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Technical Support Document

National Emission Standards for Hazardous Air Pollutants: Surface Coating of Plastic Parts and Products

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EASTERN RESEARCH GROUP, INC.

MEMORANDUM

To: Plastic Parts and Products Surface Coating NESHAP Docket No. A-99-12

From: Kim Teal, EPA/ESD, and Brian Palmer and Christy Burlew, ERG, Inc.

Date: October 10, 2002

Subject: Rationale for the Selection of the Source Category Definition and Subcategories for the Plastic Parts and Products Surface Coating Source Category.

1.0 INTRODUCTION

This memo describes EPA's rationale for the selection of the plastic parts and products surface coating source category definition and the selection of subcategories for thermoplastic olefin (TPO) coating operations, headlamp coating operations, and assembled on-road vehicle coating operations that are separate from the general use coating subcategory. Below is a list of sections within this memo:

2.0 Background Information

3.0 Selection of the Source Category Definition

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2.0 BACKGROUND INFORMATION

Plastic parts and products include, but are not limited to, plastic components of many types of products and, in many cases, the products themselves, that are formed of synthetic polymers. These plastic components and products include motor vehicle parts and accessories for automobiles, trucks, and recreational vehicles; sporting and recreational goods; toys; business

machines; laboratory and medical equipment; and household and other consumer products. The plastic parts and products surface coating source category consists of facilities that apply protective, decorative, functional, or adhesive coatings to plastic parts and products through a post-mold coating process. The source category does not include in-mold coating operations, such as the application of gel coatings to a mold in the manufacture of reinforced plastic composite parts, because these operations will be regulated by a separate NESHAP for Reinforced Plastic Composites (RPC) production.

Section 112 of the Clean Air Act (CAA) gives EPA the discretion to determine if separate emission limitations are needed for subcategories and for different classes, types, and sizes of sources within a category or subcategory. A subcategory is a group of similar sources within a given source category. The proposed rule establishes four subcategories in the plastic parts and products surface coating source category: (1) general use coating operations, (2) thermoplastic olefin (TPO) coating operations, (3) automotive headlamp coating operations, and (4) assembled on-road vehicle coating operations.

3.0 SELECTION OF THE SOURCE CATEGORY

The surface coating of plastic parts and products is on the list of source categories to be regulated because it contains major sources of hazardous air pollutants (HAP). A major source of HAP is defined by Section 112 of the CAA as any stationary source or group of stationary sources located within a contiguous area and under common control that emits or has the potential to emit considering controls, in the aggregate, 10 tons per year or more of any hazardous air pollutant or 25 tons per year or more of any combination of hazardous air pollutants. The proposed rule would control organic HAP emissions from both new and existing major sources. Area sources are not being regulated under the proposed rule.

The plastic parts and products surface coating source category includes a variety of coating operations on a vast array of plastic parts and products. Therefore, the source category and applicability criteria in the proposed rule have been broadly defined. However, EPA realized that the broad source category definition and applicability criteria could potentially include incidental surface coating operations that are not part of the source category. Most coating

operations are located at plant sites that are dedicated to surface coating, or co-located with some other activity, such as automobile assembly plants that coat plastic automobile parts or accessories off the assembly line. These co-located surface coating operations are included in the source category because they are comparable to the dedicated plastic parts surface coating facilities, in terms of the type and size of coating operation and the applicable emission control techniques.

The source category does not include facilities that use less than 100 gallons per year of all plastic parts coatings, cleaners, thinners, surface preparation materials, and adhesives. At these facilities, the plastic parts surface coating operations are not integral to the principal activity if the facility is otherwise a major source. Instead, these coating operations are only part of facility maintenance or for product touch-up and repair and are incidental to the primary activity at the facility.

We selected the criteria of 100 gallons per year after reviewing the available data and information to identify a common characteristic to distinguish those sources for which the surface coating of plastic parts and products is not an integral activity from those for which it is either their principal activity or an integral part of a production process that is the principal activity. Based on our review, we believe the quantity of coating used is the best criteria for purposes of defining the scope of the category. Other criteria that we considered but rejected were production rate, quantity of emissions, and solvent usage. These other criteria were rejected either because they were too difficult to implement or because they did not allow facilities to be compared on an equal basis.

Among those facilities for which EPA has survey data, about 10 facilities each use less than 100 total gallons per year of all coatings, cleaners, thinners, surface preparation materials, and adhesives in the plastic parts source category. These facilities do not represent the other facilities in the database because they are primarily assembly operations and only use small quantities of paint or adhesives to assist in the assembly operation and repair minor defects during the assembly operation. The small amount of paint or adhesives used at these facilities is not integral to their principal activity. Therefore, these facilities are not considered surface coating facilities and are not included in the source category, as defined in the proposed rule. The other facilities in the database for which surface coating is their principal activity (or integral to their

principal activity) used at least 300 gallons of materials per year. The EPA did not include in the MACT floor analysis the facilities that use less than 100 total gallons per year of all materials. We are not aware of any surface coating operation at a major source that is dedicated to plastic parts and products surface coating and is using less than 100 gallons of materials per year and, thus, we did not evaluate whether the MACT level of control would be appropriate for such operations if they exist.

The source category also does not include research or laboratory facilities or janitorial, building, facility maintenance operations, and hobby shops because these are not integral to plastic parts surface coating operations. The source category also does not include coating of magnet wire, coating of plastics to produce fiberglass boats (other than personal watercraft), and the extrusion of plastic onto a plastic part or product to form a coating. These surface coating activities and operations are not comparable to the surface coating operations and applicable control techniques at dedicated facilities, and are regulated or are being considered for regulation as part of other source categories. Thus, they are not considered to be within the scope of the source category.

The source category also does not include coating of plastic parts and products that is subject to certain other surface coating NESHAPs in 40 CFR part 63. These specific subparts are listed in the rule. These operations are already being regulated by another NESHAP as part of another source category and we want to avoid overlap where coating of the same part would be subject to multiple rules.

4.0 SELECTION OF THE SUBCATEGORIES

As part of the regulatory development process, we evaluated the similarities and differences among industry segments or groups of facilities comprising a source category. Once the floor has been determined for new or reconstructed and existing affected sources for a source category or subcategory, we must set MACT standards that are no less stringent than the MACT floor. Such standards must then be met by all sources within the source category or subcategory.

After reviewing survey responses from the industry, facility site visit reports, and information received from stakeholder meetings, we identified four subcategories within the

plastic parts and products surface coating source category: (1) general use coating, (2) TPO coating, (3) headlamp coating, and (4) assembled on-road vehicle coating. The general use coating subcategory includes all plastic parts and products coating operations, except TPO, headlamp, and assembled on-road vehicle coating operations, that coat a wide variety of substrates, surfaces, and types of plastic parts, as well as more specialized coating scenarios. Each of the four subcategories includes adhesive and non-adhesive coating operations and associated surface preparation, equipment cleaning, mixing and storage, and waste handling. The information used to assess and identify the TPO and headlamp coating subcategories include information collected during EPA site visits to TPO and headlamp coating sources, information from stakeholder meetings, and information provided to EPA by the National Paint and Coatings Association (NPCA). See References 1, 2, 3, and 4, respectively. The information used to identify the assembled on-road vehicle surface coating subcategory included information collected from stakeholder meetings with the Recreational Vehicle Industry Association (RVIA) and during EPA site visits. See References 5, 6, 7, 8, and 9. The following paragraphs describe why TPO coating, headlamp coating, and assembled on-road vehicle coating were identified as separate subcategories from the general use coating of plastic parts and products.

4.1 Selection of the Thermoplastic Olefin Coating (TPO) Subcategory

Olefinic substrates are non-polar plastics that include polypropylene, thermoplastic polyolefins (TPO), ethylene-propylene-diene-modified rubber (EPDM) and other ethylene-propylene copolymers. Olefinic plastics are used for highly-visible automotive applications such as bumper fascias, bumper filler strips, exterior grilles, and interior door and dash panels and airbag covers. Some of these parts must meet specific performance requirements to protect vehicle passengers (e.g., flexibility at low temperatures for air bag covers) or to minimize damage from minor contact with other objects (e.g., scuff resistance for bumper fascia).

Because of the non-polar nature of the TPO substrates, a non-polar solvent must be used in the primers for TPO (also known as adhesion promoters) so the coatings will wet-out and adhere to the substrate. The surface tensions of organic HAP solvents such as toluene, xylene, and other non-polar aromatic solvents are ideal for wetting TPO. The surface tension of polar

non-HAP solvents is too high to allow the primer to wet-out the TPO part. In conjunction with adequate wetting of the TPO, the solvents in the adhesion promoter must migrate through the surface of the TPO and swell the rubber elastomer component in the TPO. The swelling of the elastomer in the TPO and the subsequent entanglement of the elastomer with the paint provides the adhesion necessary to coat TPO successfully. Many non-HAP solvents either evaporate too quickly to adequately migrate through and swell the elastomer in the TPO, or the solvents swell the elastomer to the point of distortion of the part. Therefore, the adhesion promoters used in TPO coating operations contain high levels of non-polar organic HAP solvents to achieve adequate wetting of the substrate and swelling of the elastomer rubber to provide good adhesion between the paint and the substrate.

In addition, the TPO adhesion promoters must be applied in very thin films (0.0001 to 0.0003 inches) to achieve the best performance. The application of a thin film requires the use of a very low-solids coating. If the adhesion promoter is applied in too thick a film, it will tend to crack. If the adhesion promoter is applied too thin, the topcoat will not adhere to the TPO substrate. Current application techniques are not able to apply higher solids adhesion promoters in consistent thin films. Furthermore, associated topcoats, colorcoats, and cleaning materials used in conjunction with the adhesion promoters to coat TPO are part of the overall coating system and are chosen to be compatible with the adhesion promoter.

The unique characteristics and performance requirements of TPO substrates, and the need to use non-polar HAP solvents and a low solids content adhesion promoter means that TPO coating operations are technically distinct from coating operations in the general use coating subcategory and also have different emission characteristics. Because all coating and cleaning materials associated with the coating of TPO are interrelated, TPO coating operations are considered a separate subcategory from other plastic parts and products coating operations.

4.2 Selection of the Headlamp Coating Subcategory

Headlamp coating is considered as a separate subcategory because these coating operations require specialized reflective argent coatings and hard clear coatings to meet U.S. Department of Transportation motor vehicle safety standards for reflectivity, brightness, color,

and other performance criteria. (See 49 CFR 571.108.) The reflective argent coatings and hard clear coatings used at existing sources often contain high levels of organic HAP and low levels of solids.

The reflective argent coatings often used in headlamp coating operations are air-dried lacquers that use aluminum pigments contained in the coating to achieve the reflective finish required by the federal safety standards. These coatings use aromatic or aliphatic organic HAP solvents that allow the leafing aluminum pigments to rise to the surface of the coating to create the necessary reflective aluminum surface. There are no low-HAP alternatives for this type of sprayable, liquid coating.

The hard clear coatings used in polycarbonate headlamp coating operations, such as thermally-cured silicone coatings, are required to make the headlamp lens abrasion and scratch resistant. Polycarbonate is currently the only plastic substrate approved by the National Highway Traffic Safety Administration (NHTSA) for use in headlamp lenses because this material is shatter resistant and heat resistant. The hard clear coatings used on the polycarbonate headlamps require the use of certain organic HAP solvents, such as butyl cellosolve, in these coatings to avoid etching of the lens surface. Non-HAP solvents used in other general use plastic coatings can etch the surface of polycarbonate lenses. An etched surface would prevent light from passing through the lens correctly and would reduce the performance of the lens and create safety concerns.

The need to use specific organic HAP solvents in the reflective argent coatings and hard clear coatings for automotive headlamps prevent facilities that coat headlamps from using lower-HAP coatings. Because headlamp coating operations are technically distinct from those in the general use coating subcategory, must meet special NHTSA requirements, and have different emission characteristics, headlamp coating is considered a separate subcategory from other plastic parts and products coating operations.

4.3 Selection of the Assembled On-Road Vehicle Coating Subcategory

Assembled on-road vehicle coating operations are the painting of fully-assembled vehicles that are intended to be driven or towed on regularly maintained roadways. Examples of these coating operations are the painting of assembled recreational vehicles (including motor homes and

travel trailers), the painting of assembled fleet trucks, the painting of assembled cargo or utility trailers, the painting of assembled public transportation buses and shuttle buses, and the refinishing of automobiles and light trucks (either for cosmetic reasons or as part of collision repair activities). Assembled on-road vehicle coating operations do not include the coating of parts of vehicles prior to their assembly at an original equipment manufacturer's factory. It also does not include the coating of off-road vehicles or machinery, such as earth moving and construction equipment and railroad vehicles.

Adhesives, caulks, and sealants that are used to bond parts and to make weather-tight seals between parts are not considered part of the assembled on-road vehicle coating operations because they are used in the assembly operations and not in the final coating operations. Therefore, they are considered part of the general use coating subcategory.

Assembled on-road vehicle coating is considered a separate subcategory because these coating operations are performed on fully-assembled vehicles that may contain heat sensitive parts. In addition, fully assembled on-road vehicles are physically larger than the other plastic parts and products coated in this source category. The large size and presence of heat sensitive parts make certain lower-HAP coating technologies, such as heat-cured waterborne coatings, not feasible for use on fully assembled on-road vehicles. These factors also make these coating operations technically different from the sources that do not coat assembled on-road vehicles.

The problems associated with coating assembled on-road vehicles were first raised by the recreational vehicle manufacturers that build and coat motor homes and travel trailers. In many cases, the exterior surface of motor homes and travel trailers is almost entirely fiber-reinforced plastic (FRP). In some cases, the gel coat surface of the FRP body panels is the final finish on the recreational vehicle. However, in many cases, especially with motor homes, the assembled vehicle is partially or fully painted with an automotive-type finish. According to recreational vehicle industry representatives, more consumers are demanding fully painted motor homes and the industry is moving toward producing more fully painted motor homes. Towable recreational vehicles (e.g., travel trailers and fifth wheels) are not usually painted except to repair surface defects that occur during manufacturing. See Reference 5.

It is likely that the same problems (i.e., large part size and heat sensitive components)

encountered by the recreational vehicle manufacturers will be encountered by other facilities that coat plastic bodies for other types of assembled on-road vehicles. In addition, some facilities coat a mix of assembled on-road vehicles including automobiles, recreational vehicles, public transportation, and fleet trucks. Therefore, the coating of these other types of vehicles is included in the assembled on-road vehicle subcategory and the subcategory is not limited to just recreational vehicles. The on-road vehicle subcategory is limited to only surface coating on assembled on-road vehicles in order to avoid an overlap with source categories that include assembly-line coating operations at automobile, light-duty truck, and heavy-duty truck manufacturing facilities.

It is also important to note that the exterior surface of many assembled on-road vehicles is a mix of plastic and metal body components. An assembled on-road vehicle coating operation is considered part of this subcategory if greater than 50 percent of the surface being coated on the vehicle is plastic. For example, on many recreational vehicles the majority of the body is fiberglass, but aluminum and other metals are used for doors on exterior storage compartments and door latches, among other things. In this case, the surface coating of the entire body (including the metal parts) would be considered part of the assembled on-road vehicle subcategory.

5.0 SUMMARY

After the source category for plastic parts and products surface coating was defined and the subcategories of sources were identified, we developed emission standards for new and existing sources in the general use coating subcategory, the TPO coating subcategory, the headlamp coating subcategory, and the assembled on-road vehicle subcategory. The methodology for distinguishing the data for these sources and determining MACT for the general use, TPO, and headlamp coating subcategories is discussed in the memorandum, “Determination of Maximum Achievable Control Technology (MACT) for New and Existing Sources in the Plastic Parts and Products Surface Coating Source Category,” (Reference 10). (Docket No. A-99-12). The methodology for determining MACT for the assembled on-road vehicle coating

subcategory is discussed in the memorandum, "Determination of Maximum Achievable Control Technology (MACT) Floor for New and Existing Sources in the Assembled On-Road Vehicle Subcategory of the Plastic Parts and Products Surface Coating Source Category," (Reference 11). (Docket No. A-99-12).

6.0 REFERENCES

1. EPA Site Visit to Visteon Corporation, TPO Coating Operation in Milan, Michigan. Trip Report prepared by Christy Burlew, ERG, Inc. and Kim Teal, EPA/ESD. (Docket No. A-99-12).

2. EPA Site Visit to Visteon Corporation, Headlamp Coating Operation in Sandusky Ohio. Trip Report prepared by Christy Burlew, ERG, Inc., and Kim Teal, EPA/ESD. (Docket No. A-99-12).

3. Memorandum from Burlew, Christy, ERG, Inc., to Teal, Kim, EPA/ESD. "Summary of Responses to Issues Raised by Stakeholders for the Plastic Parts and Product Surface Coating NESHAP." (Docket No. A-99-12).

4. Paper prepared by the National Paint and Coatings Association from Nelson, Bob, Senior Director of Environmental Affairs, National Paint and Coatings Association (NPCA), for Teal, Kim, EPA/ESD. "Examples of Plastic Parts Specialty Coatings." March 16, 2001, (Docket No. A-99-12).

5. Memorandum from Palmer, Brian, ERG, Inc., to Teal, Kim, EPA/ESD. April 26, 2002. "Summary of discussions during meetings with members of the Recreational Vehicle Industry Association (RVIA) in Elkhart, Indiana on October 30 and 31, 2001." (Docket No. A-99-12).

6. Memorandum from Palmer, Brian, ERG, Inc., to Teal, Kim, EPA/ESD. February 21, 2002. "Summary of observations made at the Monaco Coach recreational vehicle (RV) manufacturing and surface coating facilities in Wakarusa and Elkhart, Indiana surveyed on October 30 and 31, 2001." (Docket No. A-99-12).

7. Memorandum from Palmer, Brian, ERG, Inc., to Teal, Kim, EPA/ESD. "Summary of observations made at the Georgie Boy recreational vehicle manufacturing facility in Edwardsburg, Indiana and the Pro-Design recreational vehicle (RV) surface coating facility in Elkhart, Indiana surveyed on October 30, 2001." **Confidential Pending**

Company Review.

8. Memorandum from Palmer, Brian, ERG, Inc., to Teal, Kim, EPA/ESD. February 21, 2002. "Summary of observations made at the Perfomance Painting, Inc., recreational vehicle (RV) surface coating facility in Elkhart, Indiana surveyed on October 31, 2001." (Docket No. A-99-12).

9. Memorandum from Palmer, Brian, ERG, Inc., to Teal, Kim, EPA/ESD. "Summary of observations made at the Dynamax Corporation recreational vehicle (RV) manufacturing and surface coating facility in Elkhart, Indiana surveyed on October 30, 2001." (Docket No. A-99-12). **Confidential Pending Company Review.**

10. Memorandum from Burlew, Christy, ERG, Inc., to Teal, Kim, EPA/ESD. September 2002. "Determination of Maximum Achievable Control Technology (MACT) Floor for New and Existing Sources in the General Use Coating, Thermoplastic Olefin (TPO), and Headlamp Coating Subcategories of the Plastic Parts and Products Surface Coating Source Category." (Docket No. A-99-12).

11. Memorandum from Palmer, Brian, ERG, Inc., to Teal, Kim, EPA/ESD. September 2002. "Determination of Maximum Achievable Control Technology (MACT) Floor for New and Existing Sources in the Assembled On-Road Vehicle Subcategory of the Plastic Parts and Products Surface Coating Source Category." (Docket No. A-99-12).

EASTERN RESEARCH GROUP, INC.

MEMORANDUM

TO: Kim Teal, U.S. Environmental Protection Agency, OAQPS (C535-03)

FROM: Brian Palmer, ERG, Inc.

DATE: October 10, 2002

SUBJECT: Determination of Maximum Achievable Control Technology (MACT) Floor for New and Existing Sources in the Assembled On-Road Vehicle Subcategory of the Plastic Parts and Products Surface Coating Source Category

1.0 INTRODUCTION

This memo describes the MACT floor analysis for new and existing sources performing surface coating on assembled on-road vehicles, including the methodology, the assumptions used during analysis, the data sources and the MACT floor results for the National Emission Standard for Hazardous Air Pollutants (NESHAP) for the Surface Coating of Plastic Parts and Products. The coating of assembled on-road vehicles is a subcategory in the source category for plastic parts and products surface coating. Below is a list of the sections within this memo:

Section 2.0 Background information

Section 3.0 Data sources

Section 4.0 Affected source and format of MACT floor

Section 5.0 MACT floor analysis methodology

Section 6.0 Data quality, revisions, and review of analysis results

Section 7.0 Representativeness of floor facilities

Section 8.0 Existing source MACT floor results

Section 9.0 New source MACT floor results

Section 10.0 Beyond-the-floor options

Section 11.0 References

2.0 BACKGROUND

Assembled on-road vehicle coating operations are the painting of fully-assembled vehicles that are intended to be driven or towed on regularly maintained roadways. Examples of these coating operations are the painting of assembled recreational vehicles (including motor homes and travel trailers), the painting of assembled fleet trucks, the painting of assembled cargo or utility trailers, the painting of assembled public transportation buses and shuttle buses, and the refinishing of automobiles and light trucks (either for cosmetic reasons or as part of collision repair activities). Assembled on-road vehicle coating operations do not include the coating of parts of vehicles prior to their assembly at an original equipment manufacturer's factory. It also does not include the coating of off-road vehicles or machinery, such as earth moving and construction equipment and railroad vehicles.

The coating operations included in this subcategory are only those coating operations that are performed on vehicles where over 50 percent of the surface being coated are plastic substrates. In general, these are the exterior body surfaces of the assembled vehicle. We have not encountered any operations in which an interior surface of an assembled on-road vehicle is coated. Adhesives, caulks, and sealants that are used to bond parts and to make weather-tight seals between parts are not be considered part of the assembled on-road vehicle coating operations because they are used in the assembly operations and not in the final coating operations. The materials used in the assembly operations are considered part of the general use subcategory in the plastic parts and products surface coating source category, as discussed in the separate memo describing the different subcategories in the plastic parts and products source category.

Assembled on-road vehicle coating is considered a separate subcategory because these coating operations are performed on fully-assembled vehicles that may contain heat sensitive parts. In addition, fully assembled on-road vehicles are physically larger than the other plastic parts and products coated in this source category. The large size and presence of heat sensitive parts make certain lower-hazardous air pollutant (HAP) coating technologies, such as heat-cured waterborne coatings, not feasible for use on fully assembled on-road vehicles. These factors also make these coating operations technically different from the sources that do not coat assembled on-road vehicles. Additional background information on the development of subcategories and

the definition of this subcategory are provided in the separate memo describing the different subcategories in the plastic parts and products surface coating source category.

Section 112(d) of the CAA directs EPA to develop standards that require the maximum degree of reduction in emissions of HAP that is achievable, which are commonly referred to as MACT standards. For existing major sources, the CAA requires MACT to be no less stringent than the average emission limitation achieved by the best-performing 12 percent of existing sources (or the best-performing five sources for categories or subcategories with fewer than 30 sources) among the data available to the Administrator. For new major sources, the CAA requires MACT to be no less stringent than the emission limitation achieved in practice by the best-controlled similar source. These minimum stringency levels are often referred to as the "MACT floor."

The term "average", as it pertains to MACT floor determinations for existing sources, described in section 112(d)(3) of the CAA, is not defined in the statute. In a Federal Register notice published on June 6, 1994 (59 FR 29196), the EPA concluded that Congress intended "average" as used in section 112(d)(3) to mean a measure of mean, median, mode, or some other measure of central tendency. The EPA concluded that it retains substantial discretion within the statutory framework to set MACT floors at appropriate levels, and that it construes the word "average" [as used in section 112(d)(3)] to authorize the EPA to use any reasonable method, in a particular factual context, to determine the central tendency of a data set.

Since the EPA has data for less than 30 sources in the assembled on-road vehicle subcategory, the existing source MACT floor is based on the average emission rate achieved by the five lowest emitting sources. The new source MACT floor is based on the emission rate of the lowest emitting similar source in the subcategory.

3.0 DATA SOURCES

3.1 Data Collection Activities for MACT Floor

The majority of the affected facilities in this subcategory are recreational vehicle manufacturers or contract paint shops that specialize in surface coating recreational vehicles. The Recreational Vehicle Industry Association (RVIA) provided data on 21 recreational vehicle manufacturing facilities and two facilities that are contract paint shops that specialize in painting recreational vehicles. The EPA visited four of these recreational vehicle manufacturing facilities

and the two contract paint shops that specialize in painting recreational vehicles.[1,2,3,4] According to the RVIA, the facilities represented by these data constitute about 65-percent of the total RV production capacity in the U.S.[5] The EPA also visited one facility that manufactures fleet-type cargo trucks on pre-manufactured chassis and performs surface coating on the completed trucks.[6]

Recreational vehicle manufacturers constitute the majority of facilities included in this subcategory, which also includes fleet-type cargo truck body manufacturers, cargo trailer manufacturers, and bus body manufacturers. The EPA did not use a survey or other mechanism to collect data beyond those provided by the RVIA, but we did perform on-line searches of a sample of truck body manufacturers, cargo trailer manufacturers, and bus body manufacturers to determine the extent to which these manufacturers used plastic body components and performed surface coating operations on the assembled vehicles. Out of 17 truck body manufacturers, only two appeared to use predominantly fiber-reinforced plastic (FRP) components. Only one out of 11 trailer manufacturers used FRP body components and these were only the fenders and end caps. Out of 20 bus manufacturers, three build some specialty busses with fiberglass bodies and several others use fiberglass end-caps, but the end caps constitute less than 50 percent of the surface area of the bus body.[7]

3.2 Assembled On-Road Vehicle Subcategory Surface Coating MACT Floor Database

The data provided by the RVIA were in the form of spreadsheets prepared and submitted by the RVIA. The data for these facilities included both materials used for assembly operations and assembled vehicle painting operations. The data for assembly operations, which are part of the general use subcategory, include adhesives, sealants, caulks, FRP touch-up materials, and assembly operation cleaning solvents. The data for the assembled vehicle painting operations included primers, topcoats, basecoats, clearcoats, specialty materials, and paint preparation and cleanup solvents. The painting data were segregated from the assembly data since the assembly operations are not considered part of the assembled on-road vehicle coating subcategory. No materials were used in both the assembly and painting operations, so there was no overlap in the data between the two operations.

Two facilities (Carriage and Skyline) were excluded from the database for this subcategory because they perform only assembly operations and do not perform any painting operations. Therefore, they do not have any operations considered part of this subcategory.

Two other facilities (Georgie Boy and Nu-Way) were excluded from the database because they reported very low coating usage in their painting operations (20 gallons and 4 gallons, respectively). We concluded that painting operations are not among these facilities' principal activities and these facilities do not represent those which are more actively engaged in painting operations.

The data for three facilities (Fleetwood facilities 47 and 77; and Winnebago) were not included in the MACT analysis because these facilities are switching from using a single-stage topcoat painting system to a basecoat/clearcoat painting system.[8,9] Because these facilities are switching to a different coating system, the prior data collected do not represent their ongoing operations. (In addition, the operations at Fleetwood facility 77 are being shifted to those at facility 47 and facility 77 is being closed, so these data were combined and are reported as Fleetwood 47/77.[10]) According to RVIA representatives, the basecoat/clearcoat systems, in which a clear topcoat is applied over a colored basecoat, give a finish that is more similar to an automotive-type finish. Consumers prefer the finish of the basecoat/clearcoat systems and manufacturers are switching over to these to meet this consumer demand, according to industry representatives. The data for Fleetwood facility 52 were not included since this facility closed in early 2001.

The data for two facilities, Coachmen and Damon, were not included in the MACT analysis because Coachmen was not similar to other sources and because the data from Damon appeared to be incomplete. Coachmen applies mostly primers to motor homes at this facility but then transfers the motor homes to another facility for final painting with a sealer, basecoat, and clearcoat.[11] Since most of the coatings applied at Coachmen are primers, which have higher solids and lower HAP contents than other coatings, this facility's emission rate does not represent the majority of other facilities in the subcategory which apply a complete paint system. Therefore, Coachmen was not included in the MACT analysis. Damon did not report using any paint preparation solvents, which typically contain substantial HAP, but little, if any, solids. All other facilities reported using paint preparation solvents. Therefore, Damon's reported emission rate is probably lower than the facility's actual emission rate and does not represent a typical facility in this subcategory. Therefore, the facility was not included in the MACT analysis.

We confirmed that all of the remaining facilities included in the subcategory database for the MACT analysis have the potential to be major sources of HAP emissions. To determine whether a facility had the potential to be a major source, total HAP emissions from the assembly and painting operations were calculated at each facility. We assumed that a facility had the potential to be a major source if the total HAP emissions from the combined assembly and painting operations were greater than one-third of the major source thresholds of 25 tpy of a combination of HAP (i.e., 8.33 tpy of HAP). We believe this criteria is more relevant than the threshold of 10 tpy of a single HAP because most facilities use many different coatings that contain a variety of HAP, rather than large amounts of a single HAP. We used the one-third criteria because we assumed that existing facilities have a potential to triple their HAP emissions by operating three shifts per day instead of one. For those facilities that did not meet this criteria based on the HAP emissions from assembly and painting operations, we checked the 1999 Toxic Release Inventory (TRI) for reported HAP emissions. Based on the 1999 TRI emissions, all of the remaining facilities in the MACT database are considered to be potential major sources of HAP because of additional HAP emissions from other operations, such as styrene emissions from fiberglass molding operations, that were not included in the RVIA database.

The data provided by the RVIA included information on the annual usage, HAP content, density, and solids content of each of the coatings and solvents used at the facility. These data were used to calculate the total pounds (lb) of organic HAP and total lb of solids from each coating and the overall emission rate from the facility in terms of lb organic HAP emitted per lb coating solids used.

