in the manufacture of products for commercial sale" (§63.1292).

For comparison, the commenter provided the definition of "research or laboratory facility" from the Clean Air Act--a facility "whose primary purpose is to conduct research and development into new processes and products, where such source... is not engaged in the manufacture of the products for commercial sale in commerce, except in a de minimis manner." 42 U.S.C. Section 7412(c)(7) (emphasis added). The commenter also cited several other NESHAPs which incorporated commercial sale "in a de minimis manner" into the R&D definition.

The commenter requested that the EPA revise the definition of "research and development process" in the proposed rule, and provided

a definition which contains a reference to product sales "in a de minimis manner" and excludes analytical laboratories.

Response: The EPA acknowledges that the statutory language in Section 112(c)(7) of the 1990 Amendments to the Clean Air Act states that the stationary source "may not be engaged in the manufacture of products for commercial sale in commerce, except in a *de minimis* manner." The Agency agrees with the commenter that the phrase "in a de minimis manner" would clarify the statutory intent, and such language has been added to the regulatory text at §63.1292. However, the EPA emphasizes that incidental commercial reproduction should be limited. A process is no longer primarily engaged in R&D or exempted from the regulation if it manufactures more than de minimis levels of commercial products. As explained in the draft final regulatory amendments to 40 CFR Part 70 (Air Docket A-93-50, items VI-A-1, VI-A-2, and VI-A-3), the EPA believes that States have the discretion to define de minimis for determining when an R&D operation would be exempt from regulation.

3.4 Standards for Slabstock Flexible Polyurethane Foam Production--Diisocyanate Emissions

Comment: The proposed rule did not require control of toluene diisocyanate (TDI) emissions from the foam production line. At proposal, EPA requested comment on the feasibility and necessity of additional controls for TDI emissions from the foam line.

Four commenters (IV-D-02, IV-D-04, IV-D-08, and IV-D-09) responded to the EPA's request for comments on this item. Three of the commenters (IV-D-02, IV-D-04, and IV-D-08) supported the EPA in proposing no control for TDI emissions from the foam production line. All three commenters referred to the fact that TDI emissions from foam production are very small. One commenter (IV-D-04) estimated TDI emissions to be less than 10 tons per year for the entire industry and noted that TDI concentrations in exhaust streams are as low as 0.47 parts per million.

Two of the commenters (IV-D-02 and IV-D-04) also noted the lack of currently available control technologies to address these emissions and the high costs of utilizing technologies that are common in other applications. One commenter (IV-D-04) provided a brief

summary of TDI emissions and the current control options. The commenter described the problems associated with activated carbon adsorption, caustic absorption, incineration, catalytic combustion, solvent absorption, and condensation as control options for TDI emissions from foam production. The commenter explained that all currently available control technologies must address the difficult problem of removing TDI, which is present in very low concentrations, from a stream moving at high velocity without creating significant back-pressure on the system.

The fourth commenter (IV-D-09) felt that there may be a need for additional controls for TDI. The commenter noted that as facilities eliminate methylene chloride as an auxiliary blowing agent, the ability to capture TDI by adsorption will be enhanced. The commenter encouraged EPA to "review whether there are any applicable work practices or equipment standards which can be incorporated into the regulation to reduce TDI and other pollutant emissions from the production line or other points not currently covered." The commenter also felt that it would be appropriate to prepare for a future §112(f) residual risk assessment by incorporating the mechanisms to collect the necessary data into the proposed regulation. Additionally, the commenter encouraged EPA to "consider the synergistic effects of sensitizers such as propylene oxide, TDI, and those sensitizers used in catalysts in its residual risk assessment."

Response: The EPA agrees with commenters IV-D-02, IV-D-04, and IV-D-08 regarding TDI emissions and control. The EPA recognizes the concerns related to the health effects of TDI, even at relatively low concentrations. However, nationwide TDI emissions from the foam tunnel at slabstock polyurethane foam production facilities are estimated to be less than 10 tons per year. A typical plant emits around 1/10 of a ton per year. In addition, TDI is present in exhaust streams in very low concentrations, typically less than 1 part per million (ppm). Currently available control technologies common to other applications are not suited to the cost-effective removal of low concentrations of TDI from a high velocity exhaust stream.

Prior to proposal, the EPA determined that the floor for the control of TDI was no control. Further, no controls techniques were identified in practice to allow the consideration of levels more stringent than the floor. After proposal, the EPA re-investigated technologies for the control of TDI emissions from the foam production line by contacting vendors of control equipment, as well as air pollution regulatory agencies in other countries. Despite indications of the existence of cost-effective TDI control technologies, none of these efforts identified any technology for TDI that the Agency believed could be cost-effectively applied to the foam tunnel in a slabstock foam production facility.

The EPA disagrees with the commenter that the elimination of methylene chloride as an auxiliary blowing agent will increase the ability to capture TDI. The EPA believes that the ability to control TDI is not dependent on whether methylene chloride is used in the foam formulation.

In the future, the EPA will conduct a §112(f) residual risk assessment of the flexible polyurethane foam industry. In a §112(f) residual risk assessment, a regulated industry is evaluated based on the risks it still poses to people and the environment. If the assessment determines that unacceptable health risks are still related to the industry, the EPA can impose additional regulations on the industry.

