S.C. Department of Health and Environmental Control

Bureau of Air Quality
Preliminary Determination

Mercedes-Benz Vans, LLC
8501 Palmetto Commerce Parkway
Ladson, South Carolina 29456
Charleston County

Permit No. 0560-0385-CA (Revision 3)
May 3, 2018

This review was performed by the Bureau of Air Quality of the South Carolina Department of Health and Environmental Control in accordance with South Carolina Regulations for the Prevention of Significant Air Quality Deterioration.

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1.0 Time Line (Permitting Action History)

07/21/2015	A Prevention of Significant Deterioration (PSD) pre-application meeting was held with representatives from Mercedes-Benz Vans, Trinity Consultants, and the South Carolina Department of Health and Environmental Control (SC DHEC), Bureau of Air Quality (BAQ).
11/02/2015	SC DHEC received a PSD permit application from Mercedes-Benz Vans.
11/18/2015	SC DHEC received a request for expedited review from Mercedes-Benz Vans.
11/24/2015	SC DHEC approved the request for expedited review from Mercedes-Benz Vans along with an information request with respect to emissions.
12/02/2015	SC DHEC requested specific information from Mercedes-Benz Vans regarding CAM for the applicable sources.
12/07/2015	SC DHEC received information from Mercedes-Benz Vans regarding the 11/24/2015 request.
12/09/2015	SC DHEC requested and received specific information from Mercedes-Benz Vans regarding emissions.
12/10/2015	SC DHEC requested specific information from Mercedes-Benz Vans regarding SC Regulation 61-62.5, Standard 5.2 for applicable sources.
12/11/2015	SC DHEC requested specific information from Mercedes-Benz Vans regarding emissions.
12/14/2015	SC DHEC requested specific information from Mercedes-Benz Vans regarding emissions.

12/15/2015	SC DHEC received information from Mercedes-Benz Vans regarding the 12/11/2015 request.
12/18/2015	SC DHEC received information from Mercedes-Benz Vans regarding the 12/14/2015 request.
12/21/2015	SC DHEC received information from Mercedes-Benz Vans regarding the 12/10/2015 request.
12/22/2015	SC DHEC requested specific information from Mercedes-Benz Vans regarding complete top down BACT analyses for applicable sources.
01/07/2016	SC DHEC requested specific information from Mercedes-Benz Vans regarding BACT analyses for applicable sources that had existing top down BACT analyses submitted.
01/13/2016	SC DHEC received information from Mercedes-Benz Vans regarding the 12/22/2015 request.
01/19/2016	SC DHEC requested specific information from Mercedes-Benz Vans regarding all top down BACT analyses
01/20/2016	SC DHEC received information from Mercedes-Benz Vans regarding the 12/02/2015 and 01/07/2016 requests.
01/25/2016	SC DHEC requested a complete application (PDF Form) from Mercedes-Benz Vans so that it may be electronically transmitted to the Environmental Protection Agency (EPA) and the Federal Land Manager (FLM).
01/26/2016	SC DHEC received information from Mercedes-Benz Vans regarding the 01/25/2016 request.
01/27/2016	Engineering Services of BAQ emailed a copy of the application to James Purvis and Lorinda Shepard of the Environmental Protection Agency (EPA) and informed them that BAQ had deemed the application complete.

01/27/2016	Engineering Services of BAQ emailed out a copy of the application to Catherine Collins and Sarah Dawsey informing them that BAQ was in receipt of and was currently reviewing a PSD application from Mercedes-Benz Vans.
01/27/2016	Engineering Services of BAQ emailed the letters sent to the EPA and the FLM to Nicole Saniti informing her that BAQ had deemed the application complete and that the application will undergo a preliminary determination.
01/29/2016	SC DHEC received information from Mercedes-Benz Vans regarding the 01/19/2016 request.
02/09/2016	Engineering Services of BAQ emailed a copy of the revised application to James Purvis and Lorinda Shepard of the Environmental Protection Agency (EPA).
02/09/2016	Engineering Services of BAQ emailed out a copy of the revised application to Catherine Collins and Sarah Dawsey informing them that BAQ was in receipt of and was currently reviewing a PSD application from Mercedes-Benz Vans.
02/16/2016	Engineering Services of BAQ emailed a copy of the revised application to James Purvis and Lorinda Shepard of the Environmental Protection Agency (EPA).
02/16/2016	Engineering Services of BAQ emailed out a copy of the revised application to Catherine Collins and Sarah Dawsey informing them that BAQ was in receipt of and was currently reviewing a PSD application from Mercedes-Benz Vans.
02/17/2016	SC DHEC requested specific information from Mercedes-Benz Vans regarding the economic analyses.

02/24/2016	SC DHEC received information from Mercedes-Benz Vans regarding the 02/17/2016 request.
02/24/2016	Engineering Services of BAQ emailed a copy of the revised application to James Purvis and Lorinda Shepard of the Environmental Protection Agency (EPA).
02/24/2016	Engineering Services of BAQ emailed out a copy of the revised application to Catherine Collins and Sarah Dawsey informing them that BAQ was in receipt of and was currently reviewing a PSD application from Mercedes-Benz Vans.
03/16/2016	The BAQ placed the PSD Preliminary Determination and PSD Construction Permit No. 0560-0385-CA on public notice for a thirty-(30) day comment period by publication in *The Post & Courier* newspaper in Charleston, South Carolina. All appropriate Federal and State Officials were notified.
04/15/2016	The BAQ issued a Final Determination and Construction Permit No. 0560-0385-CA.
2/24/2017	A PSD pre-application meeting was held to discuss revisions to the construction permit issued on 4/15/2016. The meeting included representatives from Mercedes-Benz Vans, Trinity Consultants, and SC DHEC BAQ.
04/03/2017	SC DHEC received a PSD permit application revision from Mercedes-Benz Vans.
04/19/2017	SC DHEC requested specific information from Mercedes-Benz Vans regarding the supporting documentation.
04/25/2017	Engineering Services of BAQ emailed the letters sent to the EPA and the FLM to Nicole Saniti informing her that BAQ had deemed the application revision complete and that the application revision will undergo a preliminary determination.

06/06/2017	The BAQ placed the PSD Preliminary Determination and PSD Construction Permit No. 0560-0385-CA.R1 on public notice for a thirty-(30) day comment period by publication in *The Post & Courier* newspaper in Charleston, South Carolina. All appropriate Federal and State Officials were notified.
07/17/2017	A PSD pre-application meeting was held to discuss revisions to the draft construction permit issued on 6/6/2017. The meeting included representatives from Mercedes-Benz Vans, Trinity Consultants, and SC DHEC BAQ.
07/21/2017	The BAQ issued a Final Determination and Construction Permit No. 0560-0385-CA-R1.
10/03/2017	SC DHEC received a PSD permit application revision from Mercedes-Benz Vans.
10/10/2017	SC DHEC requested specific information from Mercedes-Benz Vans regarding the supporting documentation.
10/31/2017	Engineering Services of BAQ emailed the letters sent to the EPA and the FLM to Nicole Saniti informing her that BAQ had deemed the application revision complete and that the application revision will undergo a preliminary determination.
12/21/2017	The BAQ placed the PSD Preliminary Determination and PSD Construction Permit No. 0560-0385-CA on public notice for a thirty-(30) day comment period. All appropriate Federal and State Officials were notified.
01/12/2018	A PSD pre-application meeting was held to discuss revisions to the draft construction permit issued on 12/21/2017. The meeting included representatives from Mercedes-Benz Vans, Trinity Consultants, and SC DHEC BAQ.

01/26/2018	The BAQ issued a Final Determination and Construction Permit No. 0560-0385-CA-R2.
02/20/2018	SC DHEC received a PSD permit application revision from Mercedes-Benz Vans.
02/22/2018	SC DHEC requested specific information from Mercedes-Benz Vans regarding the application emissions.
02/26/2018	Engineering Services of BAQ emailed the letters sent to the EPA and the FLM to Nicole Saniti informing her that BAQ had deemed the application revision complete and that the application revision will undergo a preliminary determination.
04/06/2018	SC DHEC requested specific information from Mercedes-Benz Vans regarding the application emissions.
04/13/2018	SC DHEC received a PSD permit application revision addendum from Mercedes-Benz Vans.
04/17/2018	Engineering Services of BAQ emailed the letters sent to the EPA and the FLM informing them of the additional information in the addendum.
05/03/2018	The BAQ placed the PSD Preliminary Determination and PSD Construction Permit No. 0560-0385-CA on public notice for a thirty-(30) day comment period. All appropriate Federal and State Officials were notified.

2.0 Introduction and Preliminary Determination

2.1 Project Overview

Mercedes-Benz Vans is proposing to expand the current assembly processes at the Charleston plant as well as add several new processes, including a body shop, paint shop, and energy center. The expansion at the facility will occur in three phases, as described below.

Table 1 – Phased Expansion Details

Phase	Production		Vehicle Weight	Start of Construction
	units/day	Units/yr		
1	162	50,544	All greater than 8,500 lbs	2016
2	242	74,880	Some less than and some greater than 8,500 lbs	2024
3	400	124,800	Some less than and some greater than 8,500 lbs	2028

Due to emissions increases associated with this proposal, the project is subject to S.C. Regulation 61-62.5, Standard No. 7, "Prevention of Significant Deterioration (PSD)."

As stated, the proposed project is subject to review under S.C. Regulation 61-62.5, Standard No. 7, "Prevention of Significant Deterioration." This regulation is equivalent to the Federal Prevention of Significant Deterioration of Air Quality regulations in Title 40 Code of Federal Regulations (CFR) Section 52.21. Pursuant to these regulations, new major stationary sources and modifications to major stationary sources of air pollution must demonstrate that they will not significantly deteriorate the air quality in their region. Mercedes-Benz Vans, LLC has potential emissions for particulate matter (PM), particulate matter 10 micrometers or less in diameter (PM_{10}), particulate matter 2.5 micrometers or less in diameter ($PM_{2.5}$) and volatile organic compounds (VOCs), which exceed the significance levels allowed in this regulation. The PSD review was conducted for PM, PM_{10}, $PM_{2.5}$ and VOCs and includes a Best Available Control Technology (BACT) determinations and Ambient Air Impact Analyses.

"Phased permitting" under PSD is a term for a specific type of project phasing that is anticipated to be necessary for the Charleston plant expansion. In a non-phased PSD permit, construction commences within 18 months of permit issuance and there is no gap in construction for longer than 18 months. A phased permit is permitting a project where the gap would exceed 18 months.

In the case of the Charleston plant, the anticipated gap between the first and second phases is approximately 72 months (early 2018 until 2024). Future market conditions could shorten the gap to less than 72 months, but the best current estimate is a 6 year gap. Thus, Mercedes-Benz Vans is seeking issuance of a PSD permit that allows for the second phase to commence construction after a gap exceeding 72 months.

Phased permits have been understood and approved by EPA since at least 1978, when EPA provided a detailed discussion of phased permitting in the preamble to the 1978 PSD, an excerpt from which is below:

> *… the Administrator does not generally intend to limit the time for construction of the project, However, the first phase must be commenced within 18 months after permit approval, and <u>each construction phase thereafter must commence within 18 months of the date approved in the permit</u> and must not have breaks exceeding 18 months.*
> *[43 FR 26396, June 19, 1978]*

The 1978 regulations included a requirement to re-assess BACT; this regulation was slightly modified to the current form in the 1980 PSD regulations (August 7, 1980).

> *For phased construction projects, the determination of best available control technology shall be reviewed and modified as appropriate at the latest reasonable time which occurs no later than 18 months prior to commencement of construction of each independent phase of the project. At such time, the owner or operator of the applicable stationary source may be required to demonstrate the adequacy of any previous determination of best available control technology for the source.*
> *[40 CFR 52.21(j)(4)]*

While not mandated by the regulation, EPA policy has been that BACT must be reevaluated prior to each phase. EPA developed draft policies that address phased projects. The 1985 revised draft policy included the following statements on phased permitting.

A single permit offers the applicant the advantages of reduced paperwork and assurance that the entire project … is permitted. [S]uch permits should specify at least two items not needed in permits for single phase projects.

i. Which BACT determinations will be re-assessed prior to commencement of construction, and

ii. The date by which later phases … of the project must commence.

Mercedes-Benz Vans proposes the following to address the two requirements specified in the EPA draft policy.

1. BACT will be reevaluated for any expansion phase if the gap in construction exceeds 18 months.
2. The date by which construction must commence is provided below.

Table 2 – Phased Commence Construction Dates	
Phase	**Start of Construction**
1	May 2016
2	January 2024
3	January 2028

2.2 **Regulatory Applicability**

The increased production capacity results in potential emissions that exceed the PSD significant thresholds. By virtue of the proposed increase, this project is subject to review under the following standards in S.C. Regulation 61-62 and Federal standards:

- S.C. Regulation 61-62.5, Standard No. 1 *Emissions from Fuel Burning Operations*
- S.C. Regulation 61-62.5, Standard No. 2 *Ambient Air Quality Standards*
- S.C. Regulation 61-62.5, Standard No. 3 *Waste Combustion and Reduction*
- S.C. Regulation 61-62.5, Standard No. 4 *Emissions from Process Industries*
- S.C. Regulation 61-62.5, Standard No. 5.2 *Control of Oxides of Nitrogen* (NO_X)
- S.C. Regulation 61-62.5, Standard No. 7 *Prevention of Significant Deterioration*
- S.C. Regulation 61-62.5, Standard No. 8, *Toxic Air Pollutants*
- S.C. Regulation 61-62.6 *Control of Fugitive Particulate Matter*
- S.C. Regulation 61-62.7 *Good Engineering Practice Stack Height*

- S.C. Regulation 61-62.60 South Carolina Designated Facility Plan and New Source Performance Standards
- 40 CFR 60 *Standards of Performance of New Stationary Sources, Subpart A, General Provisions*
- 40 CFR 60 *Standards of Performance of New Stationary Sources, Subpart Dc, Standards of Performance for Small Industrial Commercial – Institutional Steam Generating Units*
- 40 CFR 60 *Standards of Performance of New Stationary Sources, Subpart MM, Standards of Performance for Automobile and Light Duty Truck Surface Coating Operations*
- 40 CFR 60 *Standards of Performance of New Stationary Sources, Subpart IIII, Standards of Performance for Stationary Compression Ignition Internal Combustion Engines*
- S.C. Regulation 61-62.63/40 CFR 63 *National Emission Standards for Hazardous Air Pollutants (NESHAP) for Source Categories, Subpart A General Provisions*
- S.C. Regulation 61-62.63/40 CFR 63 *National Emission Standards for Hazardous Air Pollutants (NESHAP) for Source Categories, Subpart B Requirements for Control Technology Determinations for Major Sources in Accordance With Clean Air Act Sections, Sections 112(g) and 112(j)*
- 40 CFR 63, *National Emission Standards For Hazardous Air Pollutants For Source Categories, Subpart EEEE, Organic Liquids Distribution (Non-Gasoline)*
- 40 CFR 63, *National Emission Standards For Hazardous Air Pollutants For Source Categories, Subpart IIII, Surface Coating of Automobiles and Light-Duty Trucks*
- 40 CFR 63, *National Emission Standards For Hazardous Air Pollutants For Source Categories, Subpart ZZZZ, Stationary Reciprocating Internal Combustion Engines*
- 40 CFR 63, *National Emission Standards For Hazardous Air Pollutants For Source Categories, Subpart DDDDD, Industrial, Commercial, and Institutional Boilers & Process Heaters*
- 40 CFR 64, *Compliance Assurance Monitoring*
- 40 CFR 82, *Protection of Stratospheric Ozone*
- S.C. Regulation 61-62.70 *Title V Operating Permit Program*
- 40 CFR 52 *Approval And Promulgation Of Implementation Plans*, Section 52.21 *Prevention Of Significant Deterioration Of Air Quality*

3.0 Detailed Process Description

The proposed project at the Mercedes-Benz Vans facility includes the addition of a body shop, paint shop, energy center, and support operations, as well as expansion of existing assembly processes. A detailed listing of proposed equipment is provided in the permit application forms in Appendix B. A listing of equipment in each project phase in provided in Appendix E.

3.1 **Body Shop**

In the body shop, parts are welded to form the “body-in-white.” The body shop includes welding of small stamped parts, the front-end subassembly, the rear-end subassembly, the side frame subassembly, the underbody subassembly, the mid- and upper-body assembly, and panels. The body shop also uses a number of adhesives for bonding and includes re-spot welding, soldering, attachment of hinged parts (doors and hoods), and inspection. At the end of the body shop process, the “body-in-white” is lifted onto a conveyor and sent to the paint shop.

PM emissions from proposed MAG welding operations will be controlled by a cartridge filter system, which will vent within the building. PM emissions for spot welding, laser welding, and soldering operations will vent inside the building with no additional controls. VOC emissions from bonding adhesives are assumed to be emitted in the E-coat oven, which is controlled by a regenerative thermal oxidizer (RTO). There will also be fugitive CO_2 emissions from shield gases used in MAG welding.

Mercedes-Benz Vans anticipates that more body shop equipment will be added to accommodate the increase in throughput in Phase 2 and Phase 3 of the project. However, there is no change to the process description with the addition of more equipment.

3.2 **Paint Shop**

The paint shop consists of a number of processes required to paint vans manufactured at the facility. The painting process is discussed in the following subsections.

3.2.1 Surface Preparation

The vehicle bodies then are prepared to facilitate paint adhesion. The surfaces are wiped and washed to remove any dust, grease or oil from body shop operations. The body then enters a phosphating process to prevent rusting and facilitate primer adhesion. The phosphating occurs in both dip and rinse stages. There will be one (1) surface preparation process for all three project phases.

3.2.2 Electrodeposition Primer (E-Coat)

After surface pretreatment, waterborne electrodeposition primer (E-coat) is applied in a dip tank. This coating serves as the primary corrosion protection for the vehicles. After the dip tank, vehicles are rinsed in water and then baked in the E-coat oven.

The E-coat oven is heated using natural gas-fired burners and indirect heat exchangers. Low-NO_X burners are used to reduce NO_X emissions from combustion. VOC emissions from the E-coat oven are controlled with a RTO. The RTO is designed with a high thermal efficiency to reduce natural gas combustion and associated emissions. During RTO malfunction scenarios where inlet conditions present an explosion hazard to the RTO, E-coat oven VOC emissions will be routed to an emergency bypass stack, which will be vented to the atmosphere until the RTO returns to service. The emergency bypass stack is included to prevent a catastrophic failure of the system which could harm the health and safety of employees in the plant and the surrounding community. These bypass events are rare and unpredictable, therefore, emissions associated with these events are not calculated for permitting purposes. Bypass requirements are addressed under 40 CFR 63, Subpart IIII, Surface Coating of Automobiles and Light-Duty Trucks.

Once the E-coat is baked, the vehicles are sent to an E-coat cooling zone to reduce the vehicle temperature prior to application of subsequent coatings. Vehicles are conveyed from the cooling zone to be sanded and repaired, if necessary.

Prior to sanding, vehicle bodies are inspected and sent through a metal repair process to get rid of any irregularities in the vehicle bodies. After metal repair, the bodies are conveyed to the sanding deck. Next, the vehicles are further inspected and repaired. Occasionally, the sanding and repair operations remove all of the E-coat applied to a given area, revealing bare metal on the vehicle surface. In these instances, a small quantity of coating material will be applied to touch up these areas within the E-coat sanding workdeck. Emissions from this process are minimal and do not require controls for particulate matter or VOCs. Repairs may include heavy metal repair of the vehicle body, if necessary. Heavy-metal repair and exhibition-preparation booths are enclosed, and the sanding decks are open to the building. Once the vehicles have passed through the sanding decks, they are sent to a touch-up area to be wiped down and cleaned before the underbody coating process.

There will be one (1) E-coat dip tank, one (1) E-coat oven, and one (1) E-Coat sand/spot repair for all three project phases. Phase 1 will install one (1) RTO which may be replaced with a larger RTO in Phase 2 and Phase 3.

3.2.3 Sealer, Underbody Coating, and Sound Deadener Application

Following E-coat application and touch-up, seam sealers are applied at the sealer deck. The sealers used are high solids materials with low or zero VOC content. Sealers are applied to the flanges and seams of body panels with nozzles achieving 100% transfer efficiency. Dry cleaning rags are used to remove excess sealer. Solvents are managed carefully to minimize fugitive emissions.

Following the seam sealer, the bodies are conveyed to the underbody sealing area, where underfloor openings are first covered with masking material, and low or zero VOC sealer coating is applied to the underbody. The material is a sprayable polyvinyl chloride (PVC), which protects the vehicle from corrosion, prevents damage from stones, and deadens sound. The underbody PVC is applied in a robotic booth, and exhaust air from this booth is filtered and vented to the atmosphere. Following the underbody sealing areas, a coating to the vehicle underbody will be applied within underbody coating booths to provide additional corrosion protection. The emissions from these booths will pass through dry filters to reduce particulate matter emissions and will then vent to atmosphere. VOC emissions from the application area will be uncontrolled. After leaving the underbody coating booths, sound deadener material is applied to the vehicle bodies.

After necessary touch-up activities, masking material is removed, and the vehicle bodies are sent to the PVC cleaning operation. The vehicle bodies are manually cleaned, and excess PVC material is removed from the underbody. The vehicles are then sent through an ionization blower, which blows ionized air onto the vehicle and increases adhesion of the primer coating.

In Phases 1 and 2 of the project, there will be one (1) set of application areas for sealers, underbody PVC, underbody coating and sound deadeners. In Phase 3, a second set of application areas will be added.

3.2.4 Guidecoat (Primer) Application

After underbody sealing and coating, vehicle bodies enter a primer manual cleaning area and ionization blower to prepare the vehicles for primer application.

The bodies then enter the primer manual spray zone, where primer/surfacer is applied to the cut-ins (doors, underhood, etc.) of the vehicle body. The bodies then proceed to the primer robotic zone where additional primer/surfacer is applied. Interior primer is applied using high volume-low pressure (HVLP) robots, and exterior primer is applied using electrostatic (ESTA) robots. Once primer is applied to the entire vehicle, the vehicle is sent to a flash off zone, and then to the primer oven. Process exhaust from all guidecoat application booths will be routed through dry filtration systems (E-cube) to the adsorption wheel (ADW) systems, where the solvent content of the air is first adsorbed, then the concentrated desorb stream is sent to the RTO for control. Some of the remaining exhaust is filtered and re-circulated to the filtration system inlet, while the remaining exhaust is vented to the atmosphere.

The bodies are baked in the primer oven. Gas-fired indirect heaters with low-NO_X burners produce the hot air for this oven. Combustion emissions from these heaters are vented to the atmosphere. The exhaust from the oven itself contains VOCs and is ducted to the RTO for control.

During RTO malfunction scenarios where inlet conditions present an explosion hazard to the RTO, primer booth and oven VOC emissions will be routed to an emergency bypass stack, which will be vented to the atmosphere until the RTO returns to service. The emergency bypass stack is included to prevent a catastrophic failure of the system which could harm the health and safety of employees in the plant and the surrounding community. These bypass events are rare and unpredictable, therefore, emissions associated with these events are not calculated for permitting purposes. Bypass requirements are addressed under 40 CFR 63, Subpart IIII, Surface Coating of Automobiles and Light-Duty Trucks.

Following the primer oven and subsequent cooling zone, the bodies are sanded and inspected in the primer sanding booth and touch-up zone, where additional primer/surfacer is applied as necessary.

In Phases 1 and 2 of the project, only one primer application line and oven will be utilized. In Phase 3, a second primer application line and oven will be added.

3.2.5 Basecoat/Clearcoat (Topcoat) Application

All basecoats and clearcoats applied in the topcoat process are solventborne. In all proposed topcoat (basecoat and clearcoat) application zones, the overspray particulate emissions are controlled by dry filters beneath the booths.

Vehicles are passed through a manual cleaning zone and ionization blower before they enter the topcoat application stage. Exhaust from this booth is filtered and reused in the next zone.

The bodies pass into the topcoat robot interior application zone where basecoat or a single topcoat material (monocoat) is applied to the interior of the vehicle bodies using HVLP robots. Following the topcoat robot interior application zone, the vehicles enter the manual spray zone, where a basecoat or monocoat layer is applied to the cut-ins using HVLP spray guns. Following the manual spray zone, basecoat or monocoat is applied to the vehicle exteriors using ESTA robots. Bodies coated with the monocoat do not require clearcoat. Bodies coated with basecoat are then sent to clearcoat application. The bodies are then conveyed to a flash off zone.

In Phase 1 of the project, bodies requiring clearcoat re-enter the same topcoat application zones, where clearcoat is applied to the interior of the bodies using HVLP robots, cut-ins using HVLP manual spray guns, and exterior using ESTA robots. The bodies are then conveyed to the flash off zone before entering the topcoat oven.

In Phase 2 of the project, a separate clearcoat booth will be added. Therefore, bodies requiring clearcoat will pass into separate clearcoat application areas. The bodies will first enter a clearcoat robot interior application zone, where clearcoat is applied to the interior of the vehicle bodies using HVLP robots. Following the clearcoat robot interior application zone, the vehicles enter the manual spray zone, where a clearcoat layer is applied to the cut-ins using HVLP spray guns. Following the manual spray zone, clearcoat is applied to the vehicle exteriors using ESTA robots. The bodies are then conveyed to a flash off zone before entering the topcoat oven for baking.

In Phase 3 of the project, there will be two separate coating lines. The first coating line process will consist of the process and equipment described in Phase 2. The second coating line will add a single basecoat/clearcoat booth and oven and will utilize the process described for Phase 1.

Process exhaust from all basecoat and clearcoat application booths will be routed through dry filtration (E-cube) systems to the ADW systems, where the solvent content of the air is first adsorbed, then the concentrated desorb stream is sent to the RTO for control. Some of the remaining exhaust is filtered and re-circulated to the filtration system inlet, while the remaining exhaust is vented to the atmosphere.

Low-NO_X gas-fired indirect heaters produce the hot air for the topcoat oven. The exhaust from the topcoat oven section contains VOC emissions and is ducted to the RTO for control.

During RTO malfunction scenarios where inlet conditions present an explosion hazard to the RTO, topcoat booth and oven VOC emissions will be routed to an emergency bypass stack, which will be vented to the atmosphere until the RTO returns to service. The emergency bypass stack is included to prevent a catastrophic failure of the system which could harm the health and safety of employees in the plant and the surrounding community. These bypass events are rare and unpredictable, therefore, emissions associated with these events are not calculated for permitting purposes. Bypass requirements are addressed under 40 CFR 63, Subpart IIII, Surface Coating of Automobiles and Light-Duty Trucks.

After exiting the oven, the vehicle bodies are cooled in the topcoat cooler before entering the inspection deck.

3.2.6 Adhesives Application

For vehicle quality purposes, adhesive application may occur in the body shop (see Section 3.1) or following the topcoat oven. VOC emissions associated with this side panel adhesive operation are exhausted with normal building ventilation.

3.2.7 Inspection and Repair

After topcoat application, the vehicle bodies are sent to a topcoat audit area where they are inspected. Bodies that pass inspection are polished and sent to cavity wax. Vehicle bodies that do not pass inspection are sanded and sent for repair. Sanding is done on the topcoat repair decks, which are open to the building. After sanding, the bodies are sent to the appropriate repair area. Minor spot repairs are accomplished in the spot repair booth. The larger repairs are re-run through the topcoat process.

3.2.8 Spot Repair

In the spot repair process, both basecoat and clearcoat are manually applied, and the coatings are cured with portable lamps in the same booth. The air supply houses provide filtered make-up air for the spot repair booths. Gas-fired heaters with low-NO_X burners are used to temper the air during winter months. Exhaust air is filtered using dry overspray filters, and is vented to the atmosphere. There will be one (1) spot repair booth in Phase 1, two (2) spot repair booths in Phase 2, and three (3) spot repair booths in Phase 3 of the project.

3.2.9 Sika Sealing

Sika sealing is a manual process, where the welded sidewall of the vehicle body is tightened by applying a viscous black material. The nozzles used in Sika sealing achieve 100% transfer, eliminating PM emissions. The VOC content of the Sika material is low.

3.2.10 Cavity Wax

After inspection and any necessary repairs, vehicle bodies are transferred to booths where cavity wax is applied to inner recesses of the vehicle bodies. Process exhaust from all cavity wax application areas will be routed through a dry filter to the ADW system, where the solvent content of the air is first adsorbed, then the concentrated desorb stream is sent to the RTO for control. Some of the remaining exhaust is filtered and re-circulated to the filtration system inlet, while the remaining exhaust is vented to the atmosphere.

During RTO malfunction scenarios where inlet conditions present an explosion hazard to the RTO, cavity wax VOC emissions will be routed to an emergency bypass stack, which will be vented to the atmosphere until the RTO returns to service. The emergency bypass stack is included to prevent a catastrophic failure of the system which could harm the health and safety of employees in the plant and the surrounding community. These bypass events are rare and unpredictable, therefore, emissions associated with these events are not calculated for permitting purposes. Bypass requirements are addressed under 40 CFR 63, Subpart IIII, Surface Coating of Automobiles and Light-Duty Trucks.

Vehicle bodies then exit the paint shop and are sent to the assembly shop. There will be one (1) cavity wax booth for all three phases of the project.

3.2.11 Purge/Cleaning Solvent

Purge and cleaning solvents are used throughout the process to remove coating material from application equipment and vehicle bodies as-needed. A purge/cleaning solvent collection system is required to collect purge/cleaning solvent from the clearcoat application areas. The system then pumps the recovered solvent to the paint mix room for shipment off-site.

3.2.12 Paint Mix Room

The paint mix room is the area where the purchased paints and solvents are located. These materials are stored in portable containers and are fed to small closed mix tanks. The paints are re-circulated from the mix tanks to the application areas and back to the paint mix building through pumps and hard piping. This closed-loop design minimizes VOC emissions from this area.

3.2.13 Boiler

The proposed expansion will necessitate the addition of two boilers (B01 and B02) for supplying energy to the paint shop. The boilers will be equipped with low-NO_X burners to reduce NO_X emissions. Proposed boilers B01 and B02 will each have a maximum heat input capacity of 14.27 MMBtu/hr, and will be permitted to fire natural gas.

3.3 **Assembly**

The assembly area is a series of conveyors where mechanical, electrical, and trim parts are installed on the painted bodies received from the paint shop. The major areas of the assembly operations include the floor line, trim line, chassis line, and final assembly. Included within these assembly areas are fluid fill, window and windshield glazing and mounting, and transmission and engine installation. After the final assembly area, other critical operations are conducted, such as roll and brake testing, touch-up paint and underbody wax application, and leak testing.

3.3.1 Final Assembly

Operations in the assembly areas include the installation of sound-deadeners, brake lines, fuel tanks and lines, and transmission hoses. Other operations in the assembly areas include such activities as installation of various small parts, carpeting, seats, windows and programming of electrical controls. Installation of most of the items mentioned above is accomplished using mechanical fasteners.

Near the end of the assembly operation, large components such as bumpers, engine, transmission, wheels, etc. are installed. There are no emissions from these processes.

3.3.2 Window and Windshield Glazing

Window and windshield installation requires the use of a number of different chemicals for preparation and installation. Window and windshield glazing activities include the application of primers and adhesives. Multiple primers are used in the direct glazing process and an adhesive binds the windows and windshield to the car body. VOC emissions associated with the window and windshield installation are exhausted through a vent stack.

3.3.3 Fluid Filling

After the installation of mechanical, electrical, and trim components, the vehicle is sent for final connections within the engine, installation of various filters and minor engine instrumentation, and the addition of necessary fluids (i.e., fuel, brake fluid, windshield wash, refrigerant, etc.).

Onboard refueling vapor recovery (ORVR) in the gasoline-powered vehicles is used to capture fuel vapors during gasoline tank filling. The gas tank and fill pipe are designed such that fuel vapors in the gas tank travel to an activated carbon packed canister during fueling, which absorbs the vapor. When the engine is in operation, it draws the gasoline vapors into the engine intake manifold to be used as fuel. ORVR is not needed for diesel-powered vehicles, as VOC emissions from diesel fuel are minimal.

The vehicle air conditioning system is evacuated to remove air and is charged with refrigerant. There are no emissions from the pressurized refrigerant system.

Fugitive emissions from methanol based windshield washer fluid system testing and from fluid filling are volume sources exhausted through the facility HVAC system.

3.3.4 Roll and Brake Testing

After fluid filling, the engine is started and the vehicle is driven to subsequent test stations. The following functional tests take place in the roll and brake testing area:

- Wheels are aligned.
- Headlights are adjusted.
- A driving test is conducted by driving the vehicle through a series of operational cycles in stationary roll test booths.
- The ABS braking system, wheel brakes, and hand brake are tested.
- The entire electrical system is tested using a diagnostic instrument.

- Final visual inspection of the vehicle is performed.

Vehicle exhaust emissions are generated from the test stations. There will be one (1) roll and brake booth in Phase 1 of the project, which already exists at the facility. There will be two (2) roll and brake booths for Phase 2, and three (3) roll and brake booths for Phase 3.

3.3.5 Underbody Wax Application

In the underbody wax booth, underbody wax is applied to the underbody of the vehicle for corrosion protection. Particulate emissions from this booth are controlled by gravity deposition and dry filtration. The underbody wax material does not contain VOC. There will be one (1) underbody wax booth for all three project phases.

3.3.6 Final Paint Repair

Final inspection may reveal damage to the painted surface. If a body panel or spot requires painting, the vehicle is sent to final paint repair. This repair booth differs from the repair operations in the paint shop in that it is designed to repair finished vehicles. The drying ovens operate at a lower temperature when compared to the topcoat ovens in the paint shop.

In the final paint repair booth, topcoat is applied using hand spray guns. Overspray particulate emissions are controlled using dry filtration. Infrared lamps and gas-fired oven burners provide the heat for drying.

After necessary repairs have been completed, vehicles are buffed, polished and sent to staging for delivery to dealers.

There will be one (1) final paint repair booth for all three project phases.

3.4 Energy Center

The energy center is the distribution facility for utilities required by the manufacturing and support operations. Electricity, compressed air, welding cooling water, cooling tower water, and chilled water are provided to these areas from the energy center.

3.4.1 Cooling Towers

Up to seven cooling towers at the Charleston plant will provide process cooling to the facility. The cooling towers will be used for body shop, paint shop, assembly building, and energy center cooling and will be an integral part of the energy center operations.

3.4.2 Air Supply Units

There are a number of operations at the Charleston plant that require air supply units for HVAC. These operations include paint shop coating activities, workdecks for sanding, touch-up, and spot repair operations, clean rooms, and office meeting rooms throughout the facility

All paint shop air supply units are direct-fired. The exhaust from the primer booth and basecoat/clearcoat booth air supply units vents to the dry filtration systems (E-cube), then to the ADW and RTO for control. The exhaust from the remaining air supply units vents to the atmosphere. The Phase 3 social room's air supply unit is are indirect-fired with exhaust venting to the atmosphere.

3.5 **Tank Farm**

Mercedes-Benz Vans is proposing the installation of storage tanks for the following materials:

- Gasoline
- Diesel

The following materials will be supplied to the process out of drums and totes:

- Differential gear oil
- Power steering fluid
- Brake fluid
- Windshield washing fluid
- Antifreeze
- Transmission oil
- Auto transmission fluid

All atmospheric tanks will be designed with submerged fill lines, spill and overfill protection, and conservation vents to minimize atmospheric emissions. The gasoline storage tank will be equipped with Stage I vapor control, and Mercedes-Benz Vans requires suppliers of these materials to use delivery trucks equipped with Stage I control.

3.6 Emergency Generators and Fire Pump

The proposed expansion will include one (1) diesel-fired emergency generator up to 1,500 horsepower (hp) in Phase 1 and 2 of the project, and an additional diesel-fired emergency generator up to 1,500 hp in Phase 3 of the project to provide lighting and emergency power in the event of a power outage. Additionally, several smaller emergency generators are found throughout the plant to meet the needs of the facility, and include small emergency generators at the paint shop, marshalling yard and hazardous materials building. All generators will be restricted to emergency use only and will be tested periodically. The expansion will also necessitate the addition of one (1) diesel-fired emergency fire pump, which will have a capacity of up to 400 hp.

4.0 Significant Emission Rates

As shown in Table 3, this project exceeds the significant threshold as defined under PSD for PM, PM_{10}, $PM_{2.5}$, and VOC, emissions once all three phases of the project are complete.

Table 3 – PSD Applicability Analysis

Pollutant	Controlled Emissions Increase	PSD Significant Threshold	Significant Increase?
	TPY	TPY	
PM	21.32	25	No
PM_{10}	14.11	15	No
$PM_{2.5}$	12.81	10	Yes
SO_2	0.73	40	No
NO_X	39.90	40	No
CO	49.63	100	No
VOC	955.36	40	Yes
Lead	3.10E-04	0.6	No
CO_2e	63,637	75,000	No
Fluorides	0.00	3.0	No

5.0 Best Available Control Technology (BACT) Determination

5.1 BACT Requirement

BACT is defined as "an emissions limitation (including a visible emission standard) based on the maximum degree of reduction for each pollutant, taking into account energy, environmental, and economic impacts." As per S.C. Regulation 61-62.5, Standard No. 7, the BACT requirement applies to each individual new or modified affected emissions unit and pollutant emitting activity at which a net emissions increase would occur. In no case can the application of BACT result in emissions of any pollutant which would exceed emissions allowed under any applicable standard under 40 CFR 60 *New Source Performance Standard (NSPS)*, and 61 *NESHAP for Source Categories*.

Chapter B of the draft *New Source Review Workshop Manual* (October 1990) defines the BACT determination process as a 5-step process.

Step 1 – Identify All Control Technologies
Step 2 – Eliminate Technically Infeasible Options
Step 3 – Rank Remaining Control Technologies by Control Effectiveness
Step 4 – Evaluate Most Effective Controls and Document Results
Step 5 – Select BACT

Opacity is not considered to be a PSD pollutant and therefore, opacity itself does not require a BACT evaluation and establishment of a BACT limit. However, BACT can include the use of visible emission limitations or work practice standards for regulated PSD pollutants. Opacity limits have been included in the draft permit as required by State and Federal regulations. BACT cannot be less stringent than an applicable NSPS or NESHAP as outlined in 40 CFR 60, and 61.

The primary resource for establishing BACT is the RACT/BACT/LAER Clearinghouse (RBLC) on the Technology Transfer Network (TTN) maintained by the EPA. To establish BACT for a PSD source, state regulatory agencies query the RBLC. This database contains information about available control technologies for specific industry sources and lists the limits that other pollution control agencies have established for similar source types.

BAQ queried the RBLC for all process types and NSR applicable pollutants. An RBLC advanced search was queried using a standard industrial classification (SIC) code of 3711 and 3713. In addition to the RBLC, operating permits for existing facilities with similar processes and the various control options used by those facilities were reviewed.

The proposed Charleston plant expansion will result in a significant increase of PM, PM_{10}, $PM_{2.5}$ and VOC emissions. Table 4 identifies the pollutants considered in the BACT analysis for each proposed emission unit. For a number of units with low uncontrolled emissions or fugitive emissions, an abbreviated BACT analysis was completed. In lieu of a “top-down” analysis, a RBLC comparison is performed. For all other units, a “top-down” analysis is provided.

Since the majority of vans produced at the Charleston plant will weigh more than 8,500 pounds, the RBLC comparison for automotive operations should consider both SIC Code 3713 – Truck and Bus Bodies, and SIC Code 3711 – Motor Vehicles and Passenger Car Bodies. A complete list of RBLC searches performed for comparison to Mercedes-Benz Vans operations is provided as follows:

- Process Type 41.002 – Automobiles and Trucks Surface Coating
- Process Type 99.009 – Industrial Process Cooling Towers
- Process Type 17.110 – Diesel-Fired Large Internal Combustion Engines (> 500 hp)
- Process Type 13.310 – Natural Gas-Fired Commercial/Institutional Size Boilers and Furnaces (< 100 MMBtu/hr)
- Process Type 19.900 – Other Misc. Combustion
- Process type 99.012 – Welding Operations

Mercedes-Benz Vans has determined that a fifteen year lookback period in the RBLC provides control technologies and associated emission rates that are most representative of technologies that are currently available.

Additionally, Mercedes-Benz Vans reviewed recently issued permits for the Ford Kentucky Truck plant and the Hyundai Alabama plant, as these permits have yet to be added to the RBLC database. BACT determinations for these facilities are discussed throughout the analysis. Mercedes-Benz Vans is aware that Volvo Cars U.S. Operations Inc. (Volvo) has received a permit for the construction of a proposed facility in South Carolina. The Volvo construction permit application indicates that the site will utilize waterborne coatings and a fully-automated paint shop. The paint shop design includes a 90% recirculation of paint booth exhaust flow. Based on research of similar operations and RBLC database entries, Mercedes-Benz Vans is not aware of any other automobile manufacturing facility in the United States with this 90% recirculation control system design. Although Volvo and Mercedes-Benz

Vans have proposed similar add-on controls, the overall facility designs are distinct and are not directly comparable for BACT purposes.

Table 4 – BACT Analysis Summary by Unit

Unit ID	Unit Description	$PM_{10}/PM_{2.5}$	VOC
1	Energy Center Boilers	Top Down	Top Down
2	Process Combustion Sources	Top Down	Top Down
3	Paint Shop E-coat Operations	N/A	Top Down
4	Paint Shop Guidecoat Operations	Top Down	Top Down
5	Paint Shop Sealers and Adhesives Application	Top Down	Top Down
6	Paint Shop Topcoat Operations	Top Down	Top Down
6	Paint Shop Spot Repair Operations	Top Down	Top Down
6	Assembly Spot Repair Operations	Top Down	Top Down
7	Paint Shop Purge Solvent Operations	N/A	Top Down
8	Body Shop Adhesives Application	N/A	Top Down
9	Assembly Windshield Glazing Operations	N/A	Top Down
10	Assembly UB Wax Application	Top Down	N/A
PC	Paint Shop Phosphate Cleaning Operations	Top Down	N/A
BS	Body Shop Welding Areas	Top Down	N/A
PMR	Paint Shop Mixing Operations	N/A	Top Down
RB	Assembly Roll and Brake Testing	Top Down	Top Down
AFF	Assembly Fluid Fill Operations	N/A	Top Down
WST	Assembly Windshield Washer System Testing	N/A	Top Down
WD	Sand, Touch-up & Polish Operations (Workdecks)	Top Down	N/A
ASU	Air Supply Units	Top Down	Top Down
EE	Emergency Engines	Abbreviated	Abbreviated
CT	Cooling Towers	Abbreviated	N/A
TK	Storage Tanks	N/A	Abbreviated
RD	Paved Roads	Abbreviated	N/A
UBC01 UBC21	Underbody Coating Operations	Top Down	Top Down
WD	E-Coat Spot Repair Operations	Top Down	Top Down
PSA	Body Shop Adhesive Application (Paint Shop location)	N/A	Top Down

5.2 BACT for $PM/PM_{10}/PM_{2.5}$

Table 5 lists the $PM/PM_{10}/PM_{2.5}$ emissions resulting from the following process/point sources.