The EPA was not provided with original documentation (e.g., monthly material consumption logs) for the data, except that several facilities provided copies of material safety data sheets (MSDS) from which HAP content data were obtained. The MSDS data were compared to the reported HAP contents for those materials with matching MSDS and we found that the HAP contents reported on the MSDS agreed with the HAP content reported in the database. In most cases, if the HAP content data on an MSDS were reported as ranges, the upper limit of the ranges were entered into the RVIA database for the HAP content. In a few cases when the midpoint of the range was reported in the RVIA database, the range was generally narrow enough (e.g. 5 to 10 percent HAP) and the amount of coating involved was small enough

(e.g., less than 1 percent of coating used), that using the midpoint or the upper limit would not affect the outcome of the MACT analysis. In some cases, where a facility used many different colors of the same coating, the HAP content was reported for a typical coating or as a weighted-average HAP content, rather than for all colors used of that coating. We believe that the HAP contents for the different colors of the same coating would not be different enough to affect the results of the MACT analysis.

4.0 AFFECTED SOURCE AND FORMAT OF MACT FLOOR

4.1 Description of Affected Source

There are several sources of organic HAP emissions at typical assembled on-road vehicle surface coating facilities. These sources include the application, flash-off and curing steps associated with applying coatings to the assembled vehicle, the storage and handling of organic materials including coatings and solvents, the mixing of organic coatings and solvents, and equipment cleaning and surface preparation operations that often involve organic solvents and materials. The emissions from all of these processes are directly related to the organic HAP content of the materials used at a surface coating facility. However, the proportion of the organic emissions that occur at each of these different areas is difficult to estimate and may vary among facilities and may also vary over time for any one facility that changes material usage depending on the type of paint job being applied to the vehicle. Therefore, all of these emission sources are considered to be included as part of one affected source for this NESHAP: the entire assembled on-road vehicle coating operation. The affected source is also defined broadly as to allow owners/operators the flexibility to use a variety of control strategies to meet the limits and to provide operational flexibility.

4.2 Selection of the Format and Approach for Calculating the MACT Floor

The MACT floor analysis was performed using a source-wide emission rate approach. The source-wide MACT floor was calculated for the surface coating operations in the assembled on-road vehicle subcategory. The best-performing five sources were identified and the average emission rate calculated for those five sources. The ranking was done on the basis of source-wide lb of organic HAP emitted per lb coating solids used. The source-wide lb of organic HAP emitted includes all organic HAP emissions from coating materials, thinners or other additives, paint

preparation solvents, and equipment cleaning materials used by the source for assembled on-road vehicle coating. Note that by source-wide, we mean the total emissions from all the coating operations in the assembled on-road vehicle coating subcategory. Emissions from assembly operations at the same facility are not included because they are part of the general use coating subcategory and are considered in the general use MACT floor analysis. (Additional background information on the development of subcategories and the definition of this subcategory are provided in the separate memo describing the different subcategories in the plastic parts and products source category.) The following paragraphs explain the reasons for selecting a source-wide emission rate approach for the floor and for selecting the format of lb of organic HAP emitted per lb of coating solids used.

Source-wide Floor. The source-wide approach was selected because it is believed that this will allow for the maximum amount of flexibility for those facilities that coat a variety of vehicles and whose operations may fluctuate due to seasonal variations during a given year. Coating operations are variable in terms of the amount of the vehicle being painted; the number of colors used; the relative amount of primers, topcoats, basecoats, and clearcoats used; and whether the coating operation is being performed on a new vehicle or is part of a repair operation. Individual limits for each coating would not allow flexibility for sources to use higher HAP materials in certain operations and offset those excess emissions with lower HAP materials in others. The source-wide approach allows an owner or operator to meet the emission limit in the most efficient and cost-effective manner for their facility. The facility-wide emission rate approach allows use of reformulation, add-on controls, or a combination of both to meet the emission limit.

Units used in the Ranking. The MACT floor analysis was done by ranking the sources in the subcategory by the source-wide emission rates in units of lb of organic HAP emitted per lb of coating solids used. These units were selected because they allow different coatings to be compared on a uniform basis (HAP emissions per unit of coating solids), they were the basis for the MACT analyses in the other subcategories in this source category, and these units are easily calculated from the available data provided by the RVIA.

5.0 MACT FLOOR DATABASE ANALYSIS METHODOLOGY

5.1 Separation of Materials for Assembly and Painting Operations

The database provided by the RVIA included materials used for assembly operations (adhesives, caulks, sealants, and cleaners), as well as those used in painting assembled on-road vehicles. The materials used in the assembly operations will not be subject to the emission limit for assembled on-road vehicle coating operations, but will be subject to the emission limit for the general use subcategory.

The materials used in the assembled on-road vehicle painting operations (paint preparation solvents, primers, basecoats, clearcoats, topcoats, and specialty materials) were reported separately in the database provided by the RVIA and will be subject to the limit for the assembled on-road vehicle coating subcategory. There is little, if any, overlap in the materials used in the assembly and painting operations. The data were reviewed for any materials, especially solvents, that were used in both the assembly and painting operations. None were found that were used in both assembly and painting operations. Some materials were found at several facilities that were used as both a paint prep solvent and a coating reducer, but this would not affect the MACT analysis since it is based on the overall emission rate in the painting operations.

5.2 Calculation of Organic HAP Emissions and Coating Solids Used

The organic HAP emissions for each source were calculated based on the individual material usages, the densities of each material, and the weight percent of the organic HAP of the materials used in the source's vehicle painting operations. The analysis assumed that 100 percent of the organic HAP content of all materials used at the source was emitted to the atmosphere. We assumed that all the organic HAP was emitted because we assumed that all the organic HAP is associated with solvents, and other carriers, and is not part of the film-forming materials. Because the MACT floor will be a source-wide emission rate for the assembled on-road vehicle subcategory, there is no need to distinguish between the individual source of organic HAP emissions such as those that may occur during material handling versus those that occur during coating application. No sources in the assembled on-road vehicle coating subcategory use add-on control devices that would affect the percent of HAP emitted from the coating operations to the atmosphere.

To calculate the organic HAP emissions for each material used in the vehicle painting operations at a source, the total usage of that material in gallons was multiplied by the density of

that material, in lb per gallon, to calculate the lb of that material used at the source. The lb of material used was then multiplied by the weight percent of organic HAP to calculate the lb of organic HAP. The total lb of organic HAP from all materials used at a source were summed to calculate the total lb of organic HAP emitted from the coating operations at the source in this subcategory.

The lb of coating solids used in the vehicle painting operations were calculated based on the individual material usages, the densities of each material, and the weight percent solids of each of the materials. To calculate the total lb of coating solids used for each source, the usage of each material in gallons was multiplied by the density of that material, in lb per gallon, to calculate the lb of that material used at the source. The lb of material used was then multiplied by the weight percent solids of each material to calculate the lb of coating solids in each material. The total lb of solids from all coating materials used at a source were summed to calculate the total lb of coating solids used for each source in the assembled on-road vehicle subcategory.

The total lb of organic HAP emissions from all coatings materials (including surface preparation materials and thinners and other additives) were divided by the total lb of coating solids used to develop the source-specific emission rate (in lb organic HAP emitted per lb coating solids used) for each source in the assembled on-road vehicle subcategory. These source-specific emission rates were ranked from lowest to highest and reviewed to determine the sources that make up the best-performing five sources in the subcategory.

5.3 Add-on Control Devices

None of the recreational vehicle coating facilities in the MACT database are using add-on control devices for organic HAP. Therefore, no adjustment in the organic HAP emission rate based on HAP content of coatings was needed. Most facilities use a filter to remove paint-spray particulate from the exhaust from spray booths, but these filters have no effect on organic HAP emissions.

6.0 DATA QUALITY, REVISIONS, AND REVIEW OF ANALYSIS RESULTS

6.1 Review and Revisions to Address Materials Not Linked to a Specific Operation

In the database provided by the RVIA, all cleaning solvents were either designated as “cleaning materials” or as “paint preparation” solvents. “Cleaning materials” are those used for

cleaning the RV during or after assembly to remove excess adhesive, caulk, or sealant or to prepare a surface during assembly for an adhesive, caulk, or sealant. "Paint preparation" solvents are those used to remove surface contamination either before or during the painting operations. The data were reviewed for any materials, especially solvents, that were used in both the assembly and painting operations. None were found that were used in both assembly and painting operations. Some materials were found at several facilities that were used as both a paint prep solvent and a coating reducer, but this would not affect the MACT analysis since it is based on the overall emission rate in the painting operations.

6.2 Revisions Based on Additional Review of Data and Contact with Facilities

The EPA does not have copies of any surveys completed by RVIA members that may have been used in compiling the RVIA database. We reviewed the completed database and did find some data that seemed inconsistent with the data from other facilities using a similar coating process. These facilities were contacted to verify these data and, if necessary, to revise them. In one case (Coachmen), data were included on coatings that are used as a primer on the metal chassis of the RV.[12] These data for metal primers were deleted from the analysis because they would not be subject to the plastic parts and products NESHAP.

6.3 Sources Not Included in MACT Floor Ranking

Several facilities were removed from the MACT floor ranking: Carriage, Skyline; Georgie Boy; Nu-Way; Fleetwood facilities 47, 52, and 77; Winnebago; Coachmen; and Damon. The reasons for removing these facilities are discussed in section 3.2. In general, these facilities were removed for at least one of the following reasons:

- The facility performed only assembly operations and did not perform surface coating on assembled vehicles.
- The facility did not represent those facilities for which assembled on-road vehicle coating is a primary activity because they used only limited amounts of coatings (e.g., 20 gallons or less per year) on assembled vehicles.
- The facility applied mostly primers to assembled vehicles and had another facility complete the surface coating operation.
- The facility has significantly changed their operations since the data were reported to RVIA and provided to EPA.

- The data were incomplete.
- The facility has closed.

7.0 REPRESENTATIVENESS OF MACT FLOOR FACILITIES

After the review of the data analysis results discussed in Section 7.0 was complete, the five best performing facilities in the assembled on-road vehicle coating subcategory were reviewed to determine if the MACT floor represented the other sources in the subcategory. Four of the five best performing facilities are assembly facilities that also paint assembled vehicles (referred to as "in-house paint"). One facility performs only painting and does not perform any assembly; however, two other facilities in the database are also "paint only" facilities so it is reasonable for a paint-only facility to be among the five MACT floor facilities.

All of the five best facilities apply only basecoat/clearcoat paint systems and do not apply single-stage topcoats. However, RVIA representatives have indicated that their industry is moving away from single-stage topcoats in favor of basecoat/clearcoat paint systems. No facilities in the database are anticipated to use primarily single-stage topcoats in the future, so it is appropriate to base the floor on facilities using basecoat/clearcoat systems. However to the extent single-stage topcoats are used, they do not appear to have higher HAP content than basecoat/clearcoat systems, so they should be able to meet the same emission limits.

8.0 EXISTING SOURCE MACT FLOOR RESULTS

To determine the MACT floor, the source-specific emission rates for each facility in the assembled on-road vehicle subcategory were ranked from lowest to highest. The arithmetic mean was used to determine the average of these best-performing sources (see Section 2.0 for background on the CAA provisions for determining the MACT floor for existing sources).

A total of 13 existing affected sources were reviewed to determine the MACT floor for the assembled on-road vehicle subcategory. The best-performing five sources are represented by five unique facilities owned by four different companies. These five facilities had the lowest emission rates in terms of lb organic HAP emitted per lb coating solids used. The average, or arithmetic mean, of the best-performing five existing sources was determined to be 1.34 lb of organic HAP emitted per lb of coating solids used. Table 1 contains a summary of the source-specific rankings for all sources in the assembled on-road vehicle coating database.

9.0 NEW SOURCE MACT FLOOR RESULTS

The new source MACT floor for this subcategory was determined to be the same as the MACT floor for existing sources, which is 1.34 lb of organic HAP emitted per lb of coating solids used. For this subcategory, the two sources whose emission rates were lower than the existing source MACT floor were evaluated to determine whether one of them could be considered the best-performing similar source. We evaluated whether each source with a lower emission rate was similar to other sources in the subcategory. Some of the variables considered were the types of vehicles coated (e.g., motorhomes or towable RVs), the amount of the vehicle coated (either fully painted or only partially painted), whether multiple colors of basecoat were used and the overall ratio of basecoat to clearcoat, and whether or not repair coating operations were performed. Given the diversity of assembled on-road vehicle coating operations observed during EPA site visits and among the facilities present in the MACT database, we have determined that neither of the two sources with emission rates that are lower than the existing source MACT floor emission rate represent the possible range of new sources in the subcategory. For example, some facilities may use only a single color of basecoat per vehicle, while others may use up to four colors of basecoat in more elaborate color schemes. Some facilities may apply a single layer of clearcoat while others may apply two or three layers for a more durable finish. Finally, facilities that perform repair operations may need different surface preparation solvents from facilities that paint only new vehicles. Given the variability in these factors, we do not believe that the two sources with lower emission rates than the existing source floor represent a similar source for this subcategory. Therefore, the new source MACT floor is determined to be the same as the MACT floor for existing sources.

10.0 BEYOND-THE-FLOOR OPTIONS

After the MACT floors had been determined for new and existing sources in the assembled on-road vehicle subcategory, the subcategory was reviewed to identify any reasonable regulatory alternatives that are “beyond-the-floor,” taking into account emission reductions, cost, non-air quality health and environmental impacts, and energy requirements. No options beyond the MACT floor could be identified for the assembled on-road vehicle coating subcategory that

would be achievable for all new or existing facilities in the subcategory. No facilities in this subcategory use add-on control devices. We determined that presently available add-on control techniques, such as thermal oxidizers, are not technically feasible for facilities in this subcategory. This is largely because the emissions from the spray booths in which assembled vehicles are usually coated are characterized by low organic HAP concentration, high volumetric air flow rates, and intermittent emissions as workers stop spraying to perform tasks other than spraying (e.g., masking off surfaces for additional colors and wiping down surfaces with tack cloths to remove dust). There are no coating technologies applicable to this subcategory that would result in lower emissions than achieved by the existing source or new source MACT floor.

Table 1. MACT Floor Ranking of Facilities That Perform Assembled On-Road Vehicle Coating Operations

Facility Name	Facility Operations	Gallons of Coating Used in Paint Operations	lb Organic HAP from Paint Operations	lb Solids from Paint Operations	Emission Rate for Paint Operations (lb/lb solids)	Rank
Dynamax Corporation	Assembly & In-house Paint	18,155	44,397	36,141	1.23	1
Monaco Coach-Wakarusa	Assembly & In-house Paint	76,986	191,607	153,084	1.25	2
Monaco Coach-Coburg	Assembly & In-house Paint	41,347	100,141	73,988	1.35	3
Western RV	Paint Only (No Assembly)	5,496	11,388	8,161	1.40	4
Trail Wagons	Assembly & In-house Paint	1,301	5,091	3,460	1.47	5
Gulfstream	Assembly & In-house Paint	8,559	28,860	17,996	1.60	6
Monaco Coach-Elkhart	Assembly & Touch-up/Repair	2,443	6,719	4,182	1.61	7
Country Coach Inc.	Assembly & In-house Paint	16,681	38,143	22,164	1.72	8
Pro-design	Paint Only (No Assembly)	8,496	24,007	13,480	1.78	9
Fleetwood -- 44	Assembly & In-house Pt	42,773	148,689	67,110	2.22	10
Performance Paint	Paint Only (No Assembly)	8,536	33,144	13,798	2.40	11
Fleetwood -- 71	Assembly & In-house Pt	8,180	33,025	5,731	5.76	12
Jayco	Assembly & Touch-up	2,332	6,158	481	12.80	13
Georgie Boy	Assembly & Touch-up	20	37	91	0.41	N/A
Coachmen	Assembly & Touch-up	3,001	7,540	12,539	0.60	N/A
Fleetwood -- 47/77	Assembly & In-house Paint/Topcoat	15,327	26,874	33,903	0.79	N/A
Nu-way	Assembly & Touch-up	4	10	9	1.10	N/A
Damon	Assembly & Touch-up	1,816	5,526	4,935	1.12	N/A
Winnebago	Assembly & In-house Paint/Topcoat	25,627	69,892	49,189	1.42	N/A
Fleetwood -- 52	Assembly & In-house Paint/Topcoat	5,073	18,415	9,449	1.95	N/A
Carriage	Assembly only					N/A
Skyline	Assembly only					N/A

N/A: Facility was not included in the MACT ranking for the reasons discussed in section 3.2 of this memorandum.

11.0 REFERENCES

1. Memorandum from Palmer, Brian, ERG, Inc., to Teal, Kim, EPA/ESD. February 21, 2002. "Summary of observations made at the Monaco Coach recreational vehicle (RV) manufacturing and surface coating facilities in Wakarusa and Elkhart, Indiana surveyed on October 30 and 31, 2001." (Docket No. A-99-12).

2. Memorandum from Palmer, Brian. ERG, Inc., to Teal, Kim, EPA/ESD. "Summary of observations made at the Georgie Boy recreational vehicle manufacturing facility in Edwardsburg, Indiana and the Pro-Design recreational vehicle (RV) surface coating facility in Elkhart, Indiana surveyed on October 30, 2001." **Confidential Pending Company Review.**

3. Memorandum from Palmer, Brian. ERG, Inc., North Carolina, to Teal, Kim, EPA/ESD. February 21, 2002. "Summary of observations made at the Performance Painting, Inc., recreational vehicle (RV) surface coating facility in Elkhart, Indiana surveyed on October 31, 2001." (Docket No. A-99-12).

4. Memorandum from Palmer, Brian. ERG, Inc., to Teal, Kim, EPA/ESD. "Summary of observations made at the Dynamax Corporation recreational vehicle (RV) manufacturing and surface coating facility in Elkhart, Indiana surveyed on October 30, 2001." **Confidential Pending Company Review.**

5. E-mail from Kurt Anderson, Monaco Coach Corporation, to Kim Teal, U.S. EPA, January 31, 2001. Transmittal of RVIA database (RVIA MACT data.xls) to EPA.

6. Memorandum from DeAngelo, Greg, ERG, Inc., to Teal, Kim, EPA/ESD. February 19, 1999. "Report of EPA site visit to Utilimaster, Inc. in Elkhart, Indiana." **Confidential Based On Company Review.**

7. Memorandum from Palmer, Brian, ERG, Inc., to Teal, Kim, EPA/ESD. September 2002. "Summary of results of a search of the world-wide web for cargo truck, bus, and cargo trailer manufacturers and whether they use plastic bodies and whether those plastic bodies are coated." (Docket No. A-99-12).

8. E-mail from Mark Howard, Fleetwood Enterprises, to Kim Teal, U.S. EPA, January 23, 2002. Confirmation that Fleetwood is switching from topcoats to basecoat/clearcoat paint systems.

9. E-mail from Don Niver, Winnebago Industries, to Kim Teal, U.S. EPA, November 12, 2001. Clarification that Winnebago is switching from topcoats to basecoat/clearcoat paint systems.

10. See reference 8.

11. Telephone call between Earl Handshoe, Coachmen Industries and Brian Palmer, ERG, Inc., January 21, 2002. Clarification of painting operations at Coachmen facility in Elkhart, Indiana.

12. E-mail from Douglas Elliot, Coachmen Industries, Inc., to Brian Palmer, ERG, Inc., November 2, 2001. Removal of metal primers from the database for the Coachmen facility.

EASTERN RESEARCH GROUP, INC.

MEMORANDUM

TO: Kim Teal, U.S. Environmental Protection Agency, OAQPS (C539-03))

FROM: Christy Burlew, Eastern Research Group (ERG), Morrisville

DATE: October 10, 2002

SUBJECT: Determination of Maximum Achievable Control Technology (MACT) Floor for New and Existing Sources in the General Use Coating, Thermoplastic Olefin (TPO) Coating, and Headlamp Coating Subcategories of the Plastic Parts and Products Surface Coating Source Category

1.0 INTRODUCTION

This memo describes the MACT floor analysis for new and existing sources including the methodology, the assumptions used during analysis, the data sources and the MACT floor results for the National Emission Standard for Hazardous Air Pollutants (NESHAP) for the Surface Coating of Plastic Parts and Products. The MACT floor analysis for the fourth subcategory identified within the source category is discussed in the separate memorandum entitled, "Determination of Maximum Achievable Control Technology (MACT) Floor for New and Existing Sources in the Assembled On-Road Vehicle Subcategory of the Plastic Parts and Products Surface Coating Source Category" (Reference 1). Below is a list of the sections within this memo:

Section 2.0	Background information
Section 3.0	Data sources
Section 4.0	Affected source and format of MACT floor
Section 5.0	MACT floor analysis methodology
Section 6.0	Assumptions used for the purposes of analysis
Section 7.0	Data quality, revisions, and review of analysis results
Section 8.0	Representativeness of floor facilities

Section 9.0 Existing source MACT floor results
Section 10.0 New source MACT floor results
Section 11.0 Beyond-the-floor options
Section 12.0 References
Section 13.0 Appendices

2.0 BACKGROUND

The plastic parts and products surface coating industry was identified as a source category of hazardous air pollutants (HAP) under section 112(c) of the Clean Air Act (CAA), to be regulated by a NESHAP under section 112(d) of the CAA. The plastic parts and products surface coating category consists of facilities that apply protective, decorative, or functional coatings and adhesives to plastic substrates through a post-mold coating process only. The source category does not include in-mold coating processes such as gel coating.

Markets for the end-products of the plastic parts surface coating industry include the automotive industry, the recreational vehicle industry, sporting goods industry, business machines industry, toy manufacturing, laboratory equipment, household products, and other transportation products. Within this industry, some facilities are dedicated to coating a very specific type of product such as bumpers and instrument panels for the automobile industry. However, many facilities within this industry are contract coaters that may perform surface coating activities on a variety of different products and substrates within a given year.

Section 112(d) of the CAA directs EPA to develop standards that require the maximum degree of reduction in emissions of HAP that is achievable, which are commonly referred to as MACT standards. For existing major sources, the CAA requires MACT to be no less stringent than the average emission limitation achieved by the best-performing 12 percent of existing sources (or the best-performing five sources for categories or subcategories with fewer than 30 sources) among the data available to the Administrator. For new major sources, the CAA requires MACT to be no less stringent than the emission control that is achieved in practice by the best-controlled similar source. These minimum stringency levels are often referred to as the "MACT floor."

The term “average,” as it pertains to MACT floor determinations for existing sources, described in section 112(d)(3) of the CAA, is not defined in the statute. In a Federal Register notice published on June 6, 1994 (59 FR 29196), the EPA concluded that Congress intended “average” as used in section 112(d)(3) to mean a measure of mean, median, mode, or some other measure of central tendency. The EPA concluded that it retains substantial discretion within the statutory framework to set MACT floors at appropriate levels, and that it construes the word “average” [as used in section 112(d)(3)] to authorize the EPA to use any reasonable method, in a particular factual context, of determining the central tendency of a data set.

3.0 DATA SOURCES

3.1 Data Collection Activities for MACT Floor

In order to determine the number and types of facilities coating plastic parts, an Information Collection Request (ICR) questionnaire was sent to companies that were identified as potentially being part of the Plastic Parts and Products Surface Coating source category. The survey collected data on the HAP contents of the coating materials used, the applications and processes used in the coating operations, any limitations on the choice of coatings, and the types of control techniques used in the industry to limit HAP emissions. The companies that were sent the questionnaire were identified by reviewing national databases (including AIRS and TRI) by Standard Industrial Classification (SIC) code as well as consulting state and local agencies, stakeholders, and industry trade associations. Approximately 600 facilities responded to this ICR questionnaire. Also, facilities that may be subject to the plastic parts NESHAP in addition to the Auto or Miscellaneous Metal NESHAP responded to a plastic parts attachment to the surveys. Of all of the facilities that responded to the ICR questionnaire, only approximately 300 of the facilities reported that they actually performed some surface coating of plastic parts.

In addition to collecting source-specific data through the ICR questionnaires, EPA made nineteen site visits to plastic parts surface coating facilities. The qualitative data and process knowledge gained from these site visits was helpful in making decisions regarding the format of the MACT floor. These site visits confirmed the data collected through the ICR questionnaire. No differences were identified between the facility descriptions and patterns of operations that were provided in the ICR questionnaires and the actual facility operations observed during these site visits.

3.2 Plastic Parts and Products Surface Coating MACT Floor Database

The information collected from the plastic parts and products surface coating industry ICR survey responses (see Docket No. A-99-12) was entered into a database used to determine the MACT floor and to identify and analyze regulatory options. The relational database contains separate data tables that mirror the format of the ICR questionnaire. The data entered into the database from the surveys included information on the products a facility coats, the annual usage of each of the coatings and solvents at the facility, HAP contents and other material-specific data, the application methods used at the facility, the types of plastic substrates the facility coated, descriptions of the overall coating processes, and information on any control devices used at the facility. Once all of the responses were entered, the database was reviewed and edited to ensure the consistency and quality of the data. These activities included reviewing those volatile components that were flagged as organic HAP, standardizing the units provided for material usages and densities, and standardizing the names of the various volatile components. The final database of ICR responses included coating operations and facility information specific to approximately 300 facilities that reported performing some surface coating of plastic parts at their facility. An additional 22 facilities were added to this database based on data corrections and additional submittals from stakeholders. For details on the processing of the survey responses and the development of the database, refer the memorandum "Development of the Database of Plastic Parts and Products Surface Coating Sources," (Docket No. A-99-12), (Reference 2).

This database was reviewed further to distinguish true area source facilities from facilities that have the potential to be considered major sources. All facilities that indicated in their survey response that they were considered major sources or synthetic minor sources were distinguished as such in the plastic parts database. All of these facilities remained in the plastic parts MACT floor database. For those facilities that did not indicate whether or not they were a major source or that indicated that they were an area source, the HAP emissions from the coating activities were reviewed to determine if they would make the facility a major source. This review assumed that a facility had the potential to be a major source if the actual HAP emissions from the coating operations were equal to or more than one-third of the major source thresholds of 10 tpy of a single HAP or 25 tpy of a combination of HAP. The one-third criteria was used because it is assumed that existing facilities have a potential to increase their HAP emissions by operating three

shifts per day instead of one. This review determined that 87 facilities were true area sources and were excluded from the MACT floor database. Other sources were subsequently removed from the MACT floor analysis for other reasons which are discussed in the following sections of this memorandum. The final database included 202 facilities that were determined to be major, synthetic minor or potential major affected sources. These facilities were the basis for the MACT floor analysis for the source category.

4.0 AFFECTED SOURCE AND FORMAT OF MACT FLOOR

4.1 Description of Affected Source

There are several sources of organic HAP emissions at typical plastic parts and products surface coating facilities. These sources include the application, flash-off and curing steps associated with applying coatings to plastic parts, the storage and handling of organic materials including coatings and solvents, the mixing of organic coatings and solvents, and equipment cleaning and surface preparation operations that often involve organic solvents and materials. The emissions from all of these processes are directly related to the organic HAP content of the materials used at a plastic parts surface coating facility. However, the proportion of the organic emissions that occur at each of these different areas is difficult to estimate and may vary among facilities and may also vary over time for any one facility that changes materials use depending on the product. Several of the facilities visited during data gathering were either seasonal operations or job shops. These types of facilities, which are fairly common in this industry, are examples of facilities whose emissions would vary over time. Because many job shops or contract coating facilities may coat many different types of parts with many different materials during a year, the organic emissions from these facilities will vary widely from month to month depending on the types of coatings they use. Many facilities also have seasonal operations that result in variations in the amount of organic HAP emitted during any one month of the year. The ICR questionnaire responses further confirmed these observations because many of the facilities indicated that they coat a wide variety of types of parts and use various types of coatings during the year. Therefore, all of these emission sources are considered to be included as part of one affected source for this NESHAP. The affected source is also defined broadly to allow owners/operators the flexibility to use a variety of control strategies to meet the limits and to provide operational flexibility.

Within the affected source, we have identified four subcategories of plastic parts and products surface coating: general use coating, thermoplastic olefin (TPO) coating, headlamp coating, and assembled on-road vehicle coating. The rationale for the selection of these four subcategories is described fully in a separate memorandum entitled, "Rationale for the selection of the source category and subcategories for the plastic parts and products surface coating source category" (Reference 3). (See Docket No. A-99-12.) The MACT floor discussion in this memorandum covers the MACT floor analysis for the general use, TPO, and headlamp coating subcategories. The MACT floor analysis for the assembled on-road vehicle subcategory is discussed in a separate memorandum (Reference 1).

4.2 Selection of the Format and Approach for Calculating the MACT Floor

The MACT floor analysis was performed using a source-wide emission rate approach. The source-wide MACT floor was calculated for each of the three subcategories discussed in this memorandum. The best-performing 12 percent of sources for each of the subcategories was identified and the average calculated for each subcategory. The ranking was done on the basis of source-wide lb of organic HAP emitted per lb coating solids used. The source-wide lb of organic HAP emitted includes all organic HAP emissions from coating materials, thinners or other additives, and cleaning materials used by the source. The reasons for selecting a source-wide emission rate approach for the floor and for selecting the format of lb of organic HAP emitted per lb of coating solids used are explained in the following paragraphs.

Source-wide Floor. The source-wide approach was selected because it is believed that this will allow for the maximum amount of flexibility for those facilities that perform many different types of coating applications, coat many different types of parts, and whose operations may fluctuate due to seasonal variations during a given year. Coating operations are variable in terms of the process steps, substrates, coating types, and the application and curing methods used. The same coatings and control strategies are not used by every individual coating operation, or scenario. For example, product specifications may influence selection of coatings and their application methods. It would be very difficult to define and set limits on each individual coating step in every coating process. Also, such rules would allow no flexibility for sources. By developing a source-wide emission limit that includes all coating operations within a subcategory at a facility, an owner/operator can determine how to most efficiently and cost-effectively meet an

overall emission limit. For example, if a higher HAP coating is best for one application but low-HAP or non-HAP coatings can be used in other operations in the same subcategory at the facility, a broad definition of source will allow for these source-specific alternatives. The emission rate approach allows use of reformulation, add-on controls, or a combination of both to meet the applicable emission limit.