The EPA does not feel it is appropriate to require additional recordkeeping or reporting in this rule to support a future risk assessment, as suggested by commenter IV-D-09. The EPA will obtain the necessary information at the time of the risk assessment.

3.5 Standards for Slabstock Flexible Polyurethane Foam Production--HAP ABA Emissions from the Production Line

3.5.1 Allowance of Two Averaging Time Formats for Compliance with Proposed Requirements for Production Line and Source-Wide HAP ABA Emissions

Comment: The proposed rule allowed for two averaging time formats for compliance with the requirements for HAP ABA emissions from the production line, and source-wide HAP ABA and equipment cleaning emissions: (1) Compliance determined monthly for the

previous 12 months, or rolling annual compliance (§63.1297(a)(1)), and (2) compliance determined for each individual month (§63.1297(a)(2)). At proposal, EPA requested comments on any burdens caused by inclusion of the monthly compliance alternative in the proposed regulation.

Two commenters (IV-D-04 and IV-D-10) responded to the EPA's request for comments on this item. Neither commenter reported any burdens associated with inclusion of the monthly compliance alternative. However, both commenters were concerned about the potential for being assessed penalties based on 365 days of violations when using the rolling annual compliance alternative, even if the actual number of non-compliance days was much less. One commenter (IV-D-04) suggested that "compliance enforcement for this unique emissions measurement method could be adjusted to account for this anomaly."

Response: Throughout the development of the flexible polyurethane foam regulation, industry representatives pointed out the seasonal variation of the production of slabstock foam, and requested that the EPA consider this variation. In response to this facet of the slabstock foam business, the EPA based the proposed HAP ABA emission requirements on a 12-month period, where compliance would be determined each month for the previous 12 months. While industry recognized the flexibility of this 12-month averaging period, concerns were expressed related to the enforcement of such provisions. In fact the concerns expressed at that time were analogous to those made by these commenters.

In response to these concerns, the EPA included the monthly compliance alternative in the proposed regulation. This alternative, while reducing flexibility, eliminates the potential for violations for a 365-day period. Since no comments were received that indicated that the inclusion of two averaging time options was inappropriate or burdensome to either affected sources or enforcement agencies, both averaging periods were retained in the final rule.

In response to the commenters' concern about penalties associated with the 12-month averaging option, the EPA points out that the rule cannot specify a penalty structure, but can only include

the definition of a violation. Clearly, a violation of the HAP ABA (or source-wide) requirements of this rule occurs when the actual emissions exceed the allowable emissions. In the case of a violation, the State or local enforcement agency (and in some cases the EPA Regional Office) will determine the penalty for a violation.

In conclusion, the commenters continue to be concerned with the potential penalties associated with the 12-month averaging time. The EPA continues to believe that the monthly averaging time is a viable alternative available to all affected sources, and that each owner or operator will have to weigh the added flexibility of the 12-month averaging period with the potential for higher penalties associated with this option.

3.5.2 Allowable HAP ABA Emission Calculation

Comment: One comment was received in support of the concept of the variable emission limits allowed by the HAP ABA emission equation (§63.1297(b)(2)). The commenter (IV-D-04) explained that slabstock production of flexible polyurethane foam involves many different grades of foam, requiring different amounts of ABA. In addition, the commenter stated "the competitive process frequently shifts the product mix of a single plant, thereby changing the ABA requirements for indefinite periods of time."

Response: As stated in the proposal preamble at 61 FR 68409, the EPA recognizes the variability in HAP ABA emissions for different grades of foam. The EPA agrees that variable emission limits are necessary to accommodate the differing production requirements that are common in the foam production industry. The provision for variable emission limits in §63.1297(b)(2) has been retained in the final rule.

Comment: One commenter (IV-D-04) noted that there was a typographical error in the equation as published in the preamble. The first term should appear as "-25(IFD)". Two commenters (IV-D-05 and IV-D-08) noted that the HAP ABA formulation equation results in a negative (<0) value for the ABA limitation in some cases. One commenter (IV-D-05) felt that this was a result of a typing error in the published equation. The second commenter (IV-D-08) was concerned that it would be "possible for certain foams grades to

calculate a negative monthly ABA, thus reducing the total ABA and misrepresenting the intent of the ABA formulation limitation equation." This commenter recommended that the minimum amount of ABA be limited to zero (0) for averaging purposes.

Response: First, commenter IV-D-04 was correct in that there was a typographical error in the equation as published in the preamble. The first term in the equation 25(IFD) should be preceded by a negative sign. The proposed regulatory language was correct. The rule summary in the preamble for the promulgated regulation includes the correct equation.

However, commenter IV-D-05 was incorrect in assuming that an error in the published equation resulted in the equation yielding negative values. The equation indeed results in negative values for some combinations of density and indentation force deflection (IFD). The EPA did not intend that these negative values be used in calculating allowable emissions. Rather, the intent was for the foam manufacturer to use zero if the calculated HAP ABA formulation limitation was negative. However, neither the proposed regulation nor preamble stated this intention, and the Agency recognizes that this situation would clearly lead to confusion. Therefore, in accordance with commenter IV-D-08's suggestion, the EPA has revised the regulation to clearly state that zero shall be the formulation limitation if the results of the formulation limitation equation are negative.