1. Energy Center Boilers
2. Process Combustion Sources
3. E-Coat Spot Repair

4. Underbody Coating Operations
5. Cavity Wax Operations
6. Paint Shop Guidecoat Operations
7. Paint Shop Sealers and Adhesives
8. Paint Shop Topcoat Operations
9. Paint Shop Spot Repair Operations
10. Assembly Spot Repair Operations
11. Assembly UB Wax Application
12. Paint Shop Phosphate Cleaning Operations
13. Body Shop Welding Areas
14. Assembly Roll and Brake Testing
15. Sand, Touch-up and Polish Operations (Workdecks)
16. Air Supply Units

Table 5 – Potential Uncontrolled PM/PM_{10}/$PM_{2.5}$ Emissions

Equipment	Uncontrolled PM/PM_{10}/$PM_{2.5}$ Emissions (lb/hr)
Boiler #1 Boiler #2	0.21
RTO #1 ADW Desorption Heater #1 ADW Desorption Heater #2 E-Coat Oven Burner Primer (Guidecoat) Oven #1 Burner Primer (Guidecoat) Oven #2 Burner Topcoat Oven #1 Burner Topcoat Oven #2 Burner Assembly Oven Burner	0.36
Guidecoat Booth #1 Guidecoat Booth #2	100.92
Cavity Wax Operations	4.40
Underbody PVC Deck #1 Underbody PVC Deck #2	32.94
Basecoat/Clearcoat Booth #1 Clearcoat Booth #1 Basecoat/Clearcoat Booth #2	149.04
Spot Repair Booth #1 Spot Repair Booth #2 Spot Repair Booth #3	0.29
Assembly Repair Booth #1	0.72

Table 5 – Potential Uncontrolled PM/PM_{10}/$PM_{2.5}$ Emissions	
Equipment	**Uncontrolled PM/PM_{10}/$PM_{2.5}$ Emissions (lb/hr)**
Assembly UB Wax Application	3.64
Phosphate Cleaning Operations	1.38
Welding, Soldering Operations	6.78E-02
Assembly Roll and Break Testing	0.01
E-Coat Sand Primer Sand Metal/Body Repair #1 Metal/Body Repair #2 E-Coat Touch-Up Primer Touch-Up Basecoat Touch-Up Inspect/Polish	0.25
Air Supply Units (ASU01-ASU22)	0.61
Underbody Coating Operations	12.03
E-coat Spot Repair Operations	0.03

As stated in the regulatory definition, BACT is “an emissions limitation … based on the maximum degree of reduction for each regulated NSR pollutant … taking into account energy, environmental, and economic impacts ….” When BAQ determines that the imposition of an emissions limitation is not feasible, then “a design, equipment, work practice, operational standard, or combination thereof, may be prescribed” as BACT instead.

In the following PM/PM_{10}/$PM_{2.5}$ BACT evaluation for the largest emissions units, the final BACT selection for these largest units includes proposed BACT emissions limits. For the small PM/PM_{10}/$PM_{2.5}$ emissions units, emissions limits are not practical and BAQ instead has specified other measures as BACT.

5.2.1 Step 1: Identify All Available Control Technologies

The BACT analysis identifies the following control technologies that could reduce PM/PM_{10}/$PM_{2.5}$ emissions:

5.2.1.1 Boiler BACT

Using an RBLC search for similar natural gas-fired boilers and permit review results, as well as review of technical literature, potentially applicable PM/PM_{10}/$PM_{2.5}$ control technologies were identified based on the principles of the control technology and engineering experience for general combustion units. The only available control option is good combustion practices.

5.2.1.2 Paint Shop and Assembly Process Combustion Sources and Air Supply Units BACT

Using the RBLC search and permit review results, as well as review of technical literature, potentially applicable $PM/PM_{10}/PM_{2.5}$ control technologies were identified based on the principles of the control technology and engineering experience for general combustion units. The only available control option is good combustion practices.

5.2.1.3 E-Coat Spot Repair BACT

Candidate control options identified from the RBLC search, permit review, and the literature review include those classified as pollution reduction techniques. $PM/PM_{10}/PM_{2.5}$ reduction options include:

- Dry filters
- Good operating practices

These $PM/PM_{10}/PM_{2.5}$ reduction options are discussed in the following subsections.

Dry Filters (including E-cube)

Dry filters capture $PM/PM_{10}/PM_{2.5}$ emissions as a concentrated air stream passes through the filter media. Filter collection efficiency varies and is highly dependent on particulate loading. The newest technology for the automotive coating industry is a mechanical overspray separation system, which is situated below the spray booth. Contaminated air is sucked down and routed into the separation system, where the air is passed through separation modules to remove paint particles from the air. There is also a second filter stage to increase the separation rate.

5.2.1.4 Paint Shop (Guidecoat/Topcoat) BACT

$PM/PM_{10}/PM_{2.5}$ emissions from the coating operations are generated from the solids in the coating materials. Solids that do not transfer to the substrate remain airborne within the coating area as particulate matter. The operations in the proposed paint shop with potential uncontrolled $PM/PM_{10}/PM_{2.5}$ emissions greater than 5 tpy are listed as follows:

- Paint Shop guidecoat operations (Unit ID 4); and
- Paint Shop basecoat, clearcoat, and monocoat (topcoat) operations (Unit ID 6)

Candidate control options identified from the RBLC search, permit review, and the literature review include those classified as pollution reduction techniques. $PM/PM_{10}/PM_{2.5}$ reduction options include:

- Dry filters (including E-cube)
- Electrostatic scrubbers
- Wet Venturi scrubbers
- Electrostatic precipitator
- Water wash filtration

These $PM/PM_{10}/PM_{2.5}$ reduction options are discussed in the following subsections.

Dry Electrostatic Scrubbers (including E-scrub)

With dry electrostatic scrubbers (E-scrub), overspray-laden exhaust flows into the separation module, where they are removed. Active elements in the separation modules form corona clouds under a high voltage, charging all paint particles. The particles are then attracted by the passive, grounded separating plate. The separating plate is covered with a thin layer of separating agent applied using a coating system installed above it. The paint particles are bonded to the separating plate and detackified by the separating agent. The agent containing the overspray flows into a collection tank and is returned to the coating system. Some of the agent is scrubbed of the overspray by a discharge system and returned to the separating agent cycle. A large amount of the scrubbed air is recycled into the booth using a recirculation fan.

Wet Scrubbers

Electrostatic scrubbers capture $PM/PM_{10}/PM_{2.5}$ emissions by charging overspray particles and scrubbing droplets to opposite polarities. The charged droplets act as small spherical collecting electrodes filling the precipitator chamber. Because the distances of the particles to these collectors are very short, the attractive Coulomb forces are relatively high and cause the particles to move toward the charged droplets up to the mechanical contact.

Wet venturi scrubbers consist of three sections: a converging section, a throat section, and a diverging section. Exhaust air containing overspray enters the converging section and increases in velocity as the area decreases. Scrubbing liquid is introduced either at the throat or the entrance to the converging section. The exhaust stream, moving at high velocity in the throat section, shears the liquid from the throat walls, creating tiny droplets. $PM/PM_{10}/PM_{2.5}$ is removed as the exhaust air mixes with the tiny liquid droplets and then exits through the diverging section, where it slows down. The wetted $PM/PM_{10}/PM_{2.5}$ and excess liquid droplets are separated from the gas stream by an entrainment section which usually consists of a cyclonic separator and/or mist eliminator.

Both types of wet scrubbers achieve the same over-all collection efficiencies and are therefore grouped for the remainder of the analysis.

Electrostatic Precipitator

An electrostatic precipitator (ESP) controls $PM/PM_{10}/PM_{2.5}$ emissions by charging particles in the exhaust stream and forcing them onto collector walls. Collected particles are then removed by various mechanisms depending on the type of ESP. The walls of a wet ESP are sprayed with a liquid, usually water, and the effluent is collected and disposed. Dry ESPs are mechanically knocked causing the particles to dislodge and collect in hoppers. The typical collection efficiency of an ESP ranges from 90 to 99 percent.

Water Wash Filtration

Particulate emissions from spray booths can be controlled with a water curtain or waterwash filtration system. Coating exhaust air is passed through a water "wall" that traps coating overspray that leads to PM emissions. The spent water is allowed to settle, creating a sludge from the solids, the water is then recirculated through the system.

Both types of wet scrubbers achieve the same over-all collection efficiencies and are therefore grouped for the remainder of the analysis.

5.2.1.5 Underbody Coating / Cavity Wax BACT

$PM/PM_{10}/PM_{2.5}$ emissions from cavity wax operations are generated from the solids in the wax materials. Solids that do not transfer to the substrate or settle to the floor remain airborne within the process area as particulate matter.

Candidate control options identified from the RBLC search, permit review, and the literature review include those classified as pollution reduction techniques. $PM/PM_{10}/PM_{2.5}$ reduction options include:

- Dry filters (including E-cube)
- Electrostatic scrubbers
- Wet Venturi scrubbers
- Electrostatic precipitator
- Water wash filtration

5.2.1.6 Paint Shop Sealers and Adhesives BACT

The following operations are addressed in the paint shop sealers and adhesives application BACT:

- Underbody (UB) PVC Sealing
- Seam Sealing
- Sika Sealing
- Sound Deadener Adhesive (SAM) Application

With the exception of the UB-PVC sealing application, all of the other sealers and adhesives are applied using nozzles with 100% transfer efficiency. Therefore, no $PM/PM_{10}/PM_{2.5}$ is lost during the application of these materials, and there are no $PM/PM_{10}/PM_{2.5}$ emissions. Candidate control options for the UB-PVC sealer application identified from the RBLC search, permit review, and the literature review include those classified as pollution reduction techniques. $PM/PM_{10}/PM_{2.5}$ reduction options include:

- Dry filters (including E-cube)
- Electrostatic scrubbers
- Wet Venturi scrubbers
- Electrostatic precipitator
- Water wash filtration

5.2.1.7 Assembly Underbody Wax BACT

$PM/PM_{10}/PM_{2.5}$ emissions from the assembly underbody (UB) wax operations are generated from the solids in the wax materials. Solids that do not transfer to the substrate remain airborne within the process area as particulate matter.

Candidate control options identified from the RBLC search, permit review, and the literature review include those classified as pollution reduction techniques. $PM/PM_{10}/PM_{2.5}$ reduction options include:

- Dry filters (including E-cube)
- Electrostatic scrubbers
- Wet Venturi scrubbers
- Electrostatic precipitator
- Water wash filtration

5.2.1.8 Paint Shop Phosphate Cleaning BACT

Moisture from the spray wash phosphate cleaning operation contains dissolved solids from the phosphate cleaner, which results in a small amount of particulate emissions. A review of the RBLC database shows no results for $PM/PM_{10}/PM_{2.5}$ emissions from phosphate cleaning operations. Mercedes-Benz Vans reviewed permits and permit applications for similar sources and found that the only demonstrated $PM/PM_{10}/PM_{2.5}$ control for the phosphate cleaner spraying operation is the use of mist eliminators.

The $PM/PM_{10}/PM_{2.5}$ reduction options are discussed in the following subsection.

Mist Eliminator

Mist eliminators remove oil, water, and particulates from an air stream. Mist eliminators are installed as part of equipment ventilation systems. Process air passes through the mist eliminator, where particulates are separated from the air stream and captured in the within the control device.

5.2.1.9 Paint Shop / Assembly Spot Repair BACT

Candidate control options identified from the RBLC search, permit review, and the literature review include those classified as pollution reduction techniques. $PM/PM_{10}/PM_{2.5}$ reduction options include:

- Dry filters (including E-cube)
- Electrostatic scrubbers (including E-scrub)
- Wet Venturi scrubbers
- Electrostatic precipitator
- Water wash filtration
- Good Operating Practices

5.2.1.10 Body Shop Welding BACT

Candidate control options identified from the RBLC search, permit review, and the literature review include those classified as pollution reduction techniques. $PM/PM_{10}/PM_{2.5}$ reduction options include:

- Cartridge Filter
- Electrostatic Precipitator
- Good operating practices

5.2.1.11 Assembly Roll and Brake Testing BACT

Candidate control options identified from the RBLC search, permit review, and the literature review include those classified as pollution reduction techniques. $PM/PM_{10}/PM_{2.5}$ reduction options include:

- Diesel Particulate Filter (DPF)
- Engine design to meet EPA fuel economy standards

5.2.1.12 Sand, Touch-Up, and Polish (Workdecks) BACT

Candidate control options identified from the RBLC search, permit review, and the literature review include those classified as pollution reduction techniques. $PM/PM_{10}/PM_{2.5}$ reduction options include:

- Dry Filter
- Electrostatic Precipitator
- Good operating practices

5.2.2 Step 2: Technical Feasibility of Options

After the identification of control options, the second step in the BACT assessment is to eliminate technically infeasible options. A control option is eliminated from consideration if there are process-specific conditions that would prohibit the implementation of the control or if the highest control efficiency of the option would result in an emission level that is higher than any applicable regulatory limits.

5.2.2.1 Boiler BACT

Good combustion practices are a technically feasible control options for reducing $PM/PM_{10}/PM_{2.5}$ emissions from the boiler.

5.2.2.2 Paint Shop and Assembly Process Combustion Sources and Air Supply Units BACT

Good combustion practices are a technically feasible control option for reducing $PM/PM_{10}/PM_{2.5}$ emissions from the process combustion sources and Air Supply Units.

5.2.2.3 E-Coat Spot Repair BACT

All of the control technologies identified are technically feasible for the proposed E-coat spot repair operation.

5.2.2.4 Paint Shop (Guidecoat/Topcoat) BACT

A search of the RBLC database indicates that ESPs are not a demonstrated control technology for surface coating operations in the automobile industry. However, Mercedes-Benz Vans has selected more effective controls and has no need to eliminate ESPs from consideration in this step.

5.2.2.5 Underbody Coating / Cavity Wax BACT

A search of the RBLC database indicates that ESPs are not a demonstrated control technology for automotive processes. However, Mercedes-Benz Vans has selected more effective controls and has no need to eliminate ESPs from consideration in this step.

5.2.2.6 Paint Shop Sealers and Adhesives BACT

With the exception of the UB-PVC sealing application, all of the other sealers and adhesives are applied using nozzles with 100% transfer efficiency. Therefore, no $PM/PM_{10}/PM_{2.5}$ is lost during the application of these materials, and there are no $PM/PM_{10}/PM_{2.5}$ emissions.

For the control of $PM/PM_{10}/PM_{2.5}$ emissions from UB-PVC sealer application, a search of the RBLC database indicates that ESPs are not a demonstrated control technology for paint shop sealers and adhesives operations in the automobile industry.

However, Mercedes-Benz Vans has selected more effective controls and has no need to eliminate ESPs from consideration in this step.

5.2.2.7 Assembly Underbody Wax BACT

A search of the RBLC database indicates that ESPs are not a demonstrated control technology for automotive processes. However, Mercedes-Benz Vans has selected more effective controls and has no need to eliminate ESPs from consideration in this step.

5.2.2.8 Paint Shop Phosphate Cleaning BACT

The use of a mist eliminator is technically feasible.

5.2.2.9 Paint Shop / Assembly Spot Repair BACT

A search of the RBLC database indicates that ESPs are not a demonstrated control technology for surface coating operations in the automobile industry. However, Mercedes-Benz Vans has selected more effective controls and has no need to eliminate ESPs from consideration in this step.

5.2.2.10 Body Shop Welding BACT

All of the candidate control options are technically feasible.

5.2.2.11 Assembly Roll and Brake Testing BACT

Both DPF and engine design are technically feasible control options for reducing $PM/PM_{10}/PM_{2.5}$ emissions from the roll and brake testing operations.

5.2.2.12 Sand, Touch-Up, and Polish (Workdecks) BACT

All of the candidate control options are technically feasible.

5.2.3 Step 3: Ranking of Control Technologies by Control Effectiveness

The information provided by the facility regarding the efficiencies of the remaining control devices was obtained from the RBLC, manufacturer's information, EPA Air pollution fact sheets, and other state air permitting agencies. When no information for $PM_{2.5}$ was available, PM_{10} was used as a surrogate. The controls are ranked from the most to least effective based on their PM_{10} and $PM_{2.5}$ emission reduction potential (% control efficiency).

5.2.3.1 Boiler BACT

Implementing good combustion practices provides the most effective means for reducing emissions of $PM/PM_{10}/PM_{2.5}$ from the boiler.

5.2.3.2 Paint Shop and Assembly Process Combustion Sources and Air Supply Units BACT

Implementing good combustion practices provides the most effective means for reducing emissions of $PM/PM_{10}/PM_{2.5}$ from the process combustion sources and Air Supply Units.

5.2.3.3 E-Coat Spot Repair BACT

The third of the five steps in the "top-down" BACT assessment procedure is to rank technically feasible control technologies by control effectiveness. The remaining control technologies are presented in Table 6.

Table 6 – $PM/PM_{10}/PM_{2.5}$ Control Option Efficiency

Control Option	Efficiency (%)
Dry filters	95 – 99
Good operating practices	Varies

5.2.3.4 Paint Shop (Guidecoat/Topcoat) BACT

The third of the five steps in the "top-down" BACT assessment procedure is to rank technically feasible control technologies by control effectiveness. The remaining control technologies are presented in Table 7.

Table 7 – $PM/PM_{10}/PM_{2.5}$ Control Option Efficiency

Control Option	Efficiency (%)
Dry filters	95 – 99
Dry scrubbers	95 – 99
Electrostatic precipitator	90 – 99
Wet scrubbers	90 – 98.5
Water wash filtration	90

5.2.3.5 Underbody Coating / Cavity Wax BACT

The third of the five steps in the "top-down" BACT assessment procedure is to rank technically feasible control technologies by control effectiveness. The remaining control technologies are presented in Table 8.

Table 8 – PM/PM_{10}/$PM_{2.5}$ Control Option Efficiency

Control Option	Efficiency (%)
Dry filters	95 – 99
Dry scrubbers	95 – 99
Electrostatic precipitator	90 – 99
Wet scrubbers	90 – 98.5
Water wash filtration	90

5.2.3.6 Paint Shop Sealers and Adhesives BACT

The third of the five steps in the "top-down" BACT assessment procedure is to rank technically feasible control technologies by control effectiveness. The remaining control technologies are presented in Table 9.

Table 9 – PM/PM_{10}/$PM_{2.5}$ Control Option Efficiency

Control Option	Efficiency (%)
Dry filters	95 – 99
Dry scrubbers	95 – 99
Electrostatic precipitator	90 – 99
Wet scrubbers	90 – 98.5
Water wash filtration	90

5.2.3.7 Assembly Underbody Wax BACT

The third of the five steps in the "top-down" BACT assessment procedure is to rank technically feasible control technologies by control effectiveness. The remaining control technologies are presented in Table 10.

Table 10 – PM/PM_{10}/$PM_{2.5}$ Control Option Efficiency

Control Option	Efficiency (%)
Dry filters	95 – 99
Dry scrubbers	95 – 99
Electrostatic precipitator	90 – 99
Wet scrubbers	90 – 98.5
Water wash filtration	90

5.2.3.8 Paint Shop Phosphate Cleaning BACT

The mist eliminator is the only available control.

5.2.3.9 Paint Shop / Assembly Spot Repair BACT

The third of the five steps in the “top-down” BACT assessment procedure is to rank technically feasible control technologies by control effectiveness. The remaining control technologies are presented in Table 11.

Table 11 – PM/PM_{10}/$PM_{2.5}$ Control Option Efficiency

Control Option	Efficiency (%)
Dry filters	95 – 99
Dry scrubbers	95 – 99
Electrostatic precipitator	90 – 99
Wet scrubbers	90 – 98.5
Water wash filtration	90
Good operating practices	Varies

5.2.3.10 Body Shop Welding BACT

The third of the five steps in the “top-down” BACT assessment procedure is to rank technically feasible control technologies by control effectiveness. The remaining control technologies are presented in Table 12.

Table 12 – PM/PM_{10}/$PM_{2.5}$ Control Option Efficiency

Control Option	Efficiency (%)
Cartridge Filter	90 - 99
Electrostatic precipitator	90 – 99
Good operating practices	Varies

5.2.3.11 Assembly Roll and Brake Testing BACT

Particulate filters provide the most effective means for reducing PM/PM_{10}/$PM_{2.5}$ emissions from the roll and brake testing area with a control efficiency of approximately 95%. Using engines designed to meet EPA fuel economy standards is the second most effective control option for reducing PM/PM_{10}/$PM_{2.5}$ emissions.

5.2.3.12 Sand, Touch-Up, and Polish (Workdecks) BACT

The third of the five steps in the "top-down" BACT assessment procedure is to rank technically feasible control technologies by control effectiveness. The remaining control technologies are presented in Table 13.

Table 13 – $PM/PM_{10}/PM_{2.5}$ Control Option Efficiency	
Control Option	**Efficiency (%)**
Dry Filter	95-99
Electrostatic precipitator	90-99
Good operating practices	Varies

5.2.4 Step 4: Evaluation of Most Effective Controls

The top-down approach for determining BACT suggests that all available control technologies be ranked in descending order of control effectiveness. The most stringent or "top" control option is the default BACT emission limit unless the applicant demonstrates, and the permitting authority in its informed opinion agrees, that energy, environmental, and/or economic impacts justify the conclusion that the most stringent control option is not achievable in that case. Upon elimination of the most stringent control option based upon energy, environmental, and/or economic considerations, the next most stringent alternative is evaluated in the same manner. This process continues until BACT is selected.

5.2.4.1 Boiler, Paint Shop and Assembly Process Combustion Sources, Air Supply Units BACT

The $PM/PM_{10}/PM_{2.5}$ control option of good combustion practices will be applied to achieve compliance with the proposed BACT limit.

5.2.4.2 E-Coat Spot Repair BACT

The minimum annual operation and maintenance cost for a dry filter (mechanical shaker cleaned type) according to EPAs "Air Pollution Control Technology Fact Sheet" is $9,300 per m^3/sec. The exhaust air volume from the E-coat spot repair open workdeck equals approximately 6.11 m^3/sec. At this volume, the minimum annual cost to operate a dry filter would be $56,823. Since $PM/PM_{10}/PM_{2.5}$ emissions from the workdecks are only 0.08 tpy, the use a dry filter is cost prohibitive for this operation.

The only remaining feasible option for controlling $PM/PM_{10}/PM_{2.5}$ emissions from the workdecks is good operating practices.

Table 14 – $PM/PM_{10}/PM_{2.5}$ Control Option Impacts				
Control Option	**Cost/Ton [1]**	**Economical**	**Environmental Impacts**	**Energy Impacts**
Dry Filters	$56,823	Not Feasible	----	----

[1] Cost/ton is based on the Total Annual Operating Costs divided by the Emissions Reduction, based on the control efficiencies provided under Step 3.

5.2.4.3 Paint Shop (Guidecoat/Topcoat) BACT

The paint shop coating operations will be controlled by dry filters, which are the highest ranked control options. Therefore, no further evaluation is required.

5.2.4.4 Underbody Coating / Cavity Wax BACT

The paint shop underbody coating and the cavity wax application will be controlled by dry filters, which is among the highest ranked control options. Therefore, no further evaluation is required.

5.2.4.5 Paint Shop Sealers and Adhesives BACT

The UB-PVC sealer application will be controlled by dry filters, which are among the highest ranked control options. Therefore, no further evaluation is required for this operation. All of the other sealers and adhesives are applied using nozzles with 100% transfer efficiency which results in zero emissions of $PM/PM_{10}/PM_{2.5}$.

5.2.4.6 Assembly Underbody Wax BACT

The underbody wax application will be controlled by dry filters, which is among the highest ranked control options. Therefore, no further evaluation is required.

5.2.4.7 Paint Shop Phosphate Cleaning BACT

Mercedes-Benz Vans will use a mist eliminator to control particulates from the phosphate cleaning operation. Since mist eliminators represent the most stringent control, no further analysis in necessary.

5.2.4.8 Paint Shop / Assembly Spot Repair BACT

Mercedes-Benz Vans will use dry filters to reduce PM/PM_{10}/$PM_{2.5}$ emissions from the paint shop spot repair and assembly spot repair booths. Since dry filters represent the highest level control for these operations, no further analysis in required.

5.2.4.9 Body Shop Welding BACT

The uncontrolled PM/PM_{10}/$PM_{2.5}$ emissions from the body shop welding operations are 0.254 tpy when accounting for the building capture efficiency since all welding operations are conducted indoors. With potential uncontrolled PM/PM_{10}/$PM_{2.5}$ emission rates of this magnitude, add-on control technologies for VOC are cost prohibitive for all welding operations. However, for the purposes of employee health and safety, Mercedes-Benz Vans has elected to utilize a cartridge filter for MAG welding operations to reduce PM/PM_{10}/$PM_{2.5}$ emissions. The use of a cartridge filter provides an equivalent level of control to the electrostatic precipitator. The cartridge filter will vent inside the building.

5.2.4.10 Assembly Roll and Brake Testing BACT

All diesel vans are equipped with DPF, which is the top level control for the proposed operations. All vans will be equipped with engines designed to meet EPA fuel economy standards to minimize PM/PM_{10}/$PM_{2.5}$ emissions. No other control options are demonstrated for this operation, which results in minimal PM/PM_{10}/$PM_{2.5}$ emissions.

5.2.4.11 Sand, Touch-Up, and Polish (Workdecks) BACT

The minimum annual operation and maintenance cost for a dry filter according to EPAs “Air Pollution Control Technology Fact Sheet” is \$9,300 per m^3/sec. The exhaust air volume from the workdecks equals approximately 135.3 m^3/sec. At this volume, the minimum annual cost to operate a dry filter would be \$1,258,290. Since PM/PM_{10}/$PM_{2.5}$ emissions from the workdecks are only 0.92 tpy, the use a dry filter is cost prohibitive for this operation.

Similarly, the minimum annual operation and maintenance cost for a dry-ESP according to EPAs “Air Pollution Control Technology Fact Sheet” is \$8,500 per m^3/sec. At this cost, the minimum annual cost to operate a dry ESP would be approximately \$1,150,500. Since PM/PM_{10}/$PM_{2.5}$ emissions from the workdecks are only 0.92 tpy, the use an ESP is cost prohibitive for this operation.

The only remaining feasible option for controlling $PM/PM_{10}/PM_{2.5}$ emissions from the workdecks is good operating practices.

The Control Option Impacts are shown in Table 15.

Table 15 – $PM/PM_{10}/PM_{2.5}$ Control Option Impacts

Control Option	Cost/Ton [1]	Economical	Environmental Impacts	Energy Impacts
Dry Filters	$1,376,607	Not Feasible	----	----
Electrostatic Precipitator	$1,250,549	Not Feasible	----	----

[1] Cost/ton is based on the Total Annual Operating Costs divided by the Emissions Reduction, based on the control efficiencies provided under Step 3.

5.2.5 Step 5: Select BACT Controls and Limits

5.2.5.1 Boiler BACT

Similar natural gas-fired units used the AP-42 emission factors to set $PM/PM_{10}/PM_{2.5}$ BACT limits for boilers. Mercedes-Benz Vans will utilize good combustion practices to limit $PM/PM_{10}/PM_{2.5}$ emissions from the boiler. Good combustion practices include ensuring good air/fuel mixing and sufficient residence time in the combustion zone, good burner maintenance and operation, and proper fuel gas supply system design and operation. In addition, Mercedes-Benz Vans will demonstrate continuous compliance with the proposed BACT requirements by conducting an tune-up of the boiler every five years as required under 40 CFR Part 63 Subpart DDDDD.

The $PM/PM_{10}/PM_{2.5}$ BACT limit of 7.6 lb/MMscf is proposed. This limit is based on the AP-42 emission factor and is consistent with all other similar RBLC entries. Since Mercedes-Benz is proposing a BACT limit based on the AP-42 emission factor for total PM, entries based on filterable PM were not compared to the proposed BACT limit. There is one entry in the RBLC database for boilers whose emission limit is slightly lower than the limit proposed by Mercedes-Benz Vans. The RBLC database shows that Daimler Chrysler Corporation proposed a 0.15 lb/hr limit for two 13.31 MMBtu/hr natural gas-fired boilers at its Toledo facility. This limit is equal to 7.50 lb/MMscf. Mercedes-Benz Vans believes that rounding or the use of a different natural gas heating value caused this limit to be slightly lower than the AP-42 emission factor for total PM (7.60 lb/MMscf). Since the limit is rounded to two decimal places, it is possible that the limit proposed by Daimler Chrysler is between 0.15 – 0.154 lb/hr. A limit of 0.154 lb/hr is equal to 7.70 lb/MMscf, slightly higher than the

AP-42 emission factor and the limit proposed by Mercedes-Benz Vans. Therefore, Mercedes-Benz Vans has determined that the AP-42 emission factor for total PM is an appropriate BACT limit.

5.2.5.2 Paint Shop and Assembly Process Combustion Sources and Air Supply Units BACT

Similar operations used the AP-42 emission factors for natural gas combustion to set PM/PM_{10}/$PM_{2.5}$ BACT limits for the process combustion sources. Mercedes-Benz Vans will utilize good combustion practices to limit PM/PM_{10}/$PM_{2.5}$ emissions from these sources. Good combustion practices include ensuring good air/fuel mixing and sufficient residence time in the combustion zone, good burner maintenance and operation, and proper fuel gas supply system design and operation. The PM/PM_{10}/$PM_{2.5}$ BACT limit of 7.6 lb/MMscf is proposed. This limit is based on the AP-42 emission factor and is less than or equal to all other similar RBLC entries. The proposed limit is less than or equal to all of the entries in the RBLC database for similar operations. Since Mercedes-Benz Vans is proposing a BACT limit based on the AP-42 emissions factor for total PM, entries based on filterable PM were not compared to the proposed BACT limit.

5.2.5.3 E-coat Spot Repair BACT

Mercedes-Benz Vans will utilize good operating practices for E-coat spot repair operations. These operating practices include conducting all spot repair operations indoors to minimize fugitive particulate loss. The proposed PM/PM_{10}/$PM_{2.5}$ BACT requirement is provided in Table 16.

The RBLC database search results provides entries for spot repair operations. All of these entries utilize dry filters for control of PM/PM_{10}/$PM_{2.5}$ emissions from these operations, however, these repair booths are typically for topcoat and may utilize larger quantities of coating material. As discussed in Step 4, the use of add-on controls is economically infeasible for the proposed E-coat spot repair operations. Therefore, Mercedes-Benz Vans is proposing to utilize good operating practices in lieu of emission limits for these operations.

5.2.5.4 Paint Shop (Guidecoat/Topcoat) BACT

Mercedes-Benz Vans will use a dry filtration system to control PM/PM_{10}/$PM_{2.5}$ emissions from the proposed operations. The proposed BACT limits for PM/PM_{10}/$PM_{2.5}$ emissions from these operations is 1 mg/m^3 of air on a monthly average basis based on manufacturer specifications for the achievable level of control.

Since Mercedes-Benz Vans is proposing to route exhaust streams from the guidecoat and topcoat booths to ADW controls, $PM/PM_{10}/PM_{2.5}$ emissions must be negligible to ensure proper ADW operation.

Mercedes-Benz Vans conducted a review of the RBLC database and found that the proposed limit is lower than all of the outlet grain loading rates provided. It is also equivalent to a control efficiency significantly greater than the control efficiencies provided in the RBLC database.

$PM/PM_{10}/PM_{2.5}$ emissions from all guidecoat and topcoat booths are controlled by dry filtration systems. Pre-controlled $PM/PM_{10}/PM_{2.5}$ emissions from guidecoat booth 1 and booth 2 (GC01 and GC02), basecoat/clearcoat booth 1 and booth 2 (BC01 and BC21), clearcoat booth 1 (CC01), are greater than 100 tpy. Therefore, each of these units is subject to CAM. Mercedes-Benz Vans will demonstrate compliance with the proposed BACT limit by monitoring pressure drop across the filtration system, and ensuring the pressure drop is within the manufacturer's recommendations.

5.2.5.5 Paint Shop Sealers and Adhesives BACT

Mercedes-Benz Vans will use dry filters to control $PM/PM_{10}/PM_{2.5}$ emissions from the UB-PVC sealer application.

$PM/PM_{10}/PM_{2.5}$ emissions from UB-PVC sealer deck 1 and deck 2 (UBS01 and UBS21) is controlled by dry-filtration. Mercedes-Benz Vans will demonstrate compliance with the proposed BACT limit by operating the dry filters in accordance with manufacturer's recommendations to ensure the guaranteed 98.5% control efficiency.

An RBLC search results from sealer operations show emission limits include an opacity limit and an outlet grain loading rate requirement. Mercedes-Benz Vans is not proposing an opacity limit, as the correlation between opacity and $PM/PM_{10}/PM_{2.5}$ from these operations has not been established. Mercedes-Benz Vans is proposing to use filters with 98.5% control efficiency instead of an outlet grain loading rate, as the control efficiency guarantee has been provided by the equipment manufacturer and outlet grain loading information has not been provided in the manufacturer's specifications.

5.2.5.6 Underbody Coating / Cavity Wax BACT

Mercedes-Benz Vans will use dry filters to control $PM/PM_{10}/PM_{2.5}$ emissions from the underbody coating and cavity wax operations.

Although the RBLC database does not include any entries for underbody coating operations, other coating operations generate $PM/PM_{10}/PM_{2.5}$ emissions in a manner similar to the proposed underbody coating operations due to overspray. The emission limits provided are in a variety of forms, including control efficiencies, mass-based emission limits, and opacity limits. Mercedes-Benz Vans is not proposing an opacity limit, as the correlation between opacity and $PM/PM_{10}/PM_{2.5}$ from these operations has not been established. Mercedes-Benz Vans is proposing to use filters with 98.5% control efficiency instead of a mass-based emission limit, as the control efficiency guarantee has been provided by the equipment manufacturer. The control efficiency guarantee is equivalent to similar sources outlined in the application.

Mercedes-Benz Vans is not aware of any cavity wax operations listed for $PM/PM_{10}/PM_{2.5}$ in the RBLC database. Mercedes-Benz Vans will demonstrate compliance with the proposed BACT requirement by maintaining a high transfer efficiency of the cavity wax material (96% transfer efficiency) and operating the dry filters in accordance with manufacturer's recommendations to ensure the guaranteed 98.5% control efficiency. The cavity wax is applied to the inner recesses of the vehicle bodies, with only a small amount of overspray.

$PM/PM_{10}/PM_{2.5}$ emissions from all underbody coating and cavity wax operations are controlled by dry filters. Mercedes-Benz Vans will demonstrate compliance with the proposed BACT limit by regularly inspecting filters.

5.2.5.7 Assembly Underbody Wax BACT

Mercedes-Benz Vans will use dry filters to control $PM/PM_{10}/PM_{2.5}$ emissions from the assembly UB wax operation.

Mercedes-Benz Vans is not aware of any underbody wax operations listed for $PM/PM_{10}/PM_{2.5}$ in the RBLC database. Mercedes-Benz Vans will demonstrate compliance with the proposed BACT requirement by operating the dry filters in accordance with manufacturer's recommendations to ensure the guaranteed 98% control efficiency.

5.2.5.8 Paint Shop Phosphate Cleaning BACT

Mercedes-Benz Vans will use a mist eliminator to control particulates from the phosphate cleaning operation. Mercedes-Benz Vans will demonstrate compliance with the proposed BACT requirement by operating the mist eliminator in accordance with manufacturer's recommendations. Mercedes-Benz Vans is proposing this operating requirement instead of an emission limit or percent reduction requirement since pre-control and post-control emissions are not easily measureable and are not able to be determined through mass balance.

5.2.5.9 Paint Shop / Assembly Spot Repair BACT

Mercedes-Benz Vans will use dry filters to control the $PM/PM_{10}/PM_{2.5}$ emissions from paint shop and assembly spot repair operations.

Mercedes-Benz Vans will demonstrate compliance with the proposed BACT limit by operating the dry filters in accordance with manufacturer's recommendations to ensure the guaranteed 98.5% control efficiency.

Mercedes-Benz Vans is not proposing an opacity limit, as the correlation between opacity and $PM/PM_{10}/PM_{2.5}$ from these operations has not been established. Mercedes-Benz Vans is proposing to use filters with 98.5% control efficiency instead of a mass-based emission limit, as the control efficiency guarantee has been provided by the equipment manufacturer.

5.2.5.10 Body Shop Welding BACT

Mercedes-Benz Vans will control $PM/PM_{10}/PM_{2.5}$ emissions from MAG welding operations with the use of a cartridge filter. Controlling spot welding, laser welding, and laser soldering emissions with the use of a cartridge filter is cost prohibitive. Even if the same cartridge filter could be used for all welding activities, the cost of hoods and ductwork to collect and transport the small quantity of emissions to the electrostatic precipitator would exceed $10,000 per ton. Therefore, the cartridge filter will be used for MAG welding only. All other welding operations will be conducted within the body shop building to minimize $PM/PM_{10}/PM_{2.5}$ emissions.

Mercedes-Benz Vans is not proposing an opacity limit, as the correlation between opacity and $PM/PM_{10}/PM_{2.5}$ from these operations has not been established. The reduction in $PM/PM/PM_{10}$ emissions reductions that are achieved for MAG welding operations with the use of cartridge filters that vent indoors are greater than the 99% control efficiency. Mercedes-Benz Vans is not proposing a mass-based emission limits since all welding operations are conducted indoors and are not easily evaluated to demonstrate compliance. Mercedes-Benz Vans estimates that actual emissions will be negligible.

5.2.5.11 Assembly Roll and Brake Testing BACT

Mercedes-Benz Vans will utilize DPF and engines designed to meet fuel economy standards to reduce $PM/PM_{10}/PM_{2.5}$ emissions from the roll and brake testing area.

5.2.5.12 Sand, Touch-Up, and Polish (Workdecks) BACT

Mercedes-Benz Vans will utilize good operating practices for sanding, touch-up, and polish activities. These operating practices include conducting all sanding, touch-up, and polish operations indoors to minimize fugitive particulate loss.

All of the RBLC entries utilize dry filters for control of $PM/PM_{10}/PM_{2.5}$ emissions from these operations. As discussed in Step 4, the use of add-on controls is economically infeasible for the proposed operations. Therefore, these RBLC database search results are not comparable to the proposed Mercedes-Benz Vans operations. Mercedes-Benz Vans is proposing operating requirements in lieu of emission limits for these operations, as direct measurement of the emissions associated with these sources is not practical.

5.2.5.13 Additional Sources

Abbreviated analyses for units with low uncontrolled emissions or fugitive emissions sources are provided in the following subsections. Note the same control techniques that reduce PM also reduce PM_{10} and filterable $PM_{2.5}$. The BACT analyses for PM, PM_{10} and $PM_{2.5}$ are combined to eliminate redundancy.

Emergency Engines

The proposed emergency generators and fire pump (EE) are diesel-fired. The total potential $PM/PM_{10}/PM_{2.5}$ and VOC emissions from these units are each less than 3.5 tpy. In addition, the operation of this equipment will be limited to emergency events, and required routine testing. Therefore, the total hours of operation is limited to 500 hours per year. Due to the small quantity of $PM/PM_{10}/PM_{2.5}$ and VOC emissions associated with the emergency units, and the emergency nature of operation of the units, a “top-down” BACT analysis has not been conducted. These units will meet BACT requirements by complying with the applicable requirements of NSPS Subpart IIII and NESHAP Subpart ZZZZ.

Cooling Towers

The proposed cooling towers (CT01- CT07) each have uncontrolled $PM/PM_{10}/PM_{2.5}$ emission rates of less than 1 tpy. A review of the RBLC database for cooling towers with flow rates less than 10,000 gpm indicates that a drift rate of 0.001% meets BACT criteria for these units. Mercedes-Benz Vans will install cooling towers designed to meet this limit.

Roads

Mercedes-Benz Vans has determined that $PM/PM_{10}/PM_{2.5}$ emissions from roads are fugitive in nature. A number of variables factor into the calculation of fugitive dust from road travel. These include the average daily traffic (ADT) on the road within the Charleston plant (low-volume), the associated silt loading value, maximum weight of vehicles traveling the roads, and distance of load travel. In addition, the $PM/PM_{10}/PM_{2.5}$ emissions from paved roads is significantly less than that of unpaved roads. Mercedes-Benz Vans will minimize the emissions of fugitive $PM/PM_{10}/PM_{2.5}$ from roads by using paved roads throughout the facility.

Based on the analyses provided above, the proposed numerical BACT limits for the Charleston plant are summarized in Table 16. Proposed BACT operating summary requirements are provided in Table 17.

Table 16 – Selection of $PM/PM_{10}/PM_{2.5}$ BACT and Proposed Limits

Process/Equipment	Control Method	Proposed BACT Limit		
		Limit	Units	Avg. Period
Energy Center Boiler	None	7.6	lb/MMscf	3 hr
Process Combustion Sources	None	7.6	lb/MMscf	3 hr
Paint Shop Guidecoat Operations	Dry Filtration	1.0	mg/m^3	3 hr
Paint Shop Sealers and Adhesives – Underbody PVC	Dry Filtration	98.5%	% Eff	Monthly
Paintshop Topcoat Operations – Single Topcoat (Monocoat)	Dry Filtration	1.0	mg/m^3	3 hr
Paintshop Topcoat Operations – Basecoat/Clearcoat	Dry Filtration	1.0	mg/m^3	3 hr
Paintshop Topcoat Operations – Cavity Wax	Dry Filtration	98.5%	% Eff	Monthly
Assembly and Spot Repair Operations	Dry Filtration	98.5%	% Eff	Monthly
Assembly UB Wax Application	Dry Filtration	98.0%	% Eff	Monthly
Air Supply Units	None	7.6	lb/MMscf	3 hr

Table 16 – Selection of PM/PM_{10}/$PM_{2.5}$ BACT and Proposed Limits				
Process/Equipment	Control Method	Proposed BACT Limit		
		Limit	Units	Avg. Period
Cooling Towers	None	0.001	% drift rate	Monthly
Underbody Coating Operations	Dry Filtration	98.5%	% Eff	Monthly

Table 17 – Selection of PM/PM_{10}/$PM_{2.5}$ BACT Operating Requirements	
Process/Equipment	Control Method
Energy Center Boiler	Annual tune-up as required in §63.7540(a)(10)
Paint Shop Phosphate Cleaning Operations	Use of mist eliminator in accordance with manufacturer recommendations
Body Shop Welding Areas	cartridge filter (MAG welding), good operating practices, indoor venting
Assembly Roll and Brake Testing	DPF and engine design to meet EPA fuel economy standards
Sand, Touch-up& Polish (Workdecks)	Good operating practices
Emergency Generators and Fire Pump	NSPS Subpart IIII compliance
Paved Roads	Maintaining Paved Roads
E-Coat Spot Repair	Good operating practices

5.3 BACT for VOCs

The BACT analysis for VOC emissions resulting from the following process/point sources:

1. Energy Center Boilers
2. Process Combustion Sources
3. Paint Shop E-Coat
4. E-coat Spot Repair Operations
5. Paint Shop Guidecoat Operations
6. Paint Shop Sealers and Adhesives
7. Underbody Coating Operations
8. Paint Shop Topcoat Operations
9. Paint Shop Spot Repair Operations
10. Assembly Spot Repair Operations
11. Paint Shop Purge Solvent Operations
12. Body Shop Adhesives Application (all locations)

13. Assembly Windshield Glazing Operations
14. Paint Shop Mixing Operations
15. Assembly Roll and Brake Testing
16. Assembly Fluid Fill Operations
17. Assembly Windshield Washer System Testing
18. Air Supply Units

Table 18 – Potential Uncontrolled VOC Emissions

Equipment	Uncontrolled VOC Emissions (lb/hr)
Energy Center Boiler #1 Energy Center Boiler #2	0.15
RTO #1 ADW Desorption Heater #1 ADW Desorption Heater #2 E-Coat Oven Burner Primer (Guidecoat) Oven #1 Burner Primer (Guidecoat) Oven #2 Burner Topcoat Oven #1 Burner Topcoat Oven #2 Burner Assembly Oven Burner	0.26
E-Coat Oven E-Coat Dip Tank	24.39
E-coat Spot Repair Operations	0.03
Guidecoat Booth #1 Guidecoat Oven #1 Guidecoat Booth #2 Guidecoat Oven #2	145.59
Cavity Wax Operations	21.99
Sika Sealing Deck #1 Sika Sealing Deck #2 Sound Deadener Adhesive Area #1 Sound Deadener Adhesive Area #2	2.63
Underbody Coating Booth #1 Underbody Coating Booth #2	13.07
Basecoat/Clearcoat Booth #1 Clearcoat Booth #1 Topcoat Oven #1 Basecoat/Clearcoat Booth #2 Topcoat Oven #2	508.72
Spot Repair Booth #1 Spot Repair Booth #2 Spot Repair Booth #3	0.62
Assembly Repair Booth #1	1.53
Purge Solvent	57.84

Table 18 – Potential Uncontrolled VOC Emissions	
Equipment	**Uncontrolled VOC Emissions (lb/hr)**
Body Shop Adhesives Application	1.84
Body Shop Adhesives Application (Paint Shop location)	1.84
Body Shop Adhesives Application (Assembly location)	1.84
Assembly Windshield Glazing	3.31
Paint Shop Mixing	0.29
Assembly Roll and Break Testing	0.01
Fluid Fill	1.10
Windshield Washer System Testing	1.06
Air Supply Units (ASU01-ASU22)	0.56

As stated in the regulatory definition, BACT is “an emissions limitation … based on the maximum degree of reduction for each regulated NSR pollutant … taking into account energy, environmental, and economic impacts ….” When BAQ determines that the imposition of an emissions limitation is not feasible, then “a design, equipment, work practice, operational standard, or combination thereof, may be prescribed” as BACT instead.