Emission Rate Ranking Approach. The MACT floor analysis was done by ranking the sources in each of the subcategories by the source-wide emission rates in units of lb of organic HAP emitted per lb of coating solids used. The emission rate format was used because it allows small sources and larger sources to be compared and ranked on the same basis. Also, using the total lb of coating solids 'used' instead of the total amount of coating solids 'applied' encourages the use of application equipment with better transfer efficiencies as well as the use of higher-solids, lower solvent coatings. The emission rates are expressed in terms of mass of solids used because this was the format of the information reported in the responses to the ICR. Finally, the emission rate approach allows use of reformulation, add-on controls, or a combination of both to meet the applicable emission limit.

5.0 MACT FLOOR DATABASE ANALYSIS METHODOLOGY

5.1 Separation of Materials for General Use, TPO and Headlamp Coating Subcategories

For purposes of analysis, the database was separated according to those materials specific to general use coating operations, TPO coating operations, and headlamp coating operations. In most instances, an entire facility was dedicated to only one of these types of operations. For example, many of the plastics surface coating facilities in the automotive industry coat exclusively TPO bumpers and fascia or exclusively automotive headlamps. However, there were eleven facilities that had sources in more than one subcategory and therefore, the materials used had to be divided accordingly between the different subcategories.

TPO coating sources were distinguished by reviewing the "part type" and the "substrate" fields in the plastic parts ICR database. Form D of the plastic parts ICR questionnaire required information on the plastic substrate coated, the materials used to coat the parts, how the coatings were applied and cured, the specifications followed for each coating operation, and a description of the parts being manufactured as part of the description of each "coating scenario". Those

coating scenarios for which one of the part description fields indicated the coating of TPO were segregated from the other materials. Stakeholders used industry knowledge to also provide input on the list of sources EPA identified as coating TPO. Stakeholders provided a list of facilities they believed were coating TPO and this list was compared with the ICR plastic parts database to segregate all TPO coating scenarios. After identifying TPO coating operations, the intent was to identify the quantities, compositions, and properties of all materials used for those operations (including adhesive and non-adhesive coatings, thinners or other additives, and cleaning materials used for surface preparation or equipment cleaning) so that we could calculate the lb of organic HAP emitted and the lb of coating solids used for all TPO coating operations at a facility. After all the coating scenarios (on Form D) dedicated to TPO coating were identified, the materials listed as being used in these coating scenarios could then be linked to the Form B data for these materials. The Form D section requested that the survey respondents indicate all the various coating materials that were used in each of the unique coating scenarios at a facility. This type of analysis allowed the coating materials to continue to be associated with the corresponding parameters of the particular scenario. Any thinner or other additive associated with these coatings was also grouped with the appropriate coating and facility. Any thinners or other additives added to a coating were indicated in the ICR survey response by providing a typical mixing ratio for each coating and the specific thinner or other additive material used on the Form B of the survey. Also, any surface preparation or equipment cleaning material usage associated with the TPO coating was also grouped into the source-wide usages. The Form B data reported by survey respondents provides information on the annual usage of each material, the thinners or other additives used with the coating materials, as well as the densities, solids content and speciated HAP contents for each. Using the coating scenario information allowed all materials used to coat TPO (including non-adhesive and adhesive coatings, and thinners or other additives) to be identified and grouped into the TPO subcategory analysis.

Because the MACT floor analysis is based on ranking the source-wide emission rates for each subcategory, the cleaning materials associated with the TPO coating operations needed to be identified and included in the calculations. Facilities indicated the specific materials and amounts of each used for surface preparation activities and equipment cleaning activities on Form E and Form H of the ICR survey, respectively. For many facilities identified as coating TPO, the entire

facility was devoted to TPO coating so that all cleaning data reported on Forms E and H of the ICR questionnaire were incorporated into the TPO source-wide emission rate calculations. However, there were six facilities identified as coating TPO that also had coating operations in another subcategory. The cleaning data for these facilities was divided among the subcategories according to the percent of total HAP from the coatings for each subcategory. For instance, if 80% of the facilities total HAP emissions were from TPO coating materials and 20% were from general use coating materials, then 80% of the facility's total HAP emissions from cleaning material were attributed to TPO and 20% were attributed to general use. The split of cleaning emissions in this situation was done according to the proportion of coating HAP emissions because stakeholders had indicated at meetings with EPA that TPO cleaning operations were linked to the amounts and types of HAP in the coating materials used. For some facilities in the database, additional review indicated that some revisions were necessary in order to include all materials used at the facility for these operations. This additional review and subsequent revisions are discussed in Section 7.3.

Headlamp coating sources were also distinguished by reviewing the "part type" and the "substrate" fields in the plastic parts ICR database using the same methodology as discussed previously for the TPO subcategory. Those coating scenarios for which one of these fields indicated the coating of headlamps were segregated from the other materials. Because the special requirements that define the headlamp coating subcategory (such as reflectivity, safety, and weathering requirements) apply to only headlamps, any coating of tail lights, reflectors, side markers, and interior lamps were not included as part of a headlamp coating source. The sources included in the headlamp coating subcategory were distinguished according to whether the part types were listed as either exterior polycarbonate headlamp lenses for which the source was applying a hardcoat clearcoat or headlamp reflector components that were either coated with argent coatings or metallized to provide reflectivity. Stakeholders used industry knowledge to also provide input on the list of sources identified as coating headlamps. Once the appropriate coating scenarios and associated coating materials included in the headlamp coating subcategory were identified, the subsequent analysis to calculate the source-wide emission rates was done in the same manner as described for the TPO coating subcategory. There were five facilities in the headlamp coating subcategory that also have coating operations in another subcategory. The

total cleaning HAP emissions for each facility were apportioned into each subcategory according to the percent of total HAP emissions that could be attributed to each subcategory, as described previously for the TPO subcategory. For some facilities in the database, additional review indicated that some revisions were necessary in order to include all materials used at the facility for these operations. This additional review and subsequent revisions are discussed in Section 7.3.

The general use coating subcategory includes all of those coating operations not included in either the headlamp, TPO, or assembled on-road vehicle coating subcategories, which were identified as discussed previously. All coating materials that were listed under the general use coating scenarios on Form D of the ICR were included in the general use coating subcategory for each source. All subsequent analyses to determine the source-wide emission rates were conducted in the same manner as previously discussed for the TPO and headlamp coating subcategories. For the eleven facilities that had coating operations in more than one subcategory, the cleaning operations were divided among the subcategories according to percent of the total HAP emissions from each facility that could be attributed to each subcategory, as described previously for the TPO and headlamp subcategories. The assembly operations that are co-located with assembled on-road vehicle coating sources were also included in the general use coating subcategory. The data used for these operations is discussed in the memorandum, "MACT Floor Database Used to Represent the Assembled On-Road Vehicle Subcategory of the Plastic Parts and Products Surface Coating Subcategory" (Reference 4). The general use coating data were separated from the assembled on-road vehicle coating data, as discussed in Reference 1. For some facilities in the database, additional review indicated that some revisions were necessary in order to include all materials used at the facility for these operations. This additional review and subsequent revisions are discussed in Section 7.3.

5.2 Calculation of Organic HAP Emissions and Coating Solids Used

The organic HAP emissions for each source in each subcategory were calculated based on the individual material usages, the densities of each material, and the speciated weight percent of each of the organic HAP components of the materials used in the source's coating operations. With the exception of those sources that reported the use of some type of add-on control device,

it was assumed for the purposes of analysis that 100 percent of the organic HAP content of all materials used at the source was emitted to the atmosphere. The assumption that all the organic HAP content is emitted was used because it is assumed that all the organic HAP is associated with solvents, and other carriers, and is not part of the film-forming materials. Because the MACT floor will be a source-wide emission rate, there is no need to distinguish between the individual source of organic HAP emissions such as those that may occur during material handling versus those that occur during coating application. Refer to Sections 6.2 and 7.4 for a discussion of how add-on control devices were incorporated into the facility emissions calculations.

To calculate the organic HAP emissions, for each material used at a source, the total usage of that material in gallons was multiplied by the density of that material, in lb per gallon, to calculate the lb of that material used at the source. The lb of material used was then multiplied by the weight percent of each of the various HAP components to calculate the lb of each speciated HAP component, such as xylene. The total lb of organic HAP from all materials used at a source were summed to calculate the total lb of organic HAP emitted from the coating operations at the source in each subcategory.

The lb of coating solids used were calculated based on the individual material usages, the densities of each material, and the weight percent solids of each of the materials. To calculate the total lb of coating solids used for each source, the total usage of each material in gallons was multiplied by the density of that material, in lb per gallon, to calculate the lb of that material used at the source. The lb of material used was then multiplied by the weight percent solids of each material to calculate the lb of coating solids in each material. The total lb of solids from all coating materials used at a source were summed to calculate the total lb of coating solids used for each source in each subcategory. Some revisions were made to the total lb of coating solids used calculations for some sources based on additional review of the data. This review and the subsequent revisions are discussed in Section 7.5.

The total lb of organic HAP emissions from all coatings, thinners or other additives, surface preparation materials, and equipment cleaning materials were divided by the total lb of coating solids used to develop the source-specific emission rates for the sources in each of the three subcategories. These source-specific emission rates were ranked from lowest to highest and

reviewed to determine the sources that make up the best-performing 12 percent for each of the subcategories.

6.0 ASSUMPTIONS USED FOR PURPOSES OF ANALYSES

6.1 Solvent Blends

The coating composition data was reported in the ICR questionnaires as speciated volatile components and the associated weight percent. Some of these listed volatile components were easily identified as non-HAP, such as butyl acetate. Some of these listed volatile components were easily identified as HAP, such as toluene. However, some of these volatile components were identified as naphtha, petroleum hydrocarbons, mineral spirits or other types of solvent blends. These volatile components are not listed HAP; however, many of these solvent blends contain a HAP component. In cases where sources neglected to identify or report HAP for their specific solvent blends, Reference 5 was used to insert typical default HAP contents for the solvent blends. Many of these defaults are specific to certain Chemical Abstract Service (CAS) numbers while others are applied to materials according to whether that material is an aliphatic compound or an aromatic compound. For those few materials identified in the plastic parts database that did not match the specific CAS numbers in the memo and could not be identified as aliphatic or aromatic, the aromatic solvent default values were applied. The aromatic values were chosen as the default because although the HAP species were the same as for aliphatic, the HAP weight percent for aromatic solvents was higher and would not result in an underestimate of the facility HAP emissions.

6.2 Incorporation of Existing Add-on Control Devices

There were some facilities in the plastic parts database that reported existing add-on control devices installed on particular coating operations, or scenarios. Some of these add-on controls were particulate controls or exhaust fans. These controls were not incorporated in any way into the lb of organic HAP emitted calculations because they will have no effect on the organic HAP emissions. The types of add-on controls that were incorporated into the organic HAP emission calculations included carbon absorbers, thermal and catalytic oxidizers, and condensers. Only 19 facilities in the MACT floor database reported using these types of add-on control devices in combination with some capture system.

These add-on controls were reported in the ICR questionnaire specific to certain coating scenarios. Within each coating scenario there can be an application stage, a flash-off stage and a curing stage. The ICR questionnaire provided the opportunity to indicate the type of enclosure present at each of these three stages on Form D of the survey. Unless a facility provided a site-specific capture efficiency, the type of enclosure reported was used to determine what capture efficiency would be assumed for calculating the HAP reduction achieved by the add-on control devices. A permanent total enclosure (PTE) was assumed to achieve 100% capture. For the purposes of analysis, those facilities that indicated on the ICR survey that an operation was "fully enclosed" was assumed to have a PTE. A three-quarter enclosure was assumed to achieve 66% capture. Any other type of enclosure was assumed to achieve no capture and therefore, no emissions control. Because the total organic HAP emissions from coating scenarios actually occur in all three stages of the scenario, the assumption was made that a third of the total organic HAP content of all materials used was emitted at each of the three stages. All coating scenarios with add-on control devices included all three stages so that this assumption was applied in all cases except where overall capture and control efficiencies were provided by the source. (Note that in verifying information on some of the facilities after the preliminary MACT floor ranking, a change was made for a couple facilities based on additional information (see Section 7.4)).

Once the capture efficiencies were determined for all sources with add-on controls, the organics reduction efficiencies reported on the ICR questionnaires were applied to the amount of organic HAP that was being captured at each source. The one exception to the use of the reported reduction efficiencies is that any reduction efficiency for thermal oxidizers that was reported to be greater than 95% was reduced to 95% reduction efficiency.

There were 6 facilities in the MACT floor database that reported using add-on control devices for cleaning operations. Any add-on controls specific to surface preparation operations were treated in the same manner as those add-on controls listed for coating scenarios. Using the same methodology for surface preparation operations assumes that these activities take place in the same enclosure as reported for the coating operations. A different assumption was necessary for incorporating add-on controls into the HAP emissions from equipment cleaning because these operations are assumed to be done outside the application enclosures. For the purposes of analysis, the facilities that reported using add-on controls on equipment cleaning operations were

assumed to be achieving a 66 percent capture efficiency unless the capture efficiency was specified on the data submitted by the facility.

6.3 Assumed Coating Densities for Auto Survey Data

The auto data incorporated into the plastic parts database was received through a plastic parts survey attachment that was sent out with the automotive manufacturer's survey. The data provided in this attachment was somewhat different than data received from the plastic parts questionnaire. Where density information was not provided, a default density was used. The density data that were available for coatings used in the auto industry were reviewed to determine an appropriate default value. The average of the available auto density data, 8.6 lb per gallon, was used in the calculations for any auto data for which no actual density was available.

7.0 DATA QUALITY, REVISIONS, AND REVIEW OF ANALYSIS RESULTS

7.1 Review of Blank Data Fields

Review of the data entered from the responses to the ICR questionnaires indicated that sometimes information necessary to calculate the organic HAP emissions or coating solids used was not available. The critical fields for calculating the lb of organic HAP emitted or the lb of coating solids used are: the material usage, the material density, the material weight percent solids, the material's volatile components, and the weight percent of each of the material's volatile components. The database was analyzed to identify any facility for which one or more blanks were present for these critical fields. Any facility for which there were blank data for one of these critical fields was flagged in the MACT floor analysis so that it could be reviewed further. Many of the blank data fields were verified through further review. For instance, many of the blanks identified were for the solids contents of materials that were determined to be solvents that were 100 percent volatile and would not have a solids content. As part of the survey response review and data entry, facilities were contacted by phone when data were missing from key fields such as these. However, in many cases, attempts to contact the facilities were unsuccessful. After this review was complete, a total of 18 facilities were identified as having inconsistencies and missing data in fields key to developing source-wide emission rates. These 18 facilities were included in the total population of major sources because the survey responses did contain sufficient information to determine that these facilities are major sources that would be affected sources. However, these facilities were not ranked with the rest of the population because there were

insufficient data to calculate representative source-wide lb of organic HAP emitted per lb of coating solids used values for these facilities. The available data for these 18 facilities were reviewed and it does not appear that the organic HAP emissions are low enough to affect the average of the best-performing 12 percent of sources.

7.2 Review of "As Applied" versus "As Supplied" Usage Reporting

Review of the ICR questionnaires indicated that there could be a potential inconsistency in the way facilities reported the specific coating material information on the Form B section of the questionnaire. The questionnaire requested that specific coating information such as density, percent solids, usage, and percent volatile content be provided on an "as applied" basis. The Form B section of the questionnaire further requested that the speciated volatile components of the specific coating materials be provided on an "as supplied" basis. A review of the potential effects of this inconsistency was necessary to determine if the manner in which these data were reported would result in inaccurate and inconsistent source-wide values used in the MACT floor analysis.

The main error that could be caused by this potential inconsistency in the reported data would occur in the calculations of the thinning material usages. Because facilities provided a typical ratio indicating the amount of thinning material typically added to various coatings, a problem with the reported coating usages could overestimate the calculated amount of thinning materials used. For instance, if the facility reported the coating usage on Form B "as applied," then this usage would already include the thinning materials added to the coating prior to application and the calculation of thinner usage would overestimate the actual amounts used. The potential effects of this were checked by comparing the calculated values of thinning material usage to the usages of these materials reported on the Form B of the survey. Because the solvents used for thinning coatings are often also used for surface preparation and equipment cleaning, these usages are not always expected to match. The initial comparison of the calculated versus reported solvent usages resulted in 30% of the calculated usages differing from the reported usages on Form B. Further review of these facilities indicated that many of them were different due to the use of the solvent in several different applications other than thinning. The initial review did not identify any pattern of inconsistent reporting. However, the facilities for which there was a small discrepancy identified were flagged in the MACT floor database so that

further review could be done, if necessary. Approximately six facilities with a large data discrepancy were identified as needing further review to determine if the data were adequate for calculating a source-wide number. The original ICR questionnaire responses for these facilities were reviewed to assess the consistency of the data reported. These facilities were adjusted according to the original data submitted and subsequent data submitted by sources as described in Section 7.6. The methodology EPA used to assess whether there were inconsistencies in reporting was reviewed with stakeholders during meetings in August and September of 2001. The stakeholders agreed that this type of comparison approach would indicate whether inconsistent reporting was a concern. Refer to the memorandum, "Summary of Responses to Issues Raised by Stakeholders for the Plastic Parts and Products Surface Coating NESHAP" for documentation of these discussions. (See Docket No. A-99-12).

7.3 Review and Revisions to Address Materials Not Linked to a Specific Operation

During additional review of the MACT floor database, some facilities were identified as having higher total material usage reported on the Form B material sheets than was represented in the MACT floor analysis. Further investigation indicated that the reason for this discrepancy is that some facilities appeared to have only listed some of the specific materials used in a coating scenario on the Form D itself. However, some of these facilities reported usages of other materials on Form B of the survey that were not listed on the subsequent forms in the survey.This discrepancy did not occur for all facilities in the MACT floor database and furthermore, it would potentially have significant impacts on the overall facility emission rates for only a fraction of the overall number of facilities in the MACT floor database.

To address this reporting discrepancy, some additional data analysis was conducted. First, the entire database was analyzed to determine which materials listed on a Form B did not have a matching entry in one of the following locations: (1) listed on a Form B for a coating as a thinner or other additive, (2) listed on a Form D as a coating used for a specific coating scenario, (3) listed on a Form E as a surface preparation material, or (4) listed on a Form H as an equipment cleaning material. If these materials did not appear in one of these locations, then the organic HAP content and the solids content of these materials were not previously incorporated into the source-wide emission rates used to develop the MACT floor.

Once these “unlinked” materials were identified, a screening analysis was conducted to determine the extent of the effect the incorporation of these materials might have on the source-wide emission rates. A conservative assumption was made in this screening analysis that all these “unlinked” materials were either coatings, cleaning materials, thinners, or other additives and would therefore, have a potential effect on the source-wide emission rates. For each facility, the additional organic HAP emissions and the additional lb solids values that would come from these “unlinked” materials was calculated and incorporated into the source-wide emission rates. These preliminary revised emission rates were compared to the previously calculated emission rates. If the result was less than a +/- 10 percent difference, then the emission rates for those facilities were not revised to add any additional materials. For those facilities for which the comparison resulted in greater than a +/- 10 percent difference, additional review and revisions were conducted.

Out of the 202 facilities in the MACT floor ranking, 35 of them were identified in the screening analysis as having additional materials reported in the Form B sheets that could affect the overall emission rate by greater than +/- 10 percent. The data for these facilities were reviewed closely to determine what revisions were necessary. The first step in this process was to review the material names in the database and determine which of the “unlinked” materials were obviously described as coatings. There were 21 of the facilities where the “unlinked” materials could easily be identified as coatings. The source-wide emission rates for these 21 facilities were revised to incorporate the organic HAP and solids content of these additional materials. The “unlinked” materials from the rest of the facilities were identified as solvents or non-coating materials, such as metal plating. Review of the original survey responses verified that most of these solvents were most likely used as thinners. This was determined by reviewing which areas of the survey appeared to be most complete. For instance, in most cases, the equipment cleaning information was complete and descriptive which did not indicate a data gap of any kind. For most of these survey responses, the data gaps appeared to be that many coatings were high solids but did not have an associated thinner. To be as conservative as possible in the MACT floor analysis, the solvents for 11 of the facilities were incorporated into the source-wide emission rates to account for potentially unreported thinning. Finally, the emission rates for 3 of the 35 facilities reviewed were not revised because the survey responses described the materials as non-coating materials (such as metal plating).

This additional review and analysis resulted in changes to the source-wide emission rates for 32 of the facilities in the MACT floor database. The facilities that were screened out of this analysis because the potential impact was less than +/- 10 percent difference were flagged in the MACT floor database so additional review of these facilities could be done if they appeared to impact the floor calculation.

7.4 Review of Facilities in MACT Floor Using Add-on Controls

During the review of the results of the initial MACT floor analysis and ranking process, four facilities in the top-performing 12 percent of sources for the general use coating subcategory were identified as having add-on controls. Because several assumptions were used to incorporate the control and capture efficiency of these existing systems into the source-wide emission rates, the two facilities with the lowest emission rates were investigated further to determine if the assumptions used were correct. Further investigation into the survey response of one of these facilities indicated that the facility was achieving only 65 percent capture of the coating application emissions, even though the facility had reported a full enclosure. The reported capture efficiency was based on a performance test. This facility was contacted to obtain more insight into the operations of this facility and the similarities between this facility and other facilities in the plastic parts database (Reference 6). The coating processes at this facility are automated and conveyorized and the enclosures have large openings that allow products to pass through, thus reducing capture efficiency. Two of the other facilities in the top 12 percent of sources were also identified as conveyorized processes. The emissions for these two facilities were adjusted to reduce the assumed capture efficiencies to be similar to the conveyorized facility that reported 65% capture. The emissions for the facility that reported capture efficiencies in the survey were adjusted to incorporate these actual values. Further investigation into the fourth facility with add-on controls that was initially in the top 12 percent indicated that the facility was not automated and was using a permanent total enclosure to capture emissions. No adjustments were made to the emission rate for this facility. There are 15 other facilities in the MACT floor database that have add-on controls for some portion of the coating operations. In some cases, the information provided by the facility included information on capture and control efficiencies so that these source-specific values could be incorporated into the source-wide emission rates. In other cases, the information provided indicated that the capture and control systems were only incorporated

on a single line or a single part of the source-wide coating operations such that the assumptions used to incorporate these control devices into the source-wide emission rates (described in Section 6.2) do not greatly affect the overall emissions from the source.

7.5 Revisions based on Additional Review of Original Survey Responses

As additional reviews were conducted, many of the original survey responses were reviewed for the purposes of either verifying data or to assist in making decisions regarding possible revisions. As a result of several meetings with stakeholders, some additional review of the original survey responses was done for several purposes. Additional detail on specific issues raised by stakeholders can be found in the memorandum, "Summary of Responses to Issues Raised by Stakeholders for the Plastic Parts and Product Surface Coating NESHAP," (Docket No. A-99-12), (Reference 7). One review was focused on those sources whose materials data indicated that the ratio of lb of coating solids used to gallons of material used was high. Another review focused on facilities that had reported cleaning materials that contained some percentage of solids. Finally, a few surveys from the automotive manufacturer's attachment were reviewed to reconcile potential discrepancies between data for these facilities provided by stakeholders and the data in the MACT floor database.

Facilities with High Solids to Usage Ratios. The initial materials data indicated that several facilities had very high total lb of coating solids used in comparison to the total gallons of coating materials used. Stakeholders had indicated to EPA that a ratio of solids to usage that exceeds 5.0 lb of coating solids per gallon was not typical, could not be spray-applied, and should be reviewed. The entire MACT floor database was reviewed to identify all facilities with ratios that exceeded 5.0 lb of coating solids per gallon material used. There were a total of 15 facilities identified that had these high ratios that ranged from 5.06 to 32.6 lb of coating solids per gallon of material used. The materials data in the database and from the original survey responses for these facilities were reviewed to determine the reason for these high solids to usage ratios. Several of these facilities identified had high solids to usage ratios because solids from materials used for surface preparation were previously incorporated in the source-wide emission rate. This issue was reviewed and resolved as discussed in the following section, "Solids from Surface Preparation Materials". Several other facilities with initially high solids to usage ratios were resolved as a result of the analysis of "unlinked" materials discussed in Section 7.3. The fact that some facilities

reported solvent usage on a Form B but did not report this use on subsequent forms for coatings had initially underestimated the total coating material usage for some of these 15 facilities. When the unlinked thinners shown on Form B were added to the material usage calculations, as described in Section 7.3, the lb of coating solids per gallon of material used ratios were less than 5.0. Finally, some of the 15 facilities identified as having high solids to usage ratios are not affected by surface preparation solids or "unlinked" materials. The original survey responses for these facilities were reviewed and the data were verified to be correct. In these cases, the facilities are using high solids materials such as enamels, primers, hardeners, or catalysts, and most of these facilities also reported that they were using non-spray application methods such as brushes, flow coating, and roll coating. Although solids to usage ratios of greater than 5 are not feasible for spray gun applications, materials with these higher ratios can be applied through these types of non-spray applications. Therefore, no revisions were made to the calculated emission rates for these facilities.

Solids from Surface Preparation Materials. Due to the review of those facilities with high solids to usage ratios and also because of stakeholder comments, all facilities that initially had solids from surface preparation operations incorporated into the source-wide emission rates were reviewed further. The reason for this additional review is that most surface preparation operations consist of wiping down a part with a solvent or otherwise cleaning the part to prepare the surface for coating. The only materials used in these types of operations that would contain solids are detergents that are often dissolved in water and used in parts washers. The solids from these materials should not be incorporated into the source-wide emission rates because they are not indicative of production rates because the solids do not stay on the part as a film or coating. Also, including the solids from these types of detergents in a facility's source-wide emission rate would bias the results toward those facilities that happen to use this type of material for cleaning a part. Twelve facilities in the MACT floor database were identified as having solids from surface preparation materials. Eight of these facilities were using the detergent-based cleaners for surface preparation. These solids were not incorporated into the source-wide emission rates for these facilities. One facility was determined to be using high solids materials for chemical etching and chrome-plating operations. These solids were removed from the source-wide emission rate for this facility because chemical etching and chrome plating are not within the scope of the plastic

parts and products surface coating source category. One facility had reported the incorrect material numbers on the surface preparation form such that the solids were actually already incorporated as coatings. These solids were removed from the facility emission rate. Finally, two facilities had reported high solids primers and adhesion promoters on the surface preparation form. These materials would not typically be classified under surface preparation and they are considered coating materials; therefore, these solids were incorporated into the source-wide emission rates for these facilities.

Review of Individual Survey Responses. Stakeholders from the automotive industry provided EPA with summary data from some of the automotive facilities in the plastic parts and products database. In some cases, the total usages reported in the stakeholder data and the total usages developed from the MACT floor database did not match. In these cases, the data from the MACT floor database were compared to the original survey responses to determine if there had been any data entry errors. This review resulted in revisions to 4 facilities where data entry errors for material usage were identified and corrected.

7.6 Revisions Based on Data Corrections Submitted by Stakeholders

During the development of the plastic parts and products surface coating NESHAP, stakeholders questioned some of the data reported by survey respondents to the ICR questionnaire. The EPA provided a summary of the MACT floor data for all facilities in the database via the Internet (Reference 8) and agreed to accept data corrections from any facility that reviewed their MACT floor data and needed to correct or update the data provided in their initial survey response. Data corrections for 30 different facilities were submitted to EPA for review and incorporation into the MACT floor database. A summary of the types of changes submitted and how EPA incorporated these changes into the MACT floor database is provided in the following sections. The data corrections submitted by these facilities are also included in the project docket (Docket No. A-99-12).

Straightforward Data Corrections. Many of the data corrections submitted simply provided data on cleaning operations, corrected mis-reported material usages, or provided data on materials used that were not previously included in the ICR questionnaire response. These simple changes were incorporated into the final MACT floor ICR database. These changes are

documented within the database in a table, "Lookup: Database Changes for 2001," that describes the facility and the specific data that were changed or updated.

Data Corrections Incorporated into the MACT Floor Analysis. Some information provided by facilities during the data correction period could not be easily incorporated into the plastic parts ICR database. However, these changes were incorporated into the MACT floor analysis. For instance, some facilities reported source-wide capture and destruction efficiencies for control devices but did not provide all the line-by-line information to allow this information to be accurately represented in the ICR database. In these cases, the appropriate capture and control efficiencies were applied to the uncontrolled emission rates for the source as part of the MACT floor analysis. Another type of change that was incorporated into the MACT floor analysis but not the ICR database is a change to emissions from adhesives. Some facilities provided information on the amount of HAP that is emitted from certain reactive adhesives used at the facility. This emissions information was incorporated into the MACT floor analysis to adjust the organic HAP emission rate for the source, but was not included in the ICR survey database which includes material composition information. The MACT floor analysis tables for each subcategory, found in Appendix B, present the final lb of organic HAP emitted per lb of coating solids used emission rates for each source after these types of data corrections were made. As noted previously, all data corrections submitted to EPA are available in the project docket (Docket No. A-99-12).

7.7 Sources Not Included in MACT Floor Ranking

After the emission rates for all sources were calculated, sources being included in the MACT floor ranking were reviewed to identify any sources that were not representative of the source category or were over-represented in the MACT floor population.

Sources not Representative of the Source Category. A few sources that were identified as affected, major sources were included in the MACT floor database but were not included in the MACT floor ranking because the sources were determined to not be representative of the source category as a whole. One of these sources was a facility that used a combination of permanent total enclosure and add-on control device to achieve very high capture and control efficiencies. This source was reviewed further and it was determined that the high capture and control efficiencies were achieved only because the source had co-located operations that vented

organics-rich emission streams to the same control device that allowed for the high overall destruction efficiencies. This source was not included in the MACT floor ranking because it is not representative of a control configuration that is technically feasible for other plastic parts sources. Another source was removed from the general use coating subcategory MACT floor ranking because it only used high solids caulks. Again, this type of operation is not representative of typical operations at plastic parts sources. Two sources were not included in the MACT floor ranking for the general use subcategory because the data provided in the ICR questionnaires indicated that the sources were in the start-up phase and all data provided were projected usages that might not be representative of actual operations at plastic parts sources. Finally, two sources were removed from the MACT floor ranking because they were identified as using only primers and associated cleaning materials. Initially, three sources that use only primers and are all operated by the same company to perform the same type of dedicated coating operation were included in the MACT floor ranking. However, very few sources in the total population of the general use subcategory use exclusively primers. Therefore, including three virtually identical sources owned by the same company in the best-performing 12 percent of sources was over-representing this very specific and limited type of coating operation in the MACT floor. Therefore, two of the sources were removed from the MACT floor ranking. Because primer-only sources are representative of a small portion of the general use coating subcategory, the source that had the lowest source-wide emission rate was left in the MACT floor ranking. Refer to Appendix B, Table 1 for a summary of the sources included and not included in the MACT floor ranking for the general use coating subcategory.