Comment: One commenter (IV-D-05) felt that the requirements for foam grade density in §63.1297(d)(2)(i) through (iv) were overlapping. The commenter recommended a table format to simplify these requirements.

Response: The EPA agrees that the formulation limitation requirements for new sources, which are contained in §63.1297(d)(2)(i) through (iv) are confusing. In accordance with the commenter's request, the EPA has added the following table to the regulation that presents these requirements.

Table values in parts ABA per hundred parts polyol		Density ranges (pounds per cubic foot)				
		0-0.95	0.96-1.05	1.06-1.15	1.16-1.40	1.41+
IFD	0-10	Use Equation 2				
	11-15					
	16-20			0		
	21-25					
	26-30					
	31+					

Comment: One commenter (IV-D-10) was concerned about the development of the HAP ABA formulation limitation equation. Specifically, the commenter questioned how the EPA would achieve significant reductions in HAP ABA emissions without the use of emission control technology. The commenter also questioned whether the equation was developed using formulation data from facilities which use methylene chloride (MC) or facilities which use something other than MC as a blowing agent.

Response: The HAP ABA formulation limitation equation was developed using actual formulation information provided by slabstock foam manufacturers. Formulation data was used from all facilities, which included facilities that used methylene chloride (and other HAP ABAs), as well as data from plants that used technologies that reduced the amount of HAP ABA needed, and technologies that eliminated the need for HAP ABA. In all instances, only foam grades with similar densities and IFDs were compared.

At the time the information was obtained, no foam production facility used an add-on control device to reduce HAP ABA emissions (Note: the Agency has become aware of one facility in the United

States that installed a recovery device to reduce methylene chloride emissions after the initial data collection and after initial determination of the maximum achievable control technology, or MACT, floor). Therefore, the total amount of HAP ABA added in the formulation was emitted. The methods reported that reduced HAP ABA emissions were technologies that reduced or eliminated the amount of HAP ABA used in the formulation. Therefore, the EPA is confident that the "significant" emission reductions can be achieved without the use of emission control technology. In fact, from the beginning of EPA's study of the foam production industry, industry representatives have stressed that traditional add-on control technology is not amenable to this industry.

3.6 Standards for Slabstock Flexible Polyurethane Foam Production--Source-Wide Emission Limitation

Comment: Two comments were received regarding the source-wide emission limitation option. The first commenter (IV-D-04) supported the source-wide option because of the associated lower need for the use of expensive monitoring equipment and because of the associated reductions in recordkeeping.

The second commenter (IV-D-09) was concerned that while the source-wide option provides flexibility to the affected facilities, it would allow for spikes of HAP ABA emissions.

Response: The EPA agrees that the source-wide emission limitation provides flexibility to affected facilities. This option has been retained in the final rule.

The Agency acknowledges the second commenter's concern regarding short-term "spikes" in HAP ABA emissions, but maintains that the source-wide alternative does not increase the potential for such short term increases. Facilities complying with the HAP ABA emission point-specific limitation for the production line must calculate the allowable emissions using the product mix and the HAP ABA formulation limitation equation. The usage (and emissions) of HAP ABA is measured at the mixhead. Facilities complying with the source-wide alternative must use the same equation to calculate allowable emissions, but the HAP ABA usage is measured at the storage vessel. Thus, the allowable emissions level for the source-wide

alternative includes emissions from the storage vessel and leaking components in HAP ABA service, as well as emissions from the production line. Since the allowable emissions for the same product mix would be identical for the emission point-specific limitation and the source-wide alternative, and since the source-wide alternative covers more emission points, the source-wide alternative is slightly more stringent than the emission point-specific limitation. Both alternatives contain the option of complying on a monthly basis or a rolling 12-month basis. Therefore, the source-wide alternative will not provide an increased opportunity for short term spikes in HAP ABA emissions.

3.7 Standards which Prohibit the Use of HAP or HAP-Based Products

3.7.1 Prohibition of HAP Solvents as Mixhead Flush (Molded Foam) or Equipment Cleaners (Slabstock Foam)

Comment: One comment was received regarding the use of isocyanates as equipment cleaners. The commenter (IV-D-01) explained that a number of molded foam producers use isocyanates to flush the mixhead and piping at start-up, preventing contamination of raw materials during production. The resulting material can be reused in the production of molded or rebond foam, so it does not require disposal. The use of HAPs for equipment cleaning is prohibited in the proposed rule (§63.1300(a)). The commenter felt that it was not the EPA's intent to prohibit this type of flushing, although the isocyanate could be considered a HAP. The commenter requested clarification to prevent this interpretation.

Response: The EPA agrees that its intent was not to prohibit use of diisocyanates to flush the mixhead and piping at start-up or during maintenance. The requirements at §63.1300(a) have been revised to allow the use of diisocyanates as long as the diisocyanates are contained in closed-loop systems and re-used in production.