In the following VOC BACT evaluation for the largest emissions units, the final BACT selection for these largest units includes proposed BACT emissions limits. For the small VOC emissions units, emissions limits are not practical and BAQ instead has specified other measures as BACT.

5.3.1 Step 1: Identify All Available Control Technologies

The BACT analysis identifies the following control technologies that could reduce VOC emissions:

5.3.1.1 Boiler, Paint Shop and Assembly Process Combustion Sources and Air Supply Units BACT

Analyzing the RBLC search results and permit review results for similar natural gas-fired units, as well as review of technical literature, potentially applicable VOC control technologies were identified based on the principles of the control technology and engineering experience for general combustion units. These technologies are listed as follows:

- Oxidation Catalyst
- Good Combustion Practices

These VOC reduction options are discussed in the following subsections.

Oxidation Catalyst

Oxidation catalyst controls VOC emissions by facilitating the complete combustion of organic compounds to water vapor and carbon dioxide. Oxidation catalysts are effective and suitable for use with natural gas and distillate combustion.

Good Combustion Practices

Ensuring that the temperature and oxygen availability are adequate for complete combustion minimizes VOC formation. This technique includes continued operation of the boiler at the appropriate oxygen range and temperature.

The RBLC database search results list catalytic incinerators and thermal oxidizers as control devices for ovens at two facilities (Daimler Chrysler Corporation in Ohio and Subaru of Indiana Automotive, Inc.). Similar to the proposed Mercedes-Benz Vans operations, these facilities utilize these devices to control VOC emissions from paint drying in the ovens. Based on the information provided in the RBLC database, the combustion emissions from these facilities are comingled with VOC emissions from the drying process and are not comparable to the Mercedes-Benz Vans design, which utilizes indirect-fired ovens with separate drying exhaust.

5.3.1.2 E-Coat BACT

Candidate control options for E-coat operations (Unit ID 3) identified from the RBLC search, permit review, and the literature review include those classified as pollution reduction techniques. Surface coating operations include three types of emission reductions for VOC: coating materials, coating application methods, and add-on VOC controls. The available control options for E-coat in each of these categories are listed as follows:

- Coating materials
  - Powder coating material
  - Low VOC coating material
  - Waterborne coating material
- Coating application methods

  - Electrodeposition dip process
  - Spray processes
- Add-on controls
  - Regenerative thermal oxidizer (RTO) with or without ADW
  - Regenerative catalytic oxidizer (RCO) with or without ADW
  - Biofilter

These VOC reduction options are discussed in the following subsections.

Coating materials

Low VOC waterborne materials are an industry standard for E-coat materials. Mercedes-Benz Vans is not aware of any E-coat dip tank materials that would provide further emissions reductions beyond what is currently used in the industry. Powder coatings applied via spray application are also an available option that could result in reduced VOC emissions.

Coating application methods

The electrodeposition process using a dip tank provides approximately 100% transfer efficiency of the coating material to the vehicle body. The process involves submerging the vehicle body into a dip tank which holds the E-coat bath and applying direct current electricity through the bath using electrodes. When the electric field is applied, all of the charged coating particles migrate through electrophoresis toward the vehicle body, which has the opposite charge. This creates a strong bond between the coating and the vehicle body. Once the deposition is completed, the body is rinsed in spray and/or immersion rinse stations. Since this method provides the greatest available transfer efficiency and the lowest possible VOC emissions, no other methods are considered further.

Add-on controls:

RTO/RCO with or without ADW

RTO and RCO technology is widely used in the reduction of VOC emissions. RTO systems typically operate at temperatures from 1,300 ^{o}F – 1,800 ^{o}F, while RCO systems employ a catalyst bed to reduce combustion temperatures to about 700 ^{o}F – 900 ^{o}F. Both RTOs and RCOs utilize a ceramic bed to recapture the heat of the stream exiting the combustion zone. RTOs and RCOs can be designed to achieve up to 95% recovery of the thermal energy input to the system.

In cases where exhaust flow rates are very high, adsorption wheel (ADW) technology is used in combination with RTOs or RCOs to assist in the reduction of VOC emissions. The ADW concentrates VOC emissions for more economical destruction. VOCs physically adhere to the activated surface and the adsorbent is then regenerated via desorption when it reaches its adsorption capacity. Adsorption is optimal for process streams with low VOC concentrations (as low as 20 ppm) and high air flows (greater than 5,000 acfm).

Biofilter

Biofilters use microorganisms to remove volatile organic materials from exhaust streams. Biofilter systems require moderate inlet temperatures (60 to 105 ^oF), a moist, nutrient-rich environment, and a neutral pH. Organic materials are degraded to carbon dioxide, water, and various ions.

5.3.1.3 Paint Shops Sealers and Adhesives BACT

The following operations are addressed in the paint shop sealers and adhesives application BACT:

- Underbody (UB) PVC Sealing
- Seam Sealing
- Sika Sealing
- Sound Deadener Adhesive (SAM) Application

Candidate control options for sealers and adhesives (Unit ID 5) identified from the RBLC search, permit review, and the literature review include those classified as pollution reduction techniques. Surface coating operations include three types of emission reductions for VOC: coating materials, coating application methods, and add-on VOC controls. The available control options for sealers and adhesive application in each of these categories are listed as follows:

- Sealer and adhesive materials
  - Low VOC sealer and adhesive material
  - Waterborne sealer and adhesive material

- Sealer application methods

  - Nozzle applicator

- Add-on controls
  - RTO with or without ADW
  - RCO with or without ADW

The VOC reduction options not previously discussed are discussed in the following subsections.

Sealer and adhesive materials

Sealer and adhesive materials are low VOC materials that are applied to specific locations of the vehicle body. Low VOC and waterborne materials are an industry standards. Mercedes-Benz Vans is not aware of sealer or adhesive materials that would provide further VOC reductions beyond those currently used in the industry.

Sealer application methods

The transfer efficiency of the proposed sealers and adhesives is approximately 100% due to the nozzles that will be used. Mercedes-Benz Vans is not aware of application methods that would further reduce VOC emissions from sealer application.

5.3.1.4 Underbody Coating BACT

Candidate control options for the underbody coating operations (UBC01, UBC21) identified from the RBLC search, permit review, and the literature review include those classified as pollution reduction techniques. Surface coating operations include three types of emission reductions for VOC: coating materials, coating application methods, and add-on VOC controls. The available control options for underbody coating in each of these categories are listed as follows:

- Coating Materials
  - Powder coating material
  - Low VOC coating material
  - Waterborne coating material

- Coating application methods
  - High volume electrostatic
  - Low volume electrostatic
  - High volume low pressure (HVLP)

- Low volume low pressure (LVLP)

- Add-on controls
  - RTO with or without ADW
  - RCO with or without ADW

The VOC reduction options not previously discussed are discussed in the following subsections.

Coating materials

Low VOC waterborne materials are an industry standard for underbody coating materials. Mercedes-Benz Vans is not aware of any underbody coating materials that would provide further emissions reductions beyond what is currently used in the industry. Waterborne coatings and powder coatings applied via spray application are also an available option that could result in reduced VOC emissions.

Coating Application Methods

The coating application methods listed can be done with robotic or manual application. Other coating technologies, such as flow coating, dip coating, airless air spray, roll coating and thin film atomized technologies are not demonstrated in the application of underbody coating in the automotive industry.

5.3.1.5 Guidecoat / Topcoat BACT

Candidate control options for guidecoat (Unit ID 4) and topcoat (Unit ID 6) identified from the RBLC search, permit review, and the literature review include those classified as pollution reduction techniques. Surface coating operations include three types of emission reductions for VOC: coating materials, coating application methods, and add-on VOC controls. The available control options for guidecoat and topcoat in each of these categories are listed as follows:

- Coating materials
  - Powder coating material
  - Low VOC coating material
  - Waterborne coating material

- Coating application methods
  - High volume electrostatic

  - Low volume electrostatic
  - High volume low pressure (HVLP)
  - Low volume low pressure (LVLP)

- Add-on controls
  - RTO with or without ADW
  - RCO with or without ADW

These VOC reduction options not previously described are discussed in the following subsections.

Coating application methods

The coating application methods listed can be done with robotic or manual application. Other coating technologies, such as flow coating, dip coating, airless air spray, roll coating, and thin film atomized technologies are not demonstrated in the application of guidecoat or topcoat in the automotive industry.

5.3.1.6 Cavity Wax BACT

Candidate control options for cavity wax operations (Unit ID 6) identified from the RBLC search, permit review, and the literature review include those classified as pollution reduction techniques. Cavity wax operations include two types of emission reductions for VOC: wax materials and add-on VOC controls. The available control options for cavity wax in each of these categories are listed as follows:

- Wax materials
  - Waterborne material

- Add-on controls
  - RTO with or without ADW
  - RCO with or without ADW

5.3.1.7 Purge / Cleaning Solvent BACT

Candidate control options for purge and cleaning solvent operations (Unit ID 7) identified from the RBLC search, permit review, and the literature review include those classified as pollution reduction techniques. VOC reduction options include:

- Low VOC purge/cleaning solvent material
- Add-on controls for purging in areas with capture and control
- VOC work practices
- Block painting

The VOC reduction options not previously discussed are described as follows:

Low VOC purge/cleaning solvent material

Reducing the VOC vapor pressure or VOC content of the purge/cleaning solvent material used is one method of reducing VOC emissions from purge/cleaning solvent operation.

Add-on controls

Add-on controls that are used to control VOC emissions from surface coating operations generally reduce emissions from cleaning and purge/cleaning solvent operations as well. Although no facilities in the RBLC database specifically use add-on controls targeted to reduce VOC emissions from purge/cleaning solvent, the solvent is often used in controlled zones within the booths when the control equipment is operating, resulting in reduced VOC emissions.

VOC work practices

Work practice procedures used to reduce VOC emissions from purge/cleaning solvent include the following:

- Cover mixing and storage vessels for VOC-containing cleaning materials and waste cleaning materials, except when adding, removing, or mixing contents;
- Use closed containers or pipes to store and convey VOC-containing cleaning and waste cleaning materials;
- Minimize spills of VOC-containing cleaning and waste cleaning materials;
- Minimize VOC emissions during cleaning operations; and
- Follow MACT work practice standards in 40 CFR 63.3094, which are consistent with other work practices with the automobile manufacturing industry.

- Block painting, which involves painting vehicles of the same coating color in groups to reduce the need for color changes that require line purging and gun cleaning.

5.3.1.8 Body Shop Adhesives BACT

Candidate control options identified for paint shop adhesives (PSA) and body shop adhesives (Unit ID 8) from the RBLC search, permit review, and the literature review include those classified as pollution reduction techniques. VOC reduction options include:

- Adhesive Materials
  - Low VOC adhesives
  - Waterborne adhesive material
- Add-on controls
  - RTO with or without ADW
  - RCO with or without ADW

5.3.1.9 Window and Windshield Glazing / Mounting BACT

This section identifies control options for the reduction of VOC from the window and windshield glazing operation. The VOC emission from the window and windshield glazing operations are a result of volatilization as the vehicle body and windshield are being prepared and adhered to one another. Window and windshield primer and adhesives are used in this process, each with varying VOC content.

Candidate control options identified from the RBLC search, permit review, and the literature review include the following VOC reduction options:

- Low VOC materials
- VOC work practices

5.3.1.10 Assembly Roll and Brake BACT

This section identifies control options for the reduction of VOC from the assembly roll and brake testing operations.

Candidate control options identified from the RBLC search, permit review, and the literature review include the following VOC reduction options:

- Catalytic/ Thermal Oxidation
- Engine design to meet EPA fuel economy standards

5.3.1.11 Assembly Fluid Fill BACT

This section identifies control options for the reduction of VOC from the fluid filling operations.

Candidate control options identified for assembly fluid fill operations (Unit ID FF) from the RBLC search, permit review, and the literature review include those classified as pollution reduction techniques. VOC reduction options include:

- Add-on controls
  - RTO with or without ADW
  - RCO with or without ADW
- On-board refueling vapor recovery (ORVR)
- Use of low-VOC materials

5.3.1.12 Assembly Washer System Testing BACT

This section identifies control options for the reduction of VOC from the washer system testing operations.

Candidate control options identified for assembly washer system testing operations (Unit ID WST) from the RBLC search, permit review, and the literature review include those classified as pollution reduction techniques. VOC reduction options include:

- Add-on controls
  - RTO with or without ADW
  - RCO with or without ADW
- Use of low-VOC materials

5.3.1.13 Paint Shop Mixing BACT

This section identifies control options for the reduction of VOC from the paint shop mixing operations.

Candidate control options identified from the RBLC search, permit review, and the literature review include the following VOC reduction options:

- Add-on controls
  - RTO with or without ADW
  - RCO with or without ADW
- Use of low VOC materials
- VOC work practices

5.3.1.14 Paint Shop / Assembly Spot Repair BACT

Candidate control options identified from the RBLC search, permit review, and the literature review include the following VOC reduction options:

- Coating materials
  - Powder coating material
  - Low VOC coating material
  - Waterborne coating material

- Coating application methods
  - High volume electrostatic
  - Low volume electrostatic
  - High volume low pressure (HVLP)
  - Low volume low pressure (LVLP)

- Add-on controls
  - RTO with or without ADW
  - RCO with or without ADW

5.3.2 Step 2: Technical Feasibility of Options

After the identification of control options, the second step in the BACT assessment is to eliminate technically infeasible options. A control option is eliminated from consideration if there are process-specific conditions that would prohibit the implementation of the control or if the highest control efficiency of the option would result in an emission level that is higher than any applicable regulatory limits.

5.3.2.1 Boiler, Paint Shop and Assembly Process Combustion Sources and Air Supply Units BACT

All of the controls listed in Step 1 are technically feasible.

5.3.2.2 E-Coat BACT

Mercedes-Benz Vans does not consider powder coatings applied via spray application a technically feasible option, as powder application does not provide the coverage of recessed areas that is needed for corrosion protection of the vehicle body.

Biofilters are technically infeasible for controlling VOC emissions from coating operation at the Charleston plant for several reasons. First, the plant may not operate the painting operations continuously, which results in extended periods of time during which the microorganisms would not have a food source. Optimal biofilter performance requires a continuously operating source of VOC emissions. Additionally, the gas streams exiting from the painting operations are in many cases emitted from ovens, which significantly reduce the exhaust stream moisture content. As previously discussed, biofilters require a high-moisture exhaust stream to operate effectively. For these reasons, biofilter control is therefore deemed technically infeasible on all paint shop exhaust streams and is not considered further in this BACT analysis.

5.3.2.3 Paint Shops Sealers and Adhesives BACT

Sealer and adhesive application is performed in various areas of the paint shop. VOC emissions from the sealers and adhesives application are relatively low at approximately 10 tpy. Furthermore, sealers and adhesives are applied in dispersed areas of the plant and most are applied in open workdecks. Each application area has minimal emissions which would be difficult to capture. Based on the low VOC emissions and the dispersed application areas, add-on controls are not technically feasible. However, it is assumed that a portion of the VOC emissions from the materials are emitted in the primer oven, where the high temperature causes the vapor pressure of the sealers and adhesives to rise and causes some VOC to volatilize. Since the primer oven is controlled by an RTO, the sealer and adhesive emissions are controlled with the same efficiency.

5.3.2.4 Underbody Coating BACT

Coating Materials

Mercedes-Benz Vans does not consider powder coatings applied via spray application a technically feasible option, as powder application does not provide the coverage of recessed areas that is needed for corrosion protection of the vehicle underbody.

The use of waterborne coatings on the underbody of the vehicle is also not technically feasible. The primer oven and cooling zones were designed and permitted for the use of solventborne coatings, which does not allow for the temperature and humidity control or cooling capacity that is needed for waterborne coatings. Therefore, solventborne coatings must be used for the underbody coating operation based on the design of the paint shop, which is currently under construction.

Coating Application Methods

Mercedes-Benz Vans is proposing the use of manual HVLP application for the vehicle underbody. Robotic application is not technically feasible for the vehicle underbody due to the custom nature of the vehicle underbodies, the variation in location of recessed areas, and the minimal space to allow for robotic equipment. Furthermore, ESTA application it is not technically feasible for the vehicle underbody, as electrostatic paint is more attracted to corners and sharp edges and does not provide coverage for recessed areas.

Add-on Controls

Biofilters are technically infeasible for controlling VOC emissions from any coating operation at the Charleston plant for several reasons. First, the plant may not operate the painting operations continuously, which results in extended periods of time during which the microorganisms would not have a food source. Optimal biofilter performance requires a continuously operating source of VOC emissions. Additionally, the gas streams exiting from the coating operations are in many cases emitted from ovens, which significantly reduce the exhaust stream moisture content. As previously discussed, biofilters require a high-moisture exhaust stream to operate effectively. For these reasons, biofilter control is therefore deemed technically infeasible on all paint shop exhaust streams and is not considered further in this BACT analysis.

5.3.2.5 Guidecoat / Topcoat BACT

Coating materials

Powder coatings for guidecoat have been used with some success in the automobile manufacturing industry. However, for the proposed operation, there are a number of quality concerns that make powder guidecoat a technically infeasible option.

Powder coatings are typically used when only one color for guidecoat is used. Mercedes-Benz vans are offered in a variety of colors. Van plants using such a high variety of colors (more than 200 per year), use two or more guidecoat colors. Due to potential mixing of powder colors, recovery of lost powder for reuse is not possible. With the significant size of the guidecoat booth proposed at the Charleston plant, the vans would not be able to be cleaned from one vehicle to the next reclaim excess powder without mixing of colors.

The use of one guidecoat color to allow the use of powder guidecoat would ultimately result in an increase in VOC emissions. The appropriate pairing of the guidecoat color and topcoat color is required to minimize the thickness of the color-giving topcoat layer. If specific guidecoat colors are not paired with the appropriate topcoat colors, the topcoat layer thickness may increase by 50% to hide the color of the guidecoat (e.g. red topcoat on top of a grey guidecoat). This increases the paint consumption and emissions per vehicle.

Powder coatings have also been used for topcoat with limited success. Curing these coatings at high temperatures results in a yellowing effect, which negatively impacts product quality. Based on these quality concerns, Mercedes-Benz Vans has determined that powder clearcoat is technically infeasible for the proposed operation. Due to the number of color changes needed for basecoat application, powder coatings for basecoat are technically infeasible due to cross contamination.

Mercedes-Benz Vans is not aware of any van manufacturing facilities utilizing waterborne clearcoats, and does not believe that waterborne clearcoats are technically feasible for achieving the coating finish needed for van manufacturing. Mercedes is unique in using both a basecoat/clearcoat application and a monocoat application. While automotive manufacturers exclusively use a basecoat/clearcoat system, which can utilize a water-based basecoat and a solvent-based clearcoat, the monocoat system used for van manufacturing must utilize a solvent-based coating. A monocoat system is required for commercial van assembly to allow Mercedes to produce vans economically that do not require long-term the gloss and finish of a passenger automobile. With the configuration of using both basecoat/clearcoat and monocoat, it is technically infeasible to switch between solvent-based and water-based coatings as the booths are exclusively designed for one of the two coating types. Many water-based coatings contain lower solids content than a similar solvent-based coating; as well water-based paint will require slower robot application; these two aspects of water-based coating operations that would require a significant redesign of the paintshop to include additional robots to achieve the desired finish. In addition, robots would not have the capability of handling the complex application devices for three systems: a water-based base coat and two solvent-based systems (one for topcoat and one for clearcoat); therefore, further robots would be needed and exclusively dedicated to water-based or solvent-based coatings. In essence, this would require a separate line for monocoat and basecoat/clearcoat vehicles. Since vans have significantly more surface area, there is a more significant technical and economic hurdle as compared to automotive manufacturing. With the significant van surface area, the humidity associated with the Charleston area creates further technical and economic challenges associated with the cooling requirements, air supply units, and air handling units associated with the paintshop as discussed in the permit application. The additional robots and additional cooling requirements would necessitate a much longer paintshop which would not be feasible with the current site layout. Waterborne paint requires much more restrictive paint conditions with respect to temperature and humidity, which requires much higher cooling capacities and leads to higher energy consumption. Since waterborne topcoat has a VOC content of approximately 10%, the VOC content of the exhaust stream is so low that additional gas is required to fire the RTO, even with the use of an ADW. In comparison, with solventborne coatings, it is nearly an autothermic reaction. The use of waterborne paint is only advantageous if no abatement system for the booth is necessary.

Coating application methods

Mercedes-Benz Vans is proposing the use of electrostatic robots for exterior coating application, HVLP robots for interior coating application, and manual HVLP application for cut-ins and underhood application. While the ESTA robots yield the highest transfer efficiency, it is not technically feasible to use ESTA robots for coating the vehicle interiors. This is due to the confines of the vans interior. With little ventilation within the cargo room enclosure, the ESTA robots create a cloud of charged coating particles which adhere to the robots themselves in addition to the interior surfaces. HVLP application robots are better suited for coating the vehicle interiors.

The facility will produce a wide variety of sizes and styles of vehicles, with variation in the presence and location of windows and doors. Vans will be ordered directly from Mercedes-Benz Vans to meet customer specifications. Robotic application is not technically feasible for cut-ins and underhood application due to the custom nature of the proposed operations and the variation in the location of cut-ins. Furthermore, ESTA application is not technically feasible for the cut-ins and underhood, as electrostatic paint is more attracted to corners and sharp edges and does not provide adequate coverage for recesses.

Add-on controls

All add-on controls are technically feasible.

5.3.2.6 Cavity Wax BACT

Coating materials

Waterborne cavity wax materials are used in automobile manufacturing facilities in the United States. However, the amount of cavity wax required for van manufacturing is much greater than standard passenger vehicles due to the vehicle size and the need for wax around longitudinal beams. Waterborne cavity wax requires significantly more drying time in the van manufacturing process, resulting in fall-out of wax placed around longitudinal beams onto the facility floor. This wax creates an unsafe work environment and is therefore not technically feasible for the proposed operations.

Add-on controls

All add-on controls are technically feasible.

5.3.2.7 Purge / Cleaning Solvent BACT

Mercedes-Benz Vans utilizes purge/cleaning solvents designed to remove paint from paint lines and applicator equipment that are compatible with the coatings and equipment planned for use. While substituting with lower VOC materials is difficult, it is not technically infeasible.

5.3.2.8 Body Shop Adhesives BACT

Body shop adhesive application may be performed in various areas of the paint shop following the topcoat oven and cooling operation. Potential VOC emissions from the adhesives application are relatively low at approximately 7 tons per year. Furthermore, adhesives are applied in dispersed areas of the plant in open workdecks with significant air flow rates. The application areas have minimal emissions which would be difficult to capture. Based on the low VOC emissions and the dispersed application areas, add-on controls are not technically feasible.

Body shop adhesive application is performed in various areas of the body shop. Uncontrolled VOC emissions from the application are approximately 7 tpy. However, it is assumed that a portion of the VOC emissions from the body shop adhesives are emitted in the E-coat oven, where the high temperature causes the vapor pressure of the adhesives to rise and causes some VOC to volatilize. Since the E-coat oven is controlled by an RTO, emissions from the body shop adhesives are reduced by 95%.

5.3.2.9 Window and Windshield Glazing / Mounting BACT

Both VOC reduction options in Step 1 are considered feasible.

5.3.2.10 Assembly Roll and Brake BACT

Thermal or catalytic oxidation may not provide consistent VOC control efficiencies and may be difficult to operate when used to reduce VOC emissions from sources that operate for short periods of time and that experience frequent starts/stops. Since it can take time for the exhaust stream to reach the required operating temperature range for efficient oxidation, the VOC control efficiency of thermal or catalytic oxidation during startup is expected to be lower than during normal operation. Due to the start/stop nature of roll and brake testing operations, thermal or catalytic oxidation is not considered a technically feasible control option.

5.3.2.11 Assembly Fluid Fill BACT

Emissions from fluid fill are calculated using conservative assumptions regarding vapor displacement. Since the cavities to be filled will be empty, the displaced air is unlikely to contain VOC. Therefore, the use of add-on controls would not achieve any measurable reduction in VOC emissions and is not technically feasible. ORVR and the use of low-VOC materials are technically feasible.

5.3.2.12 Assembly Washer System Testing BACT

Windshield washer system testing (WST) is performed to ensure proper operation of the vehicle windshield washer systems. VOC emissions from the use of windshield washer fluid are fugitive in nature. Therefore, capture and control of VOC is technically infeasible. An RBLC search of VOC emissions from windshield washer system testing indicates that no controls are utilized for fugitive VOC emissions from this operation. Mercedes-Benz Vans utilizes a waterborne material in the assembly washer system which is considered a top-level control for this operation.

5.3.2.13 Paint Shop Mixing BACT

All of the control technologies are technically feasible.

5.3.2.14 E-coat / Paint Shop / Assembly Spot Repair BACT

Coating materials

As discussed in the original permit application for the facility, powder coatings are not technically feasible for the primer application process and traditional low-VOC coatings will be used. Since there will be no curing between the E-coat spot repair operation and the primer application booth, it is not technically feasible to utilize powder coating for the E-coat spot repair operation and traditional coating materials in the primer booth and achieve the quality finish needed for the vehicles. Therefore, powder coatings are eliminated from consideration.

As previously discussed, powder coatings are technically infeasible for the assembly spot repair operations at the Charleston plant.

Additionally, since waterborne topcoats will not be used in the paint shop, they are eliminated from consideration for the repair booth.

Coating application methods

Since repairs will occur in various areas of the vehicles, and it is not technically feasible to use ESTA technology for interior or cut-in areas as previously discussed, Mercedes-Benz Vans does not consider ESTA technology technically feasible for the E-coat spot repair booth or assembly repair booth. Robotic application is also not technically feasible for the repair booth since the location of the repairs will be impossible to predict.

Add-on controls

The use of add-on controls such as an RTO or RCO is technically feasible, although it would not likely achieve any measurable reduction in VOC emissions due to the very low concentration of VOC emissions from the exhaust stream.

5.3.3 Step 3: Ranking of Control Technologies by Control Effectiveness

The information provided by the facility regarding the efficiencies of the remaining control devices was obtained from the RBLC, manufacturer's information, EPA Air pollution fact sheets, and other state air permitting agencies. The controls are ranked from the most to least effective based on their pollutant emission reduction potential (% control efficiency).

5.3.3.1 Boiler BACT

Table 19 – VOC Control Option Efficiency

Control Option	Efficiency (%)
Oxidation catalyst	20-40
Good combustion practices	Varies

5.3.3.2 Paint Shop and Assembly Process Combustion Sources BACT

Table 20 – VOC Control Option Efficiency

Control Option	Efficiency (%)
Oxidation catalyst	20-40
Good combustion practices	Varies

5.3.3.3 Air Supply Units BACT

Table 21 – VOC Control Option Efficiency

Control Option	Efficiency (%)
Oxidation catalyst	20-40
Good combustion practices	Varies

5.3.3.4 E-Coat BACT

The third of the five steps in the "top-down" BACT assessment procedure is to rank technically feasible control technologies by control effectiveness. The remaining control technologies are presented in Table 22.

Table 22 – VOC Control Option Efficiency	
Control Option	**Efficiency (%)**
RTO/RCO with or without ADW	90 - 95
Low VOC materials	Varies
Waterborne materials	Varies

5.3.3.5 Paint Shops Sealers and Adhesives BACT

Table 23 – VOC Control Option Efficiency	
Control Option	**Efficiency (%)**
Low VOC materials	Varies
Efficient application methods	Varies

5.3.3.6 Underbody Coating BACT

Table 24 – VOC Control Option Efficiency	
Control Option	**Efficiency (%)**
RTO/RCO with or without ADW	90 - 95
Low VOC materials	Varies

5.3.3.7 Guidecoat / Topcoat BACT

The third of the five steps in the "top-down" BACT assessment procedure is to rank technically feasible control technologies by control effectiveness. The remaining control technologies are presented in Table 25.

Table 25 – VOC Control Option Efficiency	
Control Option	**Efficiency (%)**
RTO/RCO with or without ADW	90 - 95
Low VOC materials	Varies
Waterborne materials	Varies

5.3.3.8 Cavity Wax BACT

The third of the five steps in the "top-down" BACT assessment procedure is to rank technically feasible control technologies by control effectiveness. The remaining control technologies are presented in Table 26.

Table 26 – VOC Control Option Efficiency	
Control Option	**Efficiency (%)**
RTO/RCO with or without ADW	90 - 95

5.3.3.9 Purge / Cleaning Solvent BACT

Table 27 – VOC Control Option Efficiency	
Control Option	**Efficiency (%)**
Add-on control	90 - 95
Low VOC materials	Varies
VOC work practices	Varies

5.3.3.10 Body Shop Adhesives BACT

Table 28 – VOC Control Option Efficiency	
Control Option	**Efficiency (%)**
Low VOC materials	Varies

5.3.3.11 Window and Windshield Glazing / Mounting BACT

Table 29 – VOC Control Option Efficiency	
Control Option	**Efficiency (%)**
Low VOC materials	Varies
VOC work practices	Varies

5.3.3.12 Assembly Roll and Brake BACT

Utilizing engines designed to meet EPA fuel economy standards provides the most effective means for minimizing VOC emissions.

5.3.3.13 Assembly Fluid Fill BACT

Table 30 – VOC Control Option Efficiency	
Control Option	**Efficiency (%)**
ORVR	95
Low VOC materials	Varies

5.3.3.14 Assembly Washer System Testing BACT

Table 31 – VOC Control Option Efficiency	
Control Option	**Efficiency (%)**
Waterborne materials	Varies

5.3.3.15 Paint Shop Mixing BACT

Table 32 – VOC Control Option Efficiency	
Control Option	**Efficiency (%)**
RTO/RCO with or without ADW	90 - 95
Low VOC materials	Varies
VOC work practices	Varies

5.3.3.16 E-coat / Paint Shop / Assembly Spot Repair BACT

Table 33 – VOC Control Option Efficiency	
Control Option	**Efficiency (%)**
RTO/RCO with or without ADW	90 - 95
HVLP Coating	Varies
Low VOC materials	Varies

5.3.4 Step 4: Evaluation of Most Effective Controls

The top-down approach for determining BACT suggests that all available control technologies be ranked in descending order of control effectiveness. The most stringent or “top” control option is the default BACT emission limit unless the applicant demonstrates, and the permitting authority in its informed opinion agrees, that energy, environmental, and/or economic impacts justify the conclusion that the most stringent control option is not achievable in that case. Upon elimination of the most stringent control option based upon energy, environmental, and/or economic considerations, the next most stringent alternative is evaluated in the same manner. This process continues until BACT is selected.

5.3.4.1 Boiler BACT

Mercedes-Benz Vans evaluated the economic impacts of oxidation catalyst in order to determine whether this control technology is a feasible option. Potential VOC emissions from the boilers are 0.23 tpy, each. With potential uncontrolled VOC emission rates of this magnitude, add-on control technologies for VOC are cost prohibitive for the boiler. The annual control cost of oxidation catalyst exceeds $300,000 per ton of emissions reduced.

No natural gas-fired boilers at automobile manufacturing facilities listed in the RBLC have oxidation catalyst listed as a control method. All of the VOC BACT limits for comparable RBLC entries are based off the AP-42 emission factor for natural gas combustion. Therefore, based on the economic analysis and a review of similar boilers in the RBLC database, oxidation catalyst is not selected as BACT for control of VOC emissions from the boilers. The RBLC indicates that the use of gaseous fuel (i.e., natural gas) represents BACT for VOC for units in this size range. Thus, Mercedes-Benz Vans proceeded with evaluating the next most efficient control option.

The only remaining technology is good combustion practices, including the burning of natural gas in the combustion units. A properly designed and operated natural gas-fired combustion unit minimizes VOC formation by ensuring that the unit temperature and oxygen availability are adequate for complete combustion. Good combustion practices are considered BACT for VOC emissions from the boiler.

Table 34 – VOC Control Option Impacts

Control Option	Cost/Ton	Economical	Environmental Impacts	Energy Impacts
Oxidation Catalyst	$357,667	Not Feasible	----	----

5.3.4.2 Paint Shop and Assembly Process Combustion Sources BACT

Mercedes-Benz Vans evaluated the economic impacts of using oxidation catalyst to determine whether this control technology is a feasible option. Potential VOC emissions from each individual combustion source less than 0.30 tpy. With potential uncontrolled VOC emission rates of this magnitude, add-on control technologies for VOC are cost prohibitive for all process combustion units. The annual control cost of oxidation catalyst exceeds $300,000 per ton of emissions reduced.

The only remaining technology is good combustion practices, including the burning of natural gas in the combustion units. A properly designed and operated natural gas-fired combustion unit minimizes VOC formation by ensuring that the unit temperature and oxygen availability are adequate for complete combustion. Good combustion practices is considered BACT for VOC emissions for the air supply units.

Table 35 – VOC Control Option Impacts				
Control Option	**Cost/Ton**	**Economical**	**Environmental Impacts**	**Energy Impacts**
Oxidation Catalyst	$357, 667	Not Feasible	----	----

5.3.4.3 Air Supply Units BACT

Mercedes-Benz Vans evaluated the economic impacts of oxidation catalyst in order to determine whether this control technology is a feasible option. Potential VOC emissions from each source is less than 0.30 tpy. With potential uncontrolled VOC emission rates of this magnitude, add-on control technologies for VOC are cost prohibitive for all natural gas-fired combustion units. The annual control cost of oxidation catalyst exceeds $300,000 per ton of emissions reduced.

The only remaining technology is good combustion practices, including the burning of natural gas in the combustion units. A properly designed and operated natural gas-fired combustion unit minimizes VOC formation by ensuring that the unit temperature and oxygen availability are adequate for complete combustion. Good combustion practices is considered BACT for VOC emissions for the air supply units.

Table 36 – VOC Control Option Impacts				
Control Option	**Cost/Ton**	**Economical**	**Environmental Impacts**	**Energy Impacts**
Oxidation Catalyst	$357,667	Not Feasible	----	----

5.3.4.4 E-Coat BACT

In order to determine the economic feasibility of an RTO to control emissions from the E-coat dip tank, a full economic analysis was performed using capital costs and annual operating cost of controlling the dip tank exhaust stream. Since RTO control is planned for the E-coat oven, the capital costs provided include only those related to the ductwork and stack needed to route the emissions to the planned RTO. The annualized capital and operating costs were then divided by the amount of the pollutant controlled based on a 95% RTO control efficiency. Using this methodology, the calculated cost effectiveness for the E-coat dip tank is approximately $9,565 per ton. The estimated $/ton value is less than the value included in the original permit application for E-coat because the proposed usage of E-coat material is lower due to a lower film thickness requirement, and the estimated potential annual emissions (tpy) are higher due to the higher lb VOC/GAC of the proposed E-coat materials.

At the request of DHEC, Mercedes-Benz Vans has also provided an economic analysis reflecting expected actual emissions from the facility. This economic analysis uses a control efficiency percentage closer to the expected actual control efficiency instead of the manufacturer's guaranteed control efficiency (i.e., 97% vs. 95%). Additionally, the analysis removes the 10% safety factor used on the VOC content of the E-coat material, adjusts the capital recovery factor to reflect a more accurate representation of the expected equipment life (i.e., 15 years), and bases the calculation on projected actual production of 100,000 van bodies per year. The calculated cost effectiveness for the E-coat dip tank is approximately $13,853 per ton using this approach. Detailed cost analyses are provided in the application.

Even with these adjustments, the $13,853 per ton is an underestimate of the VOC control cost. First, the cost calculation assumes that the control system will achieve 100% capture of VOC emissions from the dip tank. It is unlikely that the capture efficiency will be this high unless the facility creates a permanent total enclosure, which will add to the calculated capital cost. Additionally, emissions were calculated assuming that 20% of the VOC content of the E-coat materials is emitted from the dip tank. Based on information provided by a paint shop manufacturer, recent dip tank performance testing conducted by TESLA in Fremont, CA resulted in a VOC content in the dip tank exhaust that was less than performance test detection limits. The reason for the low emissions is that the VOC content consists of long-chained VOCs which are not emitted at the E-coat dip tank temperatures. The dip tank/oven split utilized in the calculations is believed to be conservative from an emissions standpoint (overestimating emissions from the uncontrolled dip tank), which artificially reduces the $/ton control cost.

Based on the economic analyses, RTOs are eliminated from consideration for the E-coat dip tank. However, an RTO will be used to control the VOC emissions from the E-coat oven exhaust stream.

The next most stringent control for the E-coat dip operations is the use of waterborne and low-VOC materials. Mercedes-Benz Vans will use a waterborne, low-VOC E-coat in order to minimize emissions from the E-coat dip tank.

Table 37 – VOC Control Option Impacts				
Control Option	**Cost/Ton**	**Economical**	**Environmental Impacts**	**Energy Impacts**
RTO	$13,853	Not Feasible	----	----

5.3.4.5 Paint Shops Sealers and Adhesives BACT

The two remaining options, low VOC materials and efficient application methods, will both be utilized to reduce VOC emissions.

5.3.4.6 Underbody Coating BACT

Based on estimates provided by the paint shop manufacturer, a maximum of 40% of the VOCs would be emitted from the underbody coating booth, while 60% of the emissions would be routed to the primer oven, which is controlled by an RTO. Therefore, Mercedes-Benz Vans will utilize the top level of control for underbody coating VOC emitted from the primer oven.

In order to determine the economic feasibility of an RTO/RCO to control emissions from the remaining 40% of VOC emissions from the underbody application area, a full economic analysis was performed using capital costs and annual operating cost of controlling the application area exhaust stream. Since RTO control is planned for the E-coat oven, the capital costs provided include only those related to the ductwork and stack needed to route the emissions to the planned RTO. The annualized capital and operating costs were then divided by the amount of the pollutant controlled based on a 90% capture and 95% RTO control efficiency. Using this methodology, the calculated cost effectiveness for the remaining VOC emissions resulting from the underbody coating operation is approximately $6,885 per ton. This estimate is based on the permitted potential annual throughput of 124,800 vehicles, which is significantly greater than the forecasted maximum annual throughput of 90,000 vehicles. Mercedes-Benz Vans has also provided an economic analysis reflecting expected actual emissions from the facility. This economic analysis uses a control efficiency percentage closer to the expected actual control efficiency instead of the manufacturer’s guaranteed control efficiency (i.e., 97% vs. 95%). Additionally, the analysis removes the 10% safety factor used on the VOC content of the coating material, adjusts the capital recovery factor to reflect a more accurate representation of the expected equipment life (i.e., 15 years), and bases the calculation on projected actual production of 90,000 van bodies per year. The calculated cost effectiveness for the underbody coating operation is approximately $11,386 per ton using this approach. Detailed cost analyses are provided in Appendix C of the application.

Based on the economic analyses, RTOs are eliminated from consideration for the application area of the underbody coating operation. However, an RTO will be used to control VOC emissions from the primer oven exhaust stream, which contains 60% of the underbody coating emissions.

The next most stringent control for the underbody coating operations is the use of low-VOC materials. Mercedes-Benz Vans will use a low-VOC underbody coating material in order to minimize emissions from the underbody coating process.

Table 38 – VOC Control Option Impacts

Control Option	Cost/Ton	Economical	Environmental Impacts	Energy Impacts
RTO	$11,386	Not Feasible	----	----

5.3.4.7 Guidecoat / Topcoat BACT

Captured emissions from the guidecoat and topcoat booths and ovens will be controlled with RTOs. Exhaust streams from the booths will be routed to an ADW to concentrate the airflow and then to an RTO. Exhaust streams from the ovens will be routed to an RTO. Since the RTO is the top level of control for this operation, no further analysis is required in this step.

It should be noted that Mercedes-Benz Vans will coat the interior of the vans using high-volume low-pressure (HVLP) application robots, while the vehicle exteriors will be coated using electrostatic (ESTA) application robots. Cut-ins and underhood will be sprayed manually. While the ESTA robots yield the highest transfer efficiency, it is not best practice to use ESTA robots for coating the vehicle interiors. This is due to the confines of the vans interior. With little ventilation within the cargo room enclosure, the ESTA robots create a cloud of charged coating particles which adhere to the robots themselves in addition to the interior surfaces. HVLP application robots are better suited for coating the vehicle interiors.

Mercedes-Benz Vans will use a combination of RTO control and low-VOC materials to meet the lb/GACS BACT limits proposed in Step 5.

5.3.4.8 Cavity Wax BACT

Captured emissions from the cavity wax operations will be controlled with RTOs. Exhaust streams from the cavity wax booth will be routed to an ADW to concentrate the airflow and then to an RTO. Since the RTO is the top level of control for this operation, no further analysis is required in this step.

5.3.4.9 Purge / Cleaning Solvent BACT

Mercedes-Benz Vans will utilize all three identified control technologies to reduce VOC emissions from purging and cleaning solvent operations in the paint shop. When possible, purge/cleaning solvent will be utilized within controlled booths to reduce VOC emissions. If lower VOC materials become available for cleaning operations, Mercedes-Benz Vans will evaluate these materials to determine whether they may be used in the proposed facility. Finally, the work practice standards identified will be followed to the extent possible to achieve further reductions.

5.3.4.10 Body Shop Adhesives BACT

There is only one feasible control for the body shop adhesives application, which will be implemented by Mercedes-Benz Vans.

5.3.4.11 Window and Windshield Glazing / Mounting BACT

Emissions from the assembly window and windshield glazing operations will be controlled with the utilization of low-VOC materials and following VOC work practice standards to minimize VOC emissions.

5.3.4.12 Assembly Roll and Brake BACT

Mercedes-Benz Vans has determined that the top and only remaining available and technically feasible VOC control option, use of engines designed to meet EPA fuel economy standards, will be applied to achieve compliance with the proposed BACT limit.

5.3.4.13 Assembly Fluid Fill BACT

Uncontrolled VOC emissions from fluid filling are 4.89 tpy, with 4.74 tpy of the total VOC emissions coming from gasoline filling. The gasoline-fueled vans are equipped with onboard refueling vapor recovery (ORVR), which reduces VOC emissions by 95%. With the use of the ORVR system, controlled VOC emissions from fluid fill operations are 0.383 tpy. Diesel vans are not equipped with ORVR, as VOC emissions from diesel fuel are negligible.

Mercedes-Benz Vans will use ORVR system to reduce VOC emissions from gasoline filling by 95%.

5.3.4.14 Assembly Washer System Testing BACT

There is only one feasible control for the washer system testing operations, which will be implemented by Mercedes-Benz Vans. Mercedes-Benz Vans will utilize a waterborne material in the assembly washer system which is considered a top-level control for this operation.

5.3.4.15 Paint Shop Mixing BACT

Mercedes-Benz Vans conducted a cost analysis of the annualized operation and maintenance costs associated with routing VOC emissions from the paint mix room to an RTO. It was concluded due to the low VOC emissions from this operation (approximately 1.07 tpy) and the low VOC concentration in the exhaust air flow from the paint mixing operations that the use of an RTO to control VOC emissions from the paint mix room was cost-prohibitive. The cost analysis shows that the annual operating costs alone are approximately $215,894 per ton, without including capital costs.

Paint mix room VOC emissions are dependent on the type of coating materials used in other areas of the facility. As such, the use of low VOC materials is not determined based on this operation. However, Mercedes-Benz Vans will use low VOC materials for coating operations whenever feasible. The remaining control option is following VOC work practice standards for the reduction of VOC emissions.