Inclusion of Adhesive and Sealant Sources in the MACT Floor. The initial ranking of source-wide emission rates resulted in many high adhesives-use and sealants-use sources being included in the best-performing 12 percent of sources for the general use coating subcategory. The emission rates of many of these sources were low because a large portion of the coatings used are high-solids adhesives or sealants which lowers the source-wide lb of organic HAP emitted per lb of coating solids used.

The entire database was reviewed to determine what percent of the total population uses adhesives. Out of the 179 existing sources in the general use coating subcategory, 62 of these sources, or approximately 35% of the population, use some amount of adhesives. For those

sources that use greater than 10% adhesives, the average percent of coating solids attributed to adhesives use is approximately 60%. The sources initially in the general use MACT floor that were identified as having greater than 60% of the total coating solids from adhesives were excluded from the MACT floor ranking because these sources were over-representing the typical use of adhesives in the subcategory as a whole. After these sources were removed from the MACT floor ranking, there are 8 sources in the 21 best-performing sources that use adhesives. Therefore, the percentage of sources in the MACT floor facilities that use adhesives (i.e., approximately 38%) and the percentage of sources in the entire subcategory that use adhesives (i.e., 35%) are similar such that the use of adhesives by the MACT floor facilities is representative of the subcategory population as a whole.

The large use of sealants is specific to the assembly operations that are sometimes co-located with operations in the assembled on-road vehicle coating subcategory. Review of the entire database indicates that only 7 percent of the entire population in the general use subcategory are this type of assembly operation and use large amounts of high solids sealants. Therefore, to ensure that the MACT floor is representative of the overall population of sources in the subcategory, all but one of these sources was excluded from the MACT floor ranking. The inclusion of only one source in the MACT floor that uses sealants results in the same representation of this type of operation within the MACT floor sources as there is within the entire subcategory population. Refer to Appendix B, Table 1 for a summary of the sources included and not included in the MACT floor ranking for the general use coating subcategory.

8.0 REPRESENTATIVENESS OF MACT FLOOR FACILITIES

After the review of the data analysis results discussed in Section 7.0 was complete, the facilities that remained in the best-performing 12 percent for each of the subcategories were reviewed using many different parameters to determine if the MACT floor was representative of sources in each subcategory. The parameters that were considered in this review included coating types and technologies, application methods, curing temperatures, substrates, regulatory and performance specifications, part types, industry sectors and amounts of materials used. This review illustrated that there is a broad cross-section of these parameters represented by the facilities that make up the best-performing 12 percent of sources for each of the subcategories. Based on the emissions and operations data available to the Administrator for each of the

subcategories, no correlation could be identified between any of these parameters and the corresponding emission rates for the sources within each subcategory. Refer to Appendix A for summary tables of the parameters represented by the sources in the top 12 percent for each subcategory.

9.0 EXISTING SOURCE MACT FLOOR RESULTS

To determine the MACT floor, the source-specific emission rates for each of the subcategories were ranked from lowest to highest and reviewed to determine the facilities that were in the best-performing 12 percent for each subcategory or in the best-performing 5 sources for subcategories with fewer than 30 sources. The arithmetic mean was used to determine the average of these best-performing sources (see Section 2.0 for background on the CAA provisions for determining the MACT floor for existing sources).

9.1 Results of the MACT Floor for Existing Sources in the General Use Coating Subcategory

A total of 179 existing affected sources were reviewed to determine the MACT floor for the general use coating subcategory. The best-performing 12 percent of existing sources is represented by 21 unique facilities. These 21 facilities had the lowest emission rates in terms of lb organic HAP emitted per lb coating solids used. The average, or arithmetic mean, of the best-performing 12 percent of existing sources was determined to be 0.16 lb of organic HAP emitted per lb of coating solids used. Refer to Appendix B, Table 1 for a summary of the source-specific rankings for all sources in the general use coating subcategory.

9.2 Results of the MACT Floor for Existing Sources in the TPO Coating Subcategory

A total of 25 existing affected sources were reviewed to determine the MACT floor for the TPO coating subcategory. The best-performing existing sources are represented by the top five sources because there are less than 30 sources in the subcategory. These five facilities had the lowest emission rates in terms of lb organic HAP emitted per lb coating solids used. The average, or arithmetic mean, of the five best-performing existing sources was determined to be 0.23 lb of organic HAP emitted per lb of coating solids used. Refer to Appendix B, Table 2 for a summary of the source-specific rankings for all sources in this subcategory.

9.3 Results of the MACT Floor For Existing Sources in the Headlamp Coating Subcategory

A total of 10 existing affected sources were reviewed to determine the MACT floor for the headlamp coating subcategory. The best-performing existing sources are represented by the top five sources because there are less than 30 sources in the subcategory. These five facilities had the lowest emission rates in terms of lb organic HAP emitted per lb coating solids used. The average, or arithmetic mean, of the five best-performing existing sources was determined to be 0.45 lb of organic HAP emitted per lb of coating solids used. Refer to Appendix B, Table 3 for a summary of the source-specific rankings for all sources in this subcategory.

10.0 NEW SOURCE MACT FLOOR RESULTS

The new source MACT floor was determined for each of the subcategories by reviewing existing sources to identify a best-performing similar source that would set a new source MACT floor level.

General Use Coating Subcategory. The new source MACT floor for the general use coating subcategory was determined to be the same as the MACT floor for existing sources, which is 0.16 lb of organic HAP emitted per lb of coating solids used. For the general use coating subcategory, the sources whose emission rates were lower than the existing source MACT floor of 0.16 lb of organic HAP emitted per lb of solids were evaluated to determine whether one of them could be considered the best-performing similar source and represent the diversity of operations included in the subcategory.

There were nine facilities whose source-wide emission rates were lower than the average emission rate achieved by the top 12% of existing sources. EPA evaluated whether each source with a lower emission rate was similar to other sources in the subcategory in terms of parts coated, coating types, and application methods used. We found that some of the facilities with the lowest emission rates used only one or two types of coatings with a narrow range of types of parts and coating application methods. For example, one facility performing above the existing source MACT floor level uses only primers and associated cleaning materials. To produce the range of products needed in the plastic parts industry, most facilities must use multiple types of coatings, i.e. base coats, clear coats, top coats, color coats, texture coats, and undercoats. Therefore, a primer-only facility does not represent the diversity of all possible new sources in the subcategory.

Two of the nine facilities were reviewed because they were achieving lower emission rates due to add-on control devices. After further investigation into these facilities, it was determined that each add-on control device was achieving high reduction efficiencies because the facilities had very specialized, automated processes that made the emission streams concentrated enough to allow for the effective use of control devices. However, these situation were determined to not be representative of the range of possible new source plastic parts surface coating operations. Many sources coat a variety of sizes and types of parts and need to be able to change the type of parts they coat and the types of coatings and processes used and, therefore, could not design and use this type of automated process.

Because many new facilities might need to use a variety of coating types and technologies, those facilities with emission rates that were lower than the existing source MACT floor level do not represent the diversity of all new sources. Therefore, the new source MACT floor is determined to be the same as the MACT floor for existing sources. Refer to Appendix B, Table 1 for a listing of the facilities considered during the new source MACT floor determination for this subcategory.

TPO Coating Subcategory. For the TPO coating subcategory, the sources whose emission rates were lower than the existing source MACT floor of 0.23 lb of organic HAP emitted per lb of coating solids used were evaluated to determine whether there was a best-performing similar source that had a lower emission rate and would establish a new source MACT floor level for new sources in the subcategory.

There are three sources in the TPO subcategory that have lower emission rates than the existing source MACT floor level. The best-performing source was reviewed and determined to be representative of the range of new sources and was determined to establish the new source MACT floor level for the TPO subcategory at 0.17 lb of organic HAP emitted per lb of coating solids used. This source coats TPO parts, including automotive bumpers, using a waterborne TPO coating process. Available information from ICR questionnaires from this existing source indicates that waterborne coatings are feasible for TPO substrates, including TPO used in external parts such as bumpers, and can meet performance specifications for the coated parts. This existing source reported using waterborne TPO coatings and adhesion promoters on automotive bumpers and this same source further reported that these coatings were required to meet such

performance specifications as color match, high durability, flexibility, impact resistance, solvent resistance, stain resistance, adhesion, and customer specifications. These are the same types of performance specifications that other TPO sources and stakeholders have indicated as being relevant requirements for TPO coatings. When designing a new source, it would be feasible to design the TPO coating operations to use a waterborne coating process or otherwise control emissions to achieve the emission level of the best-performing individual source in this subcategory. Therefore, the MACT floor for new sources in the TPO subcategory is determined to be 0.17 lb of organic HAP emitted per lb of coating solids used. Refer to Appendix B, Table 2 for a listing of the facilities considered in the determination of the new source MACT floor for this subcategory.

Headlamp Coating Subcategory. For the headlamp coating subcategory, the sources whose emission rates were lower than the existing source MACT floor of 0.45 lb of organic HAP emitted per lb of coating solids used were evaluated to determine whether there was a best-performing similar source that had a lower emission rate and would establish a new source MACT floor level for new sources in the subcategory. There are three sources in the headlamp subcategory that have lower emission rates than the existing source MACT floor.

The identification of the new source MACT floor was conducted by reviewing the emission rates for existing headlamp coating sources excluding any organic HAP and solids from adhesives that are used in these operations. The two best-performing headlamp coating sources both use low-HAP, high-solids adhesives in the headlamp operation to do final assembly of the headlamp. While the use of these adhesives is representative of the operations at these existing sources, it is not representative of the range of operations at all potential new sources in the headlamp subcategory. The use of adhesives in headlamp coating operations is purely dependent upon individual customer needs and business decisions on whether to assemble the headlamps at the same site. The two best-performing similar sources in the headlamp subcategory achieve emission rates (excluding adhesives) of 0.034 lb of organic HAP emitted per lb of coating solids used and 0.26 lb of organic HAP emitted per lb of coating solids used.

The source that is achieving the emission rate of 0.034 lb of organic HAP emitted per lb of coating solids used has total enclosures and add-on control devices on a portion of its headlamp coating operation. It is uncertain whether other new headlamp coating sources would be able to

use enclosures and add-on control devices and achieve this emission rate. Typical organics stream concentrations estimated for sources in this category are generally too low to make the use of enclosures and control devices technically feasible. Therefore, this source is not representative of the range of all possible new sources in the headlamp coating subcategory.

The source that is achieving the emission rate of 0.26 lb of organic HAP emitted per lb of coating solids used coats automotive headlamps using low-HAP, UV-cure clearcoat technology and low-HAP vacuum metallizing technology on polycarbonate substrate. This emission rate is not achievable for existing sources that do not currently have the capability to use UV-cure clearcoat technology or vacuum metallizing technology. However, it would be feasible to design a new headlamp coating process to use similar low-HAP, UV-cure clearcoats and low-HAP vacuum metallizing technology, or otherwise control emissions to achieve the emission level of this source in the headlamp coating subcategory. Therefore, the MACT floor for new sources in the headlamp coating subcategory is determined to be 0.26 lb of organic HAP emitted per lb of coating solids used. Refer to Appendix B, Table 3 for a listing of the facilities considered in determining the new source MACT floor for this subcategory.

11.0 BEYOND-THE-FLOOR OPTIONS

After the MACT floors had been determined for new and existing sources in each subcategory, each subcategory was reviewed to identify any reasonable regulatory alternatives that are "beyond-the-floor," taking into account emission reductions, cost, non-air quality health and environmental impacts, and energy requirements. These beyond-the-floor options were compared to the MACT floor for each subcategory.

General Use Coating Subcategory. No beyond-the-floor option could be identified for the general use coating subcategory that would be applicable to all new or existing facilities in the source category. Many of the individual facilities achieving lower emission levels than the MACT floor were not using all the types of coatings that are used in the industry. This lack of representation of all the different coating types made it uncertain as to whether new facilities could achieve these same emission levels. This is described in detail in Section 10.0 and for the same reasons these sources do not constitute the new source MACT floor, they also do not constitute a beyond-the-floor option for the subcategory.

There were two sources achieving an emission level lower than the MACT floor for the general use coating subcategory by using an add-on control device. These facilities were able to get reduction efficiencies from controls because the facilities had a very specialized, automated process that made the emission streams concentrated enough to allow for the effective use of a control device. However, these concentrated emission streams are not commonly found at other plastic parts surface coating facilities. In general, add-on control techniques were determined to not be technically feasible for typical facilities in the plastic parts and products surface coating category where the only organic HAP emission streams occur during coating applications. Using knowledge of the industry, a typical spray booth size for a manual application operation was estimated. Using the estimated spray booth size and typical industrial ventilation requirements, the outlet airflow from a typical spray booth was estimated assuming that it would be enclosed with a PTE. The typical annual material usages and material organic contents reported in the database were used in combination with this estimated flowrate to calculate an average VOC stream concentration of 1-2 ppmv of VOC. This estimated VOC concentration would be much too low to allow an add-on control device, such as a thermal oxidizer, to achieve effective organic HAP destruction. Based on information reported in the plastic parts survey, a small number of facilities use a rotor concentrator prior to an incineration step to reduce organic HAP emissions. However, the surface coating operations at these facilities are automated and have higher than average outlet stream VOC concentrations. Even so, this concentrator technology can only achieve a concentration ratio (ratio of process exhaust to the desorption air) of 1:15 (Reference 9). Therefore, using a rotor concentrator that achieves this level of concentration would still not allow a stream with an initial concentration of 1-2 ppmv VOC to be controlled effectively by a thermal oxidizer or other organic HAP control device. The applicability of add-on controls for non-automated and automated coating application areas was discussed further in a teleconference with a plastic parts facility that is currently using add-on control techniques to reduce organic HAP emissions from automated application areas (Reference 6).

TPO Coating Subcategory. For the TPO coating subcategory, the use of a waterborne coating technology was identified as a beyond-the-floor option for existing sources to be considered. Refer to the preamble for a discussion of EPA's consideration of this option.

Headlamp Coating Subcategory. For the headlamp coating subcategory, the use of low-HAP, UV-cure clearcoat and low-HAP vacuum metallizing technologies was identified as a beyond-the-floor option for existing sources to be considered. Refer to the preamble for a discussion of EPA's consideration of this option.

12.0 REFERENCES

1. Memorandum from Palmer, Brian, ERG, Inc., to Teal, Kim, EPA/ESD. September 2002. "Determination of Maximum Achievable Control Technology (MACT) Floor for New and Existing Sources in the Assembled On-Road Vehicle Subcategory of the Plastic Parts and Products Surface Coating Source Category," (Docket No. A-99-12).

2. Memorandum from Burlew, Christy, ERG, Inc., to Teal, Kim, EPA/ESD, May 2002. "Development of the Information Collection Request (ICR) Database for the Plastic Parts and Products (Surface Coating) NESHAP." (Docket No. A-99-12)

3. Memorandum from Burlew, Christy, ERG, Inc., to Teal, Kim, EPA/ESD. January 2000. "Rationale for the Selection of the Source Category Definition and Subcategories for the Plastic Parts and Products Surface Coating Source Category." (Docket No. A-99-12)

4. Memorandum from Palmer, Brian, ERG, Inc., to Teal, Kim, EPA/ESD. July 2002. "Documentation of the Recreational Vehicle (RV) Database for the Plastic Parts and Products (Surface Coating) NESHAP." (Docket No. A-99-12).

5. Memorandum from Almodovár, Paul, EPA/ESD, to Coatings and Consumer Products Group Project Teams. November 19, 1998. "Petroleum Solvent Blends and Associated HAP Contents." (Docket No. A-99-12).

6. Teleconference Summary. Teal, Kim, EPA/ESD and Burlew, Christy, ERG, Inc., to Ross, Gary, Toyota Motor Mfg., and Rupp, Stuart, NUMMI. March 13, 2000. Discussion of add-on control technology system used at NUMMI facility and general applicability of add-on control systems in the plastic parts surface coating industry. (Docket No. A-99-12).

7. Memorandum from Burlew, Christy. ERG, Inc., to Teal, Kim, EPA/ESD. May 20, 2002. "Summary of Responses to Issues Raised by Stakeholders for the Plastic Parts and Product Surface Coating NESHAP." (Docket No. A-99-12).

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9. Hussey, Frank and Gupta, Ajay. Durr Environmental Inc., Plymoth, MI.. Industrial Paint & Powder On-line. "Meet VOC Regs with the Right Adsorbent." March 1998.

13.0 APPENDICES

Appendix A Summary of Parameters Represented by the MACT Floor Facilities for Each Subcategory

Appendix B Summary of Source-Specific Emission Rate and MACT Floor Rankings for Each Subcategory

Appendix A

Summary of Parameters Represented by the MACT Floor Facilities for Each Subcategory

Summary of Parameters Represented by the MACT Floor Facilities in the General Use Coating Subcategory

Parameter	General Use Coating MACT Floor Facilities*
Number of Facilities	21
Industry Segments	1 business machine/auto, 1 reinforced plastic composite (RPC), 1 misc/RPC, 3 misc/auto, 5 auto, 8 misc, 2 recreational vehicle (RV)
Cleaning Operations	10 facilities use non-HAP cleaning solvents, 11 facilities use HAP-containing cleaning solvents
Application Methods	Air-assisted airless spray, brush, conventional air spray, electrostatic spray, flow, high volume/low pressure spray (HVLP), caulk gun, roll coat, other
Coating Types	Primers, base coats, color coats, top coats, clear coats, texture coats, adhesives, EMI/RFI shielding
Coating Technology	High solids, solventborne, UV coatings, waterborne
Curing Temperatures	Ranges from ambient curing to 350 degrees F
Part Types	fiberglass reinforced plastic (FRP) hoods, fenders, auto parts, instrument panels, grilles, wheel trim, license trim, door panels, steering columns, rocker panels, RV components, glove box doors, cosmetic caps, window/louvers, golf balls, plastic machine housings, lawn tractor components and covers, cupholders, handrail and grating components
Part Descriptions	Intermediate, simple and complex shapes, flexible and rigid, exterior and interior parts
Substrate	PVC, polyurethane, thermoset, acrylonitrile butadiene styrene (ABS), polystyrene, fiberglass reinforced plastic (FRP), thermoplastic, polypropylene, other
Performance Specifications	Red and black colors, metallic color, other performance spec colors, high durability, light or UV stability, flexibility, corrosion protection, stain resistance, impact resistance, solvent resistance, other chemical resistance, abrasion resistance, customer specs, adhesion, gloss control
Regulatory Specifications	None
Total Material Usage	Ranges from 235 to 161,500 gallons

* Illustrates the wide representation of these parameters that are included in the best-performing 12 percent of sources for this subcategory.

Summary of Parameters Represented by the MACT Floor Facilities in the Headlamp Coating Subcategory

Parameter	Headlamp Coating MACT Floor Facilities*
Number of Facilities	5
Industry Segments	All 5 are automotive facilities that coat automotive headlamp components
Cleaning Operations	4 facilities use cleaning solvents that contain HAP, 1 facility uses only non-HAP cleaning solvents
Application Method	Air-assisted airless spray, conventional air spray, flow, high volume/low pressure spray (HVLP), vacuum metallizing
Coating Types	Primers, base coats, color coats, top coats, clear coats, adhesives, reflective and argent coatings
Coating Technology	High solids, solventborne, UV coatings and thermal cure coatings
Curing Temperatures	Ranges from ambient curing to 392 degrees F
Part Types	automotive headlamp components including lens, bezels, reflectors
Part Descriptions	Intermediate, simple and complex shapes, flexible and rigid, exterior parts
Substrate	polycarbonate, Lexan, thermoplastic, thermoset, ABS, acrylic
Performance Specifications	metallic color, high durability, light or UV stability, flexibility, corrosion protection, stain resistance, impact resistance, solvent resistance, abrasion resistance, customer specs, reflectivity, high heat stability
Regulatory Specifications	National Transportation Safety Board (NTSB), National Highway Traffic Safety Administration (NHTSA), Federal Motor Vehicle Safety Standards (FMVSS)
Total Material Usage	Ranges from 1,400 to 125,500 gallons

* Illustrates the wide representation of these parameters that are included in the best-performing five sources for this subcategory.

Summary of Parameters Represented by the MACT Floor Facilities in the TPO Coating Subcategory

Parameter	TPO Coating MACT Floor Facilities*
Number of Facilities	5
Industry Segments	All 5 facilities are auto original equipment manufacturers or automotive parts suppliers
Cleaning Operations	All 5 facilities use cleaning solvents that contain HAP
Application Method	Conventional air spray, electrostatic spray, high volume/low pressure spray (HVLP),
Coating Types	Primers, base coats, color coats, top coats, clear coats, adhesion promoters
Coating Technology	High solids, solventborne, UV coatings, waterborne
Curing Temperatures	Ranges from 200 to 270 degrees F
Part Types	Auto front and rear bumpers, bumper valances, door cladding, stone guards, wheel moldings, airbag assembly inserts and covers
Part Descriptions	Intermediate and simple shapes, flexible, exterior and interior parts
Substrate	Thermoplastic olefin (TPO)
Performance Specifications	Performance spec colors, high durability, light or UV stability, flexibility, stain resistance, impact resistance, solvent resistance, fire resistance, customer specs, adhesion
Regulatory Specifications	Automotive standards
Total Material Usage	Ranges from 9,500 to 209,300 gallons

* Illustrates the wide representation of these parameters that are included in the best-performing five sources for this subcategory.

Appendix B

Summary of Source-Specific Emission Rate and MACT Floor Rankings
for Each Subcategory

Table 1 - MACT Floor Ranking and Determination for the General Use Subcategory

FTN	Facility Name	Consider in Floor?***		Total Usage for General Use Coating Operations (gal)	Total Lb HAP Emitted for General Use Coating Operations	Total Lb Solids Used for General Use Coating Operations	Total Lb HAP Emitted per Lb Solids Used Emission Rate - GU
PPP612	Molded Fiber Glass - Ashtabula	a		67730.00	6866.00	418430.00	0.016
PPP568J	Cambridge Industries, Inc. - Jackson	a		38087.21	5551.00	212736.20	0.026
PPP222	Greenville Technology, Inc	a		62330.00	9189.46	187700.69	0.049
PPP321C	The Budd Company - Carey	a		72503.21	23378.09	470360.45	0.050
PPP121	Key Plastics, Inc. - Howell Division (Libralter Plastics Inc.)	a		161494.81	30316.03	456884.53	0.066
RV1019	Skyline	a		4411.00	2143.60	24659.40	0.087
PPP138C	Textron Automotive Company - Columbia Operations	a		13464.10	3764.10	36910.34	0.102
RPC398	Custom Fiberglass Manufacturing Co.	a		37352.15	11455.92	102944.71	0.111
MMP2109	Saline Plant	a		84226.22	43357.15	276854.48	0.157
PPP464	ETM Enterprises , Incorporated	a		19606.25	18228.99	109950.09	0.166
PPP488B	Mack Molding Company - Statesville	a		5717.00	4082.93	23632.82	0.173
PPP418	Risdon AMS	a		23078.00	6484.90	30690.88	0.211
PPP505	C W Ohio Inc	a		235.07	264.21	1220.85	0.216
PPP683B	Spalding Sports Worldwide - Gloversville	a		17720.00	11320.97	49617.39	0.228
PPP316	Central Coating Company, Inc	a		12725.24	5889.23	25106.65	0.235
PPP514	Mastermold, LLC	a		77744.64	19895.73	84128.49	0.236
PPP138H	Textron Automotive Company - Rantoul Operations - Plant 1	a		67801.84	53510.82	225640.97	0.237
PPP115B	Prince Corp. - Maplewood Facility	a		27683.47	20519.67	81055.10	0.253
PPP620B	Strongwell Corporation - Chatfield Division	a		8636.67	12375.19	47901.15	0.258
PPP453	K C Industries, Inc.	a		368.00	168.86	646.92	0.261
PPP115A	Prince Corp. Lakewood MFG	a		46696.19	25695.87	91242.98	0.282
PPP683A	Spalding Sports Worldwide - Chicopee	a		37961.00	29327.52	103371.28	0.284
ASC0009	New United Motor Manufacturing (NUMMI)**	a		19094.77	10322.73	36067.34	0.286
PPP529	Zehrco Plastics, Inc. - Plant 2	a		3501.83	3445.74	12025.91	0.287
PPP458G	Donnelly Corporation - Grand Haven	a		47616.71	52379.25	160238.50	0.327
PPP117C	Lescoa - Plant # 7	a		13750.00	13071.30	38445.00	0.340
PPP568	Cambridge Industries, Inc. -	a		27578.50	28799.74	78405.82	0.367
PPP687	G. S. Industries of Bassett, Inc.	a		13466.00	11125.34	29482.45	0.377
PPP367	Hadlock Plastics	a		5486.79	4832.47	12757.34	0.379
MMP2162	Delphi Delco Electronics Systems-Bypass Plants	a		1325.00	1541.90	3997.53	0.386
PPP144B	Collins & Aikman Plastics, Inc - Manchester Plant	a		28847.00	28860.98	69380.11	0.416
PPP477	LaCrosse Footwear, Inc.	a		8278.45	2632.37	6107.61	0.431
PPP601	Rene Composite Materials Corporation	a		37905.41	79560.83	180160.61	0.442
PPP561	Applied Molded Product, Corp.	a		30808.77	53568.22	120407.32	0.445
PPP323E	Wilson Sporting Goods Company	a	263	330295.85	89792.81	197379.79	0.455
MMP1702	Hay & Forge Industries	a		58986.00	125464.04	264929.67	0.474
PPP407U	MetoKote Corporation - Plants #2,3,4,5,& 10	a		1555.70	2741.58	5769.26	0.475
PPP133	Romeo Rim, Inc.	a		22305.30	24078.69	49750.57	0.484
PPP667	Vassar Industries	a		18189.00	31675.93	58620.70	0.540
PPP333B	Summit Polymers, Inc. - Valley Plant	a		12610.00	17497.19	31829.00	0.550
PPP209C	Pitney Bowes - Newton	a		489.88	81.64	147.74	0.553
PPP138F	Textron Automotive Company - NH Operations	a		20020.36	23121.81	41246.81	0.561
PPP340	Premix, Incorporated	a		5238.00	8918.68	14840.75	0.601
PPP126A	Leon Plastics, Inc.	a		26034.50	30786.28	50694.10	0.607
PPP117B	Lescoa - Breton Road Plant	a		38295.66	69919.12	114944.38	0.608
PPP586	Chance Operations, Inc.	a		8697.04	20745.21	32955.03	0.630
PPP104B	Lacks Industries, Inc. - 52nd St. Paint East	a		128417.20	235619.51	373381.20	0.631
PPP671B	Spectrum - Cubic, Inc.	a		16645.41	23310.16	35837.21	0.650
PPP498	Bedford Reinforced Plastics, Inc.	a		361.06	1305.60	1958.40	0.667
RPC269A	Nordic Fiberglass, Inc.	a		6101.89	22406.14	32510.86	0.689
RPC269B	Nordic Fiberglass, Inc.	a		5290.78	19427.74	28189.26	0.689
PPP488A	Mack Molding Company - Inman	a		19165.20	32447.28	47043.75	0.690
PPP570	Style-Mark, Inc.	a		31417.71	69286.29	98036.69	0.707
PPP548	Continental Plastics Company	a		7846.40	15192.89	21150.36	0.718