Comment: One comment was received regarding the proposed prohibition of HAP equipment cleaning. The commenter (IV-D-10) stated that the "available scientific evidence does not support the proposed provisions to prohibit (methylene chloride) in equipment cleaning..." In addition, the commenter noted that the health effects associated with methylene chloride exposure will be largely

addressed in the revised OSHA permissible exposure limit (PEL). The commenter pointed out that "New evidence of the mechanism of the action for carcinogenicity in laboratory mice and its significance to humans has been developed by HSIA and its European and Japanese counterparts. . . . The full body of the epidemiological and toxicological data on MC makes a compelling case that the solvent is unlikely to pose a cancer risk to humans . . . "

Further, the commenter opposed the proposed prohibition of HAP equipment cleaning products, stating that cleaning can be accomplished with minimal emissions and that non-HAP cleaning products are not effective for all applications.

Response: By questioning the cancer risk of methylene chloride, the commenter is indirectly questioning the inclusion of methylene chloride in the list of hazardous air pollutants contained in §112(b)(1) of the Clean Air Act. If the commenter believes that methylene chloride should be removed from the HAP list, a petition to delete methylene chloride may be submitted under §112(b)(3). However, since methylene chloride is currently on the list, and no such petition has been submitted to the Agency at this time, the final rule will continue to limit methylene chloride emissions.

Standards developed under the authority of §112(d) of the Clean Air Act are "technology-based" standards. The EPA believes that the technical bases for the selection of the prohibition of HAP equipment cleaners and mixhead flushes were sound. The rationale for the selection of the prohibition of HAP equipment cleaners and mixhead flushes is contained in the Basis and Purpose Document for the Proposed Standards (EPA-453/R-96-008a). The commenter did not present any evidence that would lead to a conclusion that this rationale was flawed. Therefore, the final rule retains the prohibition of HAP-based equipment cleaners and mixhead flushes.

3.7.2 Prohibition of HAP-Based Mold Release Agents (Molded Foam)

Comment: One comment was received regarding the proposed prohibition of HAP-based mold release agents in molded foam production. The commenter (IV-D-06) reported that their facility had been attempting to utilize HAP-free mold release agents, but that these products have not been successful in all applications.

The commenter suggested that the EPA allow for some leniency in the use of HAP-based agents. The commenter recommended a review process that would allow a facility to use HAP-based mold release agents if they demonstrated that product quality suffered with the use of HAP-free agents.

Response: It should first be pointed out that the use of non-HAP based mold release agents was determined to be the MACT floor, meaning that the Agency could not establish a MACT standard less stringent than this floor level. Further, the EPA believes that there are numerous alternatives to HAP-based mold release agents. These include naphtha- and other non-HAP solvent-based mold release agents, reduced VOC mold release agents, and for some applications, water-based mold release agents. The commenter did not provide sufficient information in their comments, or in follow-up conversations, to convince the EPA that alternatives had been fully explored at the facility in question. Therefore, the final rule retains the prohibition on the use of HAP-based mold release agents at molded foam production facilities.

3.7.3 Prohibition of HAP-Based Adhesives for Foam Repair (Molded Foam)

Comment: The proposed rule prohibits the use of HAP-based adhesives for foam repair in molded foam production. At proposal, EPA requested comment on the technical feasibility of this requirement.

Two responses to this request were received. The first commenter (IV-D-06) reported that their facility had been attempting to utilize HAP-free adhesives, but that these products have not been successful in all applications. The commenter suggested that the EPA allow for some leniency in the use of HAP-based adhesives. The commenter recommended a review process that would allow a facility to use HAP-based mold release agents if they demonstrated that product quality suffered with the use of HAP-free adhesives.

The second commenter (IV-D-10) expressed concern about the proposed prohibition of HAP-based adhesives. The commenter stated that the "available scientific evidence does not support the proposed provisions to prohibit (methylene chloride) in ... adhesives for

foam repair" In addition, the commenter noted that the health effects associated with methylene chloride exposure will be largely addressed in the revised OSHA permissible exposure limit (PEL). The commenter recommended that the EPA defer consideration of HAP-based adhesives until development of the foam fabrication NESHAP.

Response: First, the EPA disagrees with the commenter that the scientific evidence does not support the proposed provisions (see the response to the comment above regarding the prohibition of HAP-based equipment cleaning in section 3.7.1 of this document). However, the EPA does agree that the issues regarding the use of HAP-based adhesives are very similar to those being investigated by the Agency in connection with the development of a standard for the source category entitled "flexible polyurethane foam fabrication operations." The EPA confirmed that the same adhesives are used for both applications, and that similar problems are experienced in certain situations. Therefore, the final standards do not contain provisions for adhesives used to repair molded foam. Consideration of alternatives to control emissions from this source will be considered along with alternatives to reduce emissions from the use of HAP-based adhesives in the foam fabrication industry.

3.8 Monitoring Requirements

3.8.1 Monitoring of Storage Vessel Carbon Adsorption Systems

Comment: Two comments regarding the proposed monitoring requirements for storage vessel carbon adsorption systems (§63.1303(a)) were received. The first commenter (IV-D-05) felt that the monitoring requirements were not sufficiently protective. The commenter explained that "§63.1303(a) requires that existing carbon be replaced with fresh carbon immediately upon indication of carbon breakthrough. If the monthly monitoring schedule required in this section is followed, an entire month could pass with inadequate control before breakthrough is discovered." The commenter suggested a requirement for more frequent monitoring initially, to determine a "replacement interval", and less frequent monitoring once the replacement interval is known. Additionally, the commenter noted that "vent stream", as used in §63.1303(a)(1)(i) was not defined with respect to where the stream would be sampled.