Table 39 – VOC Control Option Impacts

Control Option	Cost/Ton	Economical	Environmental Impacts	Energy Impacts
RTO	$215,894	Not Feasible	----	----

5.3.4.16 E-coat / Paint Shop / Assembly Spot Repair BACT

Because spot repairs are required for such small surface areas of the coated vehicle bodies, the spot repair operations use very little coating material. As such, emissions from spot repair operations are very low. Due to the very low concentration of VOC emissions from the exhaust stream, add-on VOC controls are not economically feasible. Mercedes-Benz Vans has completed annualized cost analyses of the operation and maintenance costs associated with routing the emissions from the repair booths to the RTO. The cost analyses show that the annual operating costs for E-coat spot repair is approximately $675,608 per ton, paint shop spot repair is approximately $164,428 per ton, and approximately $11,233 per ton for assembly spot repair, without including capital costs.

The remaining control technologies (HVLP coating and low VOC materials) will both be utilized when possible to reduce VOC emissions.

Table 40 – VOC Control Option Impacts

Control Option	Cost/Ton	Economical	Environmental Impacts	Energy Impacts
RTO	$175,661	Not Feasible	----	----

5.3.5 Step 5: Select BACT Controls and Limits

5.3.5.1 Boiler BACT

Based on the control technology evaluation, good combustion practices to achieve minimum emissions of VOC is determined as the BACT for the boiler. This involves ensuring good air/fuel mixing and sufficient residence time in the combustion zone, operating with excess oxygen levels high enough to complete combustion while maximizing thermal efficiency, and ensuring proper fuel gas supply system design and operation. In addition, Mercedes-Benz Vans will demonstrate continuous compliance with the proposed emission limits by complying with the work practice standards in 40 CFR 63 Subpart DDDDD. This includes conducting an tune-up of the boiler every five years.

The RBLC database search results indicate that similar natural gas-fired units used the AP-42 emission factors to set VOC BACT limits for boilers. Mercedes-Benz Vans will use the same basis to set the VOC BACT limits. The proposed emission limit for natural gas combustion sources (5.5 lb/MMscf) is less than or equal to the calculated lb/MMscf values calculated for all other paint shop boilers.

5.3.5.2 Paint Shop and Assembly Process Combustion Sources BACT

Mercedes-Benz will use good combustion practices to minimize VOC emissions from process combustion sources. This involves ensuring good air/fuel mixing and sufficient residence time in the combustion zone, operating with excess oxygen levels high enough to complete combustion while maximizing thermal efficiency, and ensuring proper fuel gas supply system design and operation. The proposed VOC

BACT emission limit for paint shop and assembly process combustion sources (5.5 lb/MMscf) is less than or equal to the calculated lb/MMscf values calculated for all other process combustion sources.

5.3.5.3 Air Supply Units BACT

Based on the control technology evaluation, good combustion practices to minimize emissions of VOC is determined as the BACT for the air supply units. This involves inspection of burners and flame patterns, and ensuring proper fuel gas supply system design and operation. The proposed emission limit for Unit ID ASU (5.5 lb/MMscf) is less than or equal to the calculated lb/MMscf values calculated for all other air supply units.

5.3.5.4 E-Coat BACT

As discussed in Step 4, Mercedes-Benz Vans has concluded that the use of an RTO for controlling VOC emissions from the E-coat dip tank is not cost-effective. Therefore, the use of waterborne, low-VOC E-coat materials meets BACT requirements for the E-coat dip tank. VOC emissions from the E-coat oven will be controlled by an RTO, which is the top level control technology for VOC. The proposed emission limit for this operation in the initial construction permit application, which encompasses both the dip tank and the oven, is 0.13 lb VOC/GACS on a monthly average basis.

Table 41 provides a review of the recent E-coat BACT/LAER determinations for comparison to similar sources. Detailed RBLC search results are provided in the application.

Table 41 – Summary of Recent E-Coat VOC BACT/LAER Determinations

Source	Tank Control	Oven Control	Date	Limit	Unit
Nissan North America (BACT)	N/A	Oxidation	04-04-01	0.13	lb/GACS
Honda Manufacturing Alabama (BACT)	N/A	Oxidation	10-18-02	0.13	lb/GACS
Subaru, Indiana (BACT)			10-04-12	0.40	lb/GACS
Kia Motors Georgia (BACT)	N/A	Oxidation	06-20-07	0.19	lb/GACS
Volkswagen, Tennessee (BACT)	N/A	Oxidation	10-10-08	0.26	lb/GACS
Hyundai, Alabama (BACT)	N/A	Oxidation	06-12-12	0.13	lb/GACS
Ford Kentucky Truck Plant (BACT)	Oxidation	Oxidation	04-26-14	0.04	lb/GACS

Table 41 indicates that one facility has proposed an E-coat BACT limit of 0.04 lb VOC/GACS within the past 15 years. This facility (Ford Kentucky Truck plant) utilizes an RTO to control emissions from both the E-coat dip tank and the E-coat oven. However, Ford acknowledged in the permit application for the project that controlling the E-coat dip tank is likely not cost effective:

> *"Ford recognizes that not all recent E-coat operations are controlling the tank and it is likely that these units were demonstrated to be cost ineffective due to the low level of VOC emissions from E-coat. However, Ford is electing to control the tank emissions…"*

It is important to note that TESLA, which commenced commercial operation in June 2012 in an 8-hour ozone nonattainment area, does not control emissions from the E-coat dip tank. Furthermore, review of the Volvo permit and application in South Carolina indicates that Volvo is also only controlling VOC emissions from the E-coat oven and not the dip tank. Additionally, numerous facilities have been recently permitted without E-coat dip tank control, many of which are in EPA Region 4 (Kia Motors, GA, Volkswagen, TN, and Hyundai Alabama).

Based on the technical data showing minimal VOC emissions, and the calculated cost per ton of emissions ($9,565 per ton based on potential emissions and $13,853 per ton based on projected actual emissions, both of which are artificially low for the technical reasons discussed), Mercedes-Benz Vans concludes that any requirement to install VOC controls on the E-coat dip tank places undue economic hardship on the facility and creates an inequitable competitive disadvantage.

Therefore, the proposed limit is based on the use of RTO control on the E-coat oven only and is equivalent to sources with similar control scenarios in the RBLC database. This control strategy is also consistent with that of Ford Motor Company's Kansas City Plant (Operating Permit No. OP2014-035), specifically for its commercial van assembly operations.

The emission limit for E-coat (0.13 lb VOC/GACS) included in the original application was based on a material from one (1) supplier. The proposed material included in the previous application is no longer available. Therefore, Mercedes-Benz Vans evaluated additional coating materials and suppliers.

Based on an evaluation of new coatings from several suppliers, Mercedes-Benz Vans has determined that coatings from three (3) suppliers meet product specifications and could potentially be used in E-coat at the Charleston plant. Mercedes-Benz Vans has specific criteria on coating characteristics and quality, and all coatings must go through a lengthy approval process before use at the facility. It is critical that more than one supplier be approved in order to continue operations in the event of supplier coating changes, or changes in availability of one (or more) of the coatings.

Therefore, the proposed emission limits for this operation are based on the E-coat materials currently available that meet product specifications and allow the facility to consider more than one supplier and are as follows in Table 42

Table 42 – Summary of E-Coat VOC BACT Limits per Supplier

Supplier	Limit	Unit	Averaging Period
PPG	0.26	lb/GACS	Monthly
Axalta	0.15	lb/GACS	Monthly
BASF	0.16	lb/GACS	Monthly

5.3.5.5 Paint Shops Sealers and Adhesives BACT

Mercedes-Benz Vans will utilize low VOC materials and efficient application methods to reduce VOC emissions from sealer and adhesive application in the paint shop. The proposed emission limit for these operations is 0.3 lbs/gallon without water on a monthly average basis. Table 43 provides a review of the recent sealers BACT/LAER determinations for comparison to similar sources.

Table 43 – Summary of Recent Sealers VOC BACT/LAER Determinations

Source	Date	Limit	Unit
GM Lansing GR Assembly (BACT)	05-09-14	0.30	lb/gallon
Nissan North America (BACT)	04-02-01	0.30	lb/gallon
GM Delta Assembly (BACT)	09-26-01	0.30	lb/gallon
Daimler Chrysler – Sterling Heights (BACT)	12-17-01	0.30	lb/gallon
Kia Motors Georgia (BACT)	06-20-07	0.45	lb/gallon
Volkswagen, Tennessee (BACT)	10-10-08	0.30	lb/gallon
Ford Kentucky Truck Plant (BACT)	02-26-14	0.30	lb/gallon

Table 43 indicates that the proposed 0.3 lb/gallon emission limit is equivalent to the lowest emission limits for similar facilities.

5.3.5.6 Underbody Coating BACT

As discussed in Step 4, Mercedes-Benz Vans has concluded that the use of an RTO for controlling VOC emissions from the underbody coating application area is not cost-effective. Therefore, the use of low-VOC underbody coating materials as well as

RTO control for the VOC emissions from the primer oven meets BACT requirements for the underbody coating operations.

Mercedes-Benz Vans is not aware of any facilities conducting underbody coating operations within the United States. The proposed control technologies are consistent with Mercedes-Benz Vans facilities in Europe, which utilize RTO control for the primer oven and do not utilize RTO control or the underbody coating operation.

The proposed underbody coating emission limit is 4.25 pounds of VOC per gallon of underbody coating material as applied.

As a portion of the VOC emissions from the underbody coating booth are controlled by an RTO, Mercedes-Benz Vans will continuously monitor RTO temperatures and ensure that the RTO temperatures are greater than or equal to the minimum temperatures established during performance testing.

5.3.5.7 Guidecoat / Topcoat BACT

Mercedes-Benz Vans has concluded that BACT for guidecoat and topcoat applications is the use of RTO control in combination with low-VOC materials when possible to reduce VOC emissions from these operations. Exhaust from the guidecoat and topcoat booths will be directed to the ADW and then to the RTO, and exhaust from the guidecoat and topcoat ovens will be routed directly to the RTO. Table 44 provides a review of the recent guidecoat BACT/LAER determinations for comparison to similar sources.

Table 44 – Summary of Recent Guidecoat VOC BACT/LAER Determinations

Source	Date	Materials	Booth/Oven Control Technology	Limit	Unit
Honda Manufacturing Alabama (BACT)	10-18-02	Waterborne	Oven only - Oxidation	4.10	lb/GACS
Kia Motors Georgia (BACT)	07-27-07	Waterborne	Oven only - Oxidation	2.92	lb/GACS
Hyundai, Alabama (BACT)	03-23-04	Waterborne	Oxidation on automatics and oven	4.10	lb/GACS
Nissan North America (BACT)	04-02-01	Waterborne	Oven only - Oxidation	4.10	lb/GACS
Ford Kentucky Truck Plant (BACT)	02-26-14	Waterborne	Oxidation on automatics and oven	4.9	lb/GACS

The proposed guidecoat emission limit is 4.1 lb/GACS for guidecoat (primer) on a monthly average basis. The proposed limit is consistent with multiple recent lb/GACS emission limits for similar sources in the RBLC database, including the 4.1 lb/GACS limit in the Hyundai Alabama PSD permit, and lower than the 4.9 lb/GACS emission limit in the recently issued permit for the Ford Kentucky Truck plant. There is one guidecoat emission limit in the RBLC database search results for non-powder coatings that is lower than the proposed 4.1 lb/GACS limit (2.92 lb/GACS at the Kia Motors Georgia plant). Mercedes-Benz Vans is proposing add-on control technologies that are identical to or better than those utilized by this facility, however, based on the technical infeasibility of ESTA spray technology in the interior of the vans and cut-ins, a slightly higher lb/GACS emission limit is required.

Mercedes-Benz Vans is proposing two separate operating scenarios for topcoat operations depending on the finish selected by the customer. In one scenario, a single topcoat material will be applied to the van surfaces instead of a separate basecoat and clearcoat. In the second scenario, separate basecoat and clearcoat materials will be applied. Based on these scenarios, the proposed topcoat emission limits are 4.4 lb/GACS for the single topcoat scenario and 6.9 lb/GACS for the basecoat and clearcoat scenario on a monthly average basis. Table 45 provides a review of the recent topcoat BACT/LAER determinations for comparison to similar sources.

Table 45 – Summary of Recent Topcoat VOC BACT/LAER Determinations

Source	Date	Booth Control Technology	Oven Controls	Limit	Unit
Nissan North America, Mississippi (BACT)	04-02-01	Concentrator & Oxidation on CC automatic sections	Oxidation	5.20	lb/GACS
Honda Manufacturing Alabama (BACT)	10-18-02	Oxidation on CC automatic sections	Oxidation	5.20	lb/GACS
Volkswagen, Tennessee (BACT)	10-10-08	WB Basecoat/Oxidation on CC automatics	Oxidation	5.20	lb/GACS
Hyundai, Alabama (BACT)	06-12-12	WB Basecoat/Oxidation on CC automatics	Oxidation	5.20	lb/GACS
Ford Kentucky Truck Plant (BACT)	02-26-14	Concentrator & Oxidation on CC automatic sections	Oxidation	185.67	tpy

The proposed single topcoat emission limit of 4.4 lb/GACS is lower than all recently permitted facilities in the RBLC database under SIC Code 3711, and lower than those provided for SIC Code 3713. The proposed basecoat and clearcoat limit of 6.9 lb/GACS is greater than many recently permitted facilities in the RBLC database under SIC Code 3711, and lower than those provided for SIC Code 3713. Facilities in the RBLC database with lower basecoat and clearcoat lb/GACS limits utilize coating materials and coating application methods that are not feasible for the proposed operations (HVLP and manual spraying operations are required in van coating). Depending on customer demand, Mercedes-Benz Vans anticipates that the weighted average lb/GACS will be consistent with the topcoat values provided in the RBLC database in the range of 5 lb/GACS to 5.5 lb/GACS. The proposed limits are greater than the Ford Kentucky Truck plant limit of 3.65 lb/GACS; however, the Ford Kentucky Truck plant is a 3-wet process (guidecoat, basecoats, and clearcoats are applied without heated flash-off zones or oven curing between steps), which is not technically feasible for van manufacturing due to the significant coated area in both the interior and exterior of the vehicle.

Mercedes-Benz Vans will demonstrate compliance with the two proposed emission limits using two separate compliance tests. The facility will run a designated amount of vans to be coated with single topcoat (monocoat) in succession, followed by a designated amount of vans to be coated with basecoat and clearcoat in succession. The control device parameters will be monitored during the performance testing of each coating scenario. Mercedes-Benz Vans will then determine which of the two coating methods yielded the most stringent control device parameters, and the more stringent of the two parameters will be used to demonstrate continuous compliance.

VOC emissions from all guidecoat and topcoat booths are controlled by an ADW and RTO. Pre-controlled VOC emissions from guidecoat booth 1 and booth 2 (GC01 and GC02), basecoat/clearcoat booth 1 and booth 2 (BC01 and BC21), and clearcoat booth 1 (CC01) are greater than 100 tpy. Therefore, as discussed in Section 4.1.4, each of these units is subject to CAM. Mercedes-Benz Vans will continuously monitor RTO temperatures and ensure that the RTO temperatures are greater than or equal to the minimum temperatures established during performance testing.

5.3.5.8 Cavity Wax BACT

Mercedes-Benz Vans has concluded that BACT for solventborne cavity wax operations is the use of RTO control to reduce VOC emissions. Exhaust from the cavity wax booth will be directed to the ADW and then to the RTO. The proposed cavity wax BACT limit is 95% RTO control efficiency on a monthly average basis. The proposed 95% control efficiency is based on a manufacturer guarantee. All of the automobile RBLC database entries utilize waterborne or low-VOC cavity wax, which is not technically feasible for the proposed facility. All of the truck and bus body RBLC database entries have pound per gallon VOC content limits which are greater than the VOC content utilized in Mercedes-Benz Vans emission calculations. The 95% control limit meets BACT requirements for the proposed operations.

5.3.5.9 Purge / Cleaning Solvent BACT

The proposed booth controls along with the implementation of VOC reduction work practices, and evaluation of lower VOC materials will be used to reduce VOC emissions from the purge and cleaning solvent operations. Mercedes-Benz Vans conducted a review of the RBLC database and found that is difficult to evaluate purge and cleaning emissions from one facility to the next. Since each facility uses different materials and has different cleaning needs based on the number of vehicles produced, the number of color changes, the number of booths, the number of coating applicators, and the number of coating materials, the values provided in the RBLC database do not provide a meaningful basis of comparison for BACT purposes. For this reason, EPA has prescribed work practices for RACT and MACT standards for source categories using purge and cleaning solvents.

Recently issued permits rely on annual VOC emission limits (tpy) accompanied by work practice obligations. Therefore, Mercedes-Benz Vans proposes a BACT limit of 82 tpy from purge and cleaning solvent operations. It should be noted that the control method descriptions in the RBLC database for purge solvent/ cleaning operations does not represent an established BACT limit. Each facility in the RBLC database has established independent BACT limits for their respective operations, and each facility may have different capture/reclaim efficiencies in order to meet specific BACT limits. Mercedes-Benz Vans requires the flexibility to vary purge solvent capture and reclaim methods to allow for operational flexibility, while still meeting the proposed BACT limit.

VOC emissions from purge solvent operations (PS01) are controlled by an ADW and RTO. Pre-controlled VOC emissions from PS01 are greater than 100 tpy. Therefore, these operations are subject to CAM. Mercedes-Benz Vans will continuously monitor RTO temperatures and ensure that the RTO temperatures are greater than or equal to the minimum temperatures established during performance testing.

5.3.5.10 Body Shop Adhesives BACT

Mercedes-Benz Vans will utilize low VOC materials and efficient application methods to reduce VOC emissions from adhesive application in the body shop, paint shop and assembly areas. The proposed emission limit for these operations is 0.3 lbs/gallon without water on a monthly average basis. A review of the RBLC database indicates that the proposed 0.3 lb/gallon emission limit for adhesive usage is equivalent to the lowest emission limits for similar facilities.

5.3.5.11 Window and Windshield Glazing / Mounting BACT

As discussed in Step 4, Mercedes-Benz Vans will utilize low VOC materials and good VOC work practices to meet BACT requirements for the windshield/window glazing operations. A review of the RBLC database for similar operations indicates that BACT for similar operations is 0.4 lb/gal. The projected emission rate for this operation at the Charleston facility is approximately equivalent to a 0.35 lb VOC/gal (annual average) as applied. Mercedes-Benz Vans is requesting a 0.4 lb/gal limit to allow for flexibility in windshield/window glazing adhesives and primers.

5.3.5.12 Assembly Roll and Brake BACT

VOC BACT operating requirements are proposed for the roll and brake testing operations. The only facility included in the search results does not include an emission limit for the proposed operations.

5.3.5.13 Assembly Fluid Fill BACT

Mercedes-Benz Vans has determined that the use of an ORVR system for gasoline fueled vans meets BACT requirements for VOC emissions. This is consistent with the only other RBLC entry for fluid fill (Subaru of Indiana). Mercedes-Benz Vans is proposing an operating requirement instead of an emission limit for fluid fill operations, as direct measurement or determination of these emissions through mass balance is not practical.

5.3.5.14 Assembly Washer System Testing BACT

Mercedes-Benz Vans will utilize a waterborne material to reduce VOC emissions from assembly washer system testing operations. Mercedes-Benz Vans is proposing an operating requirement instead of an emission limit for washer system testing, as direct measurement or determination of these emissions through mass balance is not practical.

5.3.5.15 Paint Shop Mixing BACT

Mercedes-Benz Vans will follow VOC work practice standards to reduce VOC emissions from the paint mixing operations. These work practices standards include storing and transporting all organic-HAP-containing coatings, thinners, and cleaning materials in closed containers, and minimizing the risk of spills of these materials. Mercedes-Benz Vans is proposing work practice standards instead of an emission limit for the paint mixing operations, as direct measurement or determination of these emissions through mass balance is not practical. The RBLC database search results do not contain any entries for paint mixing operations.

5.3.5.16 E-coat / Paint Shop / Assembly Spot Repair BACT

As discussed in Step 4, Mercedes-Benz Vans will utilize HVLP spraying technology and low VOC materials when possible to meet BACT requirements for the paint repair operations. Due to the very small quantities of materials used in these operations on an hourly basis, evaluating compliance with an emission limit with a short term averaging period is very difficult. Therefore, Mercedes-Benz Vans is proposing a VOC content limit of 6 lb VOC/gal material for the spot repair operations. The limit is on a monthly average basis.

Mercedes-Benz Vans conducted a review of the RBLC database and found that is difficult to evaluate repair operations from one facility to the next. Even though there are facilities with a VOC content limit of 4.8 lb VOC/gal, the coating operations at those facilities are not comparable to the proposed coating operations. There are a number of reasons why it is infeasible for Mercedes-Benz Vans to use similar types of coating and coating operations. Therefore, these limits do not represent BACT for the proposed operations. In addition, since each facility has different repair needs based on the number of vehicles requiring repair after assembly, the values provided in the RBLC database do not provide a meaningful basis of comparison for BACT purposes. The proposed limit is based on the representative basecoat VOC content included in the potential emission calculations.

5.3.5.17 Additional Sources

Abbreviated analyses for units with low uncontrolled emissions or fugitive emissions sources are provided in the following subsections. Note the same control techniques that reduce PM also reduce PM_{10} and filterable $PM_{2.5}$. The BACT analyses for PM, PM_{10} and $PM_{2.5}$ are combined to eliminate redundancy.

Emergency Engines

The proposed emergency generators and fire pump (EE) are diesel-fired. The total potential PM/PM_{10}/$PM_{2.5}$ and VOC emissions from these units are each less than 5 tpy. In addition, the operation of this equipment will be limited to emergency events, and required routine testing. Therefore, the total hours of operation is limited to 500 hours per year. Due to the small quantity of PM/PM_{10}/$PM_{2.5}$ and VOC emissions associated with the emergency units, and the emergency nature of operation of the units, a "top-down" BACT analysis has not been conducted. These units will meet BACT requirements by complying with the applicable requirements of NSPS Subpart IIII and NESHAP Subpart ZZZZ.

Storage Tanks

All of the storage tanks (TK) associated with the expansion are considered insignificant activities for permitting purposes and each have potential uncontrolled VOC emissions of less than 5 tpy. All atmospheric tanks are designed with submerged fill lines, spill and overfill protection, and conservation vents to minimize atmospheric emissions. The gasoline storage tanks are equipped with Stage I vapor control, and Mercedes-Benz Vans requires suppliers of these materials to use delivery trucks equipped with Stage I control. Operating requirements are proposed as BACT for the storage tanks.

Based on the analyses provided above, the proposed numerical BACT limits for the Charleston plant are summarized in Table 46. Proposed BACT operating summary requirements are provided in Table 47.

Table 46 – Selection of VOC BACT and Proposed Limits

Process/Equipment	Control Method		Proposed BACT Limit		
			Limit	Units	Avg. Period
Energy Center Boiler	None		5.5	lb/MMscf	Monthly
Process Combustion Sources	None		5.5	lb/MMscf	Monthly
Paint Shop E-coat Operations	RTO	PPG	0.26	lb/GACS	Monthly
		Axalta	0.15	lb/GACS	Monthly
		BASF	0.16	lb/GACS	Monthly
Paint Shop Guidecoat Operations	Adsorption Wheel RTO		4.1	lb/GACS	Monthly
Paint Shop Sealers and Adhesives – Underbody PVC	None		0.3	lb/gal	Monthly
Paint Shop Sealers and Adhesives –	None		0.3	lb/gal	Monthly

Table 46 – Selection of VOC BACT and Proposed Limits

Process/Equipment	Control Method	Proposed BACT Limit		
		Limit	Units	Avg. Period
Seam Sealer				
Paint Shop Sealers and Adhesives – Sika Sealer	None	0.3	lb/gal	Monthly
Paint Shop Sealers and Adhesives – Sound Deadener	None	0.3	lb/gal	Monthly
Paintshop Topcoat Operations – Single Topcoat (Monocoat)	Adsorption Wheel RTO	4.4	lb/GACS	Monthly
Paintshop Topcoat Operations – Basecoat/Clearcoat	Adsorption Wheel RTO	6.9	lb/GACS	Monthly
Paintshop Topcoat Operations – Cavity Wax	Adsorption Wheel RTO	95%	% Eff	Monthly
Assembly and Spot Repair Operations	None	6	lb/gal	Monthly
Paint Shop Purge / Cleaning Solvent	Adsorption Wheel RTO	82	tpy	Annual
Body Shop Adhesives Application	None	0.3	lb/gal	Monthly
Body Shop Adhesives Application (Assembly location)	None	0.3	lb/gal	Monthly
Window/Windshield Glazing	None	0.4	lb/gal	Monthly
Assembly UB Wax Application	None	0.3	lb/gal	Monthly
Air Supply Units	None	5.5	lb/MMscf	Monthly
Underbody Coating Operations	None	4.25	lb/gal	Monthly
E-Coat Spot Repair Operations	None	6	lb/gal	Monthly
Body Shop Adhesives Application (Paint Shop location)	None	0.3	lb/gal	Monthly

Table 47 – Selection of VOC BACT Operating Requirements

Process/Equipment	Control Method
Energy Center Boiler	Annual tune-up as required in §63.7540(a)(10)
Paint Shop Mixing Operations	Following VOC work practices
Assembly Roll and Brake Testing	Engine design to meet EPA fuel economy standards
Assembly Fluid Fill Operations	Use of ORVR for gasoline vehicles
Assembly Windshield Washer System Testing	Use of water-based material
Emergency Generators and Fire Pump	NSPS Subpart IIII compliance
Storage Tank (TK01)	Stage 1 Vapor Control

6.0 Summary of BACT Limits

The BACT Determinations are summarized in Table 48.

Table 48 – Summary of BACT

Process	Pollutant	BACT Limit	Control Method
Energy Center Boiler	$PM/PM_{10}/PM_{2.5}$	7.6 lb/MMscf	None
	VOC	5.5 lb/MMscf	None
Process Combustion Sources	$PM/PM_{10}/PM_{2.5}$	7.6 lb/MMscf	None
	VOC	5.5 lb/MMscf	None
Paint Shop E-coat Operations	VOC	PPG 0.26 lb/GACS Axalta 0.15 lb/GACS BASF 0.16 lb/GACS	RTO
Paint Shop Guidecoat Operations	$PM/PM_{10}/PM_{2.5}$	1.0 mg/m^3	Dry Filtration
	VOC	4.1 lb/GACS	Adsorption Wheel RTO
Paint Shop Sealers and Adhesives – Underbody PVC	$PM/PM_{10}/PM_{2.5}$	98.5 % efficiency	Dry Filtration
	VOC	0.3 lb/gal	None
Paint Shop Sealers and Adhesives – Seam Sealer	VOC	0.3 lb/gal	None
Paint Shop Sealers and Adhesives – Sika Sealer	VOC	0.3 lb/gal	None
Paint Shop Sealers and Adhesives – Sound Deadener	VOC	0.3 lb/gal	None
Paintshop Topcoat Operations – Single Topcoat (Monocoat)	$PM/PM_{10}/PM_{2.5}$	1.0 mg/m^3	Dry Filtration
	VOC	4.4 lb/GACS	Adsorption Wheel RTO
Paintshop Topcoat Operations – Basecoat/Clearcoat	$PM/PM_{10}/PM_{2.5}$	1.0 mg/m^3	Dry Filtration
	VOC	6.9 lb/GACS	Adsorption Wheel RTO
Paintshop Topcoat Operations – Cavity Wax	$PM/PM_{10}/PM_{2.5}$	98.5 % efficiency	Dry Filtration
	VOC	95 % RTO efficiency	RTO
Assembly and Spot Repair Operations	$PM/PM_{10}/PM_{2.5}$	98.5 % efficiency	Dry Filtration
	VOC	6 lb/gal	
Paint Shop Purge / Cleaning Solvent	VOC	82 TPY	Adsorption Wheel RTO
Body Shop Adhesives Application	VOC	0.3 lb/gal	None
Body Shop Adhesives Application (Assembly location)	VOC	0.3 lb/gal	None
Window/Windshield Glazing	VOC	0.4 lb/gal	None
Assembly UB Wax Application	$PM/PM_{10}/PM_{2.5}$	98.0 % efficiency	Dry Filtration

Table 48 – Summary of BACT

Process	Pollutant	BACT Limit	Control Method
	VOC	0.3 lb/gal	None
Air Supply Units	$PM/PM_{10}/PM_{2.5}$	7.6 lb/MMscf	None
	VOC	5.5 lb/MMscf	None
Cooling Towers	$PM/PM_{10}/PM_{2.5}$	0.001% drift rate	None
Underbody Coating Operations	$PM/PM_{10}/PM_{2.5}$	98.5 % efficiency	Dry Filtration
	VOC	4.25 lb/gal	None
E-coat Spot Repair Operations	VOC	6 lb/gal	None
Body Shop Adhesives Application (Paint Shop location)	VOC	0.3 lb/gal	None

7.0 Air Quality Impact Analysis

For a major facility, PSD regulations require an applicant to analyze the impact from the construction of a proposed new source(s) on the following areas:

1. Compliance with the National Ambient Air Quality Standards (NAAQS);
2. Compliance with the PSD Increments;
3. Significant impact on PSD Class I Areas, including Class I PSD increments;
4. Impairments to visibility, soil, and vegetation; and
5. Air Quality impact of general growth associated with the source.

All major sources proposing new construction or construction modifications in South Carolina (SC) are also required to demonstrate that their facility will remain in compliance with South Carolina Regulation 61-62.5 Standards 2 (AAQS), 7 (Class II PSD Increments) and 8 (Air Toxics). General results of this compliance demonstration indicate that there will be no exceedances of NAAQS, South Carolina ambient air quality standards, or PSD increments. Refined Class I modeling indicated that there will also be no adverse effects on visibility, vegetation, or soils in any of the Class I areas within 300 km of the facility/source.

7.1 **PSD Class II Modeling Analysis**

The PSD Review requires pollutants, which are determined to be “major”, be evaluated by an Air Quality Impact Analysis and Additional Impacts Analysis. The Air Quality Impact Analysis consists of (1) a Preliminary Modeling Analysis to determine which pollutants from the proposed project at the facility only, exceed their Class II Significant Impact Levels (SIL); and (2) a more comprehensive Full Impact Analysis based on concentrations of pollutants that exceed the SIL for the facility and additional ‘facility-wide’ impacts from other facilities that may impact the Significant Impact Area (SIA) or Screening Area (SA). The Additional Impacts Analysis evaluates the impacts on soils, vegetation, and visibility.

A representative monitor was chosen to provide background ambient air quality information based on: monitor location, data quality, and data currentness. The monitor is approximately 16 kilometers from the Mercedes facility and is in an area with similar land use and land cover. The monitor is also an approved SLAMS or similar monitor type subject to the quality assurance requirements in 40 CFR Part 58 Appendix A. The monitor is also in a similar rural-suburban topographic setting with large areas of forest and has data available up through calendar year 2014. The 2012-

2014 ozone design value for the Bushy Park monitor is 0.061 ppm, which is in attainment of the NAAQS of 0.070 ppm.

7.1.1 PSD Class II Preliminary Modeling Analysis

Potential emission rates or net emission rate increases, for each pollutant determined to be significant (Table 3) at the facility, were modeled to determine: a) impacts relative to the Significant Impact Level (SIL); b) the impact area within which a Full Impact Analysis must be performed (if applicable); and c) whether or not the facility may be exempted from the ambient monitoring data requirements. Each of these three preliminary Class II analyses are discussed below.

7.1.1.1 Significant Impact Level (SIL) Analysis

As facility-wide PTE is decreasing for PM_{10} and $PM_{2.5}$, the facility chose not to revise its original SIL modeling analysis and instead proceed directly to conduct a full impact modeling analysis (explained in Section 7.1.2 below). The facility's previous SIL analysis is retained in this modeling summary; therefore, the maximum impacts presented in Table 49 below are the results of the previous SIL analysis. BAQ conducted an updated SIL modeling analysis and confirmed that the previous results are conservative.

If a modeled impact is less than or equal to the SIL, then no further PSD analysis is required. Table 49 provides the results of the SIL modeling analysis for this project for the “major” pollutants as defined above (the impacts are the maximum modeled concentrations as noted in the table). This analysis shows SIL's were exceeded for PM_{10} and $PM_{2.5}$ for each respective averaging period. Therefore, a Full Impact analysis was required for these pollutants. The Full Impact analysis assessed the combined impacts of the significant impact pollutants from the facility sources along with those from other sources in the Significant Impact Area (SIA) and the Screening Area (SA) as appropriate.

Maximum concentrations were used for the Significant Impact Level analysis (i.e. Highest-First-High) except for $PM_{2.5}$. For these newer standards, the following apply:

- 24-hour PM2.5: the highest 5-year average of the maximum 24-hour averages over 5 years of meteorological data modeled
  o Annual PM2.5: the highest 5-year average of the annual averages over 5 years of meteorological data modeled

Table 49 – Class II PSD (PSD) Significant Impact Level

Pollutant	Averaging Time	Model Used	Maximum Impact (μg/m³)[1]	SIL (μg/m³)	Exceeds SIL (Yes/No)	Significant Impact Area (km)
PM_{10}	24 Hour	AERMOD	10.2[2]	5	Yes	0.5
	Annual	AERMOD	2.4[2]	1	Yes	0.5
$PM_{2.5}$	24 Hour	AERMOD	8.7[2][3]	1.2	Yes	1.9
	Annual	AERMOD	2.2[2][4]	0.2	Yes	1.0
Ozone is not modeled, but a general impact assessment is to be made if the source is major for ozone as determined in Table 3.						
TSP is not considered a criteria pollutant for this analysis.						
1) Highest-first-high concentration except where noted otherwise						
2) Results were multiplied by 1.05 to conservatively scale up a 5% increase in facility-wide emissions from the original PSD application dated 2/4/16.						
3) Five-year average of the first-high concentrations						
4) Five-year average of the maximum annual concentration						

Ozone Assessment

The Mercedes plant is major for ozone (Table 3). Due to the highly complex reactions involving formation of ozone in the atmosphere, there is no "preferred" EPA guideline model for individual VOC source emissions.

The Southeastern United States, including South Carolina, is NO_X limited regarding ozone formation. This means that there is an excess of VOC in the atmosphere due to the number of natural sources of VOC in the environment. Thus, increases in VOC do not lead to significant increases in ozone production. To estimate impacts on ozone, an analysis was conducted using Modeled Emission Rates for Precursors (MERPs) based on Section 7 of EPA's draft guidance of December 2012 (*Guidance on the Development of Modeled Emission Rates for Precursors (MERPs) as a Tier 1 Demonstration Tool for Ozone and $PM_{2.5}$ under the PSD Permitting Program)* and the revised Table 7.1 of that guidance issued in February 2017. The analysis looked at the impacts of VOC emissions to determine the potential contribution to ozone production. The 8-hr ozone MERP value from the revised Table 7.1 for VOC is 1159 TPY. This value and the project emission increases for VOC (955.9 TPY) were used to calculate the percentage increase of project emissions versus the MERPs as follows:

(955.9 TPY VOC {source}/1159 TPY VOC {MERP}) = 82.5%

Since the percentage increase is less than 100%, the project should not have a significant impact on ozone formation.

The representative ozone monitoring station for this area, located approximately 16 km from the project location, is the Bushy Park monitor located in Berkeley County. The most recent design value of 0.061 ppm for this station shows that the area is currently in attainment with the 8-hour ozone standard of 0.070 ppm. In fact, all South Carolina ozone monitoring data shows that the entire state is meeting this standard.

Based on the insignificant impact estimated from proposed increase in VOCs, and the current ozone attainment status of the area near the facility, it is estimated that this project will have minimal impact on overall ozone formation within the surrounding area and should not cause or contribute to an exceedance of the current 8-hr ozone standard.

Secondary $PM_{2.5}$ Assessment

The AERMOD model, the preferred dispersion model for near-field analyses, does not currently include chemical transformation algorithms required to address the formation of secondary $PM_{2.5}$ from NO_x and SO_2 precursors. To address possible secondary formation, EPA's Guidance for $PM_{2.5}$ Permit Modeling was used. As outlined in that guidance, the PSD SERs for NO_x and SO_2 were used to determine whether a proposed source or modification will contribute sufficient quantities of precursor emissions requiring consideration. In this draft guidance document, EPA lists four "assessment" cases based on the PSD SERs for the NO_x and SO_2 emissions to outline what air quality analysis, if any, is required to demonstrate compliance with the $PM_{2.5}$ NAAQS. The proposed modification falls under Assessment Case 2 due to the following:

- Direct $PM_{2.5}$ emission increases associated with the project are greater than the 10 tpy SER;
- NO_x emissions associated with the project are below the 40 tpy SER; and
- SO_2 emissions associated with the project are below the 40 tpy SER.

Assessment Case 2 requires that only primary $PM_{2.5}$ impacts be addressed. Thus, a secondary impacts evaluation is not required and the $PM_{2.5}$ assessment is addressed with the modeling of the primary $PM_{2.5}$ emissions. As such, Mercedes-Benz Vans did not perform any modeling related to secondary $PM_{2.5}$ formation as part of the proposed project.

7.1.1.2 Significant Impact Area (SIA) Analysis

The SIA is a circular area with a radius extending from the source to the lesser of: 1) the most distant point where the Preliminary Modeling Analysis predicts a significant ambient impact will occur (greater than the SIL), or 2) a modeling receptor distance of 50 km. The SIA will contain the receptor field and additional sources to be used in the Full Impact Analysis (sources in the Screening Area (SA) will also be included, as appropriate).

An impact area is initially established for each pollutant for every averaging time. The final SIA selected for a pollutant is the largest of the impact areas determined for that pollutant, as shown in Table 49 above. Since the facility-wide PTE is decreasing for PM_{10} and $PM_{2.5}$, the facility chose not to revise its original SIL modeling analysis, but BAQ confirmed the SIA to be the same. All sources within the final SIAs were included in the Full Impact Analysis.

7.1.1.3 Significant Monitoring Concentration Analysis

Modeling significance results (impacts) for PM_{10} and $PM_{2.5}$ are shown below along with significant monitoring concentrations (SMCs) for these pollutants. The impacts are the maximum modeled concentrations as noted in the table. The significant monitoring concentrations are from SC Regulation 61-62.5, Standard 7.

Table 50 – Significant Monitoring Concentrations

Pollutant	Averaging Period	Max. Impact (µg/m³)(1)(2)	Significant Monitoring Concentration (µg/m³)	Exceeds (Y or N)
PM_{10}	24 Hour	10.2	10	Y
$PM_{2.5}$	24 Hour	8.7(3)	4	Y

1) Results were multiplied by 1.05 to conservatively scale up a 5% increase in facility-wide emissions from the original PSD application dated 2/4/16.
2) Highest-first-high concentration except where noted otherwise
3) Five-year average of the first-high concentrations

As discussed above, PM_{10} and $PM_{2.5}$ emissions are decreasing with this project, and the facility has conservatively retained its original SIL modeling analysis. Therefore, the SMC analysis shown above is the previous analysis as it is more conservative.

The PM_{10} and $PM_{2.5}$ concentrations exceed the SMC. Since this site is significant for VOCs, ozone monitoring data also needs to be reviewed. Section 2.4 of EPA's *Ambient Monitoring Guidelines for Prevention of Significant Deterioration* (EPA-450/4-87-007) permits the use of existing representative air quality data in place of preconstruction monitoring data, provided monitor location, quality of data, and currentness of data are acceptable.

Monitor Data

The area near the proposed facility is generally free from the impact of other point sources and area sources associated with human activities. Additionally, this area is free of complex terrain. Thus, according to the EPA document listed above, monitoring data from a regional monitor site may be used as representative background data in this case.

The proposed area for the site is an area that is generally free from the impact of other point sources and area sources associated with human activities. Additionally, the site is located in an area with no complex terrain. According to the EPA document listed above, monitoring data from a regional site may be used as representative data in these cases.

The nearest regional monitors for the Mercedes site for PM10 and PM2.5 are located in Charleston, South Carolina. The Jenkins Avenue PM10 monitor is the closest PM10 monitoring station to the project location. The Charleston FAA Beacon PM2.5 monitor is the closest PM2.5 monitoring station to the project location. The Jenkins Station and FAA Beacon are located in an urban area with commercial land use and significant PM10 and PM2.5 emissions. The Jenkins Avenue monitor is expected to provide a conservative background for the Mercedes modeling. The FAA Beacon is expected to provide a representative background for the Mercedes modeling.

Since the facility is significant for VOC, ozone monitoring data also needs to be reviewed. The nearest ozone monitoring data is available from the Bushy Park site in Berkley County and the Cape Romain monitor in Charleston County. The 2011-2013 data is 0.061 and 0.063 for these monitors respectively, both of which are below the 0.070 ppm threshold. These monitors are operated by the SC DHEC in support of National Ambient Air Quality Standards attainment activities and meet the quality assurance requirements for this work. These activities require the data to be quality assured, and the level of quality assurance for these monitors meets the requirements for PSD.

Therefore, it has been determined that the data DHEC has obtained for background concentrations are representative of the ambient pollutant concentrations in the area of the proposed facility. In accordance with Chapter C, Section III of the New Source Review Manual (Draft document, dated October 1990), the Bureau approves the use of ambient data collected at DHEC monitoring stations for pre-construction monitoring requirements.

7.1.2 PSD Class II Full Impact Modeling Analysis

A Full Impact Analysis is required for any pollutant for which the proposed source's estimated (modeled) ambient pollutant concentrations exceed the SIL (determined in Table 49). Separate analyses are performed for determining compliance with the NAAQS and PSD increments. The NAAQS analysis must also include background pollutant concentrations. The Full Impact Analysis consists of modeling all facilities within the SIA, and those in the SA which are not excluded by the screening protocol ("20D Rule," defined below). The SA is usually an area extending beyond the SIA to a distance of 50 km from the proposed source. The SIA determined for each pollutant is shown in Table 49.

The "Screening Threshold Method for PSD Modeling" or "20D Rule" was used to determine which sources within the SA to include. In order to exclude a source, the annual emissions (tpy) of a pollutant must be less than 20 times the distance (km) from the SIA to the source in the SA. Each calculated 20D distance was compared to the annual emission of each pollutant (multiple emission points at a source were grouped together, and sources within 2 km of each other were summed, prior to applying the 20D Rule). Those sources with annual emissions greater than or equal to 20D were retained and considered in the Full Impact modeling for both the Class II NAAQS and PSD Increment analyses.

7.1.2.1 PSD Class II Full Impact - National Ambient Air Quality Standards (NAAQS) Analysis

Table 51 shows a list of facilities (in the SIA, plus those in the SA that could not be excluded using the 20D Rule) that are included in the full impact analysis for NAAQS modeling.

Table 51 – Class II Full Impact Analysis – NAAQS SIA and 20D Sources

PM_{10}	$PM_{2.5}$	SO_2	NO_2	CO
Century Aluminum	Century Aluminum	--	--	--
Cummins Turbo Technologies	Cummins Turbo Technologies	--	--	--
DAK Americas LLC	DAK Americas LLC	--	--	--
Kapstone Charleston Kraft LLC	Kapstone Charleston Kraft LLC	--	--	--
Nucor Steel	Nucor Steel	--	--	--

Table 51 – Class II Full Impact Analysis – NAAQS SIA and 20D Sources				
PM_{10}	**$PM_{2.5}$**	**SO_2**	**NO_2**	**CO**
Santee Cooper – Cross	Santee Cooper – Cross	--	--	--
SCE&G Williams	SCE&G Williams	--	--	--

Table 52 shows that when proposed facility emissions are modeled with other sources in the SIA and SA, and background values are added, the National Ambient Air Quality Standards are not exceeded and compliance has been demonstrated.

Table 52 – NAAQS Class II Full Impact Analysis							
Pollutant	**Averaging Time**	**Model Used**	**Maximum Modeled Concentration ($\mu g/m^3$)**	**Background Concentration ($\mu g/m^3$)(4)**	**Total ($\mu g/m^3$)**	**Standard ($\mu g/m^3$)**	**% of Standard**
PM_{10}	24 Hour	AERMOD	9.54(1)	49.0	59	150	39
$PM_{2.5}$	24 Hour	AERMOD	7.43(2)	18.0	25	35	71
	Annual	AERMOD	2.40(3)	8.4	11	12	92
1) The highest-second-high.							
2) The highest-eighth-high averaged over five years.							
3) The five year average of the maximum annual concentrations.							
4) Backgrounds are summarized in Section E.							