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PPP333E	Summit Polymers, Inc. - East Plant	a		3125.57	6217.10	8644.49	0.719
PPP310	Aeroquip INOAC Co.	a		79009.00	156104.39	207620.94	0.752
PPP420B	Polaris Industries, Inc. - Spirit	a		14804.71	33333.41	43735.05	0.762
PPP117A	Lescoa - Middleville Plant	a		3453.50	8273.80	10767.95	0.768
PPP125	Neaton Auto Products Mfg., Inc.	a		14366.27	18595.10	21999.74	0.845
PPP425A	Contempoary Products - Plant 1	a		5937.16	24524.78	28103.47	0.873
PPP612A	Molded Fiber Glass - Union City	a		4699.30	21894.10	24907.20	0.879
PPP447E	Worthington Custom Plastics, Inc - Upper Sandusky	a		38898.94	107518.16	120844.63	0.890
PPP415	S R of Arkansas	a		161387.90	218927.97	241652.41	0.906
PPP566	Everbrite, Inc.	a		3615.11	8666.17	9307.14	0.931
PPP396	Novabus Incorporated	a		7798.81	17530.94	18761.34	0.934
PPP559A	Deco Plate Mfg	a		30284.90	64023.22	67760.00	0.945
PPP137B	UT Automotive	a		38318.03	88448.46	92252.20	0.959
PPP387	Spartek, Inc.	a		61334.23	18917.94	19529.43	0.969
PPP508	Alcoa Building Products - Gafferey Plant	a		361403.78	401793.60	409706.95	0.981
PPP313	Design House, Inc.	a		4949.00	15950.89	15977.31	0.998
RPC331	Mckenzie Sports Products, Inc.	a		526.00	883.68	879.65	1.005
PPP579	Resilite Sports Products, Inc.	a		353799.00	753204.11	691909.68	1.089
PPP103	Starcraft Automotive Group, Inc.	a		49096.97	104221.38	94580.63	1.102
PPP333G	Summit Polymers, Inc. - Vicksburg Plant	a		17476.33	51171.81	44963.25	1.138
PPP118A	Magna International - Lakeland	a		23891.20	62845.81	53777.63	1.169
PPP550A	A.R.E. Incorporated - Mt. Eaton	a		7413.00	16568.38	12951.63	1.279
PPP138B	Textron Automotive Company - Athens Operations	a		194892.78	59756.74	45868.43	1.303
PPP147	Guardian Automotive Trim, Inc.	a		74209.41	223007.70	169171.64	1.318
PPP671A	Spectrum Cubic - McConnell	a		4040.49	6621.08	4893.96	1.353
PPP592	Mermac Group, Inc.	a		81957.00	71006.09	51997.23	1.366
PPP688	Plastech/Kenton Plant	a		34240.00	103324.40	75318.47	1.372
PPP374	Nailite International	a		61938.00	321139.05	228941.69	1.403
PPP583	Plastech	a		29946.81	79767.38	55536.68	1.436
PPP306	Regal Finishing, Inc.	a		25108.20	29548.64	20232.53	1.460
PPP138E	Textron Automotive Company - Morristown Operations	a		24984.33	66008.03	44259.56	1.491
PPP113	Eldorado National	a		6411.00	12556.17	8319.36	1.509
PPP663	Dupli-Color Products Company	a		8652.36	23357.09	14715.91	1.587
PPP151	GHSP - Hart	a		1864.33	3141.96	1970.09	1.595
PPP620A	Strongwell Corporation - Bristol Division	a		488.33	654.34	400.09	1.635
PPP540	Moonlight Industries Inc.	a		11422.00	46068.48	27738.27	1.661
PPP136	UT Automotive, Berne Facility	a		21622.04	33234.12	18930.13	1.756
PPP618	SR Finishing	a		61286.80	236803.27	128600.55	1.841
PPP138A	Textron Automotive Company - Americus Operations	a		1383399.81	1696539.14	881559.65	1.924
PPP118B	Lowell Engineering	a		68146.27	151866.53	77028.73	1.972
PPP458N	Donnelly Corporation - Newaygo Facility**	a		815632.05	328695.17	161317.46	2.038
PPP361	TG (USA) Corporation	a		175873.69	317038.37	144293.81	2.197
PPP597	C & D Aerospace Inc.	a		900.75	4463.10	2009.66	2.221
PPP507	Thierica, Inc.	a		19312.03	66328.46	29538.41	2.245
PPP559B	Dott Manufacturing	a		20817.00	56158.75	23625.79	2.377
PPP119	Plastic Trim, Inc.	a		9959.00	36254.49	14926.65	2.429
PPP333A	Summit Polymers, Inc. - Kalamazoo	a		10238.00	27456.64	10002.99	2.745
PPP137F	Untited Technologies Automotive, Inc.	a		1305.85	3150.45	1125.26	2.800
PPP567	Plastic Plate, Inc. - Plant 3	a		62099.80	272612.32	95655.15	2.850
PPP137D	United Technologies Automotive	a		14182.35	12827.07	4354.16	2.946
PPP487	Artic Cat Inc. - Molding & Paint - Madison	a		44368.00	123364.99	41694.79	2.959
PPP144C	Collins & Aikman Plastics, Inc - St. Joseph Plant	a		27775.94	54917.88	17586.47	3.123
PPP129	I. I. Stanley, Inc.	a		11114.82	30102.83	9229.52	3.262

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PPP333H	Summit Polymers, Inc. - Sterling Plant	a		20137.33	54419.32	15465.04	3.519
PPP478	Rehau Incorporated	a		14980.89	57281.83	12425.64	4.610
PPP114B	ADAC Plastics Inc. - Grand Rapids	a		6366.25	29265.26	6036.16	4.848
PPP393	Plastene Supply Company	a		225373.20	1213538.05	246415.90	4.925
PPP124	LexaMar Corporation	a		20106.19	36913.26	6984.73	5.285
PPP574	Phillips Plastics Corporation - Custom Plastics Unit	a		3382.33	12551.48	2338.80	5.367
PPP443	Carsonite International - Varnville Plant	a		3262.25	16836.94	2821.88	5.967
PPP104A	Lacks Industries, Inc. - 52nd St. Paint West	a		121279.14	645249.74	101733.15	6.343
PPP510	Arkay Plastics Illinois, Inc.	a		4805.78	22563.19	3345.90	6.744
PPP633	Chromium Corporation - Conductive Coatings Division	a		6126.67	20969.01	2470.86	8.487
MMP0347	Repolgle Globes, Inc.	a		473.00	1667.39	118.45	14.076
PPP469A	Green Tokai Company LTD. - Brookville	a		10231.06	53018.52	1903.98	27.846
RPC195A	Core Materials Corporation - Columbus	a - No - >60% solids from adhesives		51403.59	21.89	84322.60	0.0003
PPP144A	Collins & Aikman Plastics, Inc - Homer Plant	a - No - >60% solids from adhesives		11133.60	64.58	47769.66	0.001
PPP137A	United Technologies Automotive - Wauseon Plant #296	a - No - >60% solids from adhesives		700.00	6.75	1980.00	0.003
MMP2154	Delphi Automotive - Vandalia	a - No - >60% solids from adhesives		38214.00	3319.00	173736.00	0.019
MMP2201	Therma-Tru Corporation, Butler, Indiana Facility	a - No - >60% solids from adhesives		18234.00	3419.64	88370.48	0.039
MMP0636	Marysville Motorcycle Plant	a - No - >60% solids from adhesives		326.62	143.03	3617.86	0.040
RV1007	Fleetwood - 47	a - No - >60% solids from adhesives		93191.70	30870.80	631086.30	0.049
PPP447B	Worthington Custom Plastics, Inc. - Mason	a - No - >60% solids from adhesives		1743.40	384.64	6811.83	0.056
RV1008	Fleetwood - 52	a - No - >60% solids from adhesives		52988.90	24201.70	412770.90	0.059
PPP138G	Textron Automotive Company - Port Huron Operations	a - No - >60% solids from adhesives		44084.61	11213.77	189868.14	0.059
MMP1285	Therma-Tru Van Buren, Arkansas	a - No - >60% solids from adhesives		14654.00	3890.64	63339.57	0.061
RV1015	Monaco Coach - Elkhart	a - No - >60% solids from adhesives		30429.60	14319.30	230181.40	0.062
PPP612C	Molded Fiber Glass - Morganton, NC	a - No - >60% solids from adhesives		47357.00	21670.00	332830.00	0.065
RV1002	Coachmen	a - No - >60% solids from adhesives		95976.00	54614.30	780277.00	0.070
RPC348B	Seasafe, Inc.	a - No - >60% solids from adhesives		8631.74	3189.16	33500.50	0.095
RV1014	Monaco Coach - Coburg	a - No - >60% solids from adhesives		134906.20	134472.90	795968.50	0.169
RV1016	Monaco Coach - Wakarusa	a - No - >60% solids from adhesives		191348.90	211786.80	1170563.20	0.181

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PPP115C	Prince Corp. - Southview Campus	a - No - >60% solids from adhesives		31374.87	23354.26	112182.89	0.208
RV1006	Fleetwood - 44	a - No - >60% solids from adhesives		126675.22	311706.87	720855.23	0.432
RPC180	Fibertech Incorporated	a - No - >60% solids from adhesives		5373.49	1473.20	1551.60	0.949
PPP524	London Industries, Inc.	a - No - >60% solids from adhesives		6067.00	10512.65	7635.33	1.377
PPP463	The Goodyear Tire & Rubber Co.	a - No - >60% solids from adhesives		473.00	1208.92	284.67	4.253
MMP1693	Essex Group, Inc.	a - No - >60% solids from adhesives		1408.86	9643.26	1840.00	5.241
PPP321A	The Budd Company - Kendallville	assumed PPP321C is representative of primer-only facilities		46681.00	14672.50	282882.00	0.052
PPP321B	The Budd Company - North Baltimore	assumed PPP321C is representative of primer-only facilities		63163.39	25778.10	336522.43	0.077
PPP550B	A.R.E. Incorporated - Massillon	a - No - atypical controlled operation not typical of source category		53040.07	7205.48	145468.18	0.050
MMP2168	Delphi Automotive Systems	a - No - No cleaning data available		139741.00	122837.47	453263.41	0.271
MMP0571	Delphi Energy and Engine Management Systems	a - No cleaning data available		4800.00	7507.00	18105.00	0.415
MMP0499	Ampcor II, Inc.	a - No-bad data		0.00	0.00	0.00	
ACS0001	Mitsubishi Motor MFG of America, INC	a - No-bad data		0.00	0.00	0.00	
PPP476d	Eastman Kodak Company - Kodak Park Site	a - No-blanks		0.00	0.00	0.00	
PPP686A	Andover Industries - Meadville	a - No-blanks		0.00	0.00	0.00	
RPC163A	Resolite	a - No-caulk only fac		0.00	0.00	0.00	
MMP0479	Glaval Corporation	a - No-no cleaning data available		1774.50	8510.12	8184.44	
PPP328	Nero Plastics Inc.	a - No-no solids		5800.06	16399.17	219644.30	0.075
PPP333C	Summit Polymers, Inc - Syntech Plant	a - No-No usage units provided		406.00	2947.56	0.00	
PPP447D	Worthington Custom Plastics - St. Matthews	a - No-no usages provided		6080.00	27372.80	0.00	
PPP677	Diversified Coatings, Inc.	a - No-no usages provided		0.00	0.00	0.00	
PPP527	Norplas Industries Inc.	a - No-reported atypical year		0.00	0.00	0.00	
PPP527ZZ	Norplas Industries Inc.	a - No-reported atypical year		0.00	0.00	0.00	
RPC158	Molded Plastic Industries, Inc.	a - No-solids		2149.09	6110.46	91987.17	
ASC013	Subaru-Isuzu Automotive Inc.	a - No-solids		0.00	0.00	0.00	
PPP629	Gentex Optics, Inc.	a - No-solids		0.00	0.00	0.00	
PPP655	Stimsonite Corporation	a - No-solids		2819.13	510.75	0.00	
PPP662B	Brentwood Industries	a - No-solids		0.00	0.00	0.00	
PPP662C	Brentwood Industries	a - No-solids		0.00	0.00	0.00	
RPC130	Royal Fiberglass Pools, Inc.	a - No-solids		0.00	0.00	0.00	
RV1011	Georgie Boy	a-No-high adh sealant use		2478.30	5360.10	17867.60	0.300
RV1017	Nu-way	a-No-high adh sealant use		2444.77	5091.68	14243.23	0.358

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RV1020	Trail Wagons	a-No-high adh sealant use		815.16	791.73	2022.67	0.391
RV1010	Fleetwood - 77	a-No-high adh sealant use		13315.77	16641.96	42244.72	0.394
RV1012	Gulf Stream	a-No-high adh sealant use		10132.75	31087.85	57857.90	0.537
RV1022	Winnebago	a-No-high adh sealant use		33781.30	26186.40	291658.10	0.090
RV1003	Country Coach Inc.	a-No-high adh sealant use					0.103
RV1005	Dynamax Corporation	a-No-high adh sealant use		20736.50	19209.90	143647.30	0.134
RV1004	Damon	a-No-high adh sealant use		2930.00	3369.99	22967.10	0.147
RV1009	Fleetwood - 71	a-No-high adh sealant use					0.175
RV1013	Jayco	a-No-high adh sealant use					0.252
END OF THE MAJOR SOURCE POPULATION USED IN MACT FLOOR DETERMINATION							
RV1001	Carriage	No-<100 gal		82.20	349.21	122.24	2.860
MMP1320	Northrop Grumman-ESSS BWI Site	No-<100 gal		0.00	0.00	0.00	
PPP137C	UT Automotive - Plant 261	No-<100 gal		0.00	0.00	0.00	
PPP209A	Pitney Bowes - Stamford	No-<100 gal		0.00	0.00	0.00	
PPP395A	Burpee Company - Barrington Plant	No-<100 gal		0.00	0.00	0.00	
PPP578	Naval Surface Warfare Center	No-<100 gal		0.00	0.00	0.00	
RPC170A	TPI Composites, Inc. - Warren Facility	No-<100 gal		0.00	0.00	0.00	
RPC307	Smith Fiberglass Products Company, a division of A.O.Smith Corporation	No-<100 gal		0.00	0.00	0.00	
RPC378	Astoria Industries of Iowa	No-<100 gal		0.00	0.00	0.00	
RPC380	Frontier Plastic Fabricators, Inc.	No-<100 gal		0.00	0.00	0.00	
PPP384	Jones Performance Products, Inc.	No-area		1778.94	2480.62	14711.44	
PPP333F	Summit Polymers, Inc. - Columbia Plant	No-area		0.00	0.00	0.00	
PPP111A	MSX International Special Vehicles Mt. Elliot	No-area		0.00	0.00	0.00	
PPP111B	MSX International Special Vehicles Lynch Rd	No-area		0.00	0.00	0.00	
PPP111C	MSX International Special Vehicles Purks	No-area		0.00	0.00	0.00	
PPP111W	MSX International - Mandoline	No-area		0.00	0.00	0.00	
PPP111X	MSX International Design Fab Center	No-area		0.00	0.00	0.00	
PPP114A	ADAC Plastics Inc. - Saranac	No-area		0.00	0.00	0.00	
PPP114C	ADAC Plastics Inc. - Muskegon	No-area		0.00	0.00	0.00	
PPP118E	Magna International - Brighton Interior Systems	No-area		0.00	0.00	0.00	
PPP123	H. A. Parts Products of Indiana Company	No-area		0.00	0.00	0.00	
PPP131A	Vaungarde, Inc. - Bradley	No-area		0.00	0.00	0.00	
PPP134	Grand Rapids Plastics, Inc.	No-area		0.00	0.00	0.00	
PPP137E	U.T. Automotive - Alma Molding Plant	No-area		0.00	0.00	0.00	
PPP144D	Collins & Aikman Plastics, Inc. - Williamston, Noble Rd	No-area		0.00	0.00	0.00	
PPP145	Atlantic Automotive Components	No-area		0.00	0.00	0.00	
PPP149	Grand Haven Plastics, Inc.	No-area		0.00	0.00	0.00	
PPP153	Marathon Ashland Petroleum LLC - Findlay, OH Garage	No-area		0.00	0.00	0.00	
PPP209B	Pitney Bowes - Milford	No-area		0.00	0.00	0.00	
PPP209D	Pitney Bowes - Danbury	No-area		0.00	0.00	0.00	
PPP248	Hitemco	No-area		0.00	0.00	0.00	
PPP301	Volant Ski Corporation	No-area		0.00	0.00	0.00	
PPP305D	Hasbro, Inc.	No-area		0.00	0.00	0.00	
PPP305E	Hasbro, Inc. - Hasbro Games	No-area		0.00	0.00	0.00	
PPP307A	Hackney & Sons Inc.	No-area		0.00	0.00	0.00	
PPP307D	Hackney & Sons Inc.	No-area		0.00	0.00	0.00	
PPP319	Document Technologies	No-area		0.00	0.00	0.00	
PPP339	E-S Plastic Products ,Inc.	No-area		0.00	0.00	0.00	
PPP342	American Mannequins Inc.	No-area		0.00	0.00	0.00	
PPP356	Metro Plastics Technologies, Inc.	No-area		0.00	0.00	0.00	
PPP389C	GI Plastek Limited Partnership, Dec-Rite Div.	No-area		0.00	0.00	0.00	

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PPP395B	Burpee Company - Cary Plant	No-area		0.00	0.00	0.00	
PPP417	Select Engineering, Inc.	No-area		0.00	0.00	0.00	
PPP425D	Contemporary Products, Inc.	No-area		0.00	0.00	0.00	
PPP441	DeKalb Molded Plastics Company	No-area		0.00	0.00	0.00	
PPP449	Menasha Corporation - Montec Plastics	No-area		0.00	0.00	0.00	
PPP452	Danmar Products, Inc.	No-area		0.00	0.00	0.00	
PPP459B	Spensor Industries, Inc.	No-area		0.00	0.00	0.00	
PPP460	St. Croix of Park Falls, LTD (St. Croix Fishing Rods)	No-area		0.00	0.00	0.00	
PPP479	Midwest Plastic Engineering, Inc.	No-area		0.00	0.00	0.00	
PPP511	GAC Plastics, LLC (formerly Glass Alternatives Corp.)	No-area		0.00	0.00	0.00	
PPP528A	Walman Optical - Baltimore	No-area		0.00	0.00	0.00	
PPP528B	Walman Optical - Bemidji	No-area		0.00	0.00	0.00	
PPP528C	Walman Optical - Billings	No-area		0.00	0.00	0.00	
PPP528D	Walman Optical - Denver	No-area		0.00	0.00	0.00	
PPP528E	Ultra Coatings	No-area		0.00	0.00	0.00	
PPP528F	Walman Optical - Duluth	No-area		0.00	0.00	0.00	
PPP528G	Walman Optical - Evansville	No-area		0.00	0.00	0.00	
PPP528H	Walman Optical - Fargo	No-area		0.00	0.00	0.00	
PPP528I	Walman Optical - Fort Wayne	No-area		0.00	0.00	0.00	
PPP528J	Walman Optical - Great Falls	No-area		0.00	0.00	0.00	
PPP528K	Walman Optical - Green Bay	No-area		0.00	0.00	0.00	
PPP528L	Walman Optical - Kent	No-area		0.00	0.00	0.00	
PPP528M	Walman Optical - Las Vegas	No-area		0.00	0.00	0.00	
PPP528N	Walman Optical - Minot	No-area		0.00	0.00	0.00	
PPP528O	Walman Optical - Missoula	No-area		0.00	0.00	0.00	
PPP528P	Walman Optical - Montgomery	No-area		0.00	0.00	0.00	
PPP528Q	Walman Optical - Norfolk	No-area		0.00	0.00	0.00	
PPP528R	Walman Optical - Omaha	No-area		0.00	0.00	0.00	
PPP528S	Walman Optical - Rock Island	No-area		0.00	0.00	0.00	
PPP528T	Walman Optical - Sioux Falls	No-area		0.00	0.00	0.00	
PPP528U	Walman Optical - Springfield	No-area		0.00	0.00	0.00	
PPP528V	Walman Optical - York	No-area		0.00	0.00	0.00	
PPP528W	Acurex	No-area		0.00	0.00	0.00	
PPP528X	Walman Optical - Duluth	No-area		0.00	0.00	0.00	
PPP546	Nu-Coat Industries, Inc.	No-area		0.00	0.00	0.00	
PPP554	Attwood Corporation	No-area		0.00	0.00	0.00	
PPP571	Advanced Fiber Products, Inc.	No-area		0.00	0.00	0.00	
PPP594	Consolidated Coating Company	No-area		0.00	0.00	0.00	
PPP634	Conformance Coatings & Prototype, Inc.	No-area		0.00	0.00	0.00	
PPP636	JSJ Plastics, Inc. (formerly Michigan Plastics Products Company)	No-area		0.00	0.00	0.00	
PPP637A	Rexam Cosmetic Packaging, Inc.	No-area		0.00	0.00	0.00	
PPP637B	Rexam Cosmetic Packaging, Inc.	No-area		0.00	0.00	0.00	
PPP642	Maracle Industrial Finishing Co., Inc.	No-area		0.00	0.00	0.00	
PPP645A	Applied Coating Technology, Inc.	No-area		0.00	0.00	0.00	
PPP645B	Applied Coating Technology, Inc.	No-area		0.00	0.00	0.00	
PPP660	Opkor Inc	No-area		0.00	0.00	0.00	
PPP668	Plastigage Corporation	No-area		0.00	0.00	0.00	
PPP684	Perfect Plastics Industries, Inc.	No-area		0.00	0.00	0.00	
RPC162	San Juan Pools of Oklahoma, Inc.	No-area		0.00	0.00	0.00	
RPC170B	TPI Composites, Inc. - Portsmouth Facility	No-area		0.00	0.00	0.00	
RPC221	GHM, Inc.	No-area		0.00	0.00	0.00	
RPC250	Crain Enterprises Inc	No-area		0.00	0.00	0.00	
RPC271	Hy-Tec Fiberglass Inc.	No-area		0.00	0.00	0.00	
RPC291B	Teel Plastics - Hitchcock Street Facility	No-area		0.00	0.00	0.00	
RPC348	GatorGrate	No-area		0.00	0.00	0.00	
RPC404	Peterson Products	No-area		0.00	0.00	0.00	
RPC212	Sabre Yachts	No-area/boats		0.00	0.00	0.00	
RPC212A	Sabre Yachts	No-area/boats		0.00	0.00	0.00	
MMP2303	Tenneco Autonmotive/Walker	No-coats metal		0.00	0.00	0.00	
PPP632	Tex-Sol Plastics	No-coats metal		0.00	0.00	0.00	
RPC349	Polar King International, Inc.	No-covered by large appliance		0.00	0.00	0.00	
PPP595	Krueger International Inc. - Manitowoc	No-covered by misc metal or metal furniture		0.00	0.00	0.00	
RPC109	Rubber and Plastic Applicators	No-gelcoats only		0.00	0.00	0.00	

Table 1 - MACT Floor Ranking and Determination for the General Use Subcategory

FTN	Facility Name	Consider in Floor?***		Total Usage for General Use Coating Operations (gal)	Total Lb HAP Emitted for General Use Coating Operations	Total Lb Solids Used for General Use Coating Operations	Total Lb HAP Emitted per Lb Solids Used Emission Rate - GU
RPC111	Downs Manufacturing	No-gelcoats only		0.00	0.00	0.00	
RPC305	Advanced Generator Technologies	No-gelcoats only		0.00	0.00	0.00	
RPC281	H & R Industries	No-gelcoats only		0.00	0.00	0.00	
RPC361	ACCRA Industries, Inc.	No-gelcoats only		0.00	0.00	0.00	
RPC138	Lippert Corporation	No-in-mold only		0.00	0.00	0.00	
ASC010H	Daimler Crysler Toledo Assmebly Plant I	No-Less than 100 gal		0.00	0.00	0.00	
PPP533	Styrotech Incorporated	No-part of fab process		0.00	0.00	0.00	
RPC157	Foldcraft Company	No-solids /gelcoat only		0.00	0.00	0.00	
RPC228A	Glasstite West	No-solids /gelcoat only		0.00	0.00	0.00	
PPP481	Sun Process Converting Inc.	No-subject to POWC		0.00	0.00	0.00	
PPP427C	Thomasville Furniture Industries, Inc. - Plant C/M/W/SB	No-wood furn		0.00	0.00	0.00	
PPP427D	Thomasville Furniture Industries, Inc. - Plant D	No-wood furn		0.00	0.00	0.00	
PPP427H	Thomasville Furniture Industries,Inc. Plant H	No-wood furn		0.00	0.00	0.00	
PPP427L	Thomas ville Furniture Industries, Inc - Lenoir Plant	No-wood furn		0.00	0.00	0.00	

** MACT Floor Result for General Use (including cleaning and adh) is 0.163 lb HAP/lb coating solids.
MACT Floor is based on population of 177 facilities, with 21 facilities representing the top 12 percent.

The new source MACT floor is the same as the existing source floor.

***Those facilities that are shaded were included in the total population of sources in this subcategory for purposes of
However, emission rates from these facilities were not incorporated into the MACT floor emission rate because of incomplete

0.163
(GU lb/lb Floor Result)

TABLE 2 - MACT Floor Ranking and Determination for the TPO Coating Subcategory

FTN	Facility Name	Total Lb HAP Control Reductions for Coating Operations	More than 1 subcategory	Cleaning Data Available?	Total Usage for TPO Coating Operations (gal)	Total Lb HAP Emitted for TPO Coating Operations	Total Lb Solids Used for TPO Coating Operations	Lb HAP Emitted per Lb Solids Used Emission Rate - TPO
PPP124	LexaMar Corporation*		Yes - split cleaning by HAP%	Yes	42020.42	22319.10	133302.65	0.167
ASC0009	New United Motor Manufacturing (NUMMI)*	55787	Yes - split cleaning by HAP%	Yes	59151.81	34344.38	169000.83	0.203
ASC002B	Honda of America Mfg., Inc. - Marysville*			Yes	209259.55	120474.53	584309.07	0.206
MMP2154	Delphi Interior & Lighting Systems, Vadalia Ops*			Yes	9478.00	4517.46	17499.10	0.258
ASC002	Honda of America Mfg., Inc. - East Liberty*			Yes	122716.44	110727.22	349970.49	0.316
PPP447B	Worthington Custom Plastics, Inc. - Mason	20941	Yes - split cleaning by HAP%	Yes	76487.04	83417.81	248812.78	0.335
PPP131B	Vaungarde, Inc. - Chestnut			Yes	11779.86	12376.39	34339.17	0.360
PPP615	The Colonel's Inc.			Yes	64632.00	58595.22	154518.75	0.379
PPP138D	Textron Automotive Company - Evart Operations			Yes	280007.61	367560.30	928766.37	0.396
PPP394	Plasti - Paint Inc			Yes	1094116.60	9779.60	24358.02	0.401
PPP239	Camrose Technologies L.L.C	263669		Yes	417995.00	308213.01	602246.68	0.512
ASC0032	Saturn Corporation	45417		Yes	201434.82	295989.10	561363.23	0.527
PPP680A	A & K Finising, Inc. - Plant I			Yes	10498.00	13775.65	23255.14	0.592
ASC0004	Nissan Motor Manufacturing Corporation, USA	89472		Yes	81821.16	116200.35	190653.93	0.609
PPP680	A & K Finishing Inc. - Plant 2			Yes	20263.57	23577.18	35689.47	0.661
PPP686	Andover Industries - Andover			Yes	72911.38	137362.31	200361.41	0.686
MMP2108	Milan Plastics Plant			Yes	536723.69	1007511.89	1187247.50	0.849
PPP118C	Magna International - Nascote Industries	279839		Yes	562330.95	575779.70	638887.22	0.901
ASC0008	Toyota Motor Manufacturing, Kentucky			Yes	463868.33	1089161.38	1176990.06	0.925
PPP420A	Polaris Industries, Inc. - Roseau			Yes	31100.59	75794.29	73040.55	1.038
PPP125	Neaton Auto Products Mfg., Inc.	10175	Yes - split cleaning by HAP%	Yes	4407.36	6178.38	5176.30	1.194
PPP142	Autoalliance International, Inc.			Yes	183594.00	371740.54	249544.17	1.490
PPP559A	Deco Plate Mfg.		Yes - split cleaning by HAP%	Yes	26146.00	90009.00	37532.00	2.398
PPP138A	Textron Automotive Company - Americus Operations		Yes - split cleaning by HAP%	Yes	1899181.82	2435608.80	920909.35	2.645
PPP501	Mayco Plastics, Inc.			Yes	36068.63	102783.27	36483.69	2.817

** MACT Floor Results - Average of top 5 facilities is 0.23 lb HAP per lb coating solids.

NOTE: Lexamar will be the new source floor level at 0.167 lb HAP/lb solids.

TABLE 3 - MACT Floor Ranking and Determination for the Headlamp Subcategory

FTN	Facility Name	Total Lb HAP Control Reductions for Coating Operations	More than 1 subcategory	Cleaning - Total Lb HAP Reduction from Controls	Total Usage for Headlamp Coating Operations (gal)	Total Lb HAP Emitted for Headlamp Coating Operations	Total Lb Solids Used for Headlamp Coating Operations	NEW HL - Lb HAP Emitted per Lb Solids Used Emission Rate (includes clean & adh)	HL Emission Rate - lb/lb (excludes adhesive coatings only)
PPP211	Valeo Sylvania, L.L.C.*	6565		0.0	125446.0	2831.2	456098.2	0.006	0.034
MMP2110	Ford Motor Company-Visteon Automotive Systems-Sandusky Plastics Plant*				67131.3	12055.4	437382.5	0.028	0.257
PPP530	MascoTech Coatings, Inc*	8101		14395.5	71898.0	57761.3	126516.0	0.457	0.384
PPP114B	ADAC Plastics Inc. - Grand Rapids		Yes - split cleaning by HAP%	0.0	1386.0	4454.6	5059.7	0.880	2.825
PPP230	Stanley Electric US Co. Inc.			0.0	57629.2	30734.4	34873.1	0.881	0.871
PPP306	Regal Finishing, Inc.		Yes - split cleaning by HAP%		2507.0	3198.6	2461.3	1.300	0.939
PPP129	I. I. Stanley Company, Inc.*		Yes - split cleaning by HAP%		20516.0	37385.1	25443.2	1.469	0.519
PPP117B	Lescoa - Breton Road Plants		Yes - split cleaning by HAP%	0.0	318.5	496.6	333.2	1.490	0.914
PPP130	Cooper Automotive Co.*			0.0	1096.5	6420.0	1537.4	4.176	0.346
PPP124	LexaMar Corporation		Yes - split cleaning by HAP%	0.0	4715.9	12164.1	2019.6	6.023	5.048

** MACT Floor - Average of the top 5 facilities is 0.45 lb HAP per lb coating solids.

EASTERN RESEARCH GROUP, INC.

MEMORANDUM

TO: Plastic Parts and Products Surface Coating NESHAP Docket No. A-99-12

FROM: Kim Teal, US EPA and Christy Burlew, Eastern Research Group (ERG)

DATE: October 10, 2002

SUBJECT: Determination of Baseline Emissions and Costs and Emissions Impacts for New and Existing Sources in the Plastic Parts and Products Surface Coating Source Category

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1.0 INTRODUCTION

This memo describes the baseline emissions and the cost and emissions impacts analyses for new and existing sources to achieve the applicable emission limits established as part of the development of the National Emission Standard for Hazardous Air Pollutants (NESHAP) for the Surface Coating of Plastic Parts and Products. This memo describes the data sources, the analysis methodology, the assumptions used in the analyses, and the results of all analyses. Below is a list of the sections within this memo:

Section 2.0 Background Information

Section 3.0 Baseline Emissions for Existing Sources

Section 4.0 Costs and Emissions Impacts Analysis for Existing Sources

Section 5.0 Summary of Cost and Emissions Impacts for Existing Sources

Section 6.0 Model Plants and Projections for New Sources

Section 7.0 Costs and Emissions Impacts Analysis for New Sources

Section 8.0 Summary of Cost and Emissions Impacts for New Sources

Section 9.0 References

Section 10.0 Appendices

2.0 BACKGROUND

The plastic parts and products surface coating industry was identified as a source category of hazardous air pollutants (HAP) under section 112(c) of the Clean Air Act (CAA), to be regulated by a NESHAP under section 112(d) of the CAA. The plastic parts and products surface coating category consists of facilities that apply protective or decorative coatings to plastic parts and products through post-mold coating processes.