The second commenter (IV-D-08) felt that storage vessel carbon adsorption systems do not require monthly monitoring. The commenter explained that the potential for breakthrough is a function of the size of the carbon unit and the TDI/ABA loading. The commenter recommended that the proposed rule be changed "to require owner/operators to calculate TDI/ABA loading, size the carbon unit and predict breakthrough. Once completed, the design records would be available on-site for inspection. The owner/operator would subsequently develop a site specific monitoring plan." The commenter felt that this approach would provide significant economic benefit without increasing TDI/ABA emissions.

Response: In response to the first comment (IV-D-05), the EPA does not feel that there is a need to require more frequent monitoring. Storage vessels in TDI/ABA service are not a source of continuous HAP emissions. Storage vessel emissions occur predominantly during filling of the storage vessels, which is a relatively infrequent operation. Considering that carbon canisters in service on storage vessels typically last 3 to 5 years, monitoring on a monthly basis should be adequate.

In response to the second comment (IV-D-08), the EPA would indicate that an alternative to monthly monitoring was provided in the proposed rule in §63.1303(a)(1). This alternative has been retained in the final rule. The alternative permits the owner or operator to set the monitoring frequency at an interval no greater than 20 percent of the carbon replacement interval. The carbon replacement interval is established through a design analysis. The design analysis will consider the vent stream composition, concentration, flow rate, humidity, and temperature. The replacement interval will be based on the capacity of the carbon bed and the schedule for filling the storage vessel. This alternative is very similar to the commenter's recommendation.

3.8.2 Monitoring of HAP ABA in Storage Vessels

Comment: The proposed rule requires weekly monitoring to determine the amount of HAP ABA in storage tanks (§63.1303(d)). The monitoring devices required in the proposed rule would have prohibited the use of gauge glasses and simple floats, which are

common in the industry. At proposal, EPA requested comment on the monitoring requirements and whether the use of gauge glasses, float systems, and other visually-read systems should be allowed.

Three commenters (IV-D-04, IV-D-08, and IV-D-10) responded to the EPA's request for comments on this item. All three commenters felt that visually-read level measurement systems, which are "standard" in the industry, should be allowed. Several reasons were provided, as summarized below.

One commenter (IV-D-04) described the size of the tanks typically found in the industry, and the reasonable percentage error that could be expected with visual measurement techniques. The commenter added that, "Errors in visual measurements will tend to be random in nature and, therefore, self-correcting over time."

The second commenter (IV-D-08) explained that the competitive nature of the industry dictates that facilities eliminate any loss of raw materials. The commenter felt that existing inventory controls could provide the necessary compliance records.

The third commenter (IV-D-10) believed that gauge glasses and simple float systems were sufficiently accurate. The commenter stated that, "Data developed by the Polyurethane Foam Association suggests that percent error associated with the current approaches is comparable to the systems that EPA's proposal would require."

Response: In order to evaluate these comments, the EPA gathered additional data after proposal. This data was obtained by conducting a survey of storage tank level measurement device vendors. The EPA also contacted foam trade organizations and foam producers. The EPA also visited a foam plant and observed first hand the use of visually-read level measurement devices to determine the storage tank level. After considering the comments and additional information, the EPA has concluded that visually-read level measurement devices are more accurate than believed prior to proposal, and that they are capable of providing accurate measurements of the amount of liquid in a storage vessel.

The EPA now believes that the use of gauge glasses and float systems will not result in significantly greater errors in level measurement than devices that meet the proposed requirements. For

example, an error analysis based on typical 10,000 gallon storage vessels and an error in measurement of 0.5 inches indicates that the error is approximately 3.27 ft^3 or 24.5 gallons (0.5 percent) for a vertical tank at half capacity. For horizontal tanks at half capacity, the error is approximately 8.8 ft^3 or 65.8 gallons (1.3 percent).

The EPA also agrees that human errors in visually-read measurement devices will be random in nature and should balance out over time. In order to minimize the potential for human error, the EPA has required that all visually-read measurement devices have permanent graduated markings from which the level will be read. This practice should eliminate any error associated with the use of non-fixed measuring tools, such as tapes or rulers.

The final rule does require that visually-read level measurement devices be calibrated once per year.

3.9 Testing Requirements

Comment: One comment regarding equipment testing (§63.1304(a)) was received. The commenter (IV-D-08) felt that pumps and valves could be "monitored annually and still ensure the proper preventive maintenance to limit potential leaks." The commenter noted that annual testing had already been proposed for connectors. The commenter felt that quarterly testing would be a significant additional cost and would not result in significant HAP ABA emission reductions.