Dispersion parameters and modeled emission rates for off-site sources included in the Class II NAAQS Full Impact Analysis are shown in the facility's application (dated February 2018) and corresponding electronic modeling files. However, dispersion parameters and modeled emission rates of off-site sources were updated by BAQ where necessary to reflect the most up-to-date emissions inventories. These include various updates related to the February 2018 revised modeling of the Nucor facility as well as several corrections to stack temperatures in the Century Aluminum facility model. The information is not included in this summary but can be found in the full impact modeling files.

7.1.2.2 PSD Class II – PSD Increment Analysis

The full impact analysis for PSD increment consuming sources is performed in the same manner as the full impact analysis for the NAAQS shown above. The sources included are all increment consuming sources from the facility and those facilities previously identified within the SIA and SA. The facilities included are shown in Table 53.

Table 53 – SIA and 20D PSD Increment Consuming Sources			
PM_{10}	$PM_{2.5}$	SO_2	NO_X
Century Aluminum	Nucor Steel	--	--
Cummins Turbo Technologies	--	--	--
DAK Americas LLC	--	--	--
Kapstone Charleston Kraft LLC	--	--	--
Nucor Steel	--	--	--
Santee Cooper – Cross	--	--	--
SCE&G Williams	--	--	--

Table 54 indicates that the maximum impact for each pollutant and averaging period does not exceed the respective PSD increment standard.

Table 54 – PSD Class II Increment Analysis					
Pollutant	Averaging Time	Model Used	Maximum Modeled Concentration ($\mu g/m^3$)(1)(2)	Standard ($\mu g/m^3$)	% of Standard
PM_{10}	24 Hour	AERMOD	10	30	33
	Annual	AERMOD	3	17	18
$PM_{2.5}$	24 Hour	AERMOD	9	9	100
	Annual	AERMOD	2	4	50
1) The highest-first-high modeled concentrations for the 5 years of Meteorological data are listed for annual averaging periods and the highest second-high for other averaging periods.					

7.2 Additional Impacts Analysis

PSD review requires an analysis of any potential impairment to visibility, soils, and vegetation that may occur as a result of the proposed or modified facility/sources. The review also requires an analysis of the air quality impact projected for the area as a result of general commercial, residential, industrial, and other growth associated with the expansion.

7.2.1 Growth

The SC PSD rules require the applicant to provide information relating to the nature and extent of air quality impacts from all commercial, residential, industrial and other growth in the area that would be affected by a new facility, or modification to an existing facility. For the purposes of this report, the area the facility would affect is defined as the significant impact area (SIA). The greatest SIA was determined to be 1.9 km (Table 49).

Mercedes anticipates that additional personnel will be employed as a result of the expansion project. Most of this workforce will come from the already existing local population. The product will be distributed throughout the world and is not being produced to support any anticipated growth in the immediate vicinity. Therefore, the construction and modification of the facility and any workforce-associated residential and commercial growth is not expected to cause or contribute to a quantifiable adverse impact on local ambient air quality.

7.2.2 Soils and Vegetation

Maximum predicted offsite impacts (highest first high) were compared to EPA screening levels or secondary NAAQS. Modeling of all the proposed emissions for the soils and vegetation analysis indicates that there will be no adverse impacts expected on soils or vegetation caused by the proposed facility emissions.

Table 55 – Soils and Vegetation Analysis

Pollutant	Averaging Time	Model Used	MAX. Impact (μg/m³) (1)	Back-ground (μg/m³)	Facility / Regional Impact (μg/m³)(2)	EPA Screening Concentration (μg/m³)	AAQS Standard (μg/m³)	Exceeds ?
PM_{10}	24 Hour	AERMOD	9.54	49.0	59	N/A	150	N
$PM_{2.5}$	24 Hour	AERMOD	7.43	18.0	25	N/A	35	N
	Annual	AERMOD	2.40	8.4	10	N/A	15	N

1) All values, unless noted otherwise, are the highest-first-high modeled concentration and include full impact sources.

2) Results include background values when available.

7.2.3 Visibility

Visibility analyses for Class II areas are not necessary for this project, as there are no visibility sensitive areas located within the project's largest Significant Impact Area (SIA) of 1.9 km.

7.3 PSD Class I Impact Analysis

A facility within 300 km of a Class I area must address the impact on the Class I area. For the visibility and deposition analyses, the recommendations in the following should be consulted: 1) *Interagency Workgroup on Air Quality Modeling Phase II Summary Report and Recommendations for Modeling Long Range Transport Impacts (IWAQM)* (EPA-454/R-98-019, December 1998); 2) *Federal Land Managers' Air Quality*

Related Values Workgroup Phase I Report (FLAG 2010) (U.S. Forest Service- Air Quality Program, the National Park Service – Air Resources Division, and the U.S. Fish & Wildlife Service – Air Quality Branch, December 2000); 3) *Regional Haze Regulations and Guidelines for Best Available Retrofit Technology* (EPA, June 15, 2005); and 4) EPA's *Guidelines on Air Quality Models (Guideline)*.

The 2010 FLAG document allows the screening of sources (that are > 50 km from the Class I area), based on total emissions of certain pollutants and distance from the source to the Class I area. When a source is screened out with Q/D ≤ 10 (where D = distance (km) from the source to the Class I area; Q = emissions (tpy) of SO_2 + NO_x + PM_{10} + H_2SO_4), the facility is not required to do an AQRV analysis. Additional information provided in public comment responses (to the FLAG document) clarified that for modified sources, applicants should only consider the emissions increases associated with the proposed project modification when calculating Q/D. In the case of this project, the Wolf Island and Okefenokee Wilderness Areas both screened out and no AQRV analysis was required.

The Cape Romain National Wildlife Refuge (NWR) also fell below the screening threshold: [Q/D = 1.87 ≤ 10, where D = 43 km and Q= 80.3 TPY (SO_2 = 0.94, NOx = 61.91, PM_{10} = 17.45 and H_2SO_4 = 0)]. However, as the wildlife refuge is within 50 km of the facility, dispersion modeling is required regardless of the Q/D results. The emissions used in the screening analysis were those submitted by the facility in a permit application addendum, dated April 13, 2018. As Q/D uses maximum allowable 24-hr emissions, and as the emissions limit the facility is taking is related to plant capacity and not daily hours of operation, the controlled emission rates were used instead of the lower limited emission rates.

AERMOD, the EPA preferred near-field model, was used since Cape Romain is located less than 50 km from the facility. Based on air dispersion and visibility modeling, the ambient air impacts of the project were estimated to be less than all threshold levels specified by all applicable regulatory requirements. Cumulative air quality modeling of the combined facility and surrounding increment-consuming facilities was performed for PM2.5. The cumulative PSD increment impacts were less than the Class I area allowable PSD increments.

7.3.1 Class I Significant Impact Level Analysis

Table 56 shows the maximum impacts on Cape Romain for PM_{10}. The air quality impacts are less than the Class I SILs for PM_{10}, annual and 24-hour averaging periods. Due to the vacatur of the PM2.5 SIL, which was valid at the time that the application was submitted, a cumulative analysis was performed for that pollutant. Therefore, the facility did not submit a Class I SIL analysis for PM2.5. No further air concentration analyses are required to demonstrate compliance with the PSD increments for PM_{10}.

Table 56 – Class I PSD Significant Impact Level Analysis					
Pollutant	**Averaging Time**	**Model Used**	**Maximum Modeled Concentration (μg/m³)(2)**	**SIL (μg/m³)**	**Significant Impact?**
PM_{10}	24 Hour	AERMOD	0.06	0.3	N
	Annual	AERMOD	0.002	0.2	N
$PM_{2.5}$	24 Hour	AERMOD	(2)	0.27	(2)
	Annual	AERMOD	(2)	0.05	(2)
1) Highest-first-high					
2) Facility chose to conservatively model Class I increment and forego the Class I SIL analysis.					

7.3.2 Class I Increment Consumption Impact Analysis

Cumulative air quality modeling of the combined facility and surrounding increment-consuming facilities was performed for PM2.5. AERMOD modeling for these increment-consuming sources was performed over the whole modeling domain for impacts on the Cape Romain NWR. The results of these cumulative effects are shown in the following table. As shown, these impacts do not exceed the allowable PSD increments for a Class I area.

Table 57 – Class I PSD Increment Impacts Cape Romain NWR					
Pollutant	**Averaging Time**	**Model Used**	**Maximum Modeled Concentration (μg/m³)**	**Standard (μg/m³)**	**% Of Standard**
$PM_{2.5}$	24 Hour	AERMOD	0.57	2	29
	Annual	AERMOD	0.05	1	5
Standards are from SC Regulation 61-62.5 Standard 7, Class I Area limits.					
1) The highest-first-high modeled concentration was used for annual averaging periods and the highest-second-high was used for all other averaging periods, except where noted otherwise.					
2) Results were multiplied by 1.05 to conservatively scale up a 5% increase in facility-wide emissions from the original PSD application dated 2/4/16.					

7.3.3 Class I Visibility Analysis

The visibility analysis evaluates the potential change in light extinction relative to the natural background as a result of the proposed project. Visibility is described through two methods, Plume Impairment (less than 50 km) and Regional Haze (greater than 50 km). Regional haze occurs at distances where the plume has become evenly dispersed into the atmosphere such that there is no definable plume. The EPA guidance (IWAQM, 1998 Revised) and the FLM guidance (FLAG, 2010) recommend the use of non-steady state dispersion modeling for both screening and refined dispersion modeling.

Plume impairment was evaluated for this project since the distance from the facility to the Cape Romain NWR was less than 50 km. Likewise, since the distance was less than 50 km, regional haze was not evaluated.

A Level 1 default screening analysis was performed in VISCREEN following the guidelines published in the *Workbook for Plume Visual Impact Screening and Analysis* (EPA-450/4-88-015, 1988; Revised 1992) (hereafter referred to as the workbook). The facility used the workbook approach default settings of F stability and a 1 m/s wind speed (a worst-case meteorological condition).

Since the background visual ranges included in the *Workbook* have since been updated in the FLAG 2010 guidance, the updated visual range was included. The monthly values included in Table 10 of FLAG 2010 for Cape Romain were averaged to determine a single annual value of 174.92 km which was input into the model.

The Cape Romain Wildlife Refuge is located 43 km east of the facility. The impacts were evaluated against the Level I default VISCREEN criteria and passed. Calculations were performed for two assumed plume-viewing backgrounds: the horizon sky and a dark terrain object. The table below shows the screening values from the results obtained using the workbook method.

Table 58 – Visibility Impairment Analysis

Background	Theta	Azi	Distance (km)	Alpha	ΔE Critical	ΔE Plume	Contrast Critical	Contrast Plume
Sky	10	122	50	47	2.0	0.304	0.05	0.005
Sky	140	122	50	47	2.0	0.175	0.05	-0.003
Terrain	10	84	43	84	2.0	0.650	0.05	0.006
Terrain	140	84	43	84	2.0	0.059	0.05	0.001

Table 59 – Visibility Impairment Analysis Inputs

Parameter	Value	Units
Particulate Matter	17.45(1)	tpy
Nitrogen Dioxides	61.91(1)	tpy
Primary Sulfur	0	tpy
Background Ozone	0.04	ppm
Plume-source-observer angle	11.25	degrees

Table 59 – Visibility Impairment Analysis Inputs		
Parameter	**Value**	**Units**
Background visual range	174.92	km
Wind Speed	1	m/s
Stability Class	F (6)	class
1) BAQ ran VISCREEN using the controlled PTE emissions submitted in the April 13, 2018 permit application addendum. These values proved to be conservative.		

7.4 South Carolina Facility-Wide Compliance Demonstration

All major sources proposing new construction or construction modifications in South Carolina are required to demonstrate compliance with South Carolina Regulation No. 62.5 Standards 2 (NAAQS), 7 (Class II PSD Increment), and 8 (Air Toxics) [Standard 7 (PSD) Part k - "Source Impact Analysis" and Part p - "Sources Impacting Federal Class I Areas - Additional Requirements" were addressed in the sections above, as appropriate]. With the exception of NO_2 emissions from the RTO (emission point O1), facility-wide emissions were exempt for Standards 2 and 7, and de minimis for Standard 8. Other information was used for Standard 2 compliance for NO_2 emissions from the RTO.

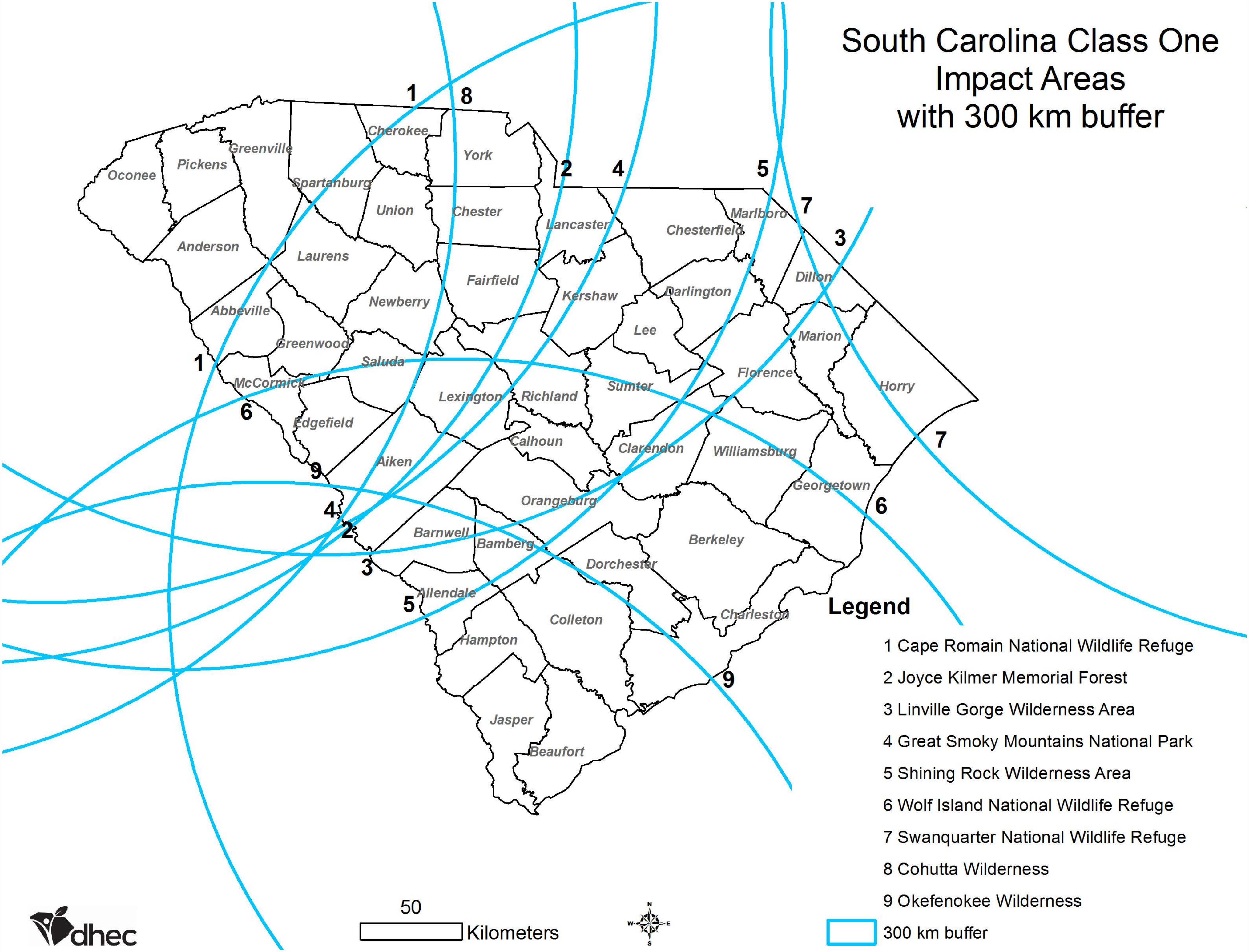
Table 60 – Standard No. 2 – Ambient Air Quality Standards Modeling Analysis							
Pollutant	**Averaging Time**	**Model Used**	**Maximum Modeled Concentration (μg/m³) (1)**	**Background Concentration (μg/m³)**	**Total (μg/m³)**	**Standard (μg/m³)**	**% of Standard**
NO_2	1 Hour	OTHER	(1)	72.1	≤188	188	≤100
	Annual	OTHER	(1)	12.4	≤100	100	≤100
1) A weight of evidence approach was used to show that emissions would not significantly contribute to the standard.							

Table 60 – Background Monitoring Data (μg/m³)									
Pollutant	**Site Name**	**County**	**Year**	**1-Hr**	**3-Hr**	**8-Hr**	**24-Hr**	**3-Mo**	**Annual**
PM_{10}	Jenkins Avenue Fire Station	Charleston	11-13				49.0		
$PM_{2.5}$	Charleston FAA Beacon	Berkeley	12-14				18.0		8.4
NO_2	Jenkins Avenue Fire Station	Charleston	11-13	72.1					12.4
PM10 24-hr is the fourth-high over three year period. The concentration listed for all other pollutants and averaging periods is the 3 year design value.									

Since the facility is subject to IIII, DDDDD, EEEE, and ZZZZ MACTs and will be required to be in compliance with this regulation upon startup of the proposed project, the facility is exempt from Standard 8 and corresponding Standard 8 modeling requirements (except manganese compounds from body shop welding, which are de minimis).

Appendix A – Class I Area Map

South Carolina Class One Impact Areas with 300 km buffer



Legend

1 Cape Romain National Wildlife Refuge
2 Joyce Kilmer Memorial Forest
3 Linville Gorge Wilderness Area
4 Great Smoky Mountains National Park
5 Shining Rock Wilderness Area
6 Wolf Island National Wildlife Refuge
7 Swanquarter National Wildlife Refuge
8 Cohutta Wilderness
9 Okefenokee Wilderness
300 km buffer

Appendix B – PSD Permit Application

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trinityconsultants.com

Trinity Consultants

February 16, 2018

Steve McCaslin, P.E.
South Carolina DHEC
Bureau of Air Quality
2600 Bull Street
Columbia, SC 29201

RECEIVED
FEB 20 2018
BUREAU OF AIR QUALITY

RE: *Mercedes-Benz Vans, LLC – Ladson, SC*
PSD Permit Revision Application

Dear Mr. McCaslin:

Mercedes-Benz Vans, LLC (Mercedes) owns and operates a van assembly plant in Ladson, Charleston County, South Carolina (the Charleston plant). Mercedes-Benz Vans submitted a Prevention of Significant Deterioration (PSD) construction and operating permit application in October 2015 and later submitted a revised application in February 2016 for the expansion of existing assembly processes and addition of new processes, including a body shop, paint shop, and energy center. Construction Permit No. 0560-0385-CA was issued on April 15, 2016 for the initial permit application. Construction Permit No. 0560-0385-CA-R1 was issued on July 21, 2017 to include design changes and additional operations that will be needed at the Charleston plant that were not included in the previous permit application. Construction Permit No. 0560-0385-CA-R2 was issued on January 26, 2018 to include changes to the E-coat operations. Since the issuance of Permit No. 0560-0385-CA-R2, Mercedes-Benz Vans has identified changes to facility operations that were not foreseen in the previous permit applications. Therefore, Mercedes-Benz Vans is submitting this application to revise the issued PSD construction and operating permit to incorporate the proposed changes to the facility.

Trinity Consultants, Inc. is submitting this construction permit application to DHEC on behalf of Mercedes for the following permit revisions:

- Proposed updates to monitoring requirements for several units onsite;
- Installation of a high efficiency particulate air (HEPA) filtration system on the body shop welding process rather than an electrostatic precipitator (ESP);
- Installation of new equipment including emergency generators, and diesel storage tank; and
- Modify the list of Air Supply Units and Rooftop Units at the Charleston Plant.

The application includes all required elements to revise the PSD permit, including updated project emission calculations, Best Available Control Technology (BACT) analyses, and permit application forms. Mercedes is requesting acceptance into the expedited review program and will provide payment for the permit application fee upon notification of acceptance.

Note that as previously approved by DHEC, Class I, Class II, and additional impacts analyses will be submitted under separate cover.

If you have any questions or comments about the information presented in this letter or the permit application, please do not hesitate to call me at (704) 553-7747.

Sincerely,

TRINITY CONSULTANTS, INC.

Tony Jabon, P.E.
Principal Consultant

cc: Jae Park – Mercedes Benz Vans, LLC
Russell Revell – Mercedes-Benz Vans, LLC
Nicole Saniti, P.E. – Trinity Consultants, Inc.

Enclosures

CONSTRUCTION AND OPERATING PERMIT APPLICATION
Mercedes-Benz Vans, LLC > Ladson, SC

RECEIVED

FEB 20 2018

BUREAU OF AIR QUALITY

Charleston Plant Expansion Revisions

Prepared By:

Jae Park – Mercedes-Benz Vans, LLC
Russell Revell – Mercedes-Benz Vans, LLC

Nicole Saniti, P.E. – Trinity Consultants, Inc.
Tony Jabon, P.E. – Trinity Consultants, Inc.
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(704) 553-7747

February 2018

Project 173402.0150

Trinity Consultants

Environmental solutions delivered uncommonly well

LIST OF TABLES

1. EXECUTIVE SUMMARY

Mercedes-Benz Vans, LLC (Mercedes-Benz Vans) owns and operates a van assembly plant in Ladson, Charleston County, South Carolina (the Charleston plant). Mercedes-Benz Vans submitted a Prevention of Significant Deterioration (PSD) construction and operating permit application in October 2015 and later submitted a revised application in February 2016 for the expansion of existing assembly processes and addition of new processes, including a body shop, paint shop, and energy center. Construction Permit No. 0560-0385-CA was issued on April 15, 2016 for the initial permit application. Construction Permit No. 0560-0385-CA-R1 was issued on July 21, 2017 to include design changes and additional operations that will be needed at the Charleston plant that were not included in the previous permit application. Construction Permit No. 0560-0385-CA-R2 was issued on January 26, 2018 to include changes to the E-coat operations. Since the issuance of Permit No. 0560-0385-CA-R2, Mercedes-Benz Vans has identified changes to facility operations that were not foreseen in the previous permit applications. Therefore, Mercedes-Benz Vans is submitting this application to revise the issued PSD construction and operating permit to incorporate the proposed changes to the facility.

1.1. PROJECT DESCRIPTION

Mercedes-Benz Vans is submitting this application to incorporate proposed changes at the Charleston plant. The requested permit revisions are summarized as follows:

- Proposed updates to monitoring requirements for several units onsite;
- Installation of a high efficiency particulate air (HEPA) filtration system on the body shop welding process rather than an electrostatic precipitator (ESP);
- Installation of new equipment including emergency generators, and diesel storage tank; and
- Modify the list of Air Supply Units and Rooftop Units at the Charleston Plant.

Detailed descriptions of the proposed changes described above and other minor permit revisions are provided in Section 2 of this application.

1.2. PERMITTING AND REGULATORY REQUIREMENTS

Facility-wide potential emissions exceed the VOC PSD major source threshold of 250 tons per year (tpy). Further, as the facility is a PSD major source, PSD permitting for the project is required for pollutants with potential emissions exceeding the Significant Emission Rates (SER), which includes particulate matter with aerodynamic diameter less than 2.5 microns ($PM_{2.5}$). In the original construction permit application, potential facility wide emissions of total PM and PM with an aerodynamic diameter less than 10 microns (PM_{10}) were greater than the SER. Facility-wide PM and PM_{10} emissions are now less than the SER due to changes described in this revision application, however, Mercedes-Benz Vans is requesting continued PSD review for PM_{10} and PM.

With this construction permit revision application, Mercedes-Benz Vans has addressed Best Available Control Technology (BACT) requirements for VOC, PM, PM_{10}, and $PM_{2.5}$ emissions. As described in Section 6 of this application, updated analyses to demonstrate compliance with requirements associated with the National Ambient Air Quality Standards (NAAQS), Class I and Class II increments, Class I visibility, and non-air quality impacts are will be provided under separate cover.

A detailed analysis of the regulatory requirements that apply to the proposed operations is provided in Section 4 of this application.

1.3. BACT DETERMINATION

Mercedes-Benz Vans has revised the BACT analysis for equipment identified in this application for the PSD-regulated pollutants exceeding the major source threshold (VOC, PM, PM_{10}, $PM_{2.5}$), generally following the "top-down" approach suggested by U.S. EPA. The top-down process begins by ranking all potentially relevant control technologies in descending order of control effectiveness. The most stringent or "top" control option is BACT unless the applicant demonstrates, and the permitting authority in its informed opinion agrees, that energy, environmental, and/or economic impacts justify the conclusion that the most stringent control option does not meet the definition of BACT. Where the top option is not determined to be BACT, the next most stringent alternative is evaluated in the same manner. This process continues until BACT is determined.

Based on the BACT review, Mercedes-Benz Vans has determined that the emission limits presented in Table 1-1 and operating requirements in Table 1-2 are BACT for the various emission units during periods of normal operation.

Table 1-1. Proposed BACT Emission Limits Summary

Equipment ID	Unit Description	$PM/PM_{10}/PM_{2.5}$ BACT Limit	Units	Avg. Period	VOC BACT Limit	Units	Avg. Period
B01, B02	Boilers	7.6	lb/MMscf	3-hour	5.5	lb/MMscf	Monthly
ASU, AS-RTU, BS-RTU, OV01, OV02, OV03	Gas-Fired Combustion Units	7.6	lb/MMscf	3-hour	5.5	lb/MMscf	Monthly

Table 1-2. Proposed BACT Operating Requirements Summary

Equipment ID	Unit Description	$PM/PM_{10}/PM_{2.5}$ BACT Operating Requirement	VOC BACT Operating Requirement
B01, B02	Boilers	Tune-ups every five (5) years as required in 40 CFR 63 Subpart DDDDD	Tune-ups every five (5) years as required in 40 CFR 63 Subpart DDDDD
ASU, AS-RTU, BS-RTU, OV01, OV02, OV03	Gas-Fired Combustion Units	Good combustion practices	Good combustion practices
EG03, EG04	Emergency Generators	NSPS Subpart IIII compliance	NSPS Subpart IIII compliance
TK03	Diesel Storage Tank	N/A	N/A
BS	Body Shop Welding Area	HEPA Filter (MAG Welding), good operating practices, indoor venting	N/A

1.4. ORGANIZATION OF APPLICATION

The permit application is organized as follows:

- Section 1 includes the application summary;
- Section 2 contains the project description;
- Section 3 contains the emission calculation methodologies and presents the facility-wide potential emissions following the proposed changes;
- Section 4 contains the regulatory applicability analysis for the proposed operations;
- Section 5 contains the BACT analyses for the proposed operations;
- Section 6 addresses the Class I and Class II area analysis, as well as the additional impacts analyses;
- Section 7 provides the DHEC-required permit application forms;
- Appendix A includes an area map, site layout, and process flow diagrams;
- Appendix B contains the detailed emissions calculations for each project phase;
- Appendix C contains BACT supporting documentation;
- Appendix D contains a detailed listing of equipment in each project phase; and
- Appendix E contains an electronic copy of the application and supporting documentation.

2. PROJECT DESCRIPTION

This section describes the proposed revisions to Construction Permit No. 0560-0385-CA-R2, including the addition of new equipment and proposed changes to monitoring and control devices. The proposed changes are described in the following subsections.

2.1. SITE DESCRIPTION

The Mercedes-Benz Vans Charleston plant is located in Charleston County, which has been designated by the United States Environmental Protection Agency (U.S. EPA) as "attainment" or "unclassifiable" for all criteria pollutants.

An area map showing the location of the facility is included in Appendix A.

2.2. PROPOSED UPDATES TO MONITORING REQUIREMENTS

2.2.1. Modify Dry Filter Monitoring Requirements

Construction Permit No. 0560-0385-CA-R2 requires that Mercedes-Benz Vans conduct daily pressure drop readings for several dry filters at the Charleston Plant. Mercedes-Benz Vans has determined that visual inspections are more appropriate for many dry filters in the assembly plant and requests that the pressure drop monitoring requirement be eliminated. Visual inspections will allow Mercedes-Benz Vans to determine filter replacement needs faster than pressure drop and will allow for the replacement of clogged media in appropriate cells of filter controls. The use of visual inspections is a common practice and consistent with monitoring conducted for similar sources in the industry. The proposed changes for the dry filter monitoring are identified in the following table.

Table 2-1. Proposed Dry Filter Monitoring Changes

Permit Condition No.	Emission Unit ID(s)	Emission Unit Description	Pre-Control Unrestricted $PM/PM_{10}/PM_{2.5}$ Emissions (tpy)	Control Device ID	Control Device Description	Proposed Monitoring Requirements
C.41	CW	Cavity Wax Booth	19.26	CD-DF	Dry Filters	Weekly Visual Inspections
C.42	UBS01	Underbody PVC Booth #1	72.14	CD-DF	Dry Filters	Weekly Visual Inspections
	UBS21	Underbody PVC Booth #2	72.14			
	UBC01, UBC21	Underbody Coating Booth #1 & #2	48.94			
	SR01, SR02, SR03	Spot Repair Booth #1, #2, & #3	1.27	CD-DF	Dry Filters	Monthly Visual Inspections
	AR01	Assembly Repair Booth	3.14			
C.43	AUW	Assembly UB Wax	15.93	CD-DF	Dry Filters	Weekly Visual Inspections

Sources identified in Table 2-1 are not subject to the more stringent monitoring requirements contained in 40 CFR Part 64 as the potential pre-control unrestricted emissions from each source are less than 100 tons per year (tpy). Therefore, Mercedes-Benz Vans believes that weekly visual inspections for the sources identified in Table 2-1 (except the repair booths) will be sufficient to demonstrate compliance. Mercedes-Benz Vans proposes a less frequent (monthly) visual inspection schedule for the repair booths due to intermittent use and very low emissions. Further details of non-applicability of 40 CFR Part 64 are provided in Section 4.1.4 of this application. The BACT determination for equipment listed in Table 2-1 has not changed, therefore, the BACT analysis is not included in Section 5 of this revision application.

2.2.2. Modify ADW Monitoring Requirements

Process exhaust from several sources at the Charleston plant will be routed through dry filtration systems (Dry X) to adsorption wheel (ADW) systems, where the solvent content of the air is first adsorbed, then the concentrated desorb stream is sent to a regenerative thermal oxidizer (RTO) for control.

Mercedes-Benz Vans requests revision of Condition C.67 for the ADWs which requires monitoring of the desorption outlet VOC concentration. Condition C.67 was included due to the 40 CFR Part 64 Compliance Assurance Monitoring (CAM) monitoring requirements. Consistent with the monitoring in Conditions C.54 and C.55, Mercedes-Benz Vans requests that DHEC update Condition C.67 to utilize the desorption gas inlet temperature as the compliance indicator in lieu of VOC concentration. Also, Mercedes-Benz Vans requests that Conditions C.54 and C.55 be modified to indicate that the facility will monitor desorption gas inlet temperature instead of outlet temperature on each ADW.

Monitoring of the desorption side of the ADW would vary greatly due to the booth operations and coatings which may have higher or lower VOC contents and would be difficult to provide an adequate range for proper operation. In addition, monitoring VOC content would be an engineering challenge given that a stream of the adsorption outlet is used for desorption inlet in the final design. Therefore, Mercedes-Benz Vans believes that continuously monitoring the desorption gas inlet temperature pursuant to Table 1 to Subpart IIII of Part 63 (Item 5), is sufficient to determine compliance with applicable regulations.

In the background documentation for Subpart IIII of Part 63, desorption gas inlet temperature is an acceptable monitoring parameter for the following reasons:[1]

> *The monitoring approach applies to the primary control equipment that concentrates the VOC emissions, and uses inlet temperature to the desorption/reactivation zone of the concentrator as the indicator that VOCs are being removed from the appropriate area of the concentrator system. The release of VOCs from the concentrator media is a direct function of the temperature in the desorption/reactivation zone. Maintaining the inlet temperature within the appropriate range provides assurance that the VOCs are being released to the secondary device (capture or destruction) as designed for the system.*

Mercedes-Benz Vans requests that Condition C.67 be updated to include desorption gas inlet temperature as the monitoring requirements contained in Table 1 to Subpart IIII of Part 63 (Item 5) will be sufficient to demonstrate compliance. Also, Mercedes-Benz Vans requests that Conditions C.54 and C.55 be modified to indicate that the facility will monitor desorption gas inlet temperature instead of outlet temperature on each ADW.

---

[1] EPA-HQ-OAR-2002-0093-0034, Attachment 3 to the Summary of Meeting with the Alliance of Automobile Manufacturers (AAM), Section "BB" II, David Green, Research Triangle Institute (RTI).

PM emission estimates from the paint shop have been updated due to a design change. A portion of the air stream from the dry filtration systems (Dry X) will be recycled back to the paint shop booths. Mercedes-Benz Vans estimates that approximately 73 percent of the air stream will be recycled. Updated emission calculations are provided in Appendix B, Section B.3.4.

2.2.3. Modify Boiler Tune-up Requirements

Permit Condition C.39 in Construction Permit No. 0560-0385-CA-R2 contains the following requirement for Boilers #1 and #2 (B01, B02):

> *The owner or operator shall develop a tune-up plan and perform tune-ups on Equipment IDs B01 and B02 in accordance with the requirements in 40 CFR 63.7540(a)(10). Records of tune-ups shall be submitted **annually**. The tune-up plan shall only be included in the initial report. Subsequent submittals of the tune-up plan are required within 30 days of the change if the plan is modified or the Department requests additional information.*

Mercedes-Benz Vans operates two boilers (B01, B02) that are subject to 40 CFR 63 Subpart DDDDD, National Emission Standards for Hazardous Air Pollutants for Major Sources: Industrial, Commercial, and Industrial Boilers and Process Heaters. B01 and B02 are natural gas-fired units with a heat input capacity of 14.27 MMBtu/hr, and each boiler is equipped with a continuous oxygen trim system that maintains an optimum fuel ratio. Pursuant to the definitions provided in 40 CFR §63.7575, B01 and B02 are considered "gas 1 units" because they only burn natural gas. In accordance with Table 3 to Subpart DDDDD, Item 1, new or existing boilers with a continuous oxygen trim system are only required to conduct a tune-up once every five (5) years.

Mercedes-Benz Vans requests that Permit Condition C.39 be modified to reduce the tune-up requirement to once every five (5) years to line up with the requirements contained in Subpart DDDDD. Under Subpart DDDDD, tune-ups are not required on a more frequent basis because B01 and B02 are each equipped with a continuous oxygen trim system that maintains an optimum fuel ratio.

2.2.4. Modify Permit Condition No. C.5 and Permit Condition No. C.8

Permit Condition C.5 in Construction Permit No. 0560-0385-CA-R2 contains the following requirement for sources subject to SC Standard No. 1:

> *(S.C. Regulation 61-62.5, Standard No. 1, Section I) The fuel burning source(s) shall not discharge into the ambient air smoke which exceeds opacity of 20%. The opacity standards set forth above do not apply during startup or shutdown. The owner/operator shall, to the extent practicable, maintain and operate any source including associated air pollution control equipment in a manner consistent with good air pollution control practices for minimizing emissions.*
>
> *In addition, the owner or operator shall maintain a log of the time, magnitude, duration, and any other pertinent information to determine periods of startup and shutdown and make available to the Department upon request.*

Mercedes-Benz Vans requests that Permit Condition C.5 be modified to remove references to the startup and shutdown recordkeeping requirements. In accordance with SC Standard No. 1 Section I(C), startup/shutdown logs are not required for natural gas-fired units. All sources referenced in Permit Condition C.5 are permitted to burn natural gas only, therefore, this recordkeeping provision is not applicable. Mercedes-Benz Vans also requests that Condition C.5 indicate that these units are natural gas-fired only.

Similarly, Condition C.8 provides a requirement to conduct a visual inspection of opacity, but indicates that these inspections are not required during periods of burning natural gas or propane only. However, the condition lists multiple emission units that are only permitted to burn natural gas. Therefore, Mercedes-Benz Vans requests that B01, B02, ADH01, ADH02, OV01, OV02, OV03, OV22, OV23, OV04, and all ASUs be removed from Condition C.8.

2.3. UPDATE CONTROL DEVICE FOR METAL ACTIVE GAS (MAG) WELDING

In the body shop, parts are welded to form the "body-in-white." The body shop includes welding of small stamped parts, the front-end subassembly, the rear-end subassembly, the side frame subassembly, the underbody subassembly, the mid- and upper-body assembly, and panels. The body shop includes re-spot welding, soldering, attachment of hinged parts (doors and hoods), and inspection.

With this application, Mercedes-Benz Vans proposes that PM emissions from the MAG welding operations be controlled by a HEPA filter system instead of an ESP as noted in Construction Permit No. 0560-0385-CA-R2. The proposed HEPA filter system will vent inside the building. The proposed HEPA filter system will achieve an equivalent level of PM control as the ESP; therefore, the proposed change does not result in any increase in potential emissions from the MAG welding operations.

PM emissions for spot welding, laser welding, and soldering operations will vent inside the building with no additional controls. There will also be fugitive CO_2 emissions from shield gases used in MAG welding. CO_2 emissions are quantified in the detailed emission calculations provided in Appendix B.

2.4. EQUIPMENT UPDATES

2.4.1. Add and Modify Emergency Generators

Mercedes-Benz Vans is proposing to install two (2) additional diesel-fired emergency generators at the Charleston Plant:

- EG03 – 30 kilowatt (kW) diesel-fired emergency generator with 74-gallon base tank
- EG04 – 1,500 horsepower (hp) diesel-fired emergency generator

Both generators will be restricted to emergency use only and will be tested periodically.

In addition, Mercedes-Benz Vans has made as-built changes to the currently permitted emergency generators and fire pump. These changes were identified in the operating permit requests for the generators. The installed generator and fire pump capacities are listed as follows:

- EG01 – 398 hp paint shop emergency generator with 956-gallon base tank
- EG02 – 65 hp hazardous materials building emergency generator with 132-gallon base tank
- FP01 – 305 hp with 500-gallon base tank

Emissions from the base tanks are assumed to be negligible.

2.4.2. Add Diesel Storage Tank

Mercedes-Benz Vans is proposing to install a 1,240 gallon diesel storage tank and associated pump with this application revision. The diesel fuel will be stored in an atmospheric tank designed with submerged fill lines, spill and overfill protection, and conservation vents to minimize atmospheric emissions.

2.4.3. Modify Number and Size of RTOs

Construction Permit No. 0560-0385-CA-R2 includes three regenerative thermal oxidizers (RTOs) that will be used to control emissions from several sources at the Charleston plant. Mercedes-Benz Vans is proposing to install one RTO during Phases 1 and 2 of the project that will be natural-gas fired and have a heat input capacity of 8 MMBtu/hr. During Phase 3, the existing RTO will be replaced with a new RTO which will have a heat input capacity up to 16 MMBtu/hr. The units will vent from the same emission point, and there will be no changes to the vent stack due to this replacement scheduled for Phase 3.

The required DHEC permit application forms have been updated to reflect the proposed change and are included in Section 7 of this application.

2.4.4. Modify Oven Heat Input Capacity

Several indirect ovens are used in the paint shops at the Charleston plant. Mercedes-Benz Vans has made several as-built changes to the heat input capacity of the oven burners. Potential emissions from the proposed equipment will decrease due to the proposed decrease in heat input capacity. A summary of the proposed updates are described in Table 2-2.

Table 2-2. Proposed Oven Heat Input Capacity Updates

Equipment ID	Emission Unit Description	Current Heat Input Capacity (MMBtu/hr)	Proposed Heat Input Capacity (MMBtu/hr)
OV01	E-Coat Oven Burners (natural gas fired)	10.44	4.85
OV02	Primer (Guidecoat) Oven #1 Burners (natural gas fired)	8.39	4.30
OV03	Topcoat Oven #1 Burners (natural gas fired)	9.01	4.27

2.4.5. Modify List of Air Supply Units

There are a number of operations at the Charleston plant that require air supply units for HVAC. These operations include paint shop coating activities, workdecks for sanding, touch-up, and spot repair operations, clean rooms, and office meeting rooms throughout the facility. The air supply units vary in capacity from 420 kW to 4,720 kW, with heat input capacities provided in Appendix B. The exhaust from the primer booth and basecoat/clearcoat booth air supply units vents to the dry filtration systems (Dry X), then to the ADW and RTO for control. The exhaust from the remaining air supply units vents to the atmosphere. The social room air supply units have been replaced with hot water coils, which are heated by the boilers. Therefore, there is no natural gas combustion associated with these units.

Mercedes-Benz Vans has made several as-built changes to the air supply units at the Charleston plant, including changes to heat input capacity and updates to equipment IDs. A summary of the proposed updates are described in Table 2-3.

Table 2-3. Proposed Updates to Air Supply Units (ASU)

Current Equipment ID	Proposed Equipment ID	Proposed Permit Change Note(s)	Proposed Emission Unit Description
ASU01, ASU02, ASU20	ASU P/BC/CC	1	Air Supply Unit for Primer Booth, BC Booth, and CC Booth (natural gas fired)
ASU03	ASU 2.1	1	Air Supply Unit 2.1 – Shop + Open Workdecks (natural gas fired)
ASU04	ASU 3	1	Air Supply Unit 3 – UBS + Repair (natural gas fired)
ASU05	ASU 2.2	1	Air Supply Unit 2.2 – Shop + Open Workdecks (natural gas fired)
ASU06	ASU 1	1	Air Supply Unit 1 – Spot Repair (natural gas fired)
ASU07	ASU 2.3	1	Air Supply Unit 2.3 – Shop (natural gas fired)
ASU08	ASU 4	1	Air Supply Unit 4 – Wax (natural gas fired)
N/A	ASU 6	1	Workdecks Air Supply Unit 6 (natural gas fired)
ASU19	ASU CR2	1	Air Supply Unit Clean Room Phase 2
ASU09	N/A	2	N/A
ASU10	N/A	2	N/A
ASU11	ASU 5	1	Workdecks Air Supply Unit 5 (natural gas fired)
ASU12	N/A	2	N/A
ASU13	N/A	2	N/A
ASU14	ASU31	1	Primer Booth Air Supply Unit Phase 3 (natural gas fired)
ASU15	ASU32	1	BC Booth Air Supply Unit Phase 3 (natural gas fired)
ASU16	ASU33	1	Workdecks Air Supply Unit 1 Phase 3 (natural gas fired)
ASU17	ASU34	1	Workdecks Air Supply Unit 2 Phase 3 (natural gas fired)
ASU18	ASU35	1	Workdecks Air Supply Unit 3 Phase 3 (natural gas fired)
ASU21	ASU36	1	Shop Ventilation Air Supply Unit Phase 3 (natural gas fired)
ASU22	ASU37	1	Social Rooms Air Supply Unit Phase 3 (natural gas fired)

Permit Change Notes:

1. Update the equipment ID and description for the ASU at the Charleston Plant.
2. Units have been eliminated from the facility design or will not be fuel-fired and will not emit regulated pollutants, therefore Mercedes-Benz Vans requests that the equipment be removed from the construction permit.

2.4.6. Modify List of Rooftop Units

The Charleston Plant operates a number of combustion sources, including natural gas-fired rooftop units (RTUs). Mercedes-Benz Vans is proposing to update the RTU equipment descriptions and heat input capacities based on as-built changes at the facility as described in Table 2-4.