The sources of organic HAP emissions from the facilities in this source category include mixing operations, storage and handling of organic HAP materials, equipment cleaning operations, surface preparation operations, thinning of coating materials, coating application, and waste handling. These operations are directly related to the organic HAP emissions at a facility. The HAP content data and facility material usages reported in the plastic parts and products Information Collection Request (ICR) questionnaire were used as the basis for much of the analysis of baseline emissions, emission reductions, and cost impacts.

There are four subcategories defined within the plastic parts and products surface coating source category: general use coating, thermoplastic olefin (TPO) coating, headlamp coating, and assembled on-road vehicle coating (Reference 1). The emission limits for existing sources are 0.16 lb of organic HAP emitted per lb of coating solids used for general use coating, 0.23 lb of organic HAP emitted per lb of coating solids used for TPO coating, 0.45 lb of organic HAP emitted per lb of coating solids used for headlamp coating, and 1.34 lb of organic HAP emitted per lb of coating solids used for assembled on-road vehicle coating. The emission limits for new sources are 0.16 lb of organic HAP emitted per lb of coating solids used for general use coating, 0.17 lb of organic HAP emitted per lb of coating solids used for TPO coating, 0.26 lb of organic HAP emitted per lb of coating solids used for headlamp coating, and 1.34 lb of organic HAP emitted per lb of coating solids used for assembled on-road vehicle coating (Reference 2). The emission limits for each subcategory were used as the basis for the costing and impacts methodology.

3.0 BASELINE EMISSIONS FOR EXISTING SOURCES

3.1 Background and Data Sources

The same calculation methodology that was used for the MACT floor analysis (Reference 2) was used to develop the baseline organic HAP emissions for each source in the MACT floor database. The usages, densities, and weight percent of organic HAP for each coating, thinner or other additive, surface preparation material, and cleaning solvent were reported in Form B of the plastic parts ICR questionnaire. These reported values were used as the basis for the total and speciated baseline HAP emissions for the plastic parts source category.

3.2 Methodology

The usages, in gallons, of each coating, thinner or other additive, or cleaning material were multiplied by the densities of each material, in lb per gallon. The resulting values were then multiplied by the weight percent of organic HAP for each material. The lb of organic HAP for each material was summed to develop the total lb of organic HAP emissions from each source. For those facilities that use solvent blends and did not report a weight percent HAP for their solvent blends, Reference 3 was used to assign typical organic HAP contents. With the exception of those facilities that reported the use of some type of add-on control device, it was assumed for the purposes of analysis that 100 percent of the organic HAP content of all materials used at a facility was emitted to the atmosphere. The assumption that all the organic HAP content is emitted was used because it is assumed that all the organic HAP is associated with the solvents, and other carriers, and is not part of the film-forming material.

This same calculation was also applied to develop the speciated baseline organic HAP emissions. The weight percent of each individual HAP component of each material, such as the weight percent of toluene in a material, was multiplied by the usage and density of that material to determine the lbs of emissions of each individual HAP component. The emissions of each individual HAP component for each material was then summed for each source and then for the total number of facilities to develop the speciated baseline emissions.

ICR responses and further correspondence with individual facilities indicated that there are 19 existing facilities that use add-on control devices. The information reported in these ICR responses regarding the types of enclosures used, the types of control devices used and the

associated control device efficiencies were applied to the calculated uncontrolled source emissions to develop baseline emissions for each source using add-on controls. For this analysis, it was assumed that a permanent total enclosure (PTE) would capture 100 percent of emissions while a three-quarter enclosure would capture 66 percent of emissions. The assumed capture efficiencies and reported control device efficiencies were applied to the calculated uncontrolled emissions from particular areas of a source to determine the amount of organic HAP controlled by these capture/control systems. As discussed in the MACT floor memo (Reference 2), adjustments were made to the assumed capture efficiencies for some facilities using add-on controls based on information contained in Reference 4. The MACT floor memo provides more details regarding the assumptions and methodology used to incorporate add-on controls into facility baseline emission rates.

3.3 Baseline Emissions Results

The total estimated baseline organic HAP emissions based on the total of 202 existing source facilities represented in the database used to develop the MACT floor is 9,820 tons per year. The majority of these emissions (approximately 85 percent of the total) are made up of a few organic HAP pollutants: methyl ethyl ketone (MEK), toluene, xylene, methyl isobutyl ketone (MIBK), and ethylene glycol butyl ether (EGBE). The total baseline organic HAP emissions and the percent distribution of each pollutant that represents all of the facilities in the plastic parts and products database is presented in Appendix A.

4.0 COSTS AND EMISSIONS IMPACTS ANALYSIS FOR EXISTING SOURCES

4.1 Background, Data Sources, and Assumptions

The MACT floor database for plastic parts includes 202 existing facilities that were in at least one of the four subcategories. These facilities were used as the basis for the costing and impacts analysis. The MACT floor analysis determined that the emission levels for the four subcategories are on the basis of lb of organic HAP emitted per lb of coating solids used (Reference 2), and it is expected that facilities will comply by using the low-HAP materials. Therefore, data regarding the cost difference between low-HAP coatings and cleaning solvents and high-HAP coatings and cleaning solvents were needed. The plastic parts ICR questionnaire

did not request information from facilities regarding the typical costs of coatings and cleaning solvents, so we used data from the 1994 Surface Coating Alternative Control Techniques (ACT) document (Reference 5) to develop facility-specific costs for reformulating coatings to meet the MACT floor level and the Chemical Marketing Reporter (CMR) on-line service (Reference 6) was used to develop typical cleaning solvent costs.

The estimated cost for facilities to meet the emission limits for each of the four subcategories is based on the assumption that all facilities can reformulate their coatings, thinners or other additives, and cleaning materials to achieve lower emission levels. The total cost of reformulation includes the annual cost increase associated with purchasing reformulated coatings and a capital cost for replacing application equipment.

The assumption that facilities will use low-HAP coatings and cleaning solvents to meet the applicable emission limits is based on the techniques used by the best-performing 12 percent of sources that set the MACT floor for each of the four subcategories. Nineteen of the twenty-one sources included in the best-performing 12 percent for the general use coating subcategory use low-HAP materials without any controls. Three of the five sources included in the best-performing five sources for the headlamp coating subcategory and 4 of the five best sources for the TPO coating subcategory use low-HAP materials without any add-on controls. None of the 5 best-performing sources in the assembled on-road vehicle subcategory have add-on controls. These floor facilities as a group represent a wide variety of substrates, coating types, industry sectors, sizes, and application methods and are representative of the subcategories as a whole. In general, add-on controls are not applicable to this source category because even if emissions were captured, the typical organic HAP concentrations would be too low for an add-on control device to be effective. Refer to the MACT floor memo (Reference 2) for more details.

Because a source can achieve emission reductions through reformulation of its coating materials, through replacement of cleaning solvents, or through a combination of both, some assumptions had to be made regarding how sources might choose to reduce emissions. Most source-specific costs are comprised of a combination of coating reformulation costs and cleaning solvent replacement costs. The specific methodology used to determine the costs attributed to cleaning solvent replacement versus coating reformulation are discussed in the following sections.

4.2 Costs Methodology for Cleaning Solvent Replacement

Although specific solvent costs were not requested in the plastic parts ICR questionnaire, the volatile component data reported on Form B of the ICR questionnaire for these cleaning solvents could be used to develop representative solvent costs for the cleaning materials used at each facility in the MACT floor database. The cost of the various cleaning solvents used at facilities in this source category could be compared to a representative cost of a non-HAP cleaning solvent so the cost for facilities to meet the MACT floor level for equipment cleaning could be estimated. In many instances, the cleaning solvent was reported to contain 100 percent of only one specific material, such as 100% methyl ethyl ketone (MEK). The baseline costs of these materials were developed by using the CMR on-line service to look up a typical cost of purchasing MEK in 1997 dollars. However, some facilities reported using cleaning solvents that were a blend of a few different volatile components. For instance, a facility might have reported a 500 gallon usage of a cleaning material named "solvent A," but the volatile components reported for this material might have been 50% toluene and 50% acetone. In these cases, the typical cost data for solvents (in 1997 dollars) found in the CMR on-line, were used to develop weighted average costs of the cleaning solvents used at each facility.

For the purposes of costing, the cost of acetone was assumed to be representative of the cost of a non-HAP-containing cleaning solvent that a facility might switch to in order to lower emissions from equipment cleaning. It is impossible to predict exactly which non-HAP cleaning solvents a facility might choose, but acetone was chosen to represent the floor level cost because this is by far the most widely used non-HAP cleaning solvent at facilities in the ICR database and it is used for a wide variety of equipment cleaning operations. The typical cost of acetone found in the CMR was applied to the total gallons of cleaning solvent materials reported for each facility in the database. It was assumed, for the purposes of analyses, that a facility would use the same amount of non-HAP cleaning solvent to meet the MACT floor as the baseline usage amount that was reported in the ICR questionnaire.

The cost differential between the costs developed for those cleaning solvent materials reported in the ICR questionnaire for each source and the average cost of using the same amount of acetone was developed for each facility. Based on this analysis, it is concluded that facilities

performing equipment cleaning using HAP-containing solvents could switch to materials that contain no organic HAP at no additional cost. The average cost of acetone and the average cost of typically used organic HAP solvents, such as MEK, are very similar. The typical cost of acetone is actually a little less per gallon than MEK or many other HAP-containing solvents, so that no cost increase is expected for facilities that must switch cleaning solvents. Appendix B presents a summary of the costs used in this analysis for many of the typical cleaning solvents in the plastic parts database.

For the purposes of costing analysis, it was assumed that sources with a high amount of organic HAP from cleaning operations would first choose to switch to a non-HAP cleaning solvent in order to reduce the overall HAP emissions from the source. Based on the analysis previously discussed, it is assumed that this switch could be done at no additional cost which makes it an effective first step at reducing emissions. For sources in the general use coating subcategory and the assembled on-road vehicle subcategory, it was assumed that all sources would completely switch to non-HAP cleaning materials. The data for the general use coating sources and the assembled on-road vehicle sources do not indicate any relationship between coating HAP contents and cleaning solvent HAP contents. Therefore, it is assumed that switching to non-HAP cleaning solvents would be a feasible first step for all general use coating sources and assembled on-road vehicle sources. Then it is assumed that the remainder of the necessary emission reductions for each source to meet the MACT floor would be achieved through coating reformulation.

For sources in the TPO and headlamp subcategories, it was assumed that facilities with a high amount of HAP from cleaning solvents would also choose to reduce cleaning emissions first. However, because the data for existing sources in these subcategories indicate that some amount of HAP in cleaning solvents may be necessary to clean the coating materials used in these specialty operations, we did not assume that sources would switch completely to non-HAP cleaning solvents. Instead, the facilities that comprise the MACT floor for each of these subcategories were reviewed and the average percent of total HAP that was attributable to cleaning at these facilities was used as the minimum cutoff for the costing analysis. The average percent of total HAP attributed to cleaning for TPO coating sources in the MACT floor is 23% and the average percent of total HAP attributed to cleaning for headlamp coating sources is 19%.

Therefore, for the purposes of costing, for any existing TPO coating source with greater than 23% of the total HAP emissions coming from cleaning, it was assumed that the source would first reduce the cleaning HAP emissions to the 23% level. The same methodology was also used for headlamp coating sources. Then it is assumed that the remainder of the necessary emission reductions for each source to meet the MACT floor would be achieved through coating reformulation.

4.3 Costs Methodology for Coating Reformulation

As previously discussed, the estimated cost for facilities to meet the emission limits for each of the four subcategories is based on the assumption that facilities will achieve some or all of the needed emissions reductions by reformulating its coating materials. The total cost of coating reformulation includes the annual cost increase associated with purchasing reformulated coatings and a capital cost for replacing coating application equipment.

4.3.1 Annual Cost of Purchasing Reformulated Coatings

To develop the annual cost increase associated with a facility purchasing lower-HAP coatings, the coating reformulation cost data from Table 5-11 in the 1994 Surface Coating ACT were assumed to be representative of the types of coatings reported in the ICR database. Table 5-11 in the ACT is based on information from the 1985 Business Machine New Source Performance Standard (NSPS) Background Information Document (BID), (Reference 7). Table 5-11 from the ACT is presented in Appendix C. These Table 5-11 data were used in a regression analysis to develop an equation that relates the cost of coatings to the gallons of coating solids and the VOC content of the coating. Since the information in Table 5-11 is originally based on information from the Business Machine NSPS, the costs and the equation developed are in terms of 1984 dollars. The reformulation equation developed and used for this analysis was:

$$\textit{Coating cost (1984 \$/gal solids)} = 62.128 - [(0.174)(\textit{lb VOC/gal coating solids})] \quad \text{(Eq. 1)}$$

The plastic parts database was used to develop a specific lb VOC per gallon coating solids value for each source. This value was developed by using the lb of organic HAP emitted per lb of solids used that was calculated for each source in the MACT floor analysis (Reference 2) as a starting point. This starting point value was then adjusted for each source to account for the emission reductions that could be achieved by switching to non-HAP cleaning solvents as discussed in Section 4.2. After accounting for the possible cleaning HAP reductions, the adjusted starting point value in lb of organic HAP emitted per lb of coating solids used was the basis for calculating reformulation costs. For use with the cost equation, this value had to be converted to lb of VOC per gallon of coating solids used. The lb of coating solids used was converted to gallons of coating solids used by using an average coating solids density of 11.5 lb/gal. This value was developed using the plastic parts database. Using the plastic parts database, a ratio of VOC to organic HAP was developed for each source so the organic HAP emissions could be converted to VOC emissions. These calculations yielded the lb of VOC per gallon of coating solids starting point for each source. Then Equation 1 could be used to determine the cost of the coating materials at the starting point. We then needed to determine the lb of VOC per gallon of coating solids needed to achieve the MACT floor, so that we could calculate the cost of coating materials at the MACT floor level. To do this, we assumed that the percent VOC reduction each source would need to meet the MACT floor is the same as the percent HAP reduction they would need. For example, if a source needs a 90% reduction in HAP to meet the 0.16 lb of organic HAP per lb of solids level for general use coating, then we assumed they would also reduce VOC by 90%. This allowed us to calculate the lb of VOC per gallon of coating solids level needed to meet the MACT floor for each source. It was also assumed that the same amount (gallons) of coating was used at the floor as at the starting point. We then applied Equation 1, using the lb of VOC per gallon needed to meet the MACT floor, to determine the cost of coating materials for each facility at the floor. The difference between the starting point costs and the floor costs for each source results in the cost to meet the MACT floor level using reformulated coatings. These cost differences were scaled from 1984 dollars to 1997 dollars using the Chemical Engineers Plant Cost Index (Reference 8).

The assumption that VOC reduction is proportional to organic HAP reduction was necessary for purposes of the analysis because it was not possible to predict on a source-by-

source basis exactly what coatings would be used to meet the floor level and whether the HAP to VOC ratio of the floor coatings would differ from that of the baseline coatings. The assumption that the VOC content of the coatings would be reduced in order to reduce organic HAP leads to a more conservative (higher) estimate of costs for control. If we had instead assumed that some sources would switch from HAP-containing coatings to coatings that contain non-HAP VOCs without substantially lowering the total VOC content of the coatings, then the reformulation equations would predict a much smaller reformulation cost. Therefore, our assumption that the percent VOC reduction is the same as the percent HAP reduction results in both HAP and VOC control and will not tend to understate the costs.

There might be an increase in cost if facilities switch to waterborne coatings that require increased drying times or temperatures. However, the data available in the plastic parts ICR database did not indicate any definite relationship between coating types and curing temperatures because there are facilities using waterborne coatings that reported ambient curing and there are facilities using high-HAP coatings that reported curing at high temperatures. Reference 2 provides more background into the data reviews that led to this conclusion. For the purposes of costing analysis, no additional cost was included to account for any differences in curing operations that might occur.

There might be cost savings associated with coating reformulation if a facility is no longer required to dispose of waste paint or other materials as hazardous waste. However, it is difficult to determine to which facilities this might apply; therefore, no cost savings associated with this were included in this analysis.

4.3.2 Capital Cost Associated with Coating Reformulation

Because many sources that reformulate their coatings to achieve the floor level might switch to a waterborne coating system, many sources may be required to replace the application equipment. Facilities using waterborne coatings must use stainless steel application equipment, such as spray guns, to avoid corrosion of the equipment that might occur (Reference 5). Because it is not possible to predict which sources might switch to waterborne coatings, this analysis assumes that all sources would need to replace application equipment to meet the floor level. There may be some instances (such as facilities that switch to high-solids coatings) in which it

would not be necessary for a facility to switch to stainless steel spray guns. Therefore, the assumption that every facility must replace spray guns may slightly overestimate the costs for coating reformulation.

To estimate the number of spray guns at each source that would need to be replaced, it is assumed that each unique coating scenario reported in Form D of the ICR questionnaire represents a single spray booth and that each spray booth represents one set of dedicated equipment. This assumption, along with the database, was used to develop the total number of spray booths at each source. The capital cost for new application equipment, which is based on the Business Machines NSPS (Reference 7), is $1,300 per spray booth in terms of 1984 dollars. This cost includes the cost of new spray guns as well as replacement pumps and hoses. These costs were scaled from 1984 to 1997 dollars using the Chemical Engineering Plant Cost Index (Reference 8).

The associated taxes, overhead, administrative and capital recovery costs were applied to the capital costs for each source to replace the application equipment. Based on guidelines in the OAQPS cost manual (Reference 9), the taxes were calculated as 1 percent of the capital investment, insurance was calculated as 1 percent of the capital investment, and administrative costs were calculated as 2 percent of the capital investment. The capital recovery was calculated assuming a 7 percent interest rate over an assumed 10-year equipment life.

4.4 Cost Results for Existing Sources to Meet the MACT Floor

The total annualized cost for all sources in all four subcategories to meet the applicable emission limits is estimated to be $10,700,000 in 1997 dollars. This annualized cost includes the cost increase for facilities to purchase reformulated coatings as well as the administrative, insurance, capital recovery, and taxes and overhead associated with the capital investment. The total capital investment for all existing source facilities to purchase stainless steel application equipment in order to meet the applicable emission limits is $803,800 in 1997 dollars.

4.5 Emissions Impacts Methodology for Existing Sources

As discussed in the MACT floor memo (Reference 2), the emission rate for each source in each subcategory was calculated as lb of organic HAP emitted per lb of coating solids used. This

emission rate was multiplied by the total amount of coating solids used at each source to develop the baseline organic HAP emissions in tons per year for each of the existing sources. The floor level emission rate for each of the existing sources was set at the applicable emission limit for the subcategory in units of lb of organic HAP emitted per lb of coating solids used. Assuming a source would still use the same amount of coating solids as reported in the ICR questionnaire, this floor-level emission rate was multiplied by the amount of coating solids used that was calculated from the database to determine the floor-level HAP emissions in tons per year for each source. The difference between the baseline HAP emissions and the floor-level HAP emissions for each source was summed to develop the total emission reductions that result from all existing sources meeting the applicable emission limits for each subcategory. The baseline emissions from all existing sources in the source category is 9,820 tons organic HAP per year; the floor-level emissions from all existing sources in the source category is 2,263 tons organic HAP per year; therefore, the emissions reduction is 7,557 tons organic HAP per year.

4.6 Costs Analysis for Assembled On-Road Vehicle Subcategory

The assembled on-road vehicle coating sources in the source category are generally co-located with assembly operations that would be subject to the general use coating subcategory limit. A discussion of the MACT floor for the assembled on-road vehicle subcategory is found in the memo, "Determination of Maximum Achievable Control Technology (MACT) Floor for New and Existing Sources in the Assembled On-Road Vehicle Subcategory of the Plastic Parts and Products Surface Coating Source Category" (Reference 10). The facility-wide costs for these 21 sources were originally calculated based on the more stringent general use coating floor limit, using the same methodology as that described for all other sources. Since adjusting the analysis to account for the portion of these facilities subject to the less stringent assembled on-road vehicle emission limit would decrease the total costs of the rule by only about 2 percent, revised costs were not estimated for the assembled on road-vehicle coating subcategory and they were left as combined costs with the general use subcategory.

5.0 SUMMARY OF COST AND EMISSIONS IMPACTS FOR EXISTING SOURCES

Table 1 below presents a summary of the costs and emission reductions for all existing sources in all of the four subcategories. Detailed costs and emission reductions are presented for each individual existing source in Appendix D.

Table 1 - Summary of Cost and Emissions Impacts for All Existing Sources

	Baseline Emissions (tons organic HAP)	Floor Level Emissions (tons organic HAP)	Emission Reductions (tons organic HAP)	Capital Cost (1997 dollars)	Total Annual Cost (1997 dollars)
Totals	9,820	2,263	7,557	803,830	10,700,000

6.0 MODEL PLANTS AND PROJECTIONS FOR NEW SOURCES

6.1 Background and Data Sources

Although a facility-specific cost and emissions impacts analysis was possible for the existing source population, model plants had to be developed to represent the expected new source population in the plastic parts and products surface coating source category. The plastic parts MACT floor database was used as the primary basis for developing new source model plants and baseline levels. Census data and SIC/NAICS codes were used to assist in estimating growth over a 5-year time period (Reference 11).

6.2 Model Plant Parameters and Analysis

For the purposes of analysis, it was assumed that the projected new sources would be similar in distribution and parameters to the existing plastic parts surface coating facilities represented in the database of ICR responses. The plastic parts database of existing sources was reviewed to identify what parameters should be used to develop model plants. Facility size was selected as one parameter that should be used to develop model plants. As facilities differ in size they also differ in production capacity, material usage, and number of spray booths and coating lines. The amount of coating solids used at each facility was used to distinguish facility size because this is a good measure of overall production. The four ranges of annual coating solids used were chosen to achieve a fairly even distribution of existing facilities over the different size categories. See Appendix E for a summary of the model plant parameters.

Because the costs associated with meeting the MACT floor levels are based partly on the organic HAP content of coatings, the existing facilities were further subdivided into “low HAP” and “high HAP” coating facilities according to the facility-specific lb of organic HAP emitted per lb of coating solids used values that were developed during the MACT floor analysis (Reference 2). The cutoffs for “low HAP” versus “high HAP” are presented for each solids usage range in the footnotes of Appendix E. These cutoffs were based on histograms generated for each of the solids usage ranges and were chosen based on where there appeared to be a natural breakpoint in the histogram. Appendix F contains these four histograms for the different solids usage ranges.

An average annual usage of cleaning materials and an average lb organic HAP emitted per gallon cleaning material used were developed for each model plant solids usage range. Appendix E summarizes these averages for each new source model plant size range. These cleaning values were the same for the “low-HAP” and “high-HAP” coating model facilities because there does not appear to be a pattern in the existing source database between the types of cleaners used and the HAP content of the coatings used at each source in the general use coating subcategory (Reference 2).

Other model plant parameters developed include an average number of spray booths (based on the number of coating scenarios reported in the plastic parts database), an average lb of organic HAP emitted per lb of coating solids used for each model plant (based on the arithmetic average of all existing source facilities mapped to each model), and an average lb of VOC emitted for each model plant (based on the arithmetic average of all existing source facilities mapped to each model). All of these model plant parameters are also summarized in Appendix E.

6.3 New Source Growth Projections

The growth projection for new sources in the plastic parts and products surface coating industry was estimated to be 4 percent over a 5-year period. This estimate was based on reviewing census data for the major SIC/NAICS codes represented in the plastic parts database of existing sources. For details on the methodology used to develop this growth projection, see the growth projection memorandum (Reference 11).

This 4 percent growth projection was applied to the number of existing sources mapped to each model plant to determine how many new facilities are expected for each model over the 5-year period. After rounding to discount any fractional results, this calculation estimates that there will be six new facilities over the 5-year period. Appendix E presents a summary of the results of this calculation.

6.4 New Source Baseline Emissions Levels

It was assumed for the purposes of analysis that the projected new sources would be similar in distribution and characteristics to the existing sources represented by the plastic parts MACT floor database. However, some state rules that would affect plastic parts surface coating facilities were identified that have implications on the emission levels that would be expected from new sources.

A large portion of the existing sources, approximately 50% of the total number of sources, in the plastic parts and products surface coating industry are located in Michigan and Ohio. A review of existing regulations for coating operations in these two states suggested that new facilities in these states would not be classified as “high HAP” facilities. The average lb organic HAP emitted per lb coating solids used for each of the new source model plants was compared to emission levels that might be required by the state regulations. The Michigan regulations, which were VOC content limits, were converted to estimate the lb of organic HAP per lb of solids that these limits might allow. The Ohio regulations, which were a lb per day limit on VOC emissions, were also converted to estimate the lb of organic HAP per lb of solids that this limit might allow. In both cases, the estimated levels of organic HAP emissions allowed by the state regulations were lower than the average organic HAP emissions for the high-HAP new source model plants. However, because of the low number of new facilities projected over the 5-year period, no change was made to adjust emission rates for any of the projected new “high HAP” facilities. The growth projection only suggests that two new “high HAP” facilities would open and it is uncertain where these facilities would be located. The other four new sources are projected to be “low-HAP” facilities as shown in Appendix E. Therefore, the new source baseline emission levels, in terms of lb of organic HAP emitted per lb of coating solids used, are typical averages based on the existing source population.

7.0 COSTS AND EMISSIONS IMPACTS ANALYSIS FOR NEW SOURCES

7.1 Background and Data Sources

All of the projected new sources over the 5-year period after the effective date of this NESHAP are assumed to be in the general use coating subcategory. This assumption was made because of the small number of projected new sources versus the large majority of existing sources that are in the general use coating subcategory. The new source MACT floor for the general use coating subcategory was determined to be the same as for existing sources (Reference 2). Therefore, the costing analysis for new sources was done using the same methodology as discussed previously for existing sources. The appropriate analysis was conducted using the corresponding parameters developed for each new source model plant.

7.2 Cleaning Solvent Replacement Analysis for the New Source Floor

The same assumptions and methodology used for existing sources, as discussed in Section 4.2, were used for estimating the emission reductions that new sources could achieve by switching existing cleaning materials to non-HAP cleaning solvents. Because the results of the existing source cost analysis for the cleaning solvent replacements indicated that facilities would incur no additional cost to use non-HAP-containing cleaning solvents, this same assumption was applied to the projected new source facilities. The baseline emission rate used to determine the costs of reformulation were adjusted for each projected new source to account for the no-cost emission reductions that could be achieved through replacement of HAP-containing cleaning solvents.

7.3 Coating Reformulation Analysis for the New Sources

The same assumptions and methodology used for existing sources, as discussed in Section 4.3, were used to determine the cost for new sources to meet the applicable new source floor emission limits. As with existing sources, the cost for new sources to meet the emission limits consists of two components. New sources are assumed to incur a capital cost associated with using application equipment made of stainless steel to resist corrosion that might occur if using low-HAP, waterborne coatings. New sources will also incur an annual cost increase associated with purchasing reformulated lower-HAP coatings to achieve the new source floor emission levels. The same analysis conducted for existing sources was done for new sources using the

appropriate new source model plant parameters (Appendix E). The estimated total annual cost for projected new sources to meet the new source floor is $194,000 in 1997 dollars. The estimated total capital investment for the projected new sources to meet the new source floor is $28,000 in 1997 dollars.

7.4 Emissions Impacts Methodology for New Sources

The emission reductions achieved by the six projected new sources meeting the new source MACT floor levels were calculated using the same methodology that was used for existing sources, as discussed in Section 4.5. The average lb of organic HAP emitted per lb of coating solids used at baseline for the new source model plants were compared to the new source MACT floor levels for the general use subcategory to assess the total organic HAP emission reductions for the new sources.

8.0 SUMMARY OF COST AND EMISSIONS IMPACTS FOR NEW SOURCES

The new source growth projections estimate that six new plastic parts and products surface coating facilities are anticipated to be built during the five-year period after the promulgation of the NESHAP. Table 2 below presents a summary of the total costs and emissions reductions associated with the new source floor for all six projected new facilities. Appendix G presents a summary of the costs and emission reductions associated with the individual projected new sources.

Table 2 - Summary of Cost and Emissions Impacts for New Sources

	Baseline Emissions (ton organic HAP)	Floor Emissions (ton organic HAP)	Emission Reductions (ton organic HAP)	Capital Cost (1997 dollars)	Annual Costs (1997 dollars)
Totals	520	80	440	28,000	137,500

9.0 REFERENCES

1. Memorandum from Teal, Kim, EPA/ESD; Palmer, Brian and Burlew, Christy, ERG, Inc., to the Plastic Parts and Products Surface Coating NESHAP Docket No. A-99-12. September, 2002. "Rationale for the Selection of the Source Category Definition and Subcategories for the Plastic Parts and Products Surface Coating Source Category." (Docket No. A-99-12).

2. Memorandum from Burlew, Christy, ERG, Inc., to Teal, Kim. EPA/ESD. September, 2002. "Determination of the Maximum Achievable Control Technology (MACT) Floor for New and Existing Sources in the General Use Coating, Thermoplastic Olefin (TPO) Coating, and Headlamp Coating Subcategories of the Plastic Parts and Products Source Category." (Docket No. A-99-12).

3. Memorandum from Almodovar, Paul, EPA/ESD, to Coatings and Consumer Products Group Project Teams. November 19, 1998. "Petroleum Solvent Blends and Associated HAP Contents." (Docket No. A-99-12).

4. Teleconference Summary. Teal, Kim, EPA/ESD and Burlew, Christy, ERG, Inc., with Ross, Gary, Toyota Motor Mfg., and Rupp, Stuart, NUMMI, March 13, 2000. "Discussion of add-on control technology system used at NUMMI facility and general applicability of add-on control systems in the plastic parts surface coating industry." (Docket No. A-99-12).