Response: For many years, the EPA has studied organic compound emissions from leaking equipment. The EPA has developed regulations for volatile organic compound (VOC) and organic HAP emissions for a variety of industries. In all of these regulations, the EPA has found that quarterly (or more frequent) monitoring of pumps and valves for leaks was appropriate. However, unique aspects of the foam industry, primarily the relatively low number of affected components, caused the EPA to seriously consider the commenter's suggestion. To evaluate this suggestion, the EPA conducted an analysis comparing the impacts of quarterly and annual monitoring

of HAP ABA pumps and valves.[1] This analysis, which examined only the emissions from pumps and valves, found approximately a 16 percent increase in the emission reduction from baseline, with an approximate 5 percent cost increase. The resulting incremental cost effectiveness in going from annual to quarterly was around $1,200 per ton of HAP emission reduction. The EPA considers this increase reasonable. In other words, the EPA believes that the additional benefits achieved from quarterly monitoring are worth the additional cost. Therefore, the final rule retains the proposed quarterly monitoring requirements.

In addition, the EPA would like to point out that the regulation offers the source-wide alternative for owners or operators that believe it will be more cost-effective to comply with a single standard for all HAP ABA and equipment cleaning emission points, rather than the emission-point specific limitations. Therefore, if the commenter elected to comply with the source-wide alternative, they would not be required to do quarterly monitoring for equipment components.

Comment: One comment was received regarding the requirement to determine the properties (IFD and density) of the foam produced (§63.1304(b)). The commenter (IV-D-08) believed that there was no benefit to testing foams which do not have any ABA in the formulation and requested an exemption from testing those foam grades.

Response: For each specific grade, the allowable emissions are calculated using the formulation limitation (which is calculated using the IFD and density of the grade) and the amount of polyol used to produce the grade. The calculation of the allowable HAP ABA emissions is unrelated to the amount of HAP ABA added to the formulation for that grade. The amount of HAP ABA added represents the actual emissions. Therefore, if a facility produced a particular grade (Grade A) with a formulation limitation greater than zero, but used no HAP ABA, then emission "credits" would be generated.

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[1] Memorandum. Norwood, P., EC/R Incorporated, to Svendsgaard, D., U.S. Environmental Protection Agency. Evaluation of Annual versus Quarterly Monitoring of Methylene Chloride Pumps and Valves for the Flexible Polyurethane Foam NESHAP. August 27, 1997,

This "credit" would then allow the owner or operator to use an amount of HAP ABA higher than the formulation limitation for another grade (Grade B). If no testing of the grade was done to verify the true grade of Grade A, then the owner or operator would not generate credits that could be used in the production of Grade B. Therefore, the EPA sees considerable benefit in testing for all grades that have formulation limitations greater than zero.

However, the EPA does believe that the burden can be reduced by eliminating the requirement that any IFD or density testing be conducted for grades where the owner or operator designates the formulation limitation as zero. This decision is reflected in the final rule.

3.10 Reporting Requirements

Comment: One comment was received in support of the proposed requirement for notification 180 days prior to changing between compliance alternatives (point source or source-wide, §63.1306(f)(1)) or between compliance methods (rolling annual or monthly, §63.1306(f)(2)). The commenter (IV-D-08) requested that the preamble be modified to reflect the 180 day notification period.

Response: The EPA acknowledges the error in the proposal preamble at 61 FR 68414. As the proposal rule states, the intent to switch the compliance method must be submitted 180 days, not 12 months, prior to the change. The requirement for notification 180 days prior to a change in compliance method has been retained in the final rule at §63.1306(f).

3.11 Recordkeeping Requirements

Comment: One comment was received regarding the proposed recordkeeping requirements for IFD and density measurements (§63.1307(c)(1)(i)(B) and (2)(i)(B)). The commenter (IV-D-08) was opposed to testing and maintaining records (IFD, density, amount of polyol used) for foam grades which do not use ABA.

Response: As noted above (see section 3.9), the EPA has determined that IFD and density testing are necessary for some foam grades that do not use an HAP ABA in the formulation, but not necessary for foam grades for which the owner or operator has designated a HAP ABA formulation limitation of zero. Therefore, the requirements

to record the IFD, density, and polyol used for these foam grades that have a designated HAP formulation limitation of zero were also removed.

Comment: One comment was received regarding the proposed recordkeeping requirements for HAP ABA storage vessels (§63.1307(c)(2)(ii). The commenter (IV-D-08) believed that the requirement to keep weekly records of HAP ABA storage vessel levels was excessive. In addition, the commenter felt that the requirement to document weekly inventories of HAP ABA provides no benefit.

Response: The EPA disagrees with this comment. While it is true that compliance with the source-wide alternative must be demonstrated monthly, the EPA strongly believes that more frequent monitoring is necessary. These weekly level measurements will help to document the monthly numbers in case a discrepancy occurs. They will also provide a greater confidence in the monthly usage calculations. Further, the EPA believes that the requirement to maintain weekly records of HAP ABA storage vessel levels is not a significant burden.

3.12 Miscellaneous

3.12.1 Authorities Delegated to States

Comment: One comment was received requesting clarification as to what authorities, if any, can be delegated to States with regards to the proposed rule. The commenter (IV-D-09) noted that many States have been delegated to implement and enforce Part 63 standards, and have in effect become the "Administrator" with all of the appropriate authorities. The commenter reported that in some instances, EPA has specified within given Part 63 standards that certain authorities were not to be delegated to States. The commenter suggests the inclusion of a similar section in this and all Part 63 NESHAPs.