Table 2-4. Proposed Updates to Rooftop Units (RTU)

Current Equipment ID	Proposed Equipment ID	Proposed Permit Change Note(s)	Proposed Emission Unit Description
RTU01	AS-RTU01	1	0.8 MMBtu/hr natural gas-fired rooftop unit (Assembly)
RTU02	N/A	2	N/A
RTU03	N/A	2	N/A
RTU04	AS-RTU04	1	0.8 MMBtu/hr natural gas-fired rooftop unit (Assembly)
RTU05	N/A	2	N/A
RTU06	AS-RTU06	1	0.8 MMBtu/hr natural gas-fired rooftop unit (Assembly)
RTU07	N/A	2	N/A
RTU08	AS-RTU08	1	0.8 MMBtu/hr natural gas-fired rooftop unit (Assembly)
RTU09	N/A	2	N/A
RTU10	AS-RTU10	1	0.8 MMBtu/hr natural gas-fired rooftop unit (Assembly)
RTU11	AS-RTU11	1	0.8 MMBtu/hr natural gas-fired rooftop unit (Assembly)
RTU12	N/A	2	N/A
RTU13	AS-RTU13	1	0.8 MMBtu/hr natural gas-fired rooftop unit (Assembly)
RTU14	BS-RTU01	3	0.8 MMBtu/hr natural gas-fired rooftop unit (Body Shop)
RTU15	BS-RTU02	3	0.8 MMBtu/hr natural gas-fired rooftop unit (Body Shop)
RTU16	N/A	2	N/A
RTU17	BS-RTU04	3	0.8 MMBtu/hr natural gas-fired rooftop unit (Body Shop)
RTU18	BS-RTU05	3	0.8 MMBtu/hr natural gas-fired rooftop unit (Body Shop)
RTU19	BS-RTU06	3	0.8 MMBtu/hr natural gas-fired rooftop unit (Body Shop)
RTU20	BS-RTU07	3	0.8 MMBtu/hr natural gas-fired rooftop unit (Body Shop)
RTU21	BS-RTU10	3	0.8 MMBtu/hr natural gas-fired rooftop unit (Body Shop)
RTU22	BS-RTU17	3	0.8 MMBtu/hr natural gas-fired rooftop unit (Body Shop)
RTU23	BS-RTU18	3	0.8 MMBtu/hr natural gas-fired rooftop unit (Body Shop)
RTU24	BS-RTU23	3	0.8 MMBtu/hr natural gas-fired rooftop unit (Body Shop)
RTU25	BS-RTU25	3	0.8 MMBtu/hr natural gas-fired rooftop unit (Body Shop)
RTU26	BS-RTU26	3	0.8 MMBtu/hr natural gas-fired rooftop unit (Body Shop)
RTU27	BS-RTU30	3	0.8 MMBtu/hr natural gas-fired rooftop unit (Body Shop)
RTU28	BS-RTU32	3	0.8 MMBtu/hr natural gas-fired rooftop unit (Body Shop)
RTU29	BS-RTU33	3	0.8 MMBtu/hr natural gas-fired rooftop unit (Body Shop)
RTU30	BS-RTU35	3	0.8 MMBtu/hr natural gas-fired rooftop unit (Body Shop)
RTU31	N/A	2	N/A
RTU32	N/A	2	N/A
RTU33	N/A	2	N/A
RTU34	N/A	2	N/A
RTU35	N/A	2	N/A

Permit Change Notes:

1. Update the equipment ID and description for the RTU located in the assembly area at the Charleston Plant.

2. Units will not be fuel-fired and will not emit regulated pollutants, therefore Mercedes-Benz Vans requests that the equipment be removed from the construction permit.
3. Update the equipment ID and description for the RTU located in the body shop at the Charleston Plant.

2.4.7. Modify Window Glazing Vent

Window and windshield installation requires the use of a number different chemicals for preparation and installation. Window and windshield glazing activities include the application of primers and adhesives. Multiple primers are used in the direct glazing process and an adhesive binds the windows and windshield to the car body.

In the original application, Mercedes-Benz Vans proposed to exhaust VOC emissions associated with the window and windshield installation with normal building ventilation. With this application revision, Mercedes-Benz Vans proposes to exhaust the emissions through a vent stack. Potential emissions will not change due to this proposed modification. No changes to the modeling demonstration will be required due to this change in vent stack parameters as the emissions associated with this source are VOC only.

2.4.8. Modify Cooling Tower Design Capacity

Seven cooling towers at the Charleston plant will provide process cooling to the facility. The cooling towers will be used for body shop and energy center cooling and will be an integral part of the energy center operations. Mercedes-Benz Vans has made several as-built changes to the cooling tower at the Charleston plant, including changes to the maximum circulating water flow rate (gallons per hour) of each unit. Potential emissions from cooling towers will decrease due to the proposed change. A summary of the proposed updates are described in Table 2-5.

Table 2-5. Proposed Cooling Tower Updates

Equipment ID	Emission Unit Description	Current Circulating Water Flowrate (gal/hr)	Proposed Circulating Water Flowrate (gal/hr)
CT01	Cooling Tower #1	150,000	412,500
CT02	Cooling Tower #2	500,000	412,500
CT03	Cooling Tower #3	500,000	412,500
CT04	Cooling Tower #4	500,000	73,800
CT05	Cooling Tower #5	500,000	484,900
CT06	Cooling Tower #6	500,000	484,900
CT07	Cooling Tower #7	500,000	484,900

The BACT determination for equipment listed in Table 2-5 has not changed, therefore, the BACT analysis for cooling towers is not included in Section 5 of this revision application.

2.5. UPDATE SC REGULATION 61-62.5 STANDARD NO. 5.2 APPLICABILITY

The provisions of this regulation apply to any stationary source constructed that emits or has the potential to emit NO_X generated from fuel combustion, has not undergone a BACT analysis for NO_X in accordance with SC Regulation 61-62.5, Standard No. 7, and meets one or more of the following criteria:

- Constructed after June 25, 2004;
- Constructed before June 25, 2004 and has replaced a burner assembly after May 25, 2007; and
- Removed from one permitted facility and moved to another permitted facility after May 25, 2007 except for process equipment and commercial or industrial boilers transferred between facilities within the state under common ownership.

Pursuant to Section I(B)(1) of Standard No. 5.2, any source emitting NO_X listed in SC Regulation 61-62.1, Section II(B), is exempt from Standard No. 5.2. Regulation 61-62.1, Section II(B) includes sources with a total uncontrolled potential to emit (PTE) of less than five (5) tons per year (tpy) each of PM, SO_2, NO_X, and CO; and a total uncontrolled PTE of less than 1,000 pounds per month (lbs/month) of VOCs. As shown in Appendix B, the potential emissions from Boiler #1 (B01), Boiler #2 (B02), E-coat oven burners (OV01), Air Supply Unit 2.1 – Shop + Open Workdecks (ASU 2.1), Air Supply Unit 2.2 – Shop + Open Workdecks (ASU 2.2), and Air Supply Unit 2.3 – Shop (ASU 2.3) are each well below 5 tpy of PM, SO_2, NO_X, and CO, and 1,000 lbs/month of VOC. Therefore, B01, B02, OV01, ASU 2.1, ASU 2.2, and ASU 2.3 are exempt from Standard No. 5.2. Mercedes-Benz Vans requests that Conditions C.16, C.17, and C.18 in Construction Permit No. 0560-0385-CA-R2 be eliminated because Standard 5.2 is not applicable to these sources.

Potential emissions from B01, B02, OV01, ASU 2.1, ASU 2.2, and ASU 2 have been provided in Appendix B of this application.

3. EMISSION CALCULATION METHODOLOGY

This section presents the calculation methodologies used to quantify potential emissions from the operations associated with this permit revision. Detailed calculations are provided in Appendix B.

3.1. COMBUSTION UNIT EMISSIONS

The Charleston plant operates a variety combustion sources. Combustion source emissions are based on emission limits, manufacturer data, and AP-42. Except for the emergency generators and paint shop combustion sources, potential firing rates for all equipment are based on the maximum heat input capacity assuming hours of operation based on the percent utilization required to remain below the proposed limits on CO_2e and NO_X emissions.[2] Mercedes-Benz Vans assumes 500 hours/yr of operation for emergency equipment. Paint shop combustion source hours of operation are equivalent to the paint shop hours of operation. A heating value of 1,026 Btu/ft[3] is assumed for natural gas, pursuant to 40 CFR 98, Subpart C, Table C-1. Mercedes-Benz Vans is not requesting limitations on hours of operation for combustion sources at the facility. Sample calculations for PM emissions from boiler B01 are provided as follows.

Potential Hourly PM Emissions from Boiler B01:

$$\text{PM Emissions}\left(\frac{\text{lb}}{\text{hr}}\right) = \text{B01 Heat Input Rating}\left(\frac{\text{MMBtu}}{\text{hr}}\right) \cdot \text{PM Emission Factor}\left(\frac{\text{lb}}{\text{MMscf}}\right) \div \text{NG Heat Value}\left(\frac{\text{MMBtu}}{\text{MMscf}}\right)$$

$$\text{PM Emissions}\left(\frac{\text{lb}}{\text{hr}}\right) = 14.27\frac{\text{MMBtu}}{\text{hr}} \cdot 7.6\frac{\text{lb}}{\text{MMscf}} \div 1{,}026\frac{\text{MMBtu}}{\text{MMscf}} = 0.11\frac{\text{lb}}{\text{hr}}$$

Potential Annual PM Emissions from Boiler B01:

$$\text{PM Emissions}\left(\frac{\text{tons}}{\text{yr}}\right) = \text{Hourly PM Emissions}\left(\frac{\text{lb}}{\text{hr}}\right) \cdot \text{Hours of Operation}\left(\frac{\text{hr}}{\text{yr}}\right) \cdot \left(\frac{\text{ton}}{2{,}000\text{ lb}}\right)$$

$$\text{PM Emissions}\left(\frac{\text{tons}}{\text{yr}}\right) = 0.11\frac{\text{lb}}{\text{hr}} \cdot 6{,}055\frac{\text{hr}}{\text{yr}} \cdot \frac{\text{ton}}{2{,}000\text{ lb}} = 0.32\frac{\text{tons}}{\text{yr}}$$

3.2. MAG WELDING EMISSIONS

PM emissions result from several operations in the proposed body shop, including MAG welding and spot welding operations. The body shop operations have a production capacity of approximately 17 vehicles per hour and 124,800 vehicles per year. MAG welding, spot welding emissions are determined by multiplying the consumable welding material per vehicle by the PM emission factor. Since all welding is performed within the building, a 90% building capture/control efficiency is included in the calculations.[3] The body shop utilizes mechanical ventilation, resulting in minimal airflow to the outside of the building and particulate residence time

[2] Note that Mercedes-Benz Vans is not requesting any limitation on hours of operation for individual emission units. Mercedes-Benz Vans will demonstrate compliance with CO_2e and NO_X emission limits by calculating 12-month rolling CO_2e and NO_X emissions on a monthly basis.

[3] A building capture efficiency of 90% is assumed for the body shop for both uncontrolled and controlled emissions based on building enclosure capture efficiency provided in *Texas Commission on Environmental Quality, Rock Crushing Plants*, Table 7, February, 2002.

that exceeds the settling time.[4] Therefore, it is expected that all PM emissions will settle on building floors. Sample calculations for PM emissions from spot welding in the body shop are provided as follows.

Potential Hourly PM Emissions from MAG Welding:

$$\text{PM Emissions}\left(\frac{\text{lb}}{\text{hr}}\right) = \text{Production Rate}\left(\frac{\text{units}}{\text{hr}}\right) \cdot \text{Welding Material Usage}\left(\frac{\text{lb}}{\text{unit}}\right) \cdot \text{PM Emission Factor}\left(\frac{\text{lb PM}}{1{,}000\text{ lb}}\right) \cdot (1 - \text{Control Eff.}) \cdot (1 - \text{Building Capture Eff.})$$

$$\text{PM Emissions}\left(\frac{\text{lb}}{\text{hr}}\right) = 17\,\frac{\text{units}}{\text{hr}} \cdot 0.3\,\frac{\text{lb material}}{\text{veh}} \cdot 20.0\,\frac{\text{lb PM}}{1{,}000\text{ lb material}} \cdot (1 - 0.95) \cdot (1 - 0.90) = 0.0005\,\frac{\text{lb}}{\text{hr}}$$

Potential Annual PM Emissions from MAG Welding:

$$\text{PM Emissions}\left(\frac{\text{tons}}{\text{yr}}\right) = \text{Production Rate}\left(\frac{\text{units}}{\text{yr}}\right) \cdot \text{Welding Material Usage}\left(\frac{\text{lb}}{\text{unit}}\right) \cdot \text{PM Emission Factor}\left(\frac{\text{lb PM}}{1{,}000\text{ lb}}\right) \cdot (1 - \text{Control Eff.}) \cdot (1 - \text{Building Capture Eff.}) \cdot \left(\frac{\text{ton}}{2{,}000\text{ lb}}\right)$$

$$\text{PM Emissions}\left(\frac{\text{tons}}{\text{yr}}\right) = 124{,}800\,\frac{\text{units}}{\text{yr}} \cdot 0.3\,\frac{\text{lb material}}{\text{veh}} \cdot 20.0\,\frac{\text{lb PM}}{1{,}000\text{ lb material}} \cdot (1 - 0.95) \cdot (1 - 0.90) \cdot \left(\frac{\text{ton}}{2{,}000\text{ lb}}\right)$$

$$\text{PM Emissions}\left(\frac{\text{tons}}{\text{yr}}\right) = 0.0019\text{ tpy}$$

3.3. TANK EMISSIONS

Emissions from the proposed diesel storage tank were estimated using the EPA TANKS 4.0.9d program. Throughput and TANKS output for the proposed tank is provided in Appendix B. Mercedes-Benz Vans assumes that the diesel generator base storage tank emissions are negligible.

[4] Particulate settling time is established using Stokes' Law.

The Charleston plant is subject to federal and state air quality regulations. This section summarizes the air permitting requirements and key air quality regulations that apply to the proposed changes to operations at the Charleston Plant.

4.1. FEDERAL REGULATIONS

Applicability or non-applicability of the following federal regulatory programs is addressed:

- New Source Review (NSR) / Prevention of Significant Deterioration (PSD)
- New Source Performance Standards (NSPS)
- National Emission Standards for Hazardous Air Pollutants (NESHAP)
- Compliance Assurance Monitoring (CAM)
- Title V Operating Permit Program

4.1.1. NSR/PSD Applicability

The proposed project detailed in the permit application submitted in October 2015, revised in February 2016, April 2017 and October 2017 exceeded the VOC PSD major source threshold of 250 tpy. Furthermore, as the facility is a PSD major source, PSD permitting is also required for pollutants with potential emissions exceeding the SER, which, for the permitted project at the Charleston plant, includes $PM_{2.5}$. In the original construction permit application, potential facility wide emissions of total PM and PM_{10} were greater than the SER. Due to changes described in this revision application, facility-wide PM and PM_{10} emissions are now less than the SER, however, Mercedes-Benz Vans is requesting continued PSD review for PM_{10} and PM.

With the previous submitted applications, Mercedes-Benz Vans requested emission limits of 40 tpy of NO_X, and 75,000 tpy of CO_2e to avoid PSD permitting requirements for these pollutants. All other PSD-regulated pollutants emitted from the facility will be below the PSD permitting thresholds without federally enforceable limits. These include CO, SO_2, and Pb. The proposed updates identified in this application revision will not alter the PSD applicability determined in the original application. Updated project emission increase calculations are provided in Table 4-1.

Table 4-1. Facility-wide Emissions and PSD Applicability

Pollutants	Project Emissions[5] (tpy)	PSD Significant Emission Rates (tpy)	PSD Permitting Required? (Yes/No)
PM	21.94	25	**Yes***
PM_{10}	14.73	15	**Yes***
$PM_{2.5}$	13.43	10	**Yes**
SO_2	0.79	40	No
CO	57.76	100	No
NO_X	35.42	40	No
VOC	955.85	40	**Yes**
H_2SO_4	0.00E+00	7	No
Fluorides	0.00E+00	3	No
Lead	3.10E-04	0.6	No
CO_2e	74,999	75,000	No

* Voluntary PM, PM_{10} PSD review

Mercedes-Benz Vans is submitting this construction and operating permit application revision in accordance with all federal and state requirements. Therefore, a complete BACT analysis for the units discussed in Section 2 of this application is provided in Section 5 of this application.

4.1.2. New Source Performance Standards (NSPS)

NSPS require new, modified, or reconstructed sources to control emissions to the level achievable by the best-demonstrated technology as specified in the applicable provisions. Moreover, any source subject to an NSPS is also subject to the general provisions of Subpart A, except as otherwise specified. The following subsections discuss applicable and non-applicable subparts to the proposed project.

4.1.2.1. 40 CFR 60 Subpart A—General Provisions

NSPS Subpart A provides general provisions referenced by other NSPS Subparts. The equipment described in Section 2 of this application is potentially subject to NSPS Subparts Kb, MM, IIII and JJJJ, which reference Subpart A. Subpart A provides requirements for notifications, performance testing, recordkeeping, monitoring, and control requirements for referencing subparts as applicable.

4.1.2.2. 40 CFR 60 Subpart Kb—Volatile Organic Liquid Storage Vessels (including Petroleum Liquid Storage Vessels)

Pursuant to §60.110b, NSPS Subpart Kb applies to the following volatile organic liquid storage vessels for which construction, reconstruction, or modification commenced after July 23, 1984:

[5] Mercedes-Benz Vans has chosen to request a 75,000 tpy synthetic minor limit on greenhouse gas emissions (CO_2e) to remain below the PSD SER.

(a) *Except as provided in paragraph (b) of this section, the affected facility to which this subpart applies is each storage vessel with a capacity greater than or equal to 75 cubic meters (m^3) that is used to store volatile organic liquids (VOL) for which construction, reconstruction, or modification is commenced after July 23, 1984.*

(b) *This subpart does not apply to storage vessels with a capacity greater than or equal to 151 m^3 storing a liquid with a maximum true vapor pressure less than 3.5 kilopascals (kPa) or with a capacity greater than or equal to 75 m^3 but less than 151 m^3 storing a liquid with a maximum true vapor pressure less than 15.0 kPa.*

Mercedes-Benz Vans is proposing to install a 1,240 gallon (4.7 m^3) diesel storage tank and a 74 gallon (0.3 m^3) diesel base tank for the 30-kW emergency generator. The proposed storage tanks each have a capacity less than 75 m^3, therefore NSPS Subpart Kb is not applicable.

4.1.2.3. 40 CFR Part 60 Subpart MM—Automobile and Light Duty Truck Surface Coating Operations

NSPS Subpart MM regulates primecoat, guidecoat, and topcoat operations at automobile assembly plants NSPS Subpart MM regulates primecoat (E-coat), guidecoat, and topcoat operations at automobile assembly plants constructed and modified after October 4, 1979. This subpart does not apply to the coating of plastic body components per §60.390(b). The proposed paint shop includes metal body coating operations. These operations include each of the three stages: E-coat (Unit ID 3), guidecoat (Unit ID 4), and topcoat (Unit ID 6). Therefore, the facility is required to meet the applicable VOC emission standards under this subpart. VOC emission standards vary based on the stages conducted in each of the coating operations. The following VOC emission limits apply to the proposed paint shop: Primecoat 0.17 kg/L ACS, Guidecoat 1.40 kg/L ACS, and Topcoat 1.47 kg/L ACS.

An initial performance test shall be conducted within 60 days of achieving the maximum production rate but no later than 180 days after startup in accordance with 40 CFR 60.8(a). All the elements listed in 40 CFR 60.395(a)(2) will be included in the initial compliance demonstration.

Mercedes-Benz Vans will comply with all applicable Subpart MM requirements, as listed in Construction Permit No. 0560-0385-CA-R2.

4.1.2.4. 40 CFR Part 60 Subpart IIII—Stationary Compression Ignition Internal Combustion Engines

NSPS Subpart IIII applies to stationary compression ignition (CI) internal combustion engines (ICE) that commence construction after July 11, 2005 or are modified or reconstructed after July 11, 2005. The Charleston plant is proposing the installation of two diesel-fired emergency generators with this application revision. Therefore, Mercedes-Benz Vans will comply with the applicable requirements of this subpart based on the model year and specifications of each engine. The applicable requirements for the emergency generators (EG03-EG04) under this subpart are shown in Table 4-2.

Table 4-2. Summary of NSPS Subpart IIII Requirements for Emergency Generators

Requirement	Action	Citation
Emission Limits	The following emission limits apply for the emergency generators with a rated power ≥ 19 kW and < 37 kW (EG03): ➢ $NMHC+NO_X$ = 7.5 g/kW-hr ➢ CO = 5.5 g/kW-hr ➢ PM = 0.6 g/kW-hr The following emission limits apply for the emergency generators with a rated power > 560 kW (EG04): ➢ $NMHC+NO_X$ = 6.4 g/kW-hr ➢ CO = 3.5 g/kW-hr ➢ PM = 0.2 g/kW-hr	§60.4205(b) §60.4202(a)(2) §89.112(a)
	Opacity limit = 20% during acceleration mode Opacity limit = 15% during lugging mode Opacity limit = 50% during the peaks in acceleration or lugging modes	§89.113(a)(1)-(3)
Monitoring/ Testing	Install a non-resettable hour meter prior to startup of the engine.	§60.4209(a)
Recordkeeping/ Reporting	If the stationary CI internal combustion engine is an emergency stationary internal combustion engine, the owner or operator is not required to submit an initial notification. Keep records of the operation of the engine in emergency and non-emergency service that are recorded through the non-resettable hour meter. Record the time of operation of the engine and the reason the engine was in operation during that time.	§60.4214(b)

4.1.2.5. 40 CFR Part 60 Subpart JJJJ—Stationary Spark Ignition Internal Combustion Engines

NSPS Subpart JJJJ applies to manufacturers, owners, and operators of new stationary spark ignition (SI) internal combustion engines (ICE) that are manufactured after the dates specified in 40 CFR 60.4230(a)(1) – (5). This subpart is applicable to emergency SI ICE with a horsepower rating greater than 25 horsepower (hp) and constructed after January 1, 2009. The Charleston plant is proposing the installation of diesel-fired emergency generators with this application. The proposed diesel-fired engines do not meet the definition of spark ignition internal combustion engines. Therefore, the facility is not subject to NSPS Subpart JJJJ.

4.1.3. National Emission Standards for Hazardous Air Pollutants (NESHAP)

4.1.3.1. 40 CFR 63 Subpart A—General Provisions

NESHAP Subpart A provides general provisions referenced by other NESHAP Subparts. The equipment described in Section 2 of this application is potentially subject to NESHAP Subparts IIII, MMMM, PPPP, ZZZZ and DDDDD, which reference Subpart A. Subpart A provides requirements for notifications, performance testing, recordkeeping, monitoring, and control requirements for referencing subparts as applicable.

4.1.3.2. 40 CFR 63 Subpart IIII—Surface Coating of Automobiles and Light-Duty Trucks

Subpart IIII applies to all new, modified, and existing automobile and light-duty truck surface coating operations located at a major source of HAP.

Per §63.3082(e), an affected source is a new affected source if construction commenced after December 24, 2002, and the construction is for a completely new automobile and light-duty truck paint shop. As discussed in the original construction permit application for the facility, the proposed paint shop will be a new affected source and will comply with the combined organic HAP emission limits in 40 CFR 63.3090 for new or reconstructed affected sources. Compliance will be demonstrated according to 40 CFR 63.3161 or 63.3171.

The vehicles to be coated at the Charleston plant will vary in size as the project phases progress. Mercedes-Benz Vans is proposing to manufacture and coat only vehicles greater than 8,500 lbs in Phase 1. The vehicles in Phase 1 would not meet the definition of automobiles and light-duty trucks as defined in §63.3176. However, in Phase 2 and Phase 3, Mercedes-Benz Vans is proposing to manufacture and coat some vehicles less than 8,500 lbs, in addition to the vehicles that are greater than 8,500 lbs. The vehicles in Phases 2 and 3 that are less than 8,500 lbs would meet the definition of automobiles and light-duty trucks as defined in Subpart IIII. Since there are future plans to manufacture and coat automobiles and light-duty trucks as the Charleston plant, Mercedes-Benz Vans is requesting that the Charleston plant be subject to the requirements of Subpart IIII. Table 4-3 shows the applicable operating limits, notification, recordkeeping, and reporting requirements of Subpart IIII as they pertain to the ADW. Due to the number of compliance options available, compliance demonstration requirements are not included in Table 4-3.

Table 4-3. Summary of NESHAP Subpart IIII Requirements for ADW

Requirement	Action	Citation
Operating Limits	For coating operations with add-on controls: you must meet the operating limits specified in Table 1 to this subpart. 5. Concentrators, including zeolite wheels and rotary carbon adsorbers a. The average desorption gas inlet temperature in any 3 hour period must not fall below the limit established according to §63.3167(e). i. Collecting the temperature data according to §63.3168(f); ii. Reducing the data to 3-hour block averages; and iii. Maintaining the 3-hour average temperature at or above the temperature limit.	§63.3093(b) §63.3093(c) Table 1
	If your add-on control device includes a concentrator, establish operating limits for the concentrator as follows: ➢ During the performance test, monitor and record the desorption gas inlet temperature at least once every 15 minutes during each of the 3 runs of the performance test. ➢ Use performance test data to calculate and record the average desorption gas inlet temperature. The minimum operating limit for the concentrator is 8 °C (15 °F) below the average desorption gas inlet temperature maintained during the performance test for that concentrator.	§63.3167(e)

Table 4-3. Summary of NESHAP Subpart IIII Requirements (cont.)

Requirement	Action	Citation
Operating Limits	➢ Keep the set point for the desorption gas inlet temperature no lower than 6 °C (10 °F) below the lower of that set point during the performance test for that concentrator and the average desorption gas inlet temperature maintained during the performance test for that concentrator.	§63.3167(e)
Notifications	Submit the Initial Notification required by §63.9(b) for a new or reconstructed affected source no later than 120 days after startup.	§63.3110(b)
	Submit the Notification of Compliance Status required by §63.9(h) no later than 60 days after the first day of the first full month following completion of all applicable performance tests.	§63.3110(c)
Recordkeeping	A copy of each notification and report that you submitted to comply with this subpart, and the documentation supporting each notification and report.	§63.3130(a)
	A current copy of information provided by materials suppliers or manufacturers	§63.3130(b)
	For each month, the records specified in paragraphs (c)(1)-(6).	§63.3130(c)
	Your records must be in a form suitable and readily available for expeditious review. Where appropriate, the records may be maintained as electronic spreadsheets or as a database. You must keep each record for 5 years following each occurrence, measurement, maintenance, corrective action, report, or record.	§63.3131(a)-(o)
Reporting	You must submit semiannual compliance reports for each affected source according to the requirements of §63.3120(a)(1) - (9).	§63.3120(a)
	You must submit reports of performance test results for emission capture systems and add-on control devices no later than 60 days after completing the tests as specified in §63.10(d)(2). You must submit reports of transfer efficiency tests no later than 60 days after completing the tests as specified in §63.10(d)(2).	§63.3120(b)
	If you used add-on control devices and you had a startup, shutdown, or malfunction during the semiannual reporting period, you must submit the reports specified in paragraphs §63.3120(c)(1) and (2).	§63.3120(c)

4.1.3.3. 40 CFR Part 63 Subpart MMMM—Surface Coating of Miscellaneous Metal Parts and Products

Subpart MMMM establishes HAP limits for miscellaneous metal parts and products surface coating facilities. Miscellaneous metal parts and products include metal motor vehicle parts and accessories.

As discussed in the original construction permit application for the facility, the vehicles to be coated in Phase 1 would not meet the definition of automobiles and light-duty trucks as defined in §63.3176, and would therefore be considered miscellaneous metal parts and products. However, in Phase 2 and Phase 3, Mercedes-Benz Vans is proposing to manufacture and coat some vehicles less than 8,500 lbs, in addition to the vehicles that are greater than 8,500 lbs. The vehicles in Phases 2 and 3 that are less than 8,500 lbs would meet the definition of automobiles and light-duty trucks as defined in Subpart IIII.

Pursuant to §63.3881(d), since the Charleston plant meets the applicability criteria in §63.3082(b) for the surface coating of automobiles and light-duty trucks, Mercedes-Benz Vans has chosen to comply with the requirements of Subpart IIII in lieu of complying with Subpart MMMM. Therefore, the coating processes at the Charleston plant will comply with the requirements of 40 CFR Part 63 Subpart IIII.

4.1.3.4. 40 CFR Part 63 Subpart PPPP—Surface Coating of Plastic Parts and Products

Subpart PPPP establishes HAP emission limits for plastic parts and products surface coating facilities. Plastic components include motor vehicle parts and accessories for automobiles, trucks, and recreation vehicles. However, the proposed operations in this revision do not include coating of plastic parts at the Charleston plant. Therefore, the facility is not subject to this requirement.

4.1.3.5. 40 CFR 63 Subpart ZZZZ—Reciprocating Internal Combustion Engines

Subpart ZZZZ regulates HAP emitted from stationary reciprocating internal combustion engines (RICE) located at major and area sources of HAP emissions. The proposed emergency compression ignition (CI) internal combustion engines will be new sources with respect to this subpart and will comply with 40 CFR 63 Subpart ZZZZ by complying with 40 CFR 60 Subpart IIII, pursuant to §63.6590(c). Since the proposed engines are not spark ignition (SI) ICE, the Charleston plant will comply with no further requirements under this Subpart.

4.1.3.6. 40 CFR 63 Subpart DDDDD—Industrial, Commercial, and Institutional Boilers & Process Heaters

This subpart establishes emission limitations and work practice standards for HAP emitted from industrial, commercial, and institutional boilers and process heaters located at major sources of HAP. This subpart also establishes requirements to demonstrate initial and continuous compliance with the emission limitations and work practice standards as well as recordkeeping and reporting requirements. As described in Section 2.2.3 of this application, Boilers B01 and B02 are considered "gas 1 units" under Subpart DDDDD and each boiler will be equipped with a continuous oxygen trim system that maintains an optimum fuel ratio. A summary of the applicable Subpart DDDDD requirements for the boiler is provided in Table 4-4.

Table 4-4. Summary of NESHAP Subpart DDDDD Requirements

Requirement	Action	Citation
Emission Limits	None	Subpart DDDDD, Table 1, Table 2
Compliance	Conduct initial tune up followed by tune-ups once every five (5) years for boilers with continuous oxygen trim systems. Tune-ups should be completed no more than 13 months after the previous tune-up. Initial tune-up shall be completed by: ➢ New Sources: 13 months after initial startup	Table 3, Item 1 §63.7515(d) §63.7540(a)(10)
Notifications	Submit a notification of alternative fuel use within 48 hours of the declaration of each period of natural gas curtailment or supply interruption.	§63.7545(f)
Recordkeeping	Maintain records of each notification and report.	§63.7555(a)
	Maintain records of fuel specification analysis.	§63.7555(g)
	Maintain tune-up records, as specified in §63.7540(a)(10)(i) through (vi).	§63.7540(a)(10)
	Maintain startup and shutdown records: ➢ The calendar date, time, occurrence and duration of each startup and shutdown. ➢ The type(s) and amount(s) of fuels used during each startup and shutdown.	§63.7555(i) §63.7555(j)
	Maintain all records and reports for five years.	§63.7560
Reporting	Submit Initial Notification within 120 calendar days after January 31, 2013.	§63.9(b)(2) §63.7545(b)
	Submit Initial Notification within 15 days after actual startup of the boiler.	§63.9(b)(4)(v) §63.7545(c)
	Submit Notification of Compliance Status report within 60 days following completion of the relevant compliance demonstration.	§63.9(h) §63.7545(e)
	Submit an annual compliance report no later than January 31 for the previous calendar year containing the information in 63.7550(c) (annual tune-up information and landfill gas fuel analysis results). Submit report electronically using CEDRI, if available.	§63.7550(b)

The ADW desorption heaters are part of the proposed carbon adsorption system to control and concentrate VOCs. As part of the control process, the carbon must be regenerated by heating it using an indirect-fired heater. The indirect-fired heaters are only used to regenerate the carbon adsorption system (control device) and do not heat any process units at the plant. Since the proposed ADW desorption heaters do not heat a transfer material "for use in a process unit", they do not meet the definition of a process heater provided in §63.7575. Therefore, the ADW desorption heaters are not subject to Subpart DDDDD.

Also pursuant to §63.7575, process heaters do not include units used for comfort heat or space heat. Since the social room air supply units provide comfort heat to the facility buildings, they are not subject to Subpart DDDDD.

4.1.4. Compliance Assurance Monitoring

Under 40 CFR 64, Compliance Assurance Monitoring (CAM), facilities are required to prepare and submit monitoring plans for certain emission units with the Title V application. The CAM Plans provide an on-going and reasonable assurance of compliance with emission limits. Under the general applicability criteria, this regulation only applies to emission units that use a control device to achieve compliance with an emission limit and whose pre-controlled emission levels exceed the major source thresholds under the Title V permitting program. Emission units with a continuous compliance determination method for a regulated pollutant are exempt from the requirements of CAM per 40 CFR 64.2(b)(1)(vi). For an emission unit with post-controlled emissions less than the major source emission thresholds, a CAM Plan is required to be submitted with the first Title V permit renewal application. For emission units that are routed to a control device and have pre-control emissions that exceed the major source threshold, Mercedes-Benz Vans comply with the CAM requirements listed in Construction Permit No. 0560-0385-CA-R2, except as described below.

As described in Section 2.2.1 of this application, several sources at the Charleston Plant are equipped with dry filters to control PM emissions. As described in Section 2.2.1 and the detailed emission calculations in Appendix B, pre-control emissions from each source do not exceed the 100 tpy major source thresholds for PM. Therefore, these operations are not subject to the CAM requirements.

As described in Section 2.2.2 of this application, Mercedes-Benz Vans requests revision of Condition C.67 for the ADWs which requires monitoring of the desorption outlet VOC concentration. Condition C.67 was included due to the 40 CFR Part 64 CAM monitoring requirements. Consistent with the monitoring in Conditions C.54 and C.55, Mercedes-Benz Vans requests that DHEC update Condition C.67 to utilize the desorption gas inlet temperature as the compliance indicator in lieu of VOC concentration.

4.1.5. Title V Operating Permit Program

40 CFR 70 establishes the federal Title V operating program. South Carolina has incorporated the provisions of this federal program in its state regulation, SC Regulation 61-62.70, *Title V Operating Permit Program*. Upon completion of the proposed project, the Charleston plant will be considered a Title V major source. As such, Mercedes-Benz Vans will submit a Title V operating permit application within 12 months after becoming a major source.

4.2. SOUTH CAROLINA REGULATION 61-62

SC Regulation 61-62 has been promulgated under authority from "The South Carolina Pollution Control Act" and these rules are applicable to each air pollution source operating in the State of South Carolina. Therefore, operations at the Charleston plant are subject to various regulations contained in these rules. The major provisions of the rules containing applicable emission/work practice standards applicable to the operations discussed in this application are discussed below.

4.2.1. Standard No. 1— Fuel Burning Operations

Regulation 61-62.5 Standard No. 1 regulates emissions of PM, SO_2, and opacity from fuel burning operations. Fuel burning operations are defined in Regulation 61-62.1 as:

> *Use of furnace, boiler, device or mechanism used principally but not exclusively, to burn any fuel for the purpose of indirect heating in which the material being heated is not contacted by and adds no substance to the products of combustion.*

The boilers, indirect paint shop combustion sources (ovens and ADW desorption heaters in Unit ID 2), and air supply units meet this definition and are subject to this standard. The requirements include:

- 20% Opacity limit (Regulation 62.5, Standard 1, Section I)
- 0.6 lb/MMBtu PM limit (Regulation 62.5, Standard 1, Section II)
- 2.3 lb/MMBtu SO_2 limit (Regulation 62.5, Standard 1, Section III)

Emission limits will be met through the use of natural gas as a fuel. Pursuant to Section I(C) of Standard 1, natural gas-fired units are not required to maintain records (in a log) of the periods of startup and shutdown.

4.2.2. Standard No. 2– Ambient Air Quality

Regulation 61-62.5 Standard No. 2 regulates ambient air quality and largely restates the allowable emission levels in the National Ambient Air Quality Standards (NAAQS). Compliance with Standard 2 is addressed in Section 6 of this application and a modeling submittal under separate cover.

4.2.3. Standard No. 3– Waste Combustion and Reduction

Regulation 61-62.5 Standard No. 3 generally regulates all sources that burn any waste other than virgin fuel for any purpose. The Charleston plant is proposing the installation of a RTO fueled by natural gas (RTO1) which will control HAP and VOC emissions from the paint shop.

RTO1 shall comply with the opacity and PM emissions limits for Industrial Incinerators. Pursuant to Standard No. 3, Section III.I.1-2, opacity shall not exceed 20%, and PM emissions shall not exceed 0.5 lbs/10^6 Btu total heat input.

Section IV sets forth the notification requirements and compliance schedules for new and existing units. The proposed RTO will begin operation after the compliance date and are therefore considered new units under this rule. Mercedes-Benz Vans will submit a notification of startup including all applicable information to the agency prior to commencing operation of RTO1, pursuant to Section IV.B.

Sections V, VI, and VIII describe the waste analysis requirements, monitoring requirements, and periodic testing requirements for sources subject to this regulation. Mercedes-Benz Vans is requesting exemption from these requirements on the basis that the exhaust streams routed to RTO1 contain minimal concentrations of PM, which is the only pollutant regulated under Standard No. 3 for industrial incinerators.

4.2.4. Standard No. 4– Emissions from Process Industries

Regulation 61-62.5 Standard No. 4 regulates various pollutants from specific process industries and particulate matter and opacity from any unspecified process sources. Process industry is defined in Regulation 61-62.1 Section I.69 as follows:

> *Any source engaged in the manufacture, processing, handling, treatment, forming, storing or any other action upon materials except fuel-burning operations.*

Section VIII sets particulate matter emission limits where not elsewhere specified. The emission limit in Section VIII – "Other Manufacturing" is calculated from the following equations:

$$E = (F)(4.10)(P)^{0.67} \quad \text{for } P < 30 \text{ tons per hour}$$
$$E = (F)(55.0\,(P)^{0.11} - 40), \quad \text{for } P \geq 30 \text{ tons per hour}$$

Where:

E	=	PM emissions limit in lb/hr;
P	=	Process weight rate in tons/hr; and
F	=	Effect factor (defined as 1)

All units other than the indirect-fired combustion units at the facility are subject to the emission limit in Section VIII. This includes all of the equipment in Table 4-5.

Table 4-5. Summary of Emission Limits for Units Subject to Standard No. 4

Unit ID	Equipment ID	Description	[P] (ton/hr)	[E] (lb/hr)
4	GC01, GC21	Paint Shop Guidecoat Booth	54.25	45.34
5	UBS01, UBS21	Underbody PVC Sealer Decks	54.25	45.34
6	CW01	Cavity Wax Operations	54.25	45.34
6	BC01, CC01, BC21	Paint Shop Topcoat Booths	54.25	45.34
6	SR01, SR02, SR03, AR01	Paint Shop Spot and Assembly Repair Booths	54.25	45.34
10	AUW	Assembly Underbody Wax Application	60.63	46.39
BS	BS01	Body Shop Welding and Soldering	54.25	45.34

Note that the emission limits provided in Table 4-5 are based on the curb weight of the largest vehicle manufactured at the facility.

Section IX sets visible emissions standards for those units where it is not elsewhere specified. Per this section, all proposed combustion equipment at the facility may not exhibit opacity greater than 20%.

Section X of Standard 4 applies to non-enclosed operations. Daimler Vans does not operate any non-enclosed stationary sources other than roads at the Charleston plant.

4.2.5. Standard No. 5– Volatile Organic Compounds

Regulation 61-62.5 Standard No. 5 regulates VOC from certain specific processes at facilities with the potential to emit VOC more than 100 tpy. The only potentially applicable sections of this standard are requirements for petroleum liquid storage in Section II.O and Section II.P, which apply to storage tanks greater than 40,000 and 39,600 gallons, respectively. The proposed revisions to the construction permit include the installation of a 1,240 gallon diesel storage tank (TK-03). The capacity of the proposed tank is less than 39,600 gallons, therefore, this standard does not apply.

4.2.6. Standard No. 5.2– Control of Oxides of Nitrogen (NO_X)

The provisions of this regulation apply to any stationary source constructed that emits or has the potential to emit NO_X generated from fuel combustion, has not undergone a BACT analysis for NO_X in accordance with SC Regulation 61-62.5, Standard No. 7, and meets one or more of the following criteria:

- Constructed after June 25, 2004;
- Constructed before June 25, 2004 and has replaced a burner assembly after May 25, 2007; and

- Removed from one permitted facility and moved to another permitted facility after May 25, 2007 except for process equipment and commercial or industrial boilers transferred between facilities within the state under common ownership.

Pursuant to Section I(B)(1) of Standard No. 5.2, any source emitting NO_X listed in Regulation 61-62.1, Section II(B) is exempt from Standard No. 5.2. Regulation 61-62.1, Section II(B) includes sources with a total uncontrolled potential to emit (PTE) of less than five (5) tons per year (tpy) each of PM, SO_2, NO_X, and CO; and a total uncontrolled PTE of less than 1,000 pounds per month (lbs/month) of VOCs. As shown in Appendix B, the potential emissions from Boiler #1 (B01), Boiler #2 (B02), E-coat oven burners (OV01), Air Supply Unit 2.1 – Shop + Open Workdecks (ASU 2.1), Air Supply Unit 2.2 – Shop + Open Workdecks (ASU 2.2), and Air Supply Unit 2.3 – Shop (ASU 2.3) are each well below 5 tpy of PM, SO_2, NO_X, and CO, and 1,000 lbs/month of VOC. Therefore, B01, B02, OV01, ASU 2.1, ASU 2.2, and ASU 2.3 are exempt from Standard No. 5.2. Mercedes-Benz Vans requests that Conditions C.16, C.17, and C.18 in Construction Permit No. 0560-0385-CA-R2 be eliminated because Standard 5.2 is not applicable to these sources.

Potential emissions from B01, B02, OV01, ASU 2.1, ASU 2.2, and ASU 2 have been provided in Appendix B of this application.

4.2.7. Standard No. 7– Prevention of Significant Deterioration

Regulation 61-62.5 Standard No. 7 is South Carolina's version of the PSD program. Table 4-1 of this section illustrates that potential emissions of at least one pollutant (VOC) will be greater than 250 tpy from the proposed project. Therefore, since at least one PSD-regulated pollutant has emissions exceeding 250 tpy, the Charleston plant is a PSD major stationary source, and PSD review is required for the project. As the entire site will then be a major PSD source, emissions increases from the project must then be assessed against the PSD SERs as shown in Table 4-1. As shown in Table 4-1, PM, PM_{10} and $PM_{2.5}$ are above the SERs for the project. The proposed updates to operations identified in this construction permit revision application will not change the PSD applicability determined in the original application as detailed in Table 4-1.

All of the requirements of Standard No. 7 are either provided with this application, or will be provided under separate cover. NAAQS modeling, increment modeling, Class I area modeling analyses, as well as an additional impacts analysis will be provided under separate cover. A complete analysis of BACT (control technology review) is provided in Section 5 of this application.

4.2.8. Standard No. 8– Toxic Air Pollutants

Regulation 61-62.5 Standard No. 8 regulates ambient air quality of certain toxic air pollutants (TAP), including federal HAP. The paint shop will be subject to the Auto MACT (40 CFR 63 Subpart IIII), the proposed boilers will be subject to Boiler MACT (40 CFR 63 Subpart DDDDD), and the proposed emergency generators will be subject to RICE MACT (40 CFR 63 Subpart ZZZZ). These operations are exempt from the requirements of Standard No. 8 for toxic air pollutants that are HAPs in accordance with Standard No. 8, Section I.D.1. Additionally, the rooftop units, and air supply units are exempt from Standard No. 8 through the combustion of virgin fuels.

Due to the variability in materials used at the Charleston plant, the proposed operations could potentially emit TAPs that are not HAPs. In accordance with Standard No. 8, Section I.D.3, Mercedes-Benz Vans requests exemption from Standard No. 8 in these instances since non-HAP/TAP emissions are controlled by MACT controls.

Emissions from body shop welding operations contain a small quantity of manganese, however, the manganese emission rate is below the modeling de minimis level. No other permitted emission units emit TAP.

4.2.9. Regulation 61-62.6– Control of Fugitive Particulate Matter

Regulation 61-62.6 requires the control of fugitive particulate matter in non-attainment areas, problem areas, and statewide. The Charleston plant is located in Charleston County, which is designated as attainment or unclassifiable for particulate matter.[6] Charleston County is also not considered a problem area. Therefore, the facility is subject to the statewide requirement to implement good dust control practices.