5. Alternative Control Techniques (ACT) Document: Surface Coating of Automotive/Transportation and Business Machine Plastic Parts. EPA 453/R-94-017. Revised April 4, 1994, (Docket No. A-99-12).

6. Chemical Marketing Reporter (CMR) on-line. "www.chemexpo.com" - chemical prices section, (Docket No. A-99-12).

7. Background Information Document (BID) for the New Source Performance Standards (NSPS) for the Surface Coating of Business Machines, December 1985, (Docket No. A-99-12).

8. Chemical Engineering Plant Cost Index, (Docket No. A-99-12).

9. Mussatti, D.C., and W.M. Vatuvak. EPA Air Pollution Cost Manual, Sixth Edition. EPA Office of Air Quality Planning and Standards. Research Triangle Park, NC. Publication No. EPA/452/B-02-001. January 2002. Chapter 2, Cost Estimation: Concepts and Methodology, p. 2-34. (Docket No. A-99-12).

10. Memorandum from Palmer, Brian, ERG, Inc., to Teal, Kim, EPA/ESD. September, 2002. "Determination of Maximum Achievable Control Technology (MACT) Floor for New and

Existing Sources in the Assembled On-Road Vehicle Coating Subcategory of the Plastic Parts and Products Surface Coating Source Category." (Docket No. A-99-12).

11. Memorandum from Burlew, Christy, ERG, Inc., to Teal, Kim, EPA/ESD. May 20, 2002. "Approach for Establishing 5-year Growth Projections for the Plastic Parts and Products Source Category for the Purposes of New Source Costs and Impacts Analyses." (Docket No. A-99-12).

10.0 APPENDICES

Appendix A Summary of Baseline Emissions

Appendix B Summary of Costs Used to Represent Typical Cleaning Solvents

Appendix C Summary of Cost Data from Surface Coating ACT (Table 5-11) Used to Develop Coating Reformulation Cost Equation

Appendix D Summary Table of Facility-specific Cost and Emissions Impacts for Existing Sources

Appendix E Summary of New Source Model Plants, Associated Parameters, and Projected New Sources

Appendix F Histograms Used to Develop Low-HAP and High-HAP Cutoffs for New Source Model Plants

Appendix G Summary Table of Facility-specific Cost and Emissions Impacts for Projected New Sources

Appendix A

Summary of Baseline Emissions

Summary of Total and Speciated Baseline Emissions for Existing Sources

Organic HAP	HAP Emissions (tpy)	% of Total Baseline Emissions
Methyl Ethyl Ketone	3,953.81	40.263%
Toluene	1,966.03	20.021%
Xylene (isomers and mixture)	1,432.53	14.588%
Methyl isobutyl ketone	572.35	5.828%
EGBE	497.17	5.063%
Ethylbenzene	346.05	3.524%
Methanol	289.11	2.944%
Glycol ethers	281.73	2.869%
Methylene Diphenyl diisocyanate	180.99	1.843%
Methylene Chloride	74.15	0.755%
Styrene	45.49	0.463%
Melamine-Formaldehyde Resin	34.01	0.346%
Ethylene glycol	27.03	0.275%
Hexane	25.93	0.264%
Hexamethylene diisocyanate	15.68	0.160%
4,4'-Methylenediphenyl diisocyanate (MDI)	8.27	0.084%
Naphthalene	8.06	0.082%
2-Nitropropane	6.55	0.067%
Dimethyl formamide	6.09	0.062%
Dibutyl Phthalate	5.51	0.056%
Formaldehyde	4.55	0.046%
Phosphoric Acid	3.63	0.037%
Triethylamine	2.92	0.030%
Cumene	2.67	0.027%
Trichloroethylene	2.55	0.026%
Methyl methacrylate	2.50	0.025%
Dimethyl phthalate	2.36	0.024%
Chlorobenzene	1.78	0.018%
1,4-Dioxane	1.08	0.011%
Propylene oxide	0.60	0.006%
Toluene diisocyanate	0.40	0.004%
P-Nitrophenol	0.37	0.004%
Ethylene glycol monobutyl ether	0.37	0.004%
Phenol	0.24	0.002%
Diethylene glycol monoethyl ether	0.21	0.002%
Vinyl acetate	0.18	0.002%
Methyl chloroform (1,1,1-Trichloroethane)	0.10	0.001%
1,2,4-Trichlorobenzene	0.08	0.001%
Benzene	0.08	0.001%
4,4-Diphenylmethane diisocyanate	0.05	0.001%
Maleic anhydride	0.03	0.0003%
Acetaldehyde	0.02	0.0002%
Other	16.69	0.170%
Total HAP Emissions (tons)*	9,820.00	

This baseline is based on the current database which may not include the entire national population.

Appendix B

Summary of Costs Used to Represent Typical Cleaning Solvents

Summary of Costs Used to Represent Typical Cleaning Solvents in Plastic Parts Database (1997 dollars)

Typical Cleaning Solvents (based on plastic parts ICR database)	Average 1997 Cost ($/gal) Based on CMR On-line Data
Acetone (100%)	$ 2.67
2-Propanol (100%)	$ 2.15
Butyl Acetate (100%)	$ 4.56
Ethyl Acetate (100%)	$ 4.50
Glycol Ethers (100%)	$ 2.99
Heptane (100%)	$ 0.82
Methyl Amyl Ketone	$ 5.27
Methyl Ethyl Ketone (MEK) (100%)	$ 3.09
Methylene Chloride (100%)	$ 4.71
Methyl Isobutyl Ketone (MIBK) (100%)	$ 4.34
Mineral Spirits (100%)	$ 10.21
n-Butanol (100%)	$ 3.43
Naphtha (100%)	$ 5.55
Sodium Hyroxide (100%)	$ 1.70
Toluene (100%)	$ 4.24
Xylene (isomers and mixture) (100%)	$ 4.55
MEK (50%) / MIBK (50%)	$ 3.84
MEK (50%) / Toluene (50%)	$ 3.64
Toluene (50%) / MIBK (50%)	$ 4.29
Xylene (60%) / Acetate (40%)	$ 3.73

Appendix C

Summary of Cost Data from Surface Coating ACT (Table 5-11) Used to Develop Coating Reformulation Cost Equation

TABLE 5-11. ESTIMATED COSTS AND VOLATILE ORGANIC COMPOUND CONTENTS OF COATINGS IN THE BUSINESS MACHINE SECTOR

	Baseline			Level 1			Level 2		
		%			%			%	
- Colorcoat	VOC[a]	Solids[b]	Cost[c]	VOC[a]	Solids[b]	Cost[c]	VOC[a]	Solids[b]	Cost[c]
- Texturecoat	4.8	32	19.18	3.5	51	30.93	2.3	68	41.78
- Primer	4.8	32	19.18	3.5	51	30.93	2.3	68	41.78
- EMI/RFI	4.5	37	21.89	2.9	59	36.35	1.2	83	51.72
Shielding	4.9	31	45.70	4.0	44	53.84	2.5	65	95.48

[a] lb VOC/gal coating, less water.

[b] Percent solids, by volume.

[c] $/gal coating as purchased.

Appendix D

Summary Table of Facility-specific Cost and Emissions Impacts for Existing Sources

Appendix D - Revised Costs/Emission Reductions for Existing Plastic Parts and Products Sources - Revised 8/10/2001

Facility Tracking No.	Facility Name (this is not corporate owner)	City	State	Subcategories at Each Facility [1]	Annual Cost Increase to Purchase Floor-level Coatings (1997$)	Total Equipment Capital Cost (1997$)	Taxes, Insurance, Admin, Capital Recovery (1997$)	Total MACT Floor Emission Reductions (ton HAP)	Total Capital Cost (1997$)	Total Annual Cost (TAC) per Facility to Meet MACT Floor (1997$) [2]	Total Annual Cost (TAC) per Facility to Meet MACT Floor - Including Annual MRR Costs (1997$) [3]
ASC0004	Nissan Motor Manufacturing Corporation, USA	Smyrna	TN	TPO	1,377.77	1,554.80	283.60	36.17	1,554.80	1,661.37	11,161.37
ASC0008	Toyota Motor Manufacturing, Kentucky	Georgetown	KY	TPO	256,878.21	3,109.60	567.19	409.23	3,109.60	257,445.40	266,945.40
ASC0009	New United Motor Manufacturing (NUMMI)**	Freemont	CA	GU, TPO	18,023.60	4,664.40	850.79	2.28	4,664.40	18,874.39	28,374.39
ASC002	Honda of America Mfg., Inc. - East Liberty*	East Liberty	OH	TPO	6,146.10	4,664.40	850.79	15.12	4,664.40	6,996.88	16,496.88
ASC002B	Honda of America Mfg., Inc. - Marysville*	Marysville	OH	TPO	none	none	none	0.00	none	0.00	9,500.00
ASC0032	Saturn Corporation	Spring Hill	TN	TPO	71,974.70	3,109.60	567.19	83.44	3,109.60	72,541.89	82,041.89
MMP0347	Repolgle Globes, Inc.	Broadview	IL	GU	none	1,554.80	283.60	0.82	1,554.80	0.00	9,500.00
MMP0479	Glaval Corporation	Elkhart	IN	GU	1,666.31	3,109.60	567.19	3.60	3,109.60	2,233.50	11,733.50
MMP0571	Delphi Energy and Engine Management Systems			GU	4,317.30	1,554.80	283.60	2.31	1,554.80	4,600.90	14,100.90
MMP0636	Marysville Motorcycle Plant	Marysville	OH	GU	none	none	none	0.00	none	0.00	9,500.00
MMP1285	Therma-Tru Van Buren, Arkansas	Van Buren	AR	GU	none	none	none	0.00	none	0.00	9,500.00
MMP1693	Essex Group, Inc.	Orleans	IN	GU	8,754.91	1,554.80	283.60	4.67	1,554.80	9,038.50	18,538.50
MMP1702	Hay & Forge Industries	Hesston	KS	GU	34,455.58	1,554.80	283.60	41.54	1,554.80	34,739.18	44,239.18
MMP2108	Milan Plastics Plant	Milan	MI	TPO	243,028.24	4,664.40	850.79	367.22	4,664.40	243,879.02	253,379.02
MMP2109	Saline Plant	Saline	MI	GU	none	none	none	0.00	none	0.00	9,500.00
MMP2110	Ford Motor Company-Visteon Automotive Systems-Sandusky Plastics Plant*	Sandusky	OH	HL	none	none	none	0.00	none	0.00	9,500.00
MMP2154	Delphi Automotive - Vandalia	Vandalia	OH	GU, TPO	1,162.24	3,109.60	567.19	0.25	3,109.60	1,729.44	11,229.44
MMP2162	Delphi Delco Electronics Systems-Bypass Plants	Kokamo	IN	GU	187.77	1,554.80	283.60	0.45	1,554.80	471.37	9,971.37
MMP2168	Delphi Automotive Systems	Adrian	MI	GU	16,418.25	3,109.60	567.19	25.16	3,109.60	16,985.44	26,485.44
MMP2201	Therma-Tru Corporation, Butler, Indiana Facility	Butler	IN	GU	3,202.38	none	none	0.00	none	0.00	9,500.00
PPP103	Starcraft Automotive Group, Inc.	Goshen	IN	GU	42,604.16	3,109.60	567.19	44.54	3,109.60	43,171.35	52,671.35
PPP104A	Lacks Industries, Inc. - 52nd St. Paint West	Kentwood	MI	GU	118,425.93	4,664.40	850.79	314.49	4,664.40	119,276.71	128,776.71
PPP104B	Lacks Industries, Inc. - 52nd St. Paint East	Kentwood	MI	GU	147,040.09	9,328.80	1,701.57	87.94	9,328.80	148,741.66	158,241.66
PPP113	Eldorado National	Salina	KS	GU	4,261.55	1,554.80	283.60	5.61	1,554.80	4,545.15	14,045.15
PPP114B	ADAC Plastics Inc. - Grand Rapids	Grand Rapids	MI	GU, HL	7,284.69	15,548.00	2,835.96	15.24	15,548.00	10,120.65	19,620.65
PPP115A	Prince Corp. Lakewood MFG	Holland	MI	GU	23,278.66	3,109.60	567.19	5.55	3,109.60	23,845.85	33,345.85
PPP115B	Prince Corp. - Maplewood Facility	Holland	MI	GU	19,480.38	1,554.80	283.60	3.78	1,554.80	19,763.98	29,263.98
PPP115C	Prince Corp. - Southview Campus	Holland	MI	GU	none	7,774.00	1,417.98	2.70	7,774.00	1,417.98	10,917.98
PPP117A	Lescoa - Middleville Plant	Middleville	MI	GU	1,166.98	6,219.20	1,134.38	3.28	6,219.20	2,301.37	11,801.37
PPP117B	Lescoa - Breton Road Plant	Grand Rapids	MI	GU, HL	14,128.49	9,328.80	1,701.57	25.94	9,328.80	15,830.06	25,330.06
PPP117C	Lescoa - Plant # 7	Kentwood	MI	GU	1,440.10	4,664.40	850.79	3.46	4,664.40	2,290.89	11,790.89
PPP118A	Magna International - Lakeland	Kentwood	MI	GU	22,615.37	3,109.60	567.19	27.12	3,109.60	23,182.56	32,682.56
PPP118B	Lowell Engineering	Alto	MI	GU	none	1,554.80	283.60	69.77	1,554.80	283.60	9,783.60
PPP118C	Magna International - Nascote Industries	Nashville	IL	TPO	1,648,110.71	1,554.80	283.60	214.42	1,554.80	1,648,394.31	1,657,894.31
PPP119	Plastic Trim, Inc.	Dayton	OH	GU	8,859.11	3,109.60	567.19	16.93	3,109.60	9,426.30	18,926.30
PPP121	Key Plastics, Inc. - Howell Division (Libralter Plastics Inc.)	Howell	MI	GU	none	none	none	0.00	none	0.00	9,500.00
PPP124	LexaMar Corporation	Boyne City	MI	GU, HL, TPO	82,107.36	9,328.80	1,701.57	23.53	9,328.80	83,808.93	93,308.93
PPP125	Neaton Auto Products Mfg., Inc.	Eaton	OH	GU, TPO	25,740.02	7,774.00	1,417.98	10.03	7,774.00	27,158.00	36,658.00
PPP126A	Leon Plastics, Inc.	Grand Rapids	MI	GU	12,957.97	3,109.60	567.19	11.34	3,109.60	13,525.16	23,025.16

Appendix D - Revised Costs/Emission Reductions for Existing Plastic Parts and Products Sources - Revised 8/10/2001

Facility Tracking No.	Facility Name (this is not corporate owner)	City	State	Subcategories at Each Facility [1]	Annual Cost Increase to Purchase Floor-level Coatings (1997$)	Total Equipment Capital Cost (1997$)	Taxes, Insurance, Admin, Capital Recovery (1997$)	Total MACT Floor Emission Reductions (ton HAP)	Total Capital Cost (1997$)	Total Annual Cost (TAC) per Facility to Meet MACT Floor (1997$) [2]	Total Annual Cost (TAC) per Facility to Meet MACT Floor - Including Annual MRR Costs (1997$) [3]
PPP129	I. I. Stanley, Inc.	Battle Creek	MI	GU, HL	17,043.49	6,219.20	1,134.38	27.28	6,219.20	18,177.87	27,677.87
PPP130	Cooper Automotive Co.*	Boyertown	PA	HL	564.51	1,554.80	283.60	2.86	1,554.80	848.11	10,348.11
PPP131B	Vaungarde, Inc. - Chestnut	Owosso	MI	TPO	7,862.09	12,438.40	2,268.76	2.24	12,438.40	10,130.85	19,630.85
PPP133	Romeo Rim, Inc.	Romeo	MI	GU	25,541.75	10,883.60	1,985.17	8.06	10,883.60	27,526.92	37,026.92
PPP136	UT Automotive, Berne Facility	Berne	IN	GU	1,854.58	6,219.20	1,134.38	15.10	6,219.20	2,988.96	12,488.96
PPP137A	United Technologies Automotive - Wauseon Plant #296	Wauseon	OH	GU	none	none	none	0.00	none	0.00	9,500.00
PPP137B	UT Automotive	Iowa City	IA	GU	47,752.54	3,109.60	567.19	36.84	3,109.60	48,319.73	57,819.73
PPP137D	United Technologies Automotive	Edinburgh	IN	GU	13,601.35	1,554.80	283.60	6.07	1,554.80	13,884.95	23,384.95
PPP137F	Untited Technologies Automotive, Inc.	Dayton	TN	GU	1,833.06	1,554.80	283.60	1.49	1,554.80	2,116.66	11,616.66
PPP138A	Textron Automotive Company - Americus Operations	Americus	GA	GU, TPO	1,678,827.19	10,883.60	1,985.17	1,889.64	10,883.60	1,680,812.36	1,690,312.36
PPP138B	Textron Automotive Company - Athens Operations	Athens	TN	GU	83,744.09	1,554.80	28.60	26.21	1,554.80	83,772.69	93,272.69
PPP138C	Textron Automotive Company - Columbia Operations	Columbia	MO	GU	none	none	none	0.00	none	0.00	9,500.00
PPP138D	Textron Automotive Company - Evart Operations	Evart	MI	TPO	148,262.38	4,664.40	850.79	76.97	4,664.40	149,113.17	158,613.17
PPP138E	Textron Automotive Company - Morristown Operations	Morristown	IN	GU	48,461.61	6,219.20	1,134.38	29.46	6,219.20	49,595.99	59,095.99
PPP138F	Textron Automotive Company - NH Operations	Farmington	NH	GU	9,911.88	1,554.80	283.60	8.26	1,554.80	10,195.47	19,695.47
PPP138G	Textron Automotive Company - Port Huron Operations	Port Huron	MI	GU	none	none	none	0.00	none	0.00	9,500.00
PPP138H	Textron Automotive Company - Rantoul Operations - Plant 1	Rantoul	IL	GU	8,059.28	6,219.20	1,134.38	8.70	6,219.20	9,193.66	18,693.66
PPP142	Autoalliance International, Inc.	Flatrock	MI	TPO	242,495.57	6,219.20	1,134.38	157.17	6,219.20	243,629.95	253,129.95
PPP144A	Collins & Aikman Plastics, Inc - Homer Plant	Homer	MI	GU	none	none	none	0.00	none	0.00	9,500.00
PPP144B	Collins & Aikman Plastics, Inc - Manchester Plant	Manchester	MI	GU	7,033.41	6,219.20	1,134.38	8.88	6,219.20	8,167.80	17,667.80
PPP144C	Collins & Aikman Plastics, Inc - St. Joseph Plant	St. Joseph	MI	GU	29,507.83	12,438.40	2,268.76	26.05	12,438.40	31,776.60	41,276.60
PPP147	Guardian Automotive Trim, Inc.	Evansville	IN	GU	291,303.37	12,438.40	2,268.76	97.97	12,438.40	293,572.13	303,072.13
PPP151	GHSP - Hart	Hart	MI	GU	711.79	3,109.60	567.19	1.41	3,109.60	1,278.98	10,778.98
PPP209C	Pitney Bowes - Newton	Newton	CT	GU	none	none	none	0.00	none	0.00	9,500.00
PPP211	Valeo Sylvania, L.L.C.*	Seymor	IN	HL	none	none	none	0.00	none	0.00	9,500.00
PPP222	Greenville Technology, Inc	Greenville	OH	GU	none	none	none	0.00	none	0.00	9,500.00
PPP230	Stanley Electric US Co. Inc.	London	OH	HL	9,349.20	3,109.60	567.19	7.52	3,109.60	9,916.40	19,416.40
PPP239	Camrose Technologies L.L.C	Ada	OK	TPO	72,276.53	3,109.60	567.19	84.85	3,109.60	72,843.72	82,343.72
PPP306	Regal Finishing, Inc.	Coloma	MI	GU, HL	32,199.27	9,328.80	1,701.57	14.20	9,328.80	33,900.84	43,400.84
PPP310	Aeroquip INOAC Co.	Fremont	OH	GU	44,953.61	4,664.40	850.79	61.44	4,664.40	45,804.39	55,304.39
PPP313	Design House, Inc.	Menmomnee Falls	WI	GU	12,543.54	1,554.80	283.60	6.70	1,554.80	12,827.14	22,327.14
PPP316	Central Coating Company, Inc	West Boylston	MA	GU	2,438.02	3,109.60	567.19	0.94	3,109.60	3,005.21	12,505.21
PPP321A	The Budd Company - Kendallville	Kendallville	IN	GU	none	none	none	0.00	none	0.00	9,500.00
PPP321B	The Budd Company - North Baltimore	North Baltimore	OH	GU	none	none	none	0.00	none	0.00	9,500.00
PPP321C	The Budd Company - Carey	Carey	OH	GU	none	none	none	0.00	none	0.00	9,500.00
PPP323E	Wilson Sporting Goods Company	Humboldt	TN	GU	42,665.30	6,219.20	1,134.38	29.11	6,219.20	43,799.68	53,299.68
PPP328	Nero Plastics Inc.	Owosso	MI	GU	none	none	none	0.00	none	0.00	9,500.00
PPP333A	Summit Polymers, Inc. - Kalamazoo	Kalamazoo	MI	GU	13,922.97	4,664.40	850.79	12.93	4,664.40	14,773.76	24,273.76
PPP333B	Summit Polymers, Inc. - Valley Plant	Kalamazoo	MI	GU	9,270.49	3,109.60	567.19	6.20	3,109.60	9,837.68	19,337.68

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PPP333E	Summit Polymers, Inc. - East Plant	Kalamazoo	MI	GU	1,667.56	3,109.60	567.19	2.42	3,109.60	2,234.75	11,734.75
PPP333G	Summit Polymers, Inc. - Vicksburg Plant	Vicksburg	MI	GU	20,422.57	3,109.60	567.19	21.99	3,109.60	20,989.76	30,489.76
PPP333H	Summit Polymers, Inc. - Sterling Plant	Mt Sterling	KY	GU	12,588.33	3,109.60	567.19	25.97	3,109.60	13,155.52	22,655.52
PPP340	Premix, Incorporated	North Kingsville	OH	GU	4,639.87	29,541.20	5,388.31	3.27	29,541.20	10,028.19	19,528.19
PPP361	TG (USA) Corporation	Perryville	MO	GU	427,950.30	6,219.20	1,134.38	146.98	6,219.20	429,084.68	438,584.68
PPP367	Hadlock Plastics	Geneva	OH	GU	3,932.56	1,554.80	283.60	1.40	1,554.80	4,216.15	13,716.15
PPP374	Nailite International	Miami	FL	GU	59,207.33	1,554.80	283.60	142.25	1,554.80	59,490.93	68,990.93
PPP387	Spartek, Inc.	Sparta	WI	GU	54,838.35	46,644.00	8,507.87	7.90	46,644.00	63,346.22	72,846.22
PPP393	Plastene Supply Company	Pottageville	MO	GU	236,363.23	9,328.80	1,701.57	587.06	9,328.80	238,064.81	247,564.81
PPP394	Plasti - Paint Inc	St Louis	MI	TPO	5,483.37	1,554.80	283.60	2.09	1,554.80	5,766.97	15,266.97
PPP396	Novabus Incorporated	Roswell	NM	GU	5,114.14	1,554.80	283.60	7.26	1,554.80	5,397.73	14,897.73
PPP407U	MetoKote Corporation - Plants #2,3,4,5,& 10	Lima	OH	GU	1,330.41	3,109.60	567.19	0.91	3,109.60	1,897.61	11,397.61
PPP415	S R of Arkansas	Wilson	AR	GU	110,789.28	13,993.20	2,552.36	90.13	13,993.20	113,341.64	122,841.64
PPP418	Risdon AMS	Thomaston	CT	GU	1,639.79	1,554.80	283.60	0.79	1,554.80	1,923.38	11,423.38
PPP420A	Polaris Industries, Inc. - Roseau	Roseau	MN	TPO	57,544.00	1,554.80	283.60	29.50	1,554.80	57,827.59	67,327.59
PPP420B	Polaris Industries, Inc. - Spirit Lake	Spirit Lake	IA	GU	13,885.53	3,109.60	567.19	13.17	3,109.60	14,452.72	23,952.72
PPP425A	Contempoary Products - Plant 1	Menomonee Falls	WI	GU	none	6,219.20	1,134.38	10.01	6,219.20	1,134.38	10,634.38
PPP443	Carsonite International - Varnville Plant	Varnville	SC	GU	5,100.55	1,554.80	283.60	8.19	1,554.80	5,384.14	14,884.14
PPP447B	Worthington Custom Plastics, Inc. - Mason	Mason	OH	GU, TPO	33,736.77	12,438.40	2,268.76	13.10	12,438.40	36,005.53	45,505.53
PPP447E	Worthington Custom Plastics, Inc - Upper Sandusky	Upper Sandusky	OH	GU	31,836.22	20,212.40	3,686.74	44.09	20,212.40	35,522.96	45,022.96
PPP453	K C Industries, Inc.	Holland	MI	GU	none	1,554.80	283.60	0.03	1,554.80	283.60	9,783.60
PPP458G	Donnelly Corporation - Grand Haven	Grand Haven	MI	GU	38,321.34	9,328.80	1,701.57	13.37	9,328.80	40,022.91	49,522.91
PPP458N	Donnelly Corporation - Newaygo Facility**	Newaygo	MI	GU	none	4,664.40	850.79	151.44	4,664.40	850.79	10,350.79
PPP463	The Goodyear Tire & Rubber Co.	St. Marys	OH	GU	989.26	1,554.80	283.60	0.58	1,554.80	1,272.85	10,772.85
PPP464	ETM Enterprises , Incorporated	Grand Ledge	MI	GU	329.41	1,554.80	283.60	0.32	1,554.80	613.00	10,113.00
PPP469A	Green Tokai Company LTD. - Brookville	Brookville	OH	GU	6,349.23	4,664.40	850.79	26.36	4,664.40	7,200.02	16,700.02
PPP477	LaCrosse Footwear, Inc.	La Crosse	WI	GU	4,723.29	3,109.60	567.19	0.83	3,109.60	5,290.49	14,790.49
PPP478	Rehau Incorporated	Sturgis	MI	GU	16,477.80	1,554.80	283.60	27.65	1,554.80	16,761.40	26,261.40
PPP487	Artic Cat Inc. - Molding & Paint - Madison	Madison	SD	GU	24,017.32	1,554.80	283.60	58.35	1,554.80	24,300.92	33,800.92
PPP488A	Mack Molding Company - Inman	Inman	SC	GU	9,117.00	10,883.60	1,985.17	12.46	10,883.60	11,102.17	20,602.17
PPP488B	Mack Molding Company - Statesville	Statesville	NC	GU	73.33	10,883.60	1,985.17	0.15	10,883.60	2,058.50	11,558.50
PPP498	Bedford Reinforced Plastics, Inc.	Bedford	PA	GU	206.49	1,554.80	283.60	0.50	1,554.80	490.09	9,990.09
PPP501	Mayco Plastics, Inc.	Sterling Heights	MI	TPO	20,835.69	3,109.60	567.19	47.20	3,109.60	21,402.88	30,902.88
PPP505	C W Ohio Inc	Conneaut	OH	GU	none	1,554.80	283.60	0.03	1,554.80	283.60	9,783.60
PPP507	Thierica, Inc.	Grand Rapids	MI	GU	31,866.57	7,774.00	1,417.98	30.80	7,774.00	33,284.55	42,784.55
PPP508	Alcoa Building Products - Gafferey Plant	Gaffney	SC	GU	457,539.14	1,554.80	283.60	168.12	1,554.80	457,822.74	467,322.74
PPP510	Arkay Plastics Illinois, Inc.	Paris	IL	GU	7,572.90	3,109.60	567.19	11.01	3,109.60	8,140.10	17,640.10
PPP514	Mastermold, LLC	Johnson Creek	WI	GU	none	1,554.80	283.60	3.22	1,554.80	283.60	9,783.60
PPP524	London Industries, Inc.	London	OH	GU	208.15	1,554.80	283.60	4.65	1,554.80	491.74	9,991.74