Response: The EPA agrees that the regulations should specify which authorities can be and cannot be delegated to State and local permitting authorities. Section 63.1309 has been added to the final rule to identify these authorities.

3.12.2 Leak Tight Certification for Tank Trucks and Rail Cars

Comment: One comment was received regarding tank trucks and rail cars that deliver TDI or other HAP to storage tanks employing

vapor balance. The commenter (IV-D-09) noted that the regulation does not specify that tank trucks and rail cars be certified leak tight periodically, and that without such a mechanism, emissions will escape from the trucks and rail cars regardless of any controls on the storage tanks.

Response: The EPA disagrees that leak tight certification for tank trucks and rail cars should be included in the regulation. Both of the primary HAP used in this industry, methylene chloride and TDI, are classified as 6.1 hazardous (i.e., toxic) materials under Department of Transportation (DOT) regulations at 49 CFR 172.01. Each is subject to specifications for cargo tanks (e.g., truck and rail cars) under 49 CFR 173. 49 CFR 178 contains numerous testing and certification requirements for cargo tanks and other containers to ensure that they are leak tight. Due to these requirements, tank trucks or rail cars delivering TDI or other HAP to affected sources will be required to be leak tight. Additional regulation under the NESHAP would be duplicative. The final regulations have not been changed to require leak certification.

3.12.3 Non-ABA HAP Emissions

Comment: One commenter (IV-D-09) noted from the requirement that pumps in TDI service be seamless or submerged in TDI or the HAP bis(2-ethylhexyl) phthalate (DEHP), it appears that DEHP may be stored at facilities, though the EPA has not specified controls for such storage. The commenter requested that the EPA provide clarification as to whether non-ABA HAP emissions were evaluated, what the results of the evaluation were, and how the emissions are to be controlled.

Response: The EPA specified in §63.1294(b) of the proposed rule that pumps in diisocyanate service must be either sealless or submerged pumps. Submerged pumps are completely immersed in bis(2-ethylhexyl)phthalate (DEHP), 2(methyloctyl)phthalate (DINP), or another neutral oil. The purpose of the fluid is to prevent diisocyanate from contacting and reacting with moisture in the air. The pump and liquid are typically contained in a rectangular container made of heavy-gauge steel. The container normally has a loose-fitting metal cover to prevent objects and dirt from falling into the liquid. If a pump seal does leak, the diisocyanate will cause the oil to

become cloudy, indicating that the seal must be replaced. The commenter was incorrect in their interpretation that pumps in diisocyanate service could be submerged in TDI.

No controls were reported for the storage of DEHP at foam plants. Therefore, the MACT floor was determined to be no control. Additionally, no control options that could be applied to these DEHP emissions were identified that the EPA believed would be cost effective. This is primarily due to the three facts (1) DEHP is typically stored in barrels or very small storage vessels, (2) the EPA does not expect any significant emissions from DEHP storage, and (3) DEHP has a very low vapor pressure and will not easily volatize under normal conditions. Therefore, no control levels above the floor were evaluated.

Comment: One comment was received regarding propylene oxide (PO) and diethanolamine (DEOA). The commenter (IV-D-04) requested that the EPA clarify that these two chemicals are not controlled under this NESHAP. The commenter stated that propylene oxide is present in small amounts as a stabilizer in methylene chloride, and is difficult to measure or account for. The commenter added that DEOA has a very high vapor pressure, is very reactive with TDI, and is used in very small amounts, so that emissions are expected to be minute.

Response: The EPA agrees with the commenter's statements regarding propylene oxide (PO) and diethanolamine (DEOA) emissions from foam production. As correctly pointed out by the commenter, PO is present in small amounts as a stabilizer in methylene chloride. This is the only source of PO identified at foam production facilities. Since many of the requirements of the rule restrict the usage of methylene chloride, PO emissions will also be reduced. Therefore, the EPA does not believe that separate requirements are necessary for PO.

No controls were specified in the rule for emissions of DEOA at foam plants because no controls were identified; therefore the MACT floor was determined to be no control. The boiling point of DEOA is very high (518°F), and it is very reactive with TDI. As a result, practically all of the DEOA added to the foam is consumed. Therefore, the EPA did not evaluate control of DEOA emissions from the production line.

Regarding the storage of DEOA, no control options that could be applied to these DEOA emissions were identified at foam production facilities. Therefore, the floor would be no control for these emissions. The three factors mentioned in the previous comment for DEHP also apply to DEOA. Therefore, no control levels above the floor were evaluated for DEOA storage vessels.

3.12.4 Request for Equivalency Determination

Comment: One commenter (IV-D-12) requested that the EPA make an equivalency determination between the proposed NESHAP and a rule which the commenter has already adopted to control emissions from the manufacturing of polymeric cellular (foam) products. The commenter proposed a means of resolving any differences between the two rules and provided a list of potential benefits of declaring the two rules equivalent.

Response: First, the commenter provided considerable information on various local regulations that regulate HAP emissions from the production of flexible slabstock foam. However, the evaluation of State and local rules for equivalency with a Federal rule is a complex task. While the comparison of control requirements can be relatively straightforward, the comparison of the compliance provisions (monitoring, reporting, recordkeeping, what constitutes a violation, etc.) is much more difficult.