[6] 40 CFR §81.341

5. CRITERIA POLLUTANT BACT ANALYSIS

As required in Regulation 61-62.5, Standard No. 7, Section (aa)(11)(c), Mercedes-Benz Vans is including a revised BACT analysis for the equipment described in Section 2 of this application. This section discusses the regulatory basis for BACT, the approach used in completing the BACT analyses, and the BACT analyses for the processes. Supporting documentation is included in Appendix C.

5.1. BACT DEFINITION

BACT is defined in the PSD regulations [40 CFR 52.21(b)(12)] as:

> *...an emissions limitation (including a visible emission standard) based on the maximum degree of reduction for each pollutant subject to regulation under Act which would be emitted from any proposed major stationary source or major modification which the Administrator, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such source or modification through application of production processes or available methods, systems, and techniques, including fuel cleaning or treatment or innovative fuel combustion techniques for control of such pollutant. In no event shall application of best available control technology result in emissions of any pollutant which would exceed the emissions allowed by any applicable standard under 40 CFR parts 60 and 61.*

South Carolina Regulation 61-62.5, Standard No. 7 Section (b)(8) provides the following BACT definition:

> *(8) "**Best available control technology (BACT)**" means an emissions limitation (including a visible emission standard) based on the maximum degree of reduction for each regulated NSR pollutant which would be emitted from any proposed major stationary source or major modification which the Department, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such source or modification through application of production processes or available methods, systems, and techniques, including fuel cleaning or treatment or innovative fuel combustion techniques for control of such pollutant. In no event shall application of BACT result in emissions of any pollutant which would exceed the emissions allowed by any applicable standard under 40 CFR 60 and 61. If the Department determines that technological or economic limitations on the application of measurement methodology to a particular emissions unit would make the imposition of an emissions standard infeasible, a design, equipment, work practice, operational standard, or combination thereof, may be prescribed instead to satisfy the requirement for the application of BACT. Such standard shall, to the degree possible, set forth the emissions reduction achievable by implementation of such design, equipment, work practice or operation, and shall provide for compliance by means which achieve equivalent results.*

5.2. BACT DETERMINATION ANALYSIS

In a memorandum dated December 1, 1987, the U.S. EPA stated their preference for a "top-down" analysis.[7] The first step in this approach is to determine the most stringent control available for a similar or identical source or source category for each emission unit. If it can be shown that this level of control is technically, environmentally, or economically infeasible for the unit in question, then the next most stringent level of control is determined and similarly evaluated. This process continues until the BACT level under consideration cannot be eliminated by any substantial or unique technical, environmental, or economic objections. Presented below

[7] U.S. EPA, Office of Air and Radiation. Memorandum from J.C. Potter to the Regional Administrators. Washington, D.C. December 1, 1987.

are the five basic steps of a "top-down" BACT analysis procedure as identified by the U.S. EPA in the October 1990 Draft *New Source Review Workshop Manual*.[8]

5.2.1. BACT Step 1– Identify All Control Technologies

Available control technologies are identified for each emission unit in question. The following methods are used to identify potential technologies: 1) researching the Reasonably Available Control Technology (RACT)/Best Available Control Technology (BACT)/Lowest Achievable Emission Reduction (LAER) Clearinghouse (RBLC) database, 2) surveying regulatory agencies, 3) drawing from previous engineering experience, 4) surveying air pollution control equipment vendors, and 5) surveying available literature.

5.2.2. BACT Step 2– Eliminate Technically Infeasible Options

After the identification of control options, an analysis is conducted to eliminate technically infeasible options. A control option is eliminated from consideration if there are process-specific conditions that prohibit the implementation of the control or if the highest control efficiency of the option would result in an emission level that is higher than any applicable regulatory limits, such as a NSPS.

5.2.3. BACT Step 3– Eliminate Technically Infeasible Options

Once technically infeasible options are removed from consideration, the remaining options are ranked based on their control effectiveness. If there is only one remaining option, or if all of the remaining technologies could achieve equivalent control efficiencies, ranking based on control efficiency is not required.

5.2.4. BACT Step 4– Evaluate the Most Effective Controls and Document Results

Beginning with the most efficient control option in the ranking, detailed economic, energy, and environmental impact evaluations are performed. If a control option is determined to be economically feasible without adverse energy or environmental impacts, it is not necessary to evaluate the remaining options with lower control efficiencies.

The economic evaluation centers on the cost effectiveness of the control option. Costs of installing and operating control technologies are estimated and annualized following the methodologies outlined in the EPA's *Control Cost Manual* (CCM)[9] and other industry resources. Cost effectiveness is expressed in dollars per ton of pollutant controlled. Objective analyses of energy and environmental impacts associated with each option are also conducted. Both beneficial and adverse impacts are discussed and quantified.

5.2.5. BACT Step 5– Select BACT

In the final step, one pollutant specific control option is proposed as BACT for each emission unit under review based on evaluations from the previous step.

The technical aspect of a BACT evaluation is a fairly non-subjective process. The same cannot be said for the economic feasibility. The definition of the limit of economic feasibility, the level at which the annual cost of

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[8] U.S. EPA, Office of Air Quality Planning and Standards. *New Source Review Workshop Manual: Prevention of Significant Deterioration and Nonattainment Area Permitting*, Draft. Research Triangle Park, NC. October 1990.

[9] U.S. EPA, Office of Air Quality Planning and Standards. EPA Control Cost Manual, 6th edition. EPA 452/B-02-001. Research Triangle Park, NC. January 2002.

owning and operating a control device or technology per ton of pollutant removed is considered an economic burden (infeasible), varies on a case-by-case basis as determined by DHEC.

Economic analyses are performed to compare total costs (capital and annual) for potential control technologies as appropriate. Capital costs include the initial cost of the components intrinsic to the complete control system. Operating costs include the financial requirements to operate the control system on an annual basis and include overhead, maintenance, outages, raw materials, and utilities.

The capital cost estimating technique is based on a factored method of determining direct and indirect installation costs. This technique is a modified version of the Lang Method whereby installation costs are expressed as a function of known equipment costs. This method is consistent with the latest U.S. EPA guidance manual on estimating control technology costs.[10]

Total purchased equipment cost represents the delivered cost of the control equipment, auxiliary equipment, and instrumentation. Auxiliary equipment consists of all the structural, mechanical and electrical components required for efficient operation of the device. Auxiliary equipment costs are estimated as a straight percentage of the basic equipment cost obtained directly from representative vendors. Direct installation costs consist of the direct expenditures for materials and labor for site preparation, foundations, structural steel, erection, piping, electrical, painting, and facilities.[11] Indirect installation costs include engineering and supervision of contractors, construction and field expenses, construction fees, and contingencies.[12] Other indirect costs include equipment startup, performance testing, working capital, and interest during construction.

Annualized costs are comprised of direct and indirect operating costs. Direct annual costs include labor, maintenance, replacement parts, raw materials, utilities, and waste disposal. Indirect operating costs include plant overhead, taxes, insurance, general administration, and capital charges. Labor supervision was estimated at 15% of operating labor. Replacement part costs are included where applicable, while raw material costs are estimated based upon the unit cost and annual consumption. With the exception of overhead, indirect operating costs are calculated as a percentage of the total capital costs. The indirect capital costs are based on the capital recovery factor (CRF) defined as:

$$CRF = \frac{i(1+i)^n}{(1+i)^n - 1}$$

where i is the annual interest rate and n is the equipment life in years. The economic life of a control system is typically 10 to 20 years. For example, a 10-year equipment economic life with an average interest rate of 9.75 percent results in a CRF of 0.1610.

5.3. BACT APPLICABILITY

The BACT requirement applies to each new or modified emission unit from which there are emissions increases of pollutants above the PSD SERs.

The proposed Charleston plant expansion results in a significant increase of PM, PM_{10}, $PM_{2.5}$ and VOC emissions. Table 5-1 identifies the pollutants considered in the BACT analysis for each emission unit described in Section 2

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[10] U.S. EPA, Office of Air Quality Planning and Standards Control Cost Manual, 6th edition, EPA/452/B-02-001, January 2002.

[11] Ibid.

[12] Ibid.

of this application. For a number of units with low uncontrolled emissions or fugitive emissions, an abbreviated BACT analysis was completed. In lieu of a "top-down" analysis, a RBLC comparison is performed. For all other units, a "top-down" analysis is provided.

Table 5-1 provides a summary of the revised BACT analyses included in this application. Please note that only the $PM/PM_{10}/PM_{2.5}$ BACT analyses for equipment described in Section 2.2.1 is provided in this section as the proposed monitoring changes are related to the dry filters only.

Table 5-1. BACT Analysis Summary By Unit

Equipment ID	Unit Description	$PM/PM_{10}/PM_{2.5}$	VOC
B01, B02	Energy Center Boilers	Top-Down	Top-Down
BS (MAG)	Body Shop MAG Welding Areas	Top-Down	N/A
ASU, AS-RTU, BS-RTU	Gas-Fired Combustion Units	Top-Down	Top-Down
EG03, EG04	Diesel-Fired Emergency Generators	Abbreviated	Abbreviated
TK03	Diesel Storage Tank	N/A	Abbreviated

5.4. ABBREVIATED BACT FOR LOW EMITTING AND FUGITIVE SOURCES

Abbreviated analyses for units with uncontrolled emissions 5 tons per year (tpy) or less and fugitive emissions sources are provided in the following subsections. Note the same control techniques that reduce PM also reduce PM_{10} and filterable $PM_{2.5}$. The BACT analyses for PM, PM_{10} and $PM_{2.5}$ are combined to eliminate redundancy.

5.4.1. Storage Tank

The proposed diesel storage tank is considered insignificant activities for permitting purposes and has potential uncontrolled VOC emissions of less than 5 pounds per year. The proposed atmospheric tank will be designed with submerged fill lines, spill and overfill protection, and conservation vents to minimize atmospheric emissions.

5.4.2. Emergency Engines

The proposed emergency generators (EG03, EG04) are diesel-fired. The total $PM/PM_{10}/PM_{2.5}$ and VOC emissions from these units are each less than 5 tpy. In addition, the operation of this equipment will be limited to emergency events, and required routine testing. Therefore, the total hours of operation is limited to 500 hours per year. Due to the small quantity of $PM/PM_{10}/PM_{2.5}$ and VOC emissions associated with the emergency units, and the emergency nature of operation of the units, a "top-down" BACT analysis has not been conducted. These units will meet BACT requirements by complying with the applicable requirements of NSPS Subpart IIII and NESHAP Subpart ZZZZ.

5.5. VOC TOP-DOWN BACT

The following sections provide the revised VOC "top-down" BACT analyses for the boilers and air supply units. The control technologies listed in the following subsections were obtained from the sources listed in Section 5.3.

5.5.1. Boiler BACT

5.5.1.1. Identification of Potential Control Techniques (Step 1)

Analyzing the RBLC search results and permit review results for similar natural gas-fired units, as well as review of technical literature, potentially applicable VOC control technologies were identified based on the principles of the control technology and engineering experience for general combustion units. These technologies are listed as follows:

- Oxidation Catalyst
- Good Combustion Practices

These VOC reduction options are discussed in the following subsections.

Oxidation Catalyst
Oxidation catalyst controls VOC emissions by facilitating the complete combustion of organic compounds to water vapor and carbon dioxide. Oxidation catalysts are effective and suitable for use with natural gas and distillate combustion.

Good Combustion Practices
Ensuring that the temperature and oxygen availability are adequate for complete combustion minimizes VOC formation. This technique includes continued operation of the boiler at the appropriate oxygen range and temperature.

5.5.1.2. Elimination of Technically Infeasible Control Options (Step 2)

All of the controls listed in Step 1 are technically feasible.

5.5.1.3. Rank of Remaining Control Technologies (Step 3)

Table 5-2. Remaining VOC Control Technologies (Boiler BACT)

Rank	Control Technology	Potential Control Efficiency of Captured VOC (%)
1	Oxidation Catalyst	20-40
2	Good Combustion Practices	Varies

5.5.1.4. Evaluation of Most Stringent Controls (Step 4)

Mercedes-Benz Vans evaluated the economic impacts of oxidation catalyst in order to determine whether this control technology is a feasible option. Potential VOC emissions from each boiler are 0.23 tpy. With potential uncontrolled VOC emission rates of this magnitude, add-on control technologies for VOC are cost prohibitive for the boilers. As shown in Appendix C, the annual control cost of oxidation catalyst exceeds $300,000 per ton of emissions reduced.

No natural gas-fired boilers at automobile manufacturing facilities listed in the RBLC have oxidation catalyst listed as a control method. All of the VOC BACT limits for comparable RBLC entries are based off the AP-42 emission factor for natural gas combustion. The comparable RBLC entries are provided in Table C.1.2.1, as part of the RLBC database search results in Appendix C. Therefore, based on the economic analysis and a review of similar boilers in the RBLC database, oxidation catalyst is not selected as BACT for control of VOC emissions from the boilers. The RBLC indicates that the use of gaseous fuel (i.e., natural gas) represents BACT for VOC for units in this size range. Thus, Mercedes-Benz Vans proceeded with evaluating the next most efficient control option.

The only remaining technology is good combustion practices, including the burning of natural gas in the combustion units. A properly designed and operated natural gas-fired combustion unit minimizes VOC formation by ensuring that the unit temperature and oxygen availability are adequate for complete combustion. Good combustion practices are considered BACT for VOC emissions from the boiler.

5.5.1.5. Selection of BACT (Step 5)

Based on the control technology evaluation, good combustion practices to achieve minimum emissions of VOC is determined as the BACT for the boilers. This involves ensuring good air/fuel mixing and sufficient residence time in the combustion zone, operating with excess oxygen levels high enough to complete combustion while maximizing thermal efficiency, and ensuring proper fuel gas supply system design and operation. In addition, Mercedes-Benz Vans will demonstrate continuous compliance with the proposed emission limits by complying with the work practice standards in SC Standard 5.2 and 40 CFR 63 Subpart DDDDD. With this application Mercedes-Benz Vans is proposing to conduct a tune-up of each boiler every five (5) years as described in Section 2.2.3.

The RBLC database search results in Table C.1.2.1 in Appendix C indicate that similar natural gas-fired units used the AP-42 emission factors to set VOC BACT limits for boilers. Mercedes-Benz Vans will use the same basis to set the VOC BACT limits. The proposed emission limit for natural gas combustion sources (5.5 lb/MMscf) is provided in Table 5-5. A column is provided in the RLBC search results in Appendix C that shows the calculated emission limit for each entry in units of lb/MMscf in order to easily compare to the AP-42 factors. The proposed limit is less than or equal to the calculated lb/MMscf values calculated for all other paint shop boilers.

5.5.2. Gas-Fired Combustion Units BACT

5.5.2.1. Identification of Potential Control Techniques (Step 1)

Using the RBLC search and permit review results, as well as review of technical literature, potentially applicable VOC control technologies were identified based on the principles of the control technology and engineering experience for natural gas-fired combustion units (i.e. ovens, ASU, RTU). These technologies are listed as follows:

- Oxidation Catalyst
- Good Combustion Practices

5.5.2.2. Elimination of Technically Infeasible Control Options (Step 2)

All of the controls listed in Step 1 are technically feasible.

5.5.2.3. *Rank of Remaining Control Technologies (Step 3)*

Table 5-3. Remaining VOC Control Technologies (Gas-Fired Combustion Units BACT)

Rank	Control Technology	Potential Control Efficiency of Captured VOC (%)
1	Oxidation Catalyst	20-40
2	Good Combustion Practices	Varies

5.5.2.4. *Evaluation of Most Stringent Controls (Step 4)*

Mercedes-Benz Vans evaluated the economic impacts of oxidation catalyst in order to determine whether this control technology is a feasible option. Potential VOC emissions from each individual natural gas-fired combustion unit are less than 0.30 tpy. With potential uncontrolled VOC emission rates of this magnitude, add-on control technologies for VOC are cost prohibitive for all natural gas-fired combustion units. As shown in Appendix C, the annual control cost of oxidation catalyst exceeds $300,000 per ton of emissions reduced.

The only remaining technology is good combustion practices, including the burning of natural gas in the combustion units. A properly designed and operated natural gas-fired combustion unit minimizes VOC formation by ensuring that the unit temperature and oxygen availability are adequate for complete combustion. Good combustion practices is considered BACT for VOC emissions for the gas-fired combustion units.

5.5.2.5. *Selection of BACT (Step 5)*

Comparable RBLC entries are provided in Table C.1.2.2, as part of the RLBC database search results in Appendix C. Based on the control technology evaluation, good combustion practices to minimize emissions of VOC is determined as the BACT for the gas-fired combustion units. This involves inspection of burners and flame patterns, and ensuring proper fuel gas supply system design and operation.

The RBLC database search results provided in Table C.1.2.2 indicate that similar operations used the AP-42 emission factors for natural gas combustion to set VOC BACT limits natural gas-fired combustion units. The proposed emission limit (5.5 lb/MMscf) is provided in Table 5-5. A column is provided in the RLBC database in Appendix C that shows the calculated emission limit for each entry in units of lb/MMscf in order to easily compare to the AP-42 factors. The proposed limit is less than or equal to the calculated lb/MMscf values calculated for all other gas-fired combustion units.

5.6. PM/ PM_{10} /$PM_{2.5}$ TOP-DOWN BACT

The following sections provide the revised PM/PM_{10}/$PM_{2.5}$ "top-down" BACT analyses for the body shop welding operations.

5.6.1. Boiler BACT

5.6.1.1. *Identification of Potential Control Techniques (Step 1)*

Using an RBLC search for similar natural gas-fired boilers and permit review results, as well as review of technical literature, potentially applicable PM/PM_{10}/$PM_{2.5}$ control technologies were identified based on the principles of the control technology and engineering experience for general combustion units. The only available control option is good combustion practices.

5.6.1.2. Elimination of Technically Infeasible Control Options (Step 2)

Good combustion practices are a technically feasible control options for reducing $PM/PM_{10}/PM_{2.5}$ emissions from the boilers.

5.6.1.3. Rank of Remaining Control Technologies (Step 3)

Implementing good combustion practices provides the most effective means for reducing emissions of $PM/PM_{10}/PM_{2.5}$ from the boilers.

5.6.1.4. Evaluation of Most Stringent Controls (Step 4)

The top and only available and technically feasible $PM/PM_{10}/PM_{2.5}$ control option will be applied to achieve compliance with the proposed BACT limit.

5.6.1.5. Selection of BACT (Step 5)

Table C.1.1.1 in the RBLC database search results in Appendix C indicates that similar natural gas-fired units used the AP-42 emission factors to set $PM/PM_{10}/PM_{2.5}$ BACT limits for boilers. Mercedes-Benz Vans will utilize good combustion practices to limit $PM/PM_{10}/PM_{2.5}$ emissions from the boilers. Good combustion practices include ensuring good air/fuel mixing and sufficient residence time in the combustion zone, good burner maintenance and operation, and proper fuel gas supply system design and operation. In addition, Mercedes-Benz Vans will demonstrate continuous compliance with the proposed BACT requirements by complying with the work practice standards in SC Standard 5.2 and 40 CFR 63 Subpart DDDDD. With this application Mercedes-Benz Vans is proposing to conduct a tune-up of each boiler every five (5) years as described in Section 2.2.3.

The proposed $PM/PM_{10}/PM_{2.5}$ BACT limit of 7.6 lb/MMscf is provided in Table 5-5. This limit is based on the AP-42 emission factor and is consistent with all other similar RBLC entries. A column is provided in the RLBC database in Appendix C that shows the calculated emission limit for each entry in units of lb/MMscf in order to easily compare to the AP-42 factors.[13] Since Mercedes-Benz is proposing a BACT limit based on the AP-42 emission factor for total PM, entries based on filterable PM were not compared to the proposed BACT limit. There is one entry in the RBLC database for boilers whose emission limit is slightly lower than the limit proposed by Mercedes-Benz Vans in Table 5-5. The RBLC database shows that Daimler Chrysler Corporation proposed a 0.15 lb/hr limit for two 13.31 MMBtu/hr natural gas-fired boilers at its Toledo facility. This limit is equal to 7.50 lb/MMscf. Mercedes-Benz Vans believes that rounding or the use of a different natural gas heating value caused this limit to be slightly lower than the AP-42 emission factor for total PM (7.60 lb/MMscf). Since the limit is rounded to two decimal places, it is possible that the limit proposed by Daimler Chrysler is between 0.15 – 0.154 lb/hr. A limit of 0.154 lb/hr is equal to 7.70 lb/MMscf, slightly higher than the AP-42 emission factor and the limit proposed by Mercedes-Benz Vans in Table 5-5. Therefore, Mercedes-Benz Vans has determined that the AP-42 emission factor for $PM/PM_{10}/PM_{2.5}$ is an appropriate BACT limit.

5.6.2. Gas-Fired Combustion Units BACT

5.6.2.1. Identification of Potential Control Techniques (Step 1)

Using the RBLC search and permit review results, as well as review of technical literature, potentially applicable $PM/PM_{10}/PM_{2.5}$ control technologies were identified based on the principles of the control technology and

[13] Mercedes-Benz Vans assumed a natural gas heating value of 1,020 Btu/scf, per AP-42 Section 1.4, Natural Gas Combustion to convert the limits in the RBLC database to units of lb/MMscf for comparison purposes.

engineering experience for gas-fired combustion units. The only available control option is good combustion practices.

5.6.2.2. Elimination of Technically Infeasible Control Options (Step 2)

Good combustion practices are a technically feasible control options for reducing $PM/PM_{10}/PM_{2.5}$ emissions from natural gas-fired combustion units.

5.6.2.3. Rank of Remaining Control Technologies (Step 3)

Implementing good combustion practices provides the most effective means for reducing emissions of $PM/PM_{10}/PM_{2.5}$ from the natural gas-fired combustion units.

5.6.2.4. Evaluation of Most Stringent Controls (Step 4)

The top and only available and technically feasible $PM/PM_{10}/PM_{2.5}$ control option will be applied to achieve compliance with the proposed BACT limit.

5.6.2.5. Selection of BACT (Step 5)

Table C.1.1.2 in the RBLC database search results in Appendix C indicates that similar operations used the AP-42 emission factors for natural gas combustion to set $PM/PM_{10}/PM_{2.5}$ BACT limits for natural gas-fired combustion units. Mercedes-Benz Vans will utilize good combustion practices to limit $PM/PM_{10}/PM_{2.5}$ emissions from the natural gas-fired combustion units. Good combustion practices include ensuring good air/fuel mixing and sufficient residence time in the combustion zone, good burner maintenance and operation, and proper fuel gas supply system design and operation. The proposed $PM/PM_{10}/PM_{2.5}$ BACT limit of 7.6 lb/MMscf is provided in Table 5-5. This limit is based on the AP-42 emission factor and is less than or equal to all other similar RBLC entries. A column is provided in the RLBC database in Appendix C that shows the calculated emission limit for each entry in units of lb/MMscf in order to easily compare to the AP-42 factors. Since Mercedes-Benz Vans is proposing a BACT limit based on the AP-42 emissions factor for total PM, entries based on filterable PM were not compared to the proposed BACT limit.

5.6.3. Body Shop MAG Welding BACT

5.6.3.1. Identification of Potential Control Techniques (Step 1)

Candidate control options identified from the RBLC search, permit review, and the literature review include those classified as pollution reduction techniques. $PM/PM_{10}/PM_{2.5}$ reduction options include:

- HEPA Filter
- Good operating practices
- Electrostatic Precipitator

5.6.3.2. Elimination of Technically Infeasible Control Options (Step 2)

There are no control options described in Section 5.6.3.1 that are technically infeasible.

5.6.3.3. Rank of Remaining Control Technologies (Step 3)

The third of the five steps in the "top-down" BACT assessment procedure is to rank technically feasible control technologies by control effectiveness. The remaining control technologies are presented in Table 5-4.

Table 5-4. Remaining $PM/PM_{10}/PM_{2.5}$ Control Technologies (MAG Welding Operations)

Rank	Control Technology	Potential Control Efficiency of Captured $PM/PM_{10}/PM_{2.5}$ (%)
1	HEPA Filter	90-99
2	Electrostatic Precipitator	90-99
3	Good Operating Practices	Varies

5.6.3.4. Evaluation of Most Stringent Controls (Step 4)

For the purposes of employee health and safety, Mercedes-Benz Vans has elected to utilize a HEPA filter to control emissions from MAG welding operations to reduce $PM/PM_{10}/PM_{2.5}$ emissions. The HEPA filter will vent inside the building. The use of a HEPA filter provides an equivalent level of control to the currently permitted electrostatic precipitator and therefore satisfies BACT requirements.

5.6.3.5. Selection of BACT (Step 5)

Mercedes-Benz Vans will control $PM/PM_{10}/PM_{2.5}$ emissions from MAG welding operations with the use of a HEPA filter. The proposed $PM/PM_{10}/PM_{2.5}$ BACT operating requirements are summarized in Table 5-6.

Table C.1.1.3 in Appendix C provides RBLC search results from body shop operations. The emission limits provided are in a variety of forms, including control efficiencies, mass-based emission limits, and opacity limits. Mercedes-Benz Vans is not proposing an opacity limit, as the correlation between opacity and $PM/PM_{10}/PM_{2.5}$ from these operations has not been established. The reduction in $PM/PM/PM_{10}$ emissions reductions that are achieved for MAG welding operations with the use of HEPA filters that vent indoors are greater than the 99% control efficiency listed for the control devices used at the Nissan North America facility of 99%. Mercedes-Benz Vans is not proposing mass-based emission limits since all welding operations are conducted indoors and are not easily evaluated to demonstrate compliance. Mercedes-Benz Vans estimates that actual emissions will be negligible.

5.7. PROPOSED BACT LIMITS

Based on the analyses provided in this section, the proposed numerical BACT limits for the proposed operations are summarized in Table 5-5. Proposed BACT operating summary requirements are provided in Table 5-6.

Table 5-5. Proposed BACT Emission Limits Summary

Equipment ID	Unit Description	$PM/PM_{10}/PM_{2.5}$ BACT Limit	Units	Avg. Period	VOC BACT Limit	Units	Avg. Period
B01, B02	Boilers	7.6	lb/MMscf	3-hour	5.5	lb/MMscf	Monthly
ASU, AS-RTU, BS-RTU, OV01, OV02, OV03	Gas-Fired Combustion Units	7.6	lb/MMscf	3-hour	5.5	lb/MMscf	Monthly

Table 5-6. Proposed BACT Operating Requirements Summary

Equipment ID	Unit Description	$PM/PM_{10}/PM_{2.5}$ BACT Operating Requirement	VOC BACT Operating Requirement
B01, B02	Boilers	Tune-ups every five (5) years as required in 40 CFR 63 Subpart DDDDD	Tune-ups every five (5) years as required in 40 CFR 63 Subpart DDDDD
ASU, AS-RTU, BS-RTU, OV01, OV02, OV03	Gas-Fired Combustion Units	Good combustion practices	Good combustion practices
EG03, EG04	Emergency Generators	NSPS Subpart IIII compliance	NSPS Subpart IIII compliance
TK03	Diesel Storage Tank	N/A	N/A
BS	Body Shop Welding Area	HEPA Filter (MAG Welding), good operating practices, indoor venting	N/A

6. CLASS I, CLASS II, AND ADDITIONAL IMPACTS ANALYSIS

The air dispersion modeling demonstrations submitted in the original application have been revised due to changes described in this application. A detailed modeling report for the proposed project including Class I, Class II, and additional impacts analysis will be provided under separate cover.

7. DHEC PERMIT APPLICATION FORMS

The required DHEC permit application forms are included in this section.

(P) dhec

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BUREAU OF AIR QUALITY

Bureau of Air Quality
Construction Permit Application
Facility Information

FACILITY IDENTIFICATION	
SC Air Permit Number (8-digits only) *(Leave blank if one has never been assigned)* 0560 - 0385	Application Date February 2018
Facility Name *(This should be the name used to identify the facility at the physical address listed below)* Mercedes-Benz Vans, LLC	Facility Federal Tax Identification Number *(Established by the U.S. Internal Revenue Service to identify a business entity)*

FACILITY PHYSICAL ADDRESS		
Physical Address: 8501 Palmetto Commerce Parkway		County: Charleston
City: Ladson	State: SC	Zip Code: 29456
Facility Coordinates *(Facility coordinates should be based at the front door or main entrance of the facility.)*		
Latitude: 32° 57' 50.25"	Longitude: 80° 06' 27.27"	☐ NAD27 *(North American Datum of 1927)* Or ☒ NAD83 *(North American Datum of 1983)*

CO-LOCATION DETERMINATION
Are there other facilities in close proximity that could be considered co-located? ☒ No ☐ Yes*
List potential co-located facilities, including air permit numbers if applicable: Not Applicable

**If yes, please submit co-location applicability determination details in an attachment to this application.*

COMMUNITY OUTREACH
What are the potential air issues and community concerns? Please provide a brief description of potential air issues and community concerns about the entire facility and/or specific project. Include how these issues and concerns are being addressed, if the community has been informed of the proposed construction project, and if so, how they have been informed.

FACILITY'S PRODUCTS / SERVICES	
Primary Products / Services *(List the primary product and/or service)* Automobile Manufacturing, Light Truck and Utility Vehicle Manufacturing	
Primary SIC Code *(Standard Industrial Classification Codes)* 3711	Primary NAICS Code *(North American Industry Classification System)* 336111
Other Products / Services *(List any other products and/or services)*	
Other SIC Code(s): 3713	Other NAICS Code(s): 336112

AIR PERMIT FACILITY CONTACT *(Person at the facility who can answer technical questions about the facility and permit application.)*			
Title/Position: Paint Engineer	Salutation: Mr.	First Name: Jae	Last Name: Park
Mailing Address: 8501 Palmetto Commerce Parkway			
City: Ladson		State: SC	Zip Code: 29456
E-mail Address: jae.park@daimler.com		Phone No.: (843) 695-5095	Cell No.:

The signed permit will be e-mailed to the designated Air Permit Contact.
If additional individuals need copies of the permit, please provide their names and e-mail addresses.

Name	E-mail Address
Russell Revell	russell.revell@daimler.com

CONFIDENTIAL INFORMATION / DATA
Does this application contain confidential information or data? ☒ No ☐ Yes*

If yes, include a sanitized version of the application for public review and* ***ONLY ONE COPY OF CONFIDENTIAL INFORMATION SHOULD BE SUBMITTED*

Bureau of Air Quality
Construction Permit Application
Facility Information

LIST OF FORMS INCLUDED *(Identify all forms included in the application package)*	
Form Name	**Included (Y/N)**
Expedited Review Request (DHEC Form 2212)	☒ Yes ☐ No
Equipment/Processes (DHEC Form 2567)	☒ Yes
Emissions (DHEC Form 2569)	☒ Yes
Regulatory Review (DHEC Form 2570)	☒ Yes
Emissions Point Information (DHEC Form 2573)	☒ Yes ☐ No (If No, Explain:)

OWNER OR OPERATOR			
Title/Position: President/CEO	Salutation: Mr.	First Name: Michael	Last Name: Balke
Mailing Address: 8501 Palmetto Commerce Parkway			
City: Ladson		State: SC	Zip Code: 29546
E-mail Address: Michael.balke@daimler.com		Phone No.: (843) 695-5142	Cell No.:

OWNER OR OPERATOR SIGNATURE

I certify, to the best of my knowledge and belief, that no applicable standards and/or regulations will be contravened or violated. I certify that any application form, report, or compliance certification submitted in this permit application is true, accurate, and complete based on information and belief formed after reasonable inquiry. I understand that any statements and/or descriptions, which are found to be incorrect, may result in the immediate revocation of any permit issued for this application.

Signature of Owner or Operator — Date: 02-15-18

PERSON AND/OR FIRM THAT PREPARED THIS APPLICATION *(If not the same person as the Professional Engineer who has reviewed and signed this application.)*			
Consulting Firm Name: Same as P.E - see below			
Title/Position:	Salutation:	First Name:	Last Name:
Mailing Address:			
City:		State:	Zip Code:
E-mail Address:		Phone No.:	Cell No.:
SC Professional Engineer License/Registration No. (if applicable):			

PROFESSIONAL ENGINEER INFORMATION			
Consulting Firm Name: Trinity Consultants, Inc.			
Title/Position: Principal Consultant	Salutation: Mr.	First Name: Antoine	Last Name: Jabon
Mailing Address: 325 Arlington Ave. Suite 500			
City: Charlotte		State: NC	Zip Code: 28203
E-mail Address: tjabon@trinityconsultants.com		Phone No.: (704) 553-7747	Cell No.:
SC License/Registration No.: 33177			

PROFESSIONAL ENGINEER SIGNATURE

I have placed my signature and seal on the engineering documents submitted, signifying that I have reviewed this construction permit application as it pertains to the requirements of *South Carolina Regulation 61-62, Air Pollution Control Regulations and Standards.*

Signature of Professional Engineer — Date: 2/19/18

SOUTH CAROLINA LICENSED PROFESSIONAL ENGINEER No. 33177 ANTOINE H. JABON

dhec

Bureau of Air Quality
Expedited Review Request Instructions
Construction Permits

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APPLICATION IDENTIFICATION		
Facility Name *(This should be the name used to identify the facility)*	SC Air Permit Number (8-digits only) *(Leave blank if one has never been assigned)*	Request Date
Mercedes-Benz Vans, LLC	0560 - 0385	February 2018

PRIMARY AIR PERMIT CONTACT			
Title/Position: Paint Engineer	Mr.	First Name: Jae	Last Name: Park
E-mail Address: jae.park@daimler.com		Phone No.: (843) 695-5095	Cell No.: ( ) -

SECONDARY AIR PERMIT CONTACT *(If the Department is unable to contact the primary air permit contact please provided a secondary contact.)*			
Title/Position: Principal Consultant	Mr.	First Name: Antoine	Last Name: Jabon
E-mail Address: tjabon@trinityconsultants.com		Phone No.: (704) 553-7747	Cell No.: ( ) -

Check One	Permit Type	Expedited Review Days*	Fee**
☐	Minor Source Construction Permit	30	$3,000
☐	Synthetic Minor Construction Permit	65	$4,000
☐	Prevention of Significant Deterioration (PSD) not impacting a Class I Area (no Class I modeling required)	120	$20,000
☐	Prevention of Significant Deterioration (PSD) Modification not impacting a Class I Area (no Class I modeling required) No BACT limit change but requires Public Notice	120	$5,000
☐	Prevention of Significant Deterioration (PSD) Modification not impacting a Class I Area (no Class I modeling required) Number of BACT Pollutants ___ X $5,000 per BACT modification	120	Total Fee $ ____ Maximum of $20,000
☐	Prevention of Significant Deterioration (PSD) impacting a Class I Area (Class I modeling required)	150	$25,000
☐	Prevention of Significant Deterioration (PSD) Modification impacting a Class I Area (Class I modeling required) No BACT limit change but requires Public Notice	150	$5,000
☒	Prevention of Significant Deterioration (PSD) Modification impacting a Class I Area (Class I modeling required) Number of BACT Pollutants <u>2</u> X $5,000 per BACT modification	150	Total Fee **$10,000** Maximum of $25,000
☐	**Concrete** Minor Source Construction Permit Relocation Request	10	$1,500
☐	**Asphalt** Synthetic Minor Construction Permit Relocation Request	15	$3,500

*All days above are calendar days, but exclude State holidays, and building closure dates due to severe weather or other emergencies. Expedited days for asphalt and concrete also exclude weekends.

****DO NOT SEND PAYMENT UNTIL THE APPLICATION HAS BEEN ACCEPTED INTO THE EXPEDITED PROGRAM.** If chosen for expedited review, you will be notified by phone for verbal acceptance into the program. Fees must be paid within five business days of acceptance.

PRIMARY AIR PERMIT CONTACT SIGNATURE
I have read the most recent version of the Expedited Review Program Standard Operating Procedures and accept all of the terms and conditions within. I understand that it is my responsibility to ensure an application of the highest quality is submitted in a timely manner, and to address any requests for additional information by the deadline specified. I understand that submittal of this request form is not a guarantee that expedited review will be granted.

[signature] 2/14/18

Signature of Primary Air Permit Contact Date

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FEB 20 2018
BUREAU OF AIR QUALITY

APPLICATION IDENTIFICATION

(Please ensure that the information list in this table is the same on all of the forms and required information submitted in this construction permit application package.)

Facility Name *(This should be the name used to identify the facility)*	SC Air Permit Number (8-digits only) *(Leave blank if one has never been assigned)*	Application Date
Mercedes-Benz Vans, LLC	0560 - 0385	February 2018

PROJECT DESCRIPTION

Brief Project Description (What, why, how, etc.): Daimler Vans is proposing to expand current assembly operations at the Ladson plant to include a paint shop, body shop, and additional assembly areas, including all associated combustion equipment. This application revises information submitted to the Department for Construction Permit No. 0560-0385, 0560-0385-R1, and 0560-0385-R2.

ATTACHMENTS

☒ Process Flow Diagram	Location in Application: Appendix A
☒ Detailed Project Description	Location in Application: Application Section 2

EQUIPMENT / PROCESS INFORMATION

Equipment ID Process ID	Action	Equipment / Process Description	Maximum Design Capacity (Units)	Control Device ID(s)	Pollutants Controlled (Include CAS#)	Capture System Efficiency and Description	Emission Point ID(s)
B01	☐ Add ☐ Remove ☐ Modify ☒ Other	Boiler #1 (14.27 MMBtu/hr natural gas fired)	14.27 MMBtu/hr	N/A	N/A	N/A	EP-B01
B02	☐ Add ☐ Remove ☐ Modify ☒ Other	Boiler #2 (14.27 MMBtu/hr natural gas fired)	14.27 MMBtu/hr	N/A	N/A	N/A	EP-B02
OV01	☐ Add ☐ Remove ☒ Modify ☐ Other	E-Coat Oven Burners (natural gas fired)	4.85 MMBtu/hr	N/A	N/A	N/A	EP-RO12 EP-RO13 EP-RO14 EP-RO14a EP-RO15
OV02	☐ Add ☐ Remove ☒ Modify ☐ Other	Primer (Guidecoat) Oven #1 Burners (natural gas fired)	4.30 MMBtu/hr	N/A	N/A	N/A	EP-RO22 EP-RO23 EP-RO24 EP-RO24a EP-RO25

EQUIPMENT / PROCESS INFORMATION							
Equipment ID Process ID	Action	Equipment / Process Description	Maximum Design Capacity (Units)	Control Device ID(s)	Pollutants Controlled (Include CAS#)	Capture System Efficiency and Description	Emission Point ID(s)
OV03	☐ Add ☐ Remove ☒ Modify ☐ Other	Topcoat Oven #1 Burners (natural gas fired)	4.27 MMBtu/hr	N/A	N/A	N/A	EP-RO32 EP-RO33 EP-RO34 EP-RO35 EP-RO36
ED01	☐ Add ☐ Remove ☒ Modify ☐ Other	E-Coat Oven	124,800, units/yr	CD-RTO1	VOC, HAP	100%	EP-O1
GC01	☐ Add ☐ Remove ☒ Modify ☐ Other	Guidecoat (Primer Booth) #1	124,800, units/yr	CD-FS1, CD-FS2, CD-FS3, CD-ADW1, CD-ADW2, CD-ADW3, CD-RTO1	PM / PM_{10} / $PM_{2.5}$, VOC, and HAP	100%	EP-O1
GC21	☐ Add ☐ Remove ☒ Modify ☐ Other	Guidecoat (Primer Booth) #2	124,800, units/yr	CD-FS4, CD-ADW4, CD-RTO1	PM / PM_{10} / $PM_{2.5}$, VOC, and HAP	100%	EP-O1
GO01	☐ Add ☐ Remove ☒ Modify ☐ Other	Guidecoat (Primer) Oven #1	124,800, units/yr	CD-RTO1	VOC, HAP	100%	EP-O1
GO21	☐ Add ☐ Remove ☒ Modify ☐ Other	Guidecoat (Primer) Oven #2	124,800, units/yr	CD-RTO1	VOC, HAP	100%	EP-O1
UBC01	☐ Add ☐ Remove ☐ Modify ☒ Other	Underbody Coating Booth #1	124,800, units/yr	CD-DF	PM / PM_{10} / $PM_{2.5}$	100%	EP-UBC01 EP-RO41
UBC21	☐ Add ☐ Remove ☐ Modify ☒ Other	Underbody Coating Booth #2	124,800, units/yr	CD-DF	PM / PM_{10} / $PM_{2.5}$	100%	EP-UBC21 EP-RO341
UBS01	☐ Add ☐ Remove ☐ Modify ☒ Other	Underbody PVC Booth #1	124,800, units/yr	CD-DF	PM / PM_{10} / $PM_{2.5}$	100%	EP-RO41

EQUIPMENT / PROCESS INFORMATION							
Equipment ID Process ID	Action	Equipment / Process Description	Maximum Design Capacity (Units)	Control Device ID(s)	Pollutants Controlled (Include CAS#)	Capture System Efficiency and Description	Emission Point ID(s)
UBS21	☐ Add ☐ Remove ☐ Modify ☒ Other	Underbody PVC Booth #2	124,800, units/yr	CD-DF	PM / PM_{10} / $PM_{2.5}$	100%	EP-RO341
BC21	☐ Add ☐ Remove ☒ Modify ☐ Other	Basecoat/Clearcoat Booth #2	124,800, units/yr	CD-FS4, CD-ADW4, CD-RTO1	PM / PM_{10} / $PM_{2.5}$, VOC, and HAP	100%	EP-O1
TO21	☐ Add ☐ Remove ☒ Modify ☐ Other	Topcoat Oven #2	124,800, units/yr	CD-RTO1	VOC, HAP	100%	EP-O1
SR01	☐ Add ☐ Remove ☐ Modify ☒ Other	Spot Repair Booth #1	124,800, units/yr	CD-DF	PM / PM_{10} / $PM_{2.5}$	100%	EP-RO60
SR02	☐ Add ☐ Remove ☐ Modify ☒ Other	Spot Repair Booth #2	124,800, units/yr	CD-DF	PM / PM_{10} / $PM_{2.5}$	100%	EP-RO60
SR03	☐ Add ☐ Remove ☐ Modify ☒ Other	Spot Repair Booth #3	124,800, units/yr	CD-DF	PM / PM_{10} / $PM_{2.5}$	100%	EP-RO60
AR01	☐ Add ☐ Remove ☐ Modify ☒ Other	Assembly Repair Booth	124,800, units/yr	CD-DF	PM / PM_{10} / $PM_{2.5}$	100%	EP-AR01
CW	☐ Add ☐ Remove ☐ Modify ☒ Other	Cavity Wax Booth	124,800 units/yr	CD-DF, CD-ADW1, CD-ADW2, CD-ADW3, CD-RTO1	PM / PM_{10} / $PM_{2.5}$, VOC, and HAP	100%	EP-O1
PS01	☐ Add ☐ Remove ☒ Modify ☐ Other	Purge/Cleaning Solvent	124,800 units/yr	CD-ADW1, CD-ADW2, CD-ADW3, CD-ADW4, CD-RTO1	PM / PM_{10} / $PM_{2.5}$, VOC, and HAP	100%	EP-O1