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PPP529	Zehrco Plastics, Inc. - Plant 2	Ashtabula	OH	GU	2,082.92	1,554.80	283.60	0.76	1,554.80	2,366.52	11,866.52
PPP530	MascoTech Coatings, Inc*	China Township	MI	HL	none	none	none	0.00	none	0.00	9,500.00
PPP540	Moonlight Industries Inc.	Comstock Part	MI	GU	1,313.27	1,554.80	283.60	20.82	1,554.80	1,596.87	11,096.87
PPP548	Continental Plastics Company	Fraser	MI	GU	3,236.48	4,664.40	850.79	5.90	4,664.40	4,087.27	13,587.27
PPP550A	A.R.E. Incorporated - Mt. Eaton	Mt. Eaton	OH	GU	8,294.27	1,554.80	283.60	7.25	1,554.80	8,577.86	18,077.86
PPP550B	A.R.E. Incorporated - Massillon	Massillon	OH	GU	none	none	none	0.00	none	0.00	9,500.00
PPP559A	Deco Plate Mfg	Lapeer	MI	GU, TPO	48,380.33	6,219.20	1,134.38	67.28	6,219.20	49,514.71	59,014.71
PPP559B	Dott Manufacturing	Deckville	MI	GU	27,239.60	6,219.20	1,134.38	26.19	6,219.20	28,373.98	37,873.98
PPP561	Applied Molded Product, Corp.	Watertown	WI	GU	3,459.37	3,109.60	567.19	17.15	3,109.60	4,026.56	13,526.56
PPP566	Everbrite, Inc.	Pardeeville	WI	GU	3,607.42	4,664.40	850.79	3.59	4,664.40	4,458.20	13,958.20
PPP567	Plastic Plate, Inc. - Plant 3	Cascade TWP	MI	GU	92,098.51	12,438.40	2,268.76	128.65	12,438.40	94,367.28	103,867.28
PPP568	Cambridge Industries, Inc. - Lapeer	Lapeer	MI	GU	6,617.21	6,219.20	1,134.38	8.13	6,219.20	7,751.59	17,251.59
PPP568J	Cambridge Industries, Inc. - Jackson	Jackson	OH	GU	none	none	none	0.00	none	0.00	9,500.00
PPP570	Style-Mark, Inc.	Archbold	OH	GU	26,373.10	6,219.20	1,134.38	26.80	6,219.20	27,507.48	37,007.48
PPP574	Phillips Plastics Corporation - Custom Plastics Unit	Phillips	WI	GU	1,628.19	10,883.60	1,985.17	6.09	10,883.60	3,613.36	13,113.36
PPP579	Resilite Sports Products, Inc.	Sunbury	PA	GU	156,641.35	3,109.60	567.19	321.25	3,109.60	157,208.54	166,708.54
PPP583	Plastech	Bryan	OH	GU	29,530.95	3,109.60	567.19	35.44	3,109.60	30,098.15	39,598.15
PPP586	Chance Operations, Inc.	Wichita	KS	GU	53,670.93	4,664.40	850.79	7.74	4,664.40	54,521.71	64,021.71
PPP592	Mermac Group, Inc.	Sullivan	MO	GU	83,242.18	4,664.40	850.79	31.34	4,664.40	84,092.96	93,592.96
PPP597	C & D Aerospace Inc.	Ontario	CA	GU	3,005.36	1,554.80	283.60	2.07	1,554.80	3,288.95	12,788.95
PPP601	Rene Composite Materials Corporation	Pearisburg	VA	GU	56,095.63	7,774.00	1,417.98	25.37	7,774.00	57,513.61	67,013.61
PPP612	Molded Fiber Glass - Ashtabula	Ashtabula	OH	GU	none	none	none	0.00	none	0.00	9,500.00
PPP612A	Molded Fiber Glass - Union City	Union City	PA	GU	9,869.39	7,774.00	1,417.98	8.95	7,774.00	11,287.37	20,787.37
PPP612C	Molded Fiber Glass - Morganton, NC	Morganton	NC	GU	none	none	none	0.00	none	0.00	9,500.00
PPP615	The Colonel's Inc.	Milan	MI	TPO	18,020.08	7,774.00	1,417.98	11.53	7,774.00	19,438.06	28,938.06
PPP618	SR Finishing	Portageville	MO	GU	44,647.94	1,554.80	283.60	108.11	1,554.80	44,931.54	54,431.54
PPP620A	Strongwell Corporation - Bristol Division	Bristol	VA	GU	493.24	1,554.80	283.60	0.30	1,554.80	776.84	10,276.84
PPP620B	Strongwell Corporation - Chatfield Division	Chatfield	MN	GU	3,317.81	1,554.80	283.60	2.36	1,554.80	3,601.40	13,101.40
PPP633	Chromium Corporation - Conductive Coatings Division	Lufkin	TX	GU	4,687.48	1,554.80	283.60	10.29	1,554.80	4,971.08	14,471.08
PPP663	Dupli-Color Products Company	Elk Grove Village	IL	GU	15,813.24	1,554.80	283.60	10.50	1,554.80	16,096.83	25,596.83
PPP667	Vassar Industries	Vassar	MI	GU	6,037.04	6,219.20	1,134.38	11.15	6,219.20	7,171.42	16,671.42
PPP671A	Spectrum Cubic - McConnell	Grand Rapids	MI	GU	156.27	1,554.80	283.60	2.92	1,554.80	439.86	9,939.86
PPP671B	Spectrum - Cubic, Inc.	Grand Rapids	MI	GU	9,079.27	3,109.60	567.19	8.79	3,109.60	9,646.46	19,146.46
PPP680	A & K Finishing Inc. - Plant 2	Kentwood	MI	TPO	14,404.90	1,554.80	283.60	7.68	1,554.80	14,688.50	24,188.50
PPP680A	A & K Finising, Inc. - Plant I	Kentwood	MI	TPO	4,332.44	1,554.80	283.60	4.21	1,554.80	4,616.03	14,116.03
PPP683A	Spalding Sports Worldwide - Chicopee	Chicopee	MA	GU	6,185.89	1,554.80	283.60	6.39	1,554.80	6,469.49	15,969.49
PPP683B	Spalding Sports Worldwide - Gloversville	Gloversville	NY	GU	2,687.89	1,554.80	283.60	1.69	1,554.80	2,971.49	12,471.49
PPP686	Andover Industries - Andover	Andover	OH	TPO	134,310.52	1,554.80	283.60	45.64	1,554.80	134,594.12	144,094.12
PPP687	G. S. Industries of Bassett, Inc.	Bassett	VA	GU	5,807.79	3,109.60	567.19	3.20	3,109.60	6,374.98	15,874.98
PPP688	Plastech/Kenton Plant	Kenton	TN	GU	23,306.09	1,554.80	283.60	45.64	1,554.80	23,589.69	33,089.69
RPC180	Fibertech Incorporated	Franksville	WI	GU	1,147.12	3,109.60	567.19	0.61	3,109.60	1,714.32	11,214.32
RPC195A	Core Materials Corporation - Columbus	Columbus	OH	GU	none	none	none	0.00	none	0.00	9,500.00

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Facility Tracking No.	Facility Name (this is not corporate owner)	City	State	Subcategories at Each Facility [1]	Annual Cost Increase to Purchase Floor-level Coatings (1997$)	Total Equipment Capital Cost (1997$)	Taxes, Insurance, Admin, Capital Recovery (1997$)	Total MACT Floor Emission Reductions (ton HAP)	Total Capital Cost (1997$)	Total Annual Cost (TAC) per Facility to Meet MACT Floor (1997$) [2]	Total Annual Cost (TAC) per Facility to Meet MACT Floor - Including Annual MRR Costs (1997$) [3]
RPC269A	Nordic Fiberglass, Inc.	Warren	MN	GU	3,580.30	1,554.80	283.60	8.60	1,554.80	3,863.90	13,363.90
RPC269B	Nordic Fiberglass, Inc.	Devils Lake	ND	GU	3,104.38	1,554.80	283.60	7.46	1,554.80	3,387.98	12,887.98
RPC331	Mckenzie Sports Products, Inc.	Salisbury	NC	GU	60.88	3,109.60	567.19	0.37	3,109.60	628.08	10,128.08
RPC348B	Seasafe, Inc.	Lafayette	LA	GU	none	none	none	0.00	none	0.00	9,500.00
RPC398	Custom Fiberglass Manufacturing Co.	Long Beach	CA	GU	none	none	none	0.00	none	0.00	9,500.00
RV1002	Coachmen			GU	none	none	none	0.00	none	0.00	9,500.00
RV1003	Country Coach Inc.			GU	8,034.00	7,774.00	1,417.98	12.30	7,774.00	9,451.98	18,951.98
RV1004	Damon			GU	3,617.25	7,774.00	1,417.98	2.22	7,774.00	5,035.23	14,535.23
RV1005	Dynamax Corporation			GU	30,459.34	7,774.00	1,417.98	17.42	7,774.00	31,877.32	41,377.32
RV1006	Fleetwood - 44			GU	183,074.84	7,774.00	1,417.98	98.19	7,774.00	184,492.82	193,992.82
RV1007	Fleetwood - 47			GU	none	none	none	0.00	none	0.00	9,500.00
RV1008	Fleetwood - 52			GU	none	none	none	0.00	none	0.00	9,500.00
RV1009	Fleetwood - 71			GU	29,260.73	7,774.00	1,417.98	15.62	7,774.00	30,678.71	40,178.71
RV1010	Fleetwood - 77			GU	9,254.93	7,774.00	1,417.98	4.94	7,774.00	10,672.91	20,172.91
RV1011	Georgie Boy			GU	2,363.39	7,774.00	1,417.98	1.26	7,774.00	3,781.37	13,281.37
RV1012	Gulf Stream			GU	43,937.42	7,774.00	1,417.98	23.91	7,774.00	45,355.40	54,855.40
RV1013	Jayco			GU	49,978.63	7,774.00	1,417.98	29.49	7,774.00	51,396.61	60,896.61
RV1014	Monaco Coach - Coburg			GU	1,362.50	7,774.00	1,417.98	3.56	7,774.00	2,780.48	12,280.48
RV1015	Monaco Coach - Elkhart			GU	none	none	none	0.00	none	0.00	9,500.00
RV1016	Monaco Coach - Wakarusa			GU	11,625.96	7,774.00	1,417.98	12.25	7,774.00	13,043.94	22,543.94
RV1017	Nu-way			GU	2,640.21	7,774.00	1,417.98	1.41	7,774.00	4,058.19	13,558.19
RV1018	Pro-Design			GU	12,572.85	7,774.00	1,417.98	10.92	7,774.00	13,990.83	23,490.83
RV1019	Skyline			GU	none	none	none	0.00	none	0.00	9,500.00
RV1020	Trail Wagons			GU	3,881.19	7,774.00	1,417.98	2.50	7,774.00	5,299.17	14,799.17
RV1021	Western RV			GU	4,385.05	7,774.00	1,417.98	2.69	7,774.00	5,803.03	15,303.03
RV1022	Winnebago			GU	none	7,774.00	1,417.98	20.77	7,774.00	1,417.98	10,917.98
					8,771,798.0			7,555.66	803,831.60	8,914,675.98	10,672,175.98

[1] This column indicates which of the three subcategories apply to each facility. All costs and emission reductions are totals for all subcategories located at a facility.
[2] This TAC value is the sum of the taxes, insurance, and capital recovery plus the annual cost increase to purchase reformulated coatings.
[3] This TAC is the TOTAL TAC that includes the items mentioned above as well as monitoring, recordkeeping, and reporting (MRR) costs.
The facility-specific TAC is the calculated annual compliance costs plus the average MRR burden cost per facility ($9,500) that was estimated for the OMB83I.
Note: Those facilities with shaded cost values are those facilities that already meet the MACT floor.
The only cost attributed to these facilities is the MRR cost estimated for this rule.

Appendix E

Summary of New Source Model Plants, Associated Parameters, and Projected New Sources

Summary of New Source Model Plants, Associated Parameters, and Projected New Sources

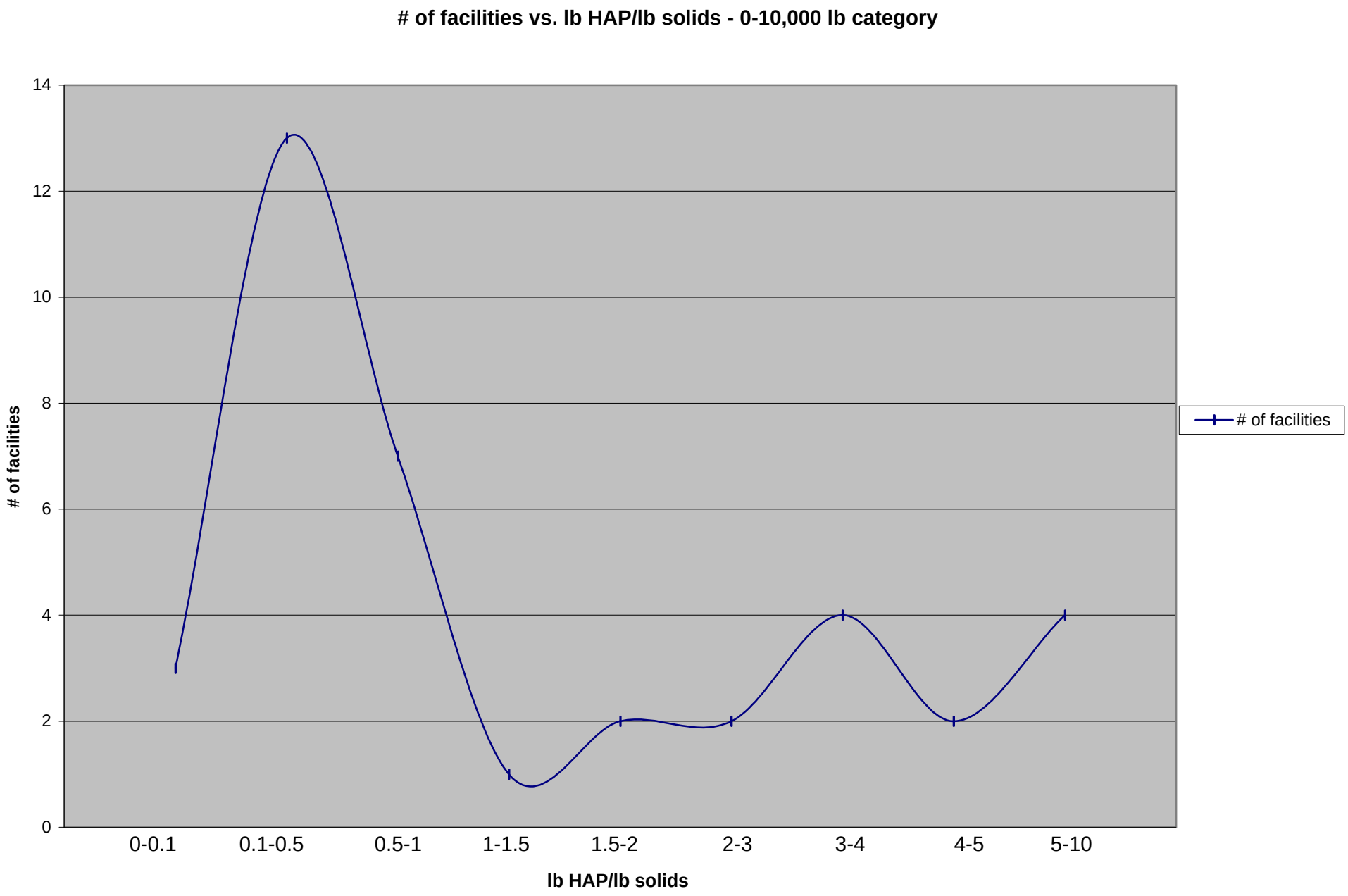
Model Plant	Lb Coating Solids Usage Range	High/Low HAP Coatings	Avg Coating Solids Usage (lb)	Avg lb organic HAP emitted per lb coating solids used	Avg Cleaning Usage (gal)	Avg lb HAP/gal cleaning material	# of Existing Facilities in Model Plant	5-year Growth Projection (%)	New Facilities in Each Model after 5 Yrs (calc)	New Facilities in Each Model after 5 Yrs (rounded)	New Facilities in Each Model after 5 Yrs (adjust for state rules)
1	0-10,000	Low HAP	4180	0.37	2050	2.62	23	4%	0.92	1	1
2	0-10,000	High HAP	2530	3.96	2050	2.62	15	4%	0.6	1	1
3	10,000 - 30,000	Low HAP	19370	0.46	2500	2.52	25	4%	1	1	1
4	10,000 - 30,000	High HAP	17280	2.03	2500	2.52	10	4%	0.4	0	0
5	30,000 - 100,000	Low HAP	54360	0.47	7340	2.79	33	4%	1.32	1	1
6	30,000 - 100,000	High HAP	59900	2.13	7340	2.79	9	4%	0.36	0	0
7	>100,000	Low HAP	638640	0.2	110800	2.01	29	4%	1.16	1	1
8	>100,000	High HAP	287830	1.31	110800	2.01	14	4%	0.56	1	1
									Total of New Facilities	**6**	**6**

Note: All model plant parameters are averages based on the database of existing sources which was used to develop the MACT floor.

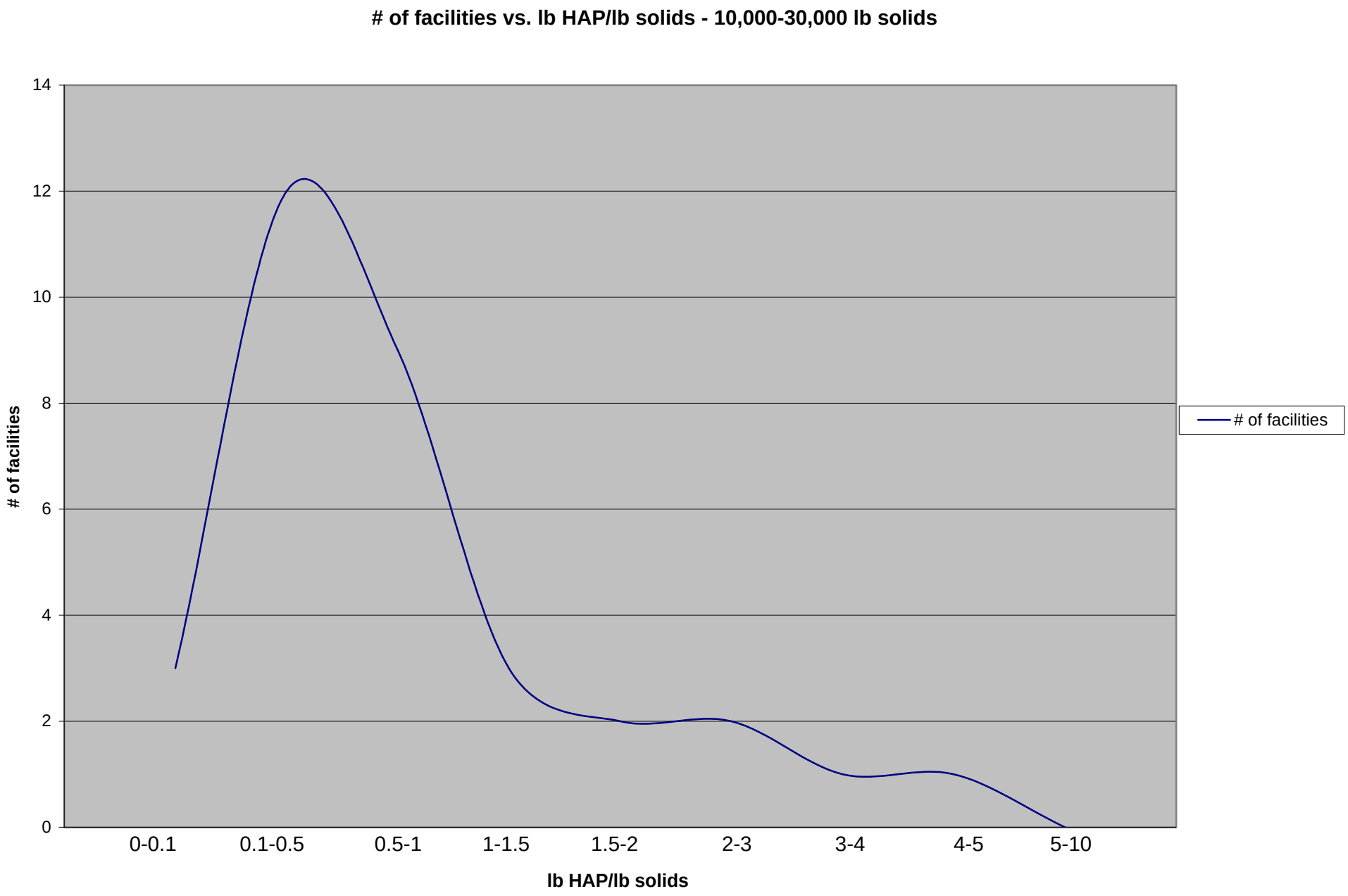
Appendix F

Histograms Used to Develop Low-HAP and High-HAP Cutoffs for New Source Model Plants

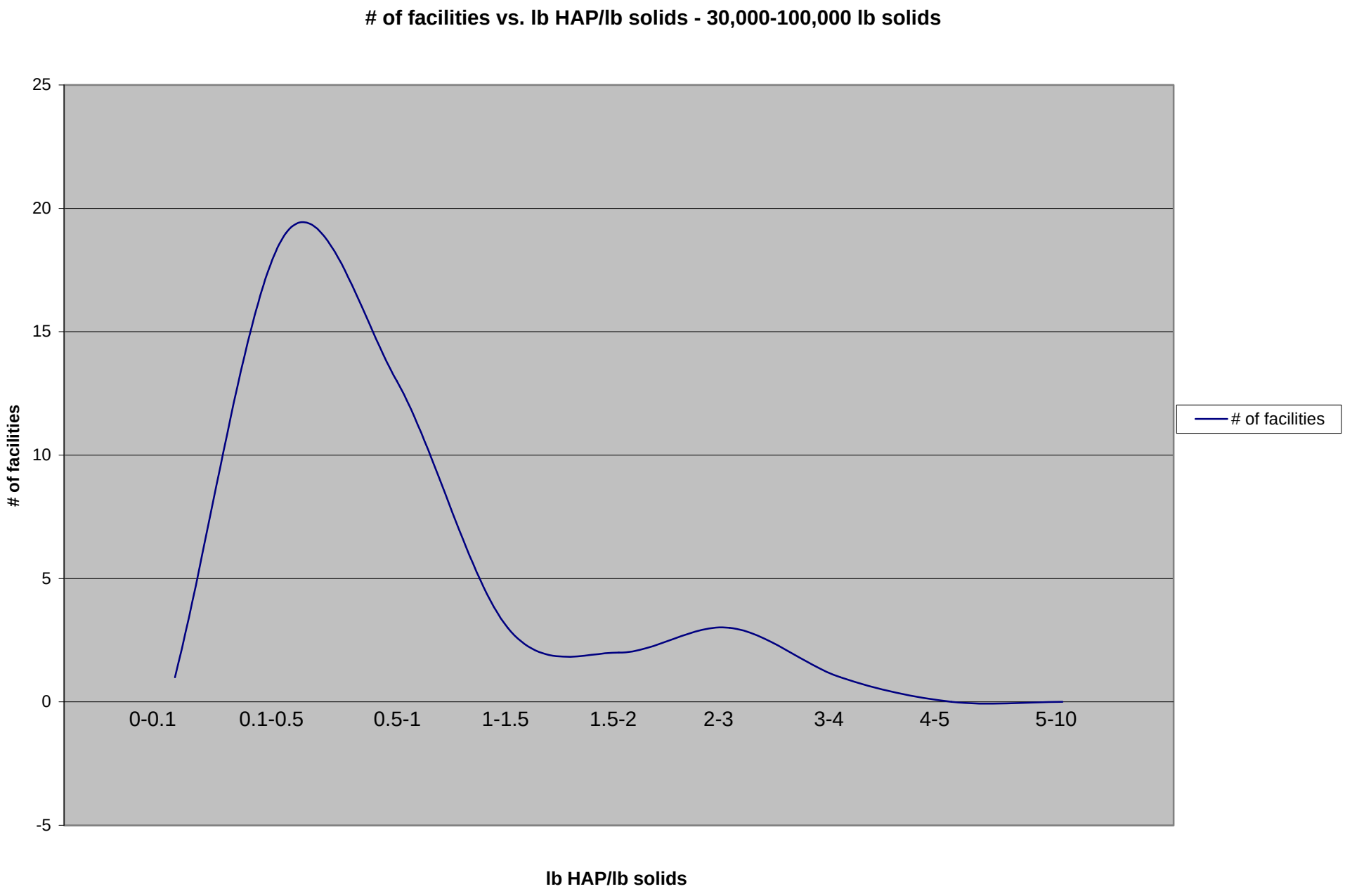
Histogram Used to Develop Low-HAP/High-HAP Cutoffs for the 0-10,000 lb solids New Source Model Plant



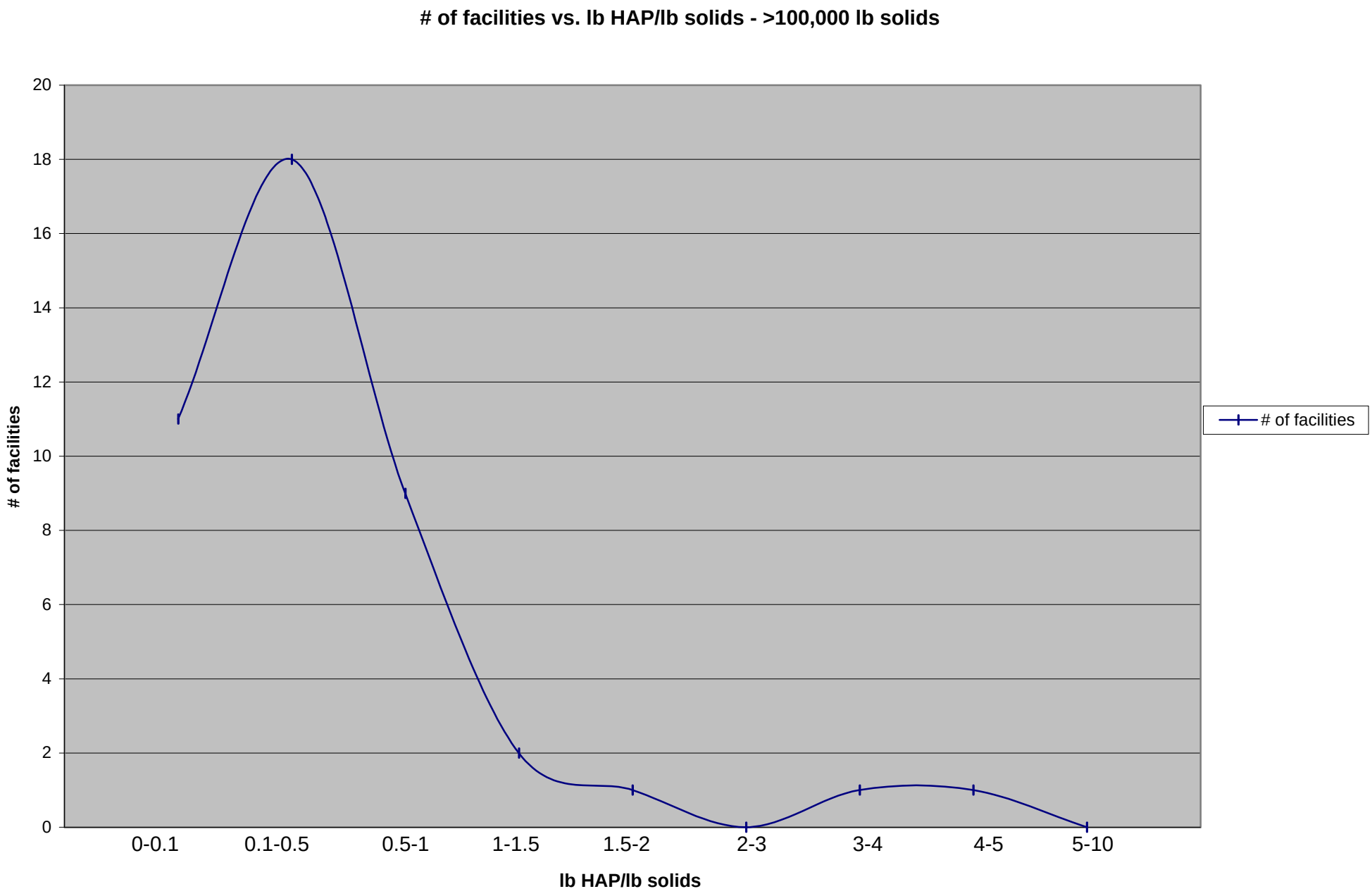
Histogram Used to Develop Low-HAP/High-HAP Cutoffs for the 10,000-30,000 lb solids New Source Model Plant



Histogram Used to Develop Low-HAP/High-HAP Cutoffs for the 30,000-100,000 lb solids New Source Model Plant



Histogram Used to Develop Low-HAP/High-HAP Cutoffs for the >100,000 lb solids New Source Model Plant



Appendix G

Summary Table of Facility-specific Cost and Emissions Impacts for Projected New Sources

TABLE 2 - Plastic Parts New Source Model Plants and Projected New Facilities (Cost and Emission Reductions Analysis)
file: ISEGnwsourc1_801rv3.xls
updated: 8/10/2001

New Source Model Plant Parameters[1]							Coating Reformulation Costs/Reductions				Totals [2]			
Model Plant	Coating Solids Usage Range (lb)	High/Low HAP Coatings	Avg Coating Solids Usage (lb)	Avg lb HAP per Lb Coating Solids (including cleaning	Avg # of Coating Lines	New Facilities Projected for 5-years in Each Model	Annual Coating Cost Increase - 1997$ (floor - baseline cost)	Equipment Capital Cost Associated with Coating Reformulation (1997$)	Taxes, Insurance, Admin, & Capital Recovery (1997$)	Revised Lb HAP Emission Reductions from Coating Reformulation	TAC per Model to Meet the 0.16 lb HAP per lb solids MACT Floor	Lb HAP per Model to Meet the 0.16 lb HAP per lb solids MACT Floor (includes MRR costs)	Total Capital Cost for MACT Floor (1997 $)	Total Annual Emission Reductions for Projected New Sources (ton HAP)
1	0-10,000	Low HAP	4,180	1.66	3	1	557.95	4,664	851	6,270	1,409	10,908	4,664	3.1
2	0-10,000	High HAP	2,530	6.08	3	1	1,291.29	4,664	851	14,977	2,142	11,642	4,664	7.5
3	10,000 - 30,000	Low HAP	19,370	0.79	3	1	3,032.42	4,664	851	12,203	3,883	13,383	4,664	6.1
5	30,000 - 100,000	Low HAP	54,360	0.85	3	1	8,045.25	4,664	851	37,508	8,896	18,396	4,664	18.7
7	>100,000	Low HAP	638,640	0.55	3	1	43,631.36	4,664	851	249,069	44,482	53,982	4,664	124.5
8	>100,000	High HAP	287,830	2.08	3	1	75,822.82	4,664	851	552,633	76,674	86,174	4,664	276.3
		Totals				**6**	**132,381**	**27,986**	**5,105**	**872,660**	**137,486**	**194,485**	**27,986**	**436.2**

[1] The model plant parameters are averages based on existing source data. New sources are assumed to be similar to existing sources.
The number of new sources is based on the estimated 5-year growth projection of 4%.
Refer to the memorandum "Approach for Developing 5-year Growth Projections for the Plastic Parts and Products Source Category" for the development of this percentage.

[2] These totals represent the totals for each new source model since there is only one new facility projected for each model.

[3] The TAC including monitoring, recordkeeping, and reporting (MRR) costs are the calculated compliance costs plus the average MRR burden estimated per facility ($9,500) from the OMB83I.

Note: There are relatively few existing source facilities that are in the TPO and HL subcategories.
Since there are very few projected new facilities, for the purposes of analysis no projected new facilities were assumed to be in the TPO or HL subcategories..