Conducting an equivalency determination in conjunction with the evaluation of public comments on a proposed rule is even more difficult. Equivalency with the final rule must be evaluated, so the Agency must first decide all the rule changes to be made in response to public comments before initiating the equivalency evaluation. Therefore, an equivalency determination as requested by the commenter would delay promulgation of the rule, perhaps substantially. The EPA does not believe that delaying promulgation of the federal rule to allow an equivalency determination of one specific State or local rule is appropriate. Therefore, the EPA did not conduct an equivalency determination with the commenter's rule.

In conclusion, the EPA determined that an equivalency determination should be conducted after promulgation of the final rule in accordance with the provisions of 40 CFR 63, Subpart E.

3.12.5 Format of Emission Standards

Comment: One comment regarding the format of the emission standards was received. The commenter (IV-D-03) was concerned that the proposed rule was "not in the form of emission standards, but of design and operational standards, with an extensive reliance on the use of reformulated materials."

The commenter felt that the EPA should "modify the proposed rule to specify target emissions or target emissions reductions, and allow sources to choose any appropriate means of attaining these targets." The commenter also stated that "At a minimum, the rule should explicitly allow use of air pollution control equipment at all affected sources, without a requirement to petition EPA to use that equipment. While the Agency might argue that proposed §63.1305 already allows the use of control equipment, a requirement to seek the approval of the Administrator represents a huge practical barrier to doing so."

The commenter suggested language reflecting this position to be added to §63.1297, §63.1300, and §63.1301.

Response: During the development of the regulation, the EPA consulted with the flexible polyurethane foam industry in determining the format of the regulation. The formats selected for the various emission points provide considerable flexibility in how a facility can comply with the rule.

With regard to the HAP ABA provisions of the regulation, the EPA strongly disagrees with the commenter's assertion that the regulation is "a straightjacket approach forcing specified approaches to pollution prevention . . . . " In fact, the HAP ABA provisions specify target emission levels, just as the commenter requested. These target (i.e., allowable) emissions take into account production schedules and types of foam produced. The owners and operators have complete flexibility in deciding how to reduce emissions below the allowable emissions level. It is true, however, that recovery devices are the only type of "add-on" control for which

requirements are specified in the regulation. If an owner or operator wanted to use a combustion or other control device, a request for an alternative control would have to be submitted to the Agency.

The EPA considered including specific requirements for a variety of control devices in the regulation, but was convinced by the industry that such provisions were not needed. According to the industry, the slabstock foam production process is not amenable to capturing and controlling the HAP ABA emissions in a traditional manner. Although State and local environmental agencies are continuing to require additional emission reduction in this industry, the EPA is only aware of one foam facility in the United States that has installed add-on control (a carbon adsorber) to reduce HAP ABA emissions.

In conclusion, the EPA believes that add-on control techniques other than recovery devices could potentially reduce HAP ABA emissions. However, the industry's strong opinions that such techniques would seldom, if ever, be used led the EPA to conclude that it was not necessary to include provisions for these hypothetical applications in the regulation. Nothing in the commenter's argument changes this opinion. Therefore, the final rule continues to require that the use of any control device other than a recovery device be approved by the Administrator.

With regard to the other emission points mentioned by the commenter (mold release agents and adhesive reformulation), the proposed rule did not specify a technology that must be used to comply. For both of these types of emission points, the proposed rule prohibited the use of HAP-based products. As discussed in section 3.7.3, the prohibition in the use of HAP-based adhesives has been removed from the regulation. The final rule maintains the requirement that no HAP-based products be used as mold release agents. While the EPA acknowledges that add-on control could potentially be used to reduce emissions from HAP-based mold release agents, the Agency doubts that such devices could ever meet the requirements of the regulation (i.e., 100 percent control). Therefore, the final rule does not include provisions for the use of add-on control equipment for mold release agent releases. However, the option is

available to submit an alternative control technology demonstration to the Administrator in this or any situation.

In conclusion, the EPA did not change the regulation in response to these comments. The Agency believes that the rule provides flexibility in how an owner or operator elects to comply with the rule. Further, for HAP ABA, the EPA believes that the provisions for obtaining approval to utilize add-on control devices other than recovery devices are appropriate, given the unlikely event that such technologies would ever be selected by the owner or operator of a foam facility.

3.12.6 Regulatory Language

Comment: One comment was received regarding the regulatory language in §63.1300(a)-(c). The commenter (IV-D-07) was concerned about the use of the word "source" in the term "molded flexible polyurethane foam source"--which is not defined in the proposed rule. The commenter noted that the word "source" could be broadly interpreted to include not only a specific foam process but an entire building or facility. Thus, it could be interpreted that this rule bans the use of HAP solvents and other HAP-based material at non-polyurethane foam process throughout a building or facility if such building or facility happens to also house a molded flexible polyurethane foam or rebond foam process." The commenter felt that this was not the EPA's intent, and suggested language to clarify the situation.

Response: The EPA agrees that the use of "molded flexible polyurethane foam source" in §63.1300(a)-(c) is confusing. The language in those provisions has been replaced with "molded flexible polyurethane foam process," which is defined in §63.1292. This change should clarify when the use of HAP solvents, HAP-based mold release agents, and HAP-based adhesives is prohibited.