EQUIPMENT / PROCESS INFORMATION							
Equipment ID Process ID	Action	Equipment / Process Description	Maximum Design Capacity (Units)	Control Device ID(s)	Pollutants Controlled (Include CAS#)	Capture System Efficiency and Description	Emission Point ID(s)
AW	☐ Add ☐ Remove ☒ Modify ☐ Other	Assembly Glazing	124,800 units/yr	N/A	N/A	N/A	EP-AW
AUW	☐ Add ☐ Remove ☐ Modify ☒ Other	Assembly UB Wax	124,800, units/yr	CD-DF	PM / PM_{10} / $PM_{2.5}$	100%	EP-AUW
BS-01	☐ Add ☐ Remove ☒ Modify ☐ Other	Body Shop Welding	124,800, units/yr	CD-HEPA (MAG only)	PM / PM_{10} / $PM_{2.5}$	100%	EP-BS
ASU P/BC/CC	☐ Add ☐ Remove ☒ Modify ☐ Other	Air Supply Unit for Primer Booth, BC Booth, and CC Booth (natural gas fired)	6.49 MMBtu/hr	N/A	N/A	N/A	EP-O1
ASU 2.1	☐ Add ☐ Remove ☒ Modify ☐ Other	Air Supply Unit 2.1 – Shop + Open Workdecks (natural gas fired)	10 MMBtu/hr	N/A	N/A	N/A	EP-O1
ASU 3	☐ Add ☐ Remove ☒ Modify ☐ Other	Air Supply Unit 3 – UBP + Repair (natural gas fired)	7.44 MMBtu/hr	N/A	N/A	N/A	EP-ASU 3
ASU 2.2	☐ Add ☐ Remove ☒ Modify ☐ Other	Air Supply Unit 2.2 – Shop + Open Workdecks (natural gas fired)	10 MMBtu/hr	N/A	N/A	N/A	EP-ASU 2.2
ASU 1	☐ Add ☐ Remove ☒ Modify ☐ Other	Air Supply Unit 1 – Spot Repair (natural gas fired)	4.82 MMBtu/hr	N/A	N/A	N/A	EP-ASU 1
ASU 2.3	☐ Add ☐ Remove ☒ Modify ☐ Other	Air Supply Unit 2.3 – Shop	10 MMBtu/hr	N/A	N/A	N/A	EP-ASU 2.3
ASU 4	☐ Add ☐ Remove ☒ Modify ☐ Other	Air Supply Unit 4 – Wax (natural gas fired)	4.84 MMBtu/hr	N/A	N/A	N/A	EP-ASU 4

EQUIPMENT / PROCESS INFORMATION							
Equipment ID Process ID	Action	Equipment / Process Description	Maximum Design Capacity (Units)	Control Device ID(s)	Pollutants Controlled (Include CAS#)	Capture System Efficiency and Description	Emission Point ID(s)
ASU 6	☐ Add ☐ Remove ☒ Modify ☐ Other	Workdecks Air Supply Unit 6 (natural gas fired)	8.54 MMBtu/hr	N/A	N/A	N/A	EP-ASU 6
ASU CR2	☐ Add ☐ Remove ☒ Modify ☐ Other	Air Supply Unit Clean Room Phase 2 (natural gas fired)	5.83 MMBtu/hr	N/A	N/A	N/A	EP-ASU CR2
ASU 5	☐ Add ☐ Remove ☒ Modify ☐ Other	Workdecks Air Supply Unit 5 (natural gas fired)	5.83 MMBtu/hr	N/A	N/A	N/A	EP-ASU 5
ASU31	☐ Add ☐ Remove ☒ Modify * ☐ Other	Primer Booth Air Supply Unit Phase 3 (natural gas fired)	7.57 MMBtu/hr	N/A	N/A	N/A	EP-ASU31
ASU32	☐ Add ☐ Remove ☒ Modify * ☐ Other	BC Booth Air Supply Unit Phase 3 (natural gas fired)	7.68 MMBtu/hr	N/A	N/A	N/A	EP-ASU32
ASU33	☐ Add ☐ Remove ☒ Modify * ☐ Other	Workdecks Air Supply Unit 1 Phase 3 (natural gas fired)	4.96 MMBtu/hr	N/A	N/A	N/A	EP-ASU33
ASU34	☐ Add ☐ Remove ☒ Modify * ☐ Other	Workdecks Air Supply Unit 2 Phase 3 (natural gas fired)	2.56 MMBtu/hr	N/A	N/A	N/A	EP-ASU34
ASU35	☐ Add ☐ Remove ☒ Modify * ☐ Other	Workdecks Air Supply Unit 3 Phase 3 (natural gas fired)	8.05 MMBtu/hr	N/A	N/A	N/A	EP-ASU35
ASU36	☐ Add ☐ Remove ☒ Modify * ☐ Other	Shop Ventilation Air Supply Unit Phase 3 (natural gas fired)	1.26 MMBtu/hr	N/A	N/A	N/A	EP-ASU36
ASU37	☐ Add ☐ Remove ☒ Modify * ☐ Other	Social Rooms Air Supply Unit Phase 3 (natural gas fired)	1.53 MMBtu/hr	N/A	N/A	N/A	EP-ASU37

EQUIPMENT / PROCESS INFORMATION							
Equipment ID Process ID	Action	Equipment / Process Description	Maximum Design Capacity (Units)	Control Device ID(s)	Pollutants Controlled (Include CAS#)	Capture System Efficiency and Description	Emission Point ID(s)
ASU01	☐ Add ☒ Remove ☐ Modify ☐ Other	Primer Booth Air Supply Unit (natural gas fired)	7.57 MMBtu/hr	N/A	N/A	N/A	EP-O1 EP-O2 EP-O301
ASU02	☐ Add ☒ Remove ☐ Modify ☐ Other	BC Booth Air Supply Unit (natural gas fired)	7.68 MMBtu/hr	N/A	N/A	N/A	EP-O1 EP-O2 EP-O301
ASU20	☐ Add ☒ Remove ☐ Modify ☐ Other	CC Booth Air Supply Unit (natural gas fired)	9.21 MMBtu/hr	N/A	N/A	N/A	EP-O1 EP-O2 EP-O301
ASU09	☐ Add ☒ Remove ☐ Modify ☐ Other	Clean Room 1 Air Supply Unit (natural gas fired)	1.26 MMBtu/hr	N/A	N/A	N/A	EP-ASU09
ASU10	☐ Add ☒ Remove ☐ Modify ☐ Other	Clean Room 2 Air Supply Unit (natural gas fired)	1.62 MMBtu/hr	N/A	N/A	N/A	EP-ASU10
ASU12	☐ Add ☒ Remove ☐ Modify ☐ Other	Shop Ventilation 2 Air Supply Unit (natural gas fired)	4.09 MMBtu/hr	N/A	N/A	N/A	EP-ASU12
ASU13	☐ Add ☒ Remove ☐ Modify ☐ Other	Social Rooms Air Supply Unit (natural gas fired)	1.53 MMBtu/hr	N/A	N/A	N/A	EP-ASU13
AS-RTU01	☐ Add ☐ Remove ☒ Modify * ☐ Other	0.8 MMBtu/hr natural gas-fired rooftop unit (Assembly)	0.80 MMBtu/hr	N/A	N/A	N/A	EP-AS-RTU01
RTU02	☐ Add ☒ Remove ☐ Modify ☐ Other	Rooftop Unit 02 (natural gas fired)	0.60 MMBtu/hr	N/A	N/A	N/A	EP-RTU02
RTU03	☐ Add ☒ Remove ☐ Modify ☐ Other	Rooftop Unit 03 (natural gas fired)	0.60 MMBtu/hr	N/A	N/A	N/A	EP-RTU03

EQUIPMENT / PROCESS INFORMATION							
Equipment ID Process ID	Action	Equipment / Process Description	Maximum Design Capacity (Units)	Control Device ID(s)	Pollutants Controlled (Include CAS#)	Capture System Efficiency and Description	Emission Point ID(s)
AS-RTU04	☐ Add ☐ Remove ☒ Modify * ☐ Other	0.8 MMBtu/hr natural gas-fired rooftop unit (Assembly)	0.80 MMBtu/hr	N/A	N/A	N/A	EP-AS-RTU04
RTU05	☐ Add ☒ Remove ☐ Modify ☐ Other	Rooftop Unit 05 (natural gas fired)	0.60 MMBtu/hr	N/A	N/A	N/A	EP-RTU05
AS-RTU06	☐ Add ☐ Remove ☒ Modify * ☐ Other	0.8 MMBtu/hr natural gas-fired rooftop unit (Assembly)	0.80 MMBtu/hr	N/A	N/A	N/A	EP-AS - RTU06
RTU07	☐ Add ☒ Remove ☐ Modify ☐ Other	Rooftop Unit 07 (natural gas fired)	0.60 MMBtu/hr	N/A	N/A	N/A	EP-RTU07
AS-RTU08	☐ Add ☐ Remove ☒ Modify * ☐ Other	0.8 MMBtu/hr natural gas-fired rooftop unit (Assembly)	0.80 MMBtu/hr	N/A	N/A	N/A	EP-AS-RTU08
RTU09	☐ Add ☒ Remove ☐ Modify ☐ Other	Rooftop Unit 09 (natural gas fired)	0.60 MMBtu/hr	N/A	N/A	N/A	EP-RTU09
AS-RTU10	☐ Add ☐ Remove ☒ Modify * ☐ Other	0.8 MMBtu/hr natural gas-fired rooftop unit (Assembly)	0.80 MMBtu/hr	N/A	N/A	N/A	EP-AS-RTU10
AS-RTU10	☐ Add ☐ Remove ☒ Modify * ☐ Other	0.8 MMBtu/hr natural gas-fired rooftop unit (Assembly)	0.80 MMBtu/hr	N/A	N/A	N/A	EP-AS-RTU11
RTU12	☐ Add ☒ Remove ☐ Modify ☐ Other	Rooftop Unit 12 (natural gas fired)	0.27 MMBtu/hr	N/A	N/A	N/A	EP-RTU12
AS-RTU13	☐ Add ☐ Remove ☒ Modify * ☐ Other	0.8 MMBtu/hr natural gas-fired rooftop unit (Assembly)	0.80 MMBtu/hr	N/A	N/A	N/A	EP-AS-RTU13

EQUIPMENT / PROCESS INFORMATION							
Equipment ID Process ID	Action	Equipment / Process Description	Maximum Design Capacity (Units)	Control Device ID(s)	Pollutants Controlled (Include CAS#)	Capture System Efficiency and Description	Emission Point ID(s)
BS-RTU01	☐ Add ☐ Remove ☒ Modify * ☐ Other	0.8 MMBtu/hr natural gas-fired rooftop unit (Body Shop)	0.80 MMBtu/hr	N/A	N/A	N/A	EP-BS-RTU01
BS-RTU02	☐ Add ☐ Remove ☒ Modify * ☐ Other	0.8 MMBtu/hr natural gas-fired rooftop unit (Body Shop)	0.80 MMBtu/hr	N/A	N/A	N/A	EP-BS-RTU02
RTU16	☐ Add ☒ Remove ☐ Modify ☐ Other	Rooftop Unit 16 (natural gas fired)	0.02 MMBtu/hr	N/A	N/A	N/A	EP-RTU16
BS-RTU04	☐ Add ☐ Remove ☒ Modify * ☐ Other	0.8 MMBtu/hr natural gas-fired rooftop unit (Body Shop)	0.80 MMBtu/hr	N/A	N/A	N/A	EP-BS-RTU04
BS-RTU05	☐ Add ☐ Remove ☒ Modify * ☐ Other	0.8 MMBtu/hr natural gas-fired rooftop unit (Body Shop)	0.80 MMBtu/hr	N/A	N/A	N/A	EP-BS-RTU05
BS-RTU06	☐ Add ☐ Remove ☒ Modify * ☐ Other	0.8 MMBtu/hr natural gas-fired rooftop unit (Body Shop)	0.80 MMBtu/hr	N/A	N/A	N/A	EP-BS-RTU06
BS-RTU07	☐ Add ☐ Remove ☒ Modify * ☐ Other	0.8 MMBtu/hr natural gas-fired rooftop unit (Body Shop)	0.80 MMBtu/hr	N/A	N/A	N/A	EP-BS-RTU07
BS-RTU10	☐ Add ☐ Remove ☒ Modify * ☐ Other	0.8 MMBtu/hr natural gas-fired rooftop unit (Body Shop)	0.80 MMBtu/hr	N/A	N/A	N/A	EP-BS-RTU10
BS-RTU17	☐ Add ☐ Remove ☒ Modify * ☐ Other	0.8 MMBtu/hr natural gas-fired rooftop unit (Body Shop)	0.80 MMBtu/hr	N/A	N/A	N/A	EP-BS-RTU17
BS-RTU18	☐ Add ☐ Remove ☒ Modify * ☐ Other	0.8 MMBtu/hr natural gas-fired rooftop unit (Body Shop)	0.80 MMBtu/hr	N/A	N/A	N/A	EP-BS-RTU18

EQUIPMENT / PROCESS INFORMATION							
Equipment ID Process ID	Action	Equipment / Process Description	Maximum Design Capacity (Units)	Control Device ID(s)	Pollutants Controlled (Include CAS#)	Capture System Efficiency and Description	Emission Point ID(s)
BS-RTU23	☐ Add ☐ Remove ☒ Modify * ☐ Other	0.8 MMBtu/hr natural gas-fired rooftop unit (Body Shop)	0.80 MMBtu/hr	N/A	N/A	N/A	EP-BS-RTU23
BS-RTU25	☐ Add ☐ Remove ☒ Modify * ☐ Other	0.8 MMBtu/hr natural gas-fired rooftop unit (Body Shop)	0.80 MMBtu/hr	N/A	N/A	N/A	EP-BS-RTU25
BS-RTU26	☐ Add ☐ Remove ☒ Modify * ☐ Other	0.8 MMBtu/hr natural gas-fired rooftop unit (Body Shop)	0.80 MMBtu/hr	N/A	N/A	N/A	EP-BS-RTU26
BS-RTU30	☐ Add ☐ Remove ☒ Modify * ☐ Other	0.8 MMBtu/hr natural gas-fired rooftop unit (Body Shop)	0.80 MMBtu/hr	N/A	N/A	N/A	EP-BS-RTU30
BS-RTU32	☐ Add ☐ Remove ☒ Modify * ☐ Other	0.8 MMBtu/hr natural gas-fired rooftop unit (Body Shop)	0.80 MMBtu/hr	N/A	N/A	N/A	EP-BS-RTU32
BS-RTU33	☐ Add ☐ Remove ☒ Modify * ☐ Other	0.8 MMBtu/hr natural gas-fired rooftop unit (Body Shop)	0.80 MMBtu/hr	N/A	N/A	N/A	EP-BS-RTU33
BS-RTU35	☐ Add ☐ Remove ☒ Modify * ☐ Other	0.8 MMBtu/hr natural gas-fired rooftop unit (Body Shop)	0.80 MMBtu/hr	N/A	N/A	N/A	EP-BS-RTU35
RTU31	☐ Add ☒ Remove ☐ Modify ☐ Other	Rooftop Unit 31 (natural gas fired)	0.60 MMBtu/hr	N/A	N/A	N/A	EP-RTU31
RTU32	☐ Add ☒ Remove ☐ Modify ☐ Other	Rooftop Unit 32 (natural gas fired)	0.60 MMBtu/hr	N/A	N/A	N/A	EP-RTU32
RTU33	☐ Add ☒ Remove ☐ Modify ☐ Other	Rooftop Unit 33 (natural gas fired)	1.59 MMBtu/hr	N/A	N/A	N/A	EP-RTU33

EQUIPMENT / PROCESS INFORMATION							
Equipment ID Process ID	Action	Equipment / Process Description	Maximum Design Capacity (Units)	Control Device ID(s)	Pollutants Controlled (Include CAS#)	Capture System Efficiency and Description	Emission Point ID(s)
RTU34	☐ Add ☒ Remove ☐ Modify ☐ Other	Rooftop Unit 34 (natural gas fired)	1.59 MMBtu/hr	N/A	N/A	N/A	EP-RTU34
RTU35	☐ Add ☒ Remove ☐ Modify ☐ Other	Rooftop Unit 35 (natural gas fired)	1.59 MMBtu/hr	N/A	N/A	N/A	EP-RTU35
CT01	☐ Add ☐ Remove ☒ Modify ☐ Other	Cooling tower #1	412,500 gal/hr	N/A	N/A	N/A	CT01
CT02	☐ Add ☐ Remove ☒ Modify ☐ Other	Cooling tower #2	412,500 gal/hr	N/A	N/A	N/A	CT02
CT03	☐ Add ☐ Remove ☒ Modify ☐ Other	Cooling tower #3	412,500 gal/hr	N/A	N/A	N/A	CT03
CT04	☐ Add ☐ Remove ☒ Modify ☐ Other	Cooling tower #4	73,800 gal/hr	N/A	N/A	N/A	CT04
CT05	☐ Add ☐ Remove ☒ Modify ☐ Other	Cooling tower #5	484,900 gal/hr	N/A	N/A	N/A	CT05
CT06	☐ Add ☐ Remove ☒ Modify ☐ Other	Cooling tower #6	484,900 gal/hr	N/A	N/A	N/A	CT06
CT07	☐ Add ☐ Remove ☒ Modify ☐ Other	Cooling tower #7	484,900 gal/hr	N/A	N/A	N/A	CT07
TK03	☒ Add ☐ Remove ☐ Modify ☐ Other	Diesel storage tank	8,760 hr/yr	N/A	N/A	N/A	EP-TK03

EQUIPMENT / PROCESS INFORMATION							
Equipment ID Process ID	Action	Equipment / Process Description	Maximum Design Capacity (Units)	Control Device ID(s)	Pollutants Controlled (Include CAS#)	Capture System Efficiency and Description	Emission Point ID(s)
EG03	☒ Add ☐ Remove ☐ Modify ☐ Other	Emergency Generator 03	500 hr/yr	N/A	N/A	N/A	EP-EG03
EG04	☒ Add ☐ Remove ☐ Modify ☐ Other	Emergency Generator 04	500 hr/yr	N/A	N/A	N/A	EP-EG04

* Equipment ID and Equipment description have been updated as described in Section 2 of the construction permit application.

CONTROL DEVICE INFORMATION					
Control Device ID	Action	Control Device Description	Maximum Design Capacity (Units)	Inherent/Required/Voluntary (Explain)	Destruction/Removal Efficiency Determination
CD-ESP	☐ Add ☒ Remove ☐ Modify ☐ Other	Electrostatic Precipitator	124,800, units/yr	Required	95%
CD-HEPA	☒ Add ☐ Remove ☐ Modify ☐ Other	HEPA Filter (MAG Only)	124,800, units/yr	Required	95%
CD-DF	☐ Add ☐ Remove ☐ Modify ☒ Other	Dry Filters	124,800, units/yr	Required	98.5% (CW, UBS01, UBS21, UBC01, UBC21, SR01, SR02, SR03, AR01) 98% (AUW)
CD-RTO1	☐ Add ☐ Remove ☒ Modify ☐ Other	Regenerative Thermal Oxidizer (RTO) #1	8 MMBtu/hr (Phase 1) 16 MMBtu/hr (Phase 2 or 3)	Required	95%
CD-RTO2	☐ Add ☒ Remove ☐ Modify ☐ Other	Regenerative Thermal Oxidizer (RTO) #2	3.41 MMBtu/hr	Required	95%
CD-RTO3	☐ Add ☒ Remove ☐ Modify ☐ Other	Regenerative Thermal Oxidizer (RTO) #3	3.41 MMBtu/hr	Required	95%

RAW MATERIAL AND PRODUCT INFORMATION			
Equipment ID Process ID Control Device ID	Raw Material(s)	Product(s)	Fuels Combusted
B01, B02	N/A	Hot Water	Natural Gas
OV01, OV02, OV03	N/A	Process Heat	Natural Gas
AW	Primer and Adhesive	Vehicle Bodies	N/A
BS01	Welding Material	Vehicle Bodies	N/A
ASUs	N/A	Process Air	Natural Gas
AS-RTUs, BS-RTUs	N/A	Process Air	Natural Gas
CT01 - CT07	N/A	Process Cooling	N/A
TK03	Diesel	Diesel Storage	N/A
EG03, EG04	N/A	Electricity	Diesel

MONITORING AND REORTING INFORMATION					
Equipment ID Process ID Control Device ID	Pollutant(s)/Parameter(s) Monitored	Monitoring Frequency	Reporting Frequency	Monitoring/Reporting Basis	Averaging Period(s)
B01, B02	Fuel Usage	Monthly	Semiannual	NSPS Subpart Dc	Monthly
B01, B02	Tune-up	Biannual	Biannual	SC Regulation 61-62.5 Std. No. 5.2, NESHAP Subpart DDDDD	24 months
OV01, OV02, OV03	N/A	N/A	N/A	N/A	N/A
CW, UBS01, UBS21, UBC01, UBC21, and AUW to CD-DF	Visual Inspection	Weekly	Semi-Annual	SC Regulation 61-62.5 Standard No. 7	Weekly
SR01, SR02, SR03, and AR01 to CD-DF	Visual Inspection	Monthly	Semi-Annual	SC Regulation 61-62.5 Standard No. 7	Monthly
AW	N/A	N/A	N/A	N/A	N/A
CD-HEPA	N/A	N/A	N/A	N/A	N/A
ASUs	N/A	N/A	N/A	N/A	N/A
AS-RTUs, BS-RTUs	N/A	N/A	N/A	N/A	N/A
CT01 - CT07	N/A	N/A	N/A	N/A	N/A
TK03	N/A	N/A	N/A	N/A	N/A
EG03, EG04	Hours of Operation	As necessary	As necessary	NSPS Subpart IIII	Annual

dhec

Bureau of Air Quality
Construction Permit Application
Emissions

APPLICATION IDENTIFICATION (Please ensure that the information list in this table is the same on all of the forms and required information submitted in this construction permit application package.)		
Facility Name (This should be the name used to identify the facility) Mercedes-Benz Vans, LLC	SC Air Permit Number (8-digits only) (Leave blank if one has never been assigned) 0560 - 0385	Application Date February 2018

ATTACHMENTS (Check all the appropriate checkboxes if included as an attachment)	
☒ Sample Calculations, Emission Factors Used, etc.	☒ Detailed Explanation of Assumptions, Bottlenecks, etc.
☒ Supporting Information: Manufacturer's Data, etc.	☐ Source Test Information
☒ Details on Limits Being Taken for Limited Emissions	☒ NSR Analysis

SUMMARY OF PROJECTED CHANGE IN FACILITY WIDE POTENTIAL EMISSIONS
(Calculated at maximum design capacity.)

Pollutants	Emission Rates Prior to Construction / Modification (tons/year)			Emission Rates After Construction / Modification (tons/year)		
	Uncontrolled	Controlled	Limited	Uncontrolled	Controlled	Limited
Particulate Matter (PM)	1,353.39	29.51	26.97	1,353.99	24.65	21.94
Particulate Matter <10 Microns (PM_{10})	1,346.10	22.23	19.77	1,346.70	17.36	14.73
Particulate Matter <2.5 Microns ($PM_{2.5}$)	1,344.79	20.92	18.46	1,345.39	16.05	13.43
Sulfur Dioxide (SO_2)	0.72	0.72	0.59	0.93	0.93	0.79
Nitrogen Oxides (NO_x)	48.94	48.94	38.55	46.37	46.37	35.42
Carbon Monoxide (CO)	77.43	77.43	59.16	76.98	76.98	57.76
Volatile Organic Compounds (VOC)	3,442.84	1,110.37	952.04	3,446.70	1,114.23	955.85
Lead (Pb)	4.18E-04	4.18E-04	3.09E-04	4.24E-04	4.24E-04	3.10E-04
Highest HAP Prior to Construction (CAS #:)	Multiple >10	Multiple >10		Multiple >10	Multiple >10	
Highest HAP After Construction (CAS #:)						
Total HAP Emissions*	415.56	415.56	358.18	415.58	415.58	358.18

Include emissions from exempt equipment and emission increases from process changes that were exempt from construction permits.
(*All HAP emitted from the various equipment or processes must be listed in the appropriate "Potential Emission Rates at Maximum Design Capacity" Table)

dhec

Bureau of Air Quality
Construction Permit Application
Emissions

POTENTIAL EMISSION RATES AT MAXIMUM DESIGN CAPACITY									
Equipment ID / Process ID	**Emission Point ID**	**Pollutants** (Include CAS #)	**Calculation Methods / Limits Taken / Other Comments**	**Uncontrolled**		**Controlled**		**Limited**	
				lbs/hr	**tons/yr**	**lbs/hr**	**tons/yr**	**lbs/hr**	**tons/yr**
See Appendix B of the Application									

APPLICATION IDENTIFICATION (Please ensure that the information list in this table is the same on all of the forms and required information submitted in this construction permit application package.)		
Facility Name *(This should be the name used to identify the facility)*	SC Air Permit Number (8-digits only) *(Leave blank if one has never been assigned)*	Application Date
Mercedes-Benz Vans, LLC	0560 - 0385	February 2018

STATE AND FEDERAL AIR POLLUTION CONTROL REGULATIONS AND STANDARDS
(If not listed below add any additional regulations that are triggered.)

Regulation	Applicable		Include all limits, work practices, monitoring, record keeping, etc.		
	Yes	No	Explain Applicability Determination	List the specific limitations and/or requirements that apply.	How will compliance be demonstrated?
Regulation 61-62.1, Section II(E) Synthetic Minor Construction Permits	☐	☒	See Section 4	N/A	N/A
Regulation 61-62.1, Section II(G) Conditional Major Operating Permits	☐	☒	See Section 4	N/A	N/A
Regulation 61-62.5, Standard No. 1 Emissions from Fuel Burning Operations	☒	☐	See Section 4	See Section 4	See Section 4
Regulation 61-62.5, Standard No. 2 Ambient Air Quality Standards	☒	☐	See Section 4	See Section 4	See Section 4
Regulation 61-62.5, Standard No. 3 Waste Combustion and Reduction	☐	☒	See Section 4	N/A	N/A
Regulation 61-62.5, Standard No. 4 Emissions from Process Industries	☒	☐	See Section 4	See Section 4	See Section 4
Regulation 61-62.5, Standard No. 5 Volatile Organic Compounds	☐	☒	See Section 4	N/A	N/A
Regulation 61-62.5, Standard No. 5.2 Control of Oxides of Nitrogen	☐	☒	See Sections 2 and 4	N/A	N/A
Regulation 61-62.5, Standard No. 7 Prevention of Significant Deterioration*	☒	☐	See Section 4	See Section 4	See Section 4
Regulation 61-62.5, Standard No. 7.1 Nonattainment New Source Review*	☐	☒	See Section 4	N/A	N/A
Regulation 61-62.5, Standard No. 8 Toxic Air Pollutants	☐	☒	See Section 4	N/A	N/A
Regulation 61-62.6 Control of Fugitive Particulate Matter	☒	☐	See Section 4	See Section 4	See Section 4

STATE AND FEDERAL AIR POLLUTION CONTROL REGULATIONS AND STANDARDS *(If not listed below add any additional regulations that are triggered.)*					
Regulation	Applicable		Include all limits, work practices, monitoring, record keeping, etc.		
	Yes	No	Explain Applicability Determination	List the specific limitations and/or requirements that apply.	How will compliance be demonstrated?
Regulation 61-62.68 Chemical Accident Prevention Provisions	☐	☒	N/A	N/A	N/A
Regulation 61-62.70 Title V Operating Permit Program	☒	☐	See Section 4	See Section 4	See Section 4
40 CFR Part 64 - Compliance Assurance Monitoring (CAM)	☐	☒	See Section 4	N/A	N/A
40 CFR 60 Subpart A - General Provisions	☒	☐	See Section 4	See Section 4	See Section 4
Subpart Kb	☐	☒	See Section 4	N/A	N/A
Subpart MM	☒	☐	See Section 4	See Section 4	See Section 4
Subpart IIII	☒	☐	See Section 4	See Section 4	See Section 4
Subpart JJJJ	☐	☒	See Section 4	N/A	N/A
40 CFR 61 Subpart A - General Provisions	☐	☒	N/A	N/A	N/A
	☐	☐			
40 CFR 63 Subpart A - General Provisions	☒	☐	See Section 4	See Section 4	See Section 4
Subpart IIII	☒	☐	See Section 4	See Section 4	See Section 4
Subpart MMMM	☐	☒	See Section 4	N/A	N/A
Subpart PPPP	☐	☒	See Section 4	N/A	N/A
Subpart ZZZZ	☒	☐	See Section 4	See Section 4	See Section 4
Subpart DDDDD	☒	☐	See Section 4	See Section 4	See Section 4
	☐	☐			

* Green House Gas emissions must be quantified if these regulations are triggered.

dhec

Bureau of Air Quality
Construction Permit Application
Application Revision Request

CONSTRUCTION PERMIT IDENTIFICATION			
SC Air Permit Number *(8-digits only)* *(Leave blank if unknown or has never been assigned)*	Construction Permit ID	Date Construction Permit Issued	Revision Request Date
0560 - 0385	0560-0385-CA-R2	January 26, 2018	February 2018
Facility Name *(This should be the name used to identify the facility)*			
Mercedes-Benz Vans, LLC			

CONSTRUCTION PERMIT APPLICATION FORMS BEING REVISED
(Amended construction permit forms must be filled out completely and attached to this modification request.)

Form #	Date of Original Submittal	Brief Description of Revision
D-2566	February 2016	No change
D-2567	February 2016	Revised equipment form as described in Section 2 of the application.
D-2569	February 2016	Revised facility-wide emission estimate as described in the application. Calculations are provided in Appendix B.
D-2570	February 2016	Revised regulatory applicability as described in Section 2 of the application
D-2573	February 2016	Updated modeling demonstration (see modeling report)

OWNER OR OPERATOR

Title/Position: President/CEO	Salutation: Mr	First Name: Michael	Last Name: Balke
Mailing Address: 8501 Palmetto Commerce Parkway			
City: Ladson		State: SC	Zip Code: 29546
E-mail Address: Michael.balke@daimler.com		Phone No.: (843) 695-5142	Cell No.:

OWNER OR OPERATOR SIGNATURE

I certify, to the best of my knowledge and belief, that no applicable standards and/or regulations will be contravened or violated. I certify that any application form, report, or compliance certification submitted in this permit application is true, accurate, and complete based on information and belief formed after reasonable inquiry. I understand that any statements and/or descriptions, which are found to be incorrect, may result in the immediate revocation of any permit issued for this application.

M. Balke 02-15-18

Signature of Owner or Operator Date

AIR PERMIT CONSULTANT *(If not the same person as the Professional Engineer.)*			
Consulting Firm Name: Same as P.E. (see below)			
Title/Position:	Salutation:	First Name:	Last Name:
Mailing Address:			
City:		State:	Zip Code:
E-mail Address:		Phone No.:	Cell No.:
PROFESSIONAL ENGINEER INFORMATION			
Consulting Firm Name: Trinity Consultants, Inc.			
Title/Position: Principal Consultant	Salutation: Mr.	First Name: Antoine	Last Name: Jabon
Mailing Address: 325 Arlington Ave. Suite 500			
City: Charlotte		State: NC	Zip Code: 28203
E-mail Address: tjabon@trinityconsultants.com		Phone No.: (704) 553-7747	Cell No.:
SC License/Registration No.: 33177			
PROFESSIONAL ENGINEER SIGNATURE			
I have placed my signature and seal on the engineering documents submitted, signifying that I have reviewed this construction permit application as it pertains to *South Carolina Regulation 61-62, Air Pollution Control Regulations and Standards*.			

2/19/18

Signature of Professional Engineer — Date

SOUTH CAROLINA LICENSED PROFESSIONAL ENGINEER No. 33177 ANTOINE H. JABON

A. APPLICATION IDENTIFICATION	
1. Facility Name: Mercedes-Benz Vans, LLC	
2. SC Air Permit Number (if known; 8-digits only): 0560 - 0385	3. Application Date: February 2018
4. Project Description: Modifications to Construction Permit No. 0560-0385-R2 as described in Section 2 of the application.	

B. FACILITY INFORMATION	
1. Is your company a Small Business? ☐ Yes ☒ No	2. If a Small Business or small government facility, is Bureau assistance being requested? ☐ Yes ☒ No
3. Are other facilities collocated for air compliance? ☐ Yes ☒ No	4. If Yes, provide permit numbers of collocated facilities:

C. AIR CONTACT			
Consulting Firm Name (if applicable): Trinity Consultants, Inc.			
Title/Position: Principal Consultant	Salutation: Mr.	First Name: Antoine	Last Name: Jabon
Mailing Address: 325 Arlington Avenue, Suite 500			
City: Charlotte		State: NC	Zip Code: 28203
E-mail Address: tjabon@trinityconsultants.com		Phone No.: (704) 553-7747	Cell No.:

D. EMISSION POINT DISPERSION PARAMETERS
Source data requirements are based on the appropriate source classification. Each emission point is classified as a point, area, volume, or flare source. Contact the Bureau of Air Quality for clarification of data requirements. Include sources on a scaled site map. Also, a picture of area or volume sources would be helpful but is not required. A user generated document or spreadsheet may be substituted in lieu of this form provided all of the required emission point parameters are submitted in the same order, units, etc. as presented in these tables.
Abbreviations / Units of Measure: UTM = Universal Transverse Mercator; °N = Degrees North; °W = Degrees West; m = meters; AGL = Above Ground Level; ft = feet; ft/s = feet per second; ° = Degrees; °F = Degrees Fahrenheit

dhec

E. POINT SOURCE DATA
(Point sources such as stacks, chimneys, exhaust fans, and vents.)

Emission Point ID	Description/Name	Point Source Coordinates Projection:				Release Height AGL (ft)	Temp. (°F)	Exit Velocity (ft/s)	Inside Diameter (ft)	Discharge Orientation	Rain Cap? (Y/N)	Distance To Nearest Property Boundary (ft)	Building		
		UTM E (m)	UTM N (m)	Lat (°N)	Long (°W)								Height (ft)	Length (ft)	Width (ft)
	See Modeling Report														

F. AREA SOURCE DATA
(Area sources such as storage piles, and other sources that have low level or ground level releases with no plumes.)

Emission Point ID	Description/Name	Area Source Coordinates Projection:				Release Height AGL (ft)	Easterly Length (ft)	Northerly Length (ft)	Angle From North (°)	Distance To Nearest Property Boundary (ft)
		UTM E (m)	UTM N (m)	Lat (°N)	Long (° W)					
	N/A									

G. VOLUME SOURCE DATA
(Volume sources such as building fugitives that have initial dispersion vertical depth prior to release.)

Emission Point ID	Description/Name	Volume Source Coordinates Projection:				Release Height AGL (ft)	Initial Horizontal Dimension (ft)	Initial Vertical Dimension (ft)	Distance To Nearest Property Boundary (ft)
		UTM E (m)	UTM N (m)	Lat (°N)	Long (° W)				
	See Modeling Report								

H. FLARE SOURCE DATA

(Point sources where the combustion takes place at the tip of the stack.)

Emission Point ID	Description/Name	Flare Source Coordinates Projection:				Release Height AGL (ft)	Heat Release Rate (BTU/hr)	Distance To Nearest Property Boundary (ft)	Building		
		UTM E (m)	UTM N (m)	Lat (°N)	Long (° W)				Height (ft)	Length (ft)	Width (ft)
	N/A										

I. AREA CIRCULAR SOURCE DATA

Emission Point ID	Description/Name	Area Circular Source Coordinates Projection:				Release Height AGL (ft)	Radius of Area (ft)	Distance To Nearest Property Boundary (ft)
		UTM E (m)	UTM N (m)	Lat (°N)	Long (° W)			
	N/A							

J. AREA POLY SOURCE DATA

Emission Point ID	Description/Name	Area Poly Source Coordinates Projection:		Release Height AGL (ft)	Number of Vertices
		UTM E (m)	UTM N (m)		
	N/A				

K. OPEN PIT SOURCE DATA

Emission Point ID	Description/Name	Open Pit Source Coordinates Projection:		Release Height AGL (ft)	Easterly Length (ft)	Northerly Length (ft)	Volume (ft^3)	Angle From North (°)
		UTM E (m)	UTM N (m)					
	N/A							

L. EMISSION RATES						
Emission Point ID	Pollutant Name	CAS #	Emission Rate (lb/hr)	Same as Permitted (1)	Controlled or Uncontrolled	Averaging Period
	See Modeling Report			☐ Yes ☐ No		
				☐ Yes ☐ No		
				☐ Yes ☐ No		
				☐ Yes ☐ No		
				☐ Yes ☐ No		
				☐ Yes ☐ No		
				☐ Yes ☐ No		
				☐ Yes ☐ No		
				☐ Yes ☐ No		
				☐ Yes ☐ No		
				☐ Yes ☐ No		
				☐ Yes ☐ No		
				☐ Yes ☐ No		
				☐ Yes ☐ No		
				☐ Yes ☐ No		
				☐ Yes ☐ No		
				☐ Yes ☐ No		
				☐ Yes ☐ No		
				☐ Yes ☐ No		
				☐ Yes ☐ No		
				☐ Yes ☐ No		
				☐ Yes ☐ No		
				☐ Yes ☐ No		
				☐ Yes ☐ No		
				☐ Yes ☐ No		
				☐ Yes ☐ No		
				☐ Yes ☐ No		

(1) Any difference between the rates used for permitting and the air compliance demonstration must be explained in the application report.

APPENDIX A: AREA MAP, SITE LAYOUT, AND PROCESS FLOW DIAGRAMS

Mercedes-Benz Vans, LLC

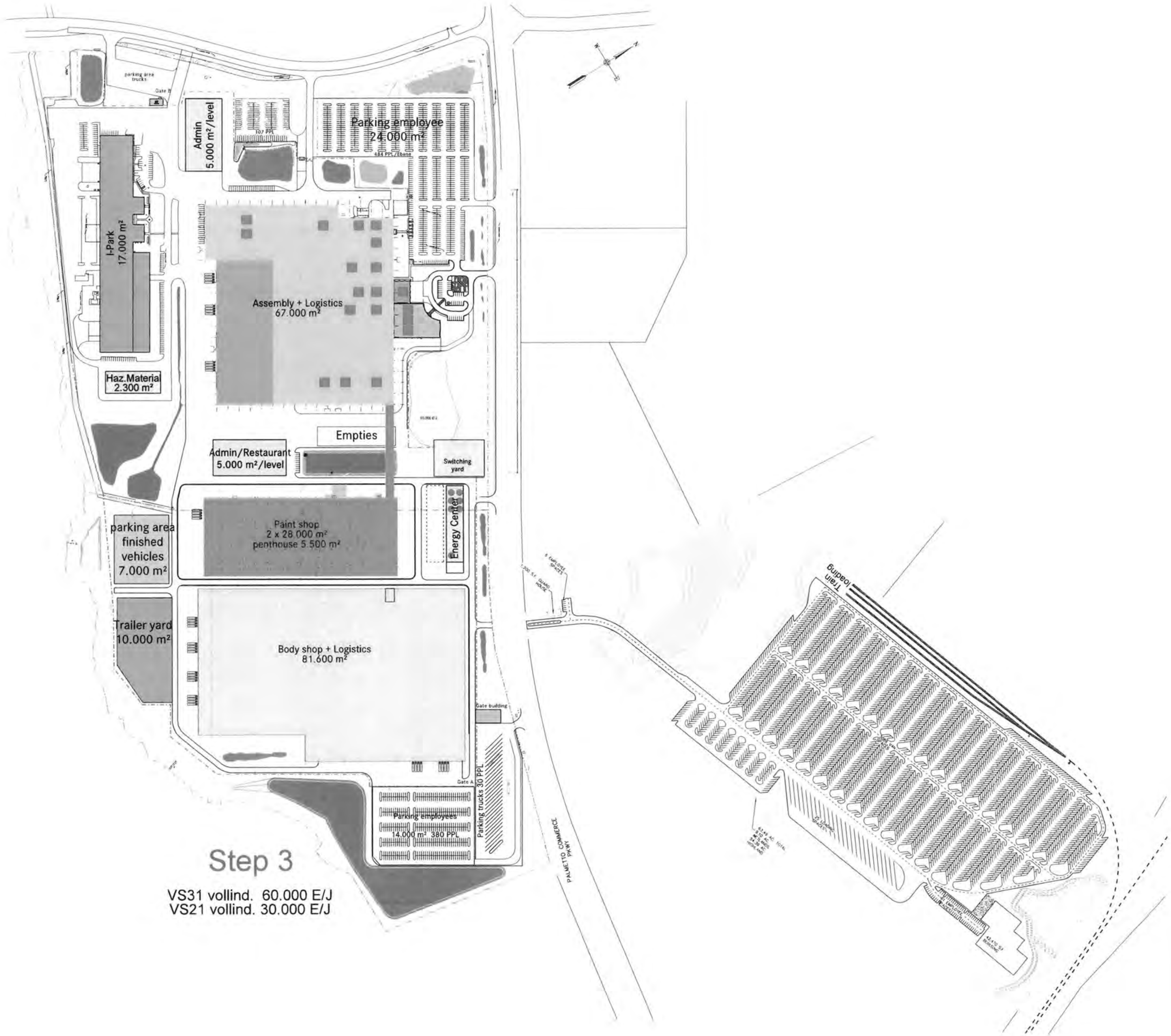
Charleston Plant Expansion Area Map

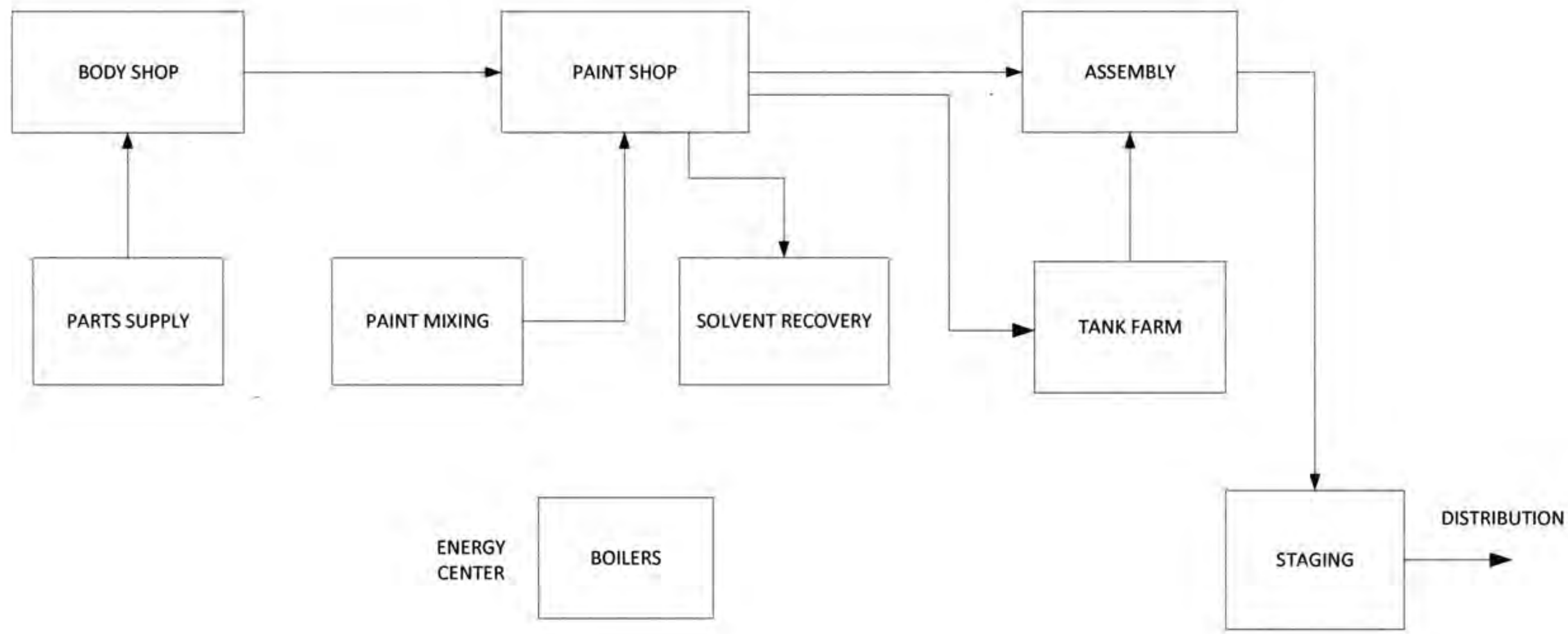
Edge Markings in UTM Coordinates (meters)

0 275 550

USGS Aerial Photograph
UTM Zone 17

Trinity Consultants


Admin
5.000 m²/level
Parking employee
24.000 m²
I-Park
17.000 m²
Assembly + Logistics
67.000 m²
Haz.Material
2.300 m²
Empties
Admin/Restaurant
5.000 m²/level
Switching yard
Energy Center
parking area
finished
vehicles
7.000 m²
Paint shop
2 x 28.000 m²
penthouse 5.500 m²
Trailer yard
10.000 m²
Body shop + Logistics
81.600 m²
Gate building
Gate A
Parking trucks 30 PPL
Parking employees
14.000 m² 380 PPL
PALMETTO COMMERCE PKWY
Train loading
Step 3
VS31 vollind. 60.000 E/J
VS21 vollind. 30.000 E/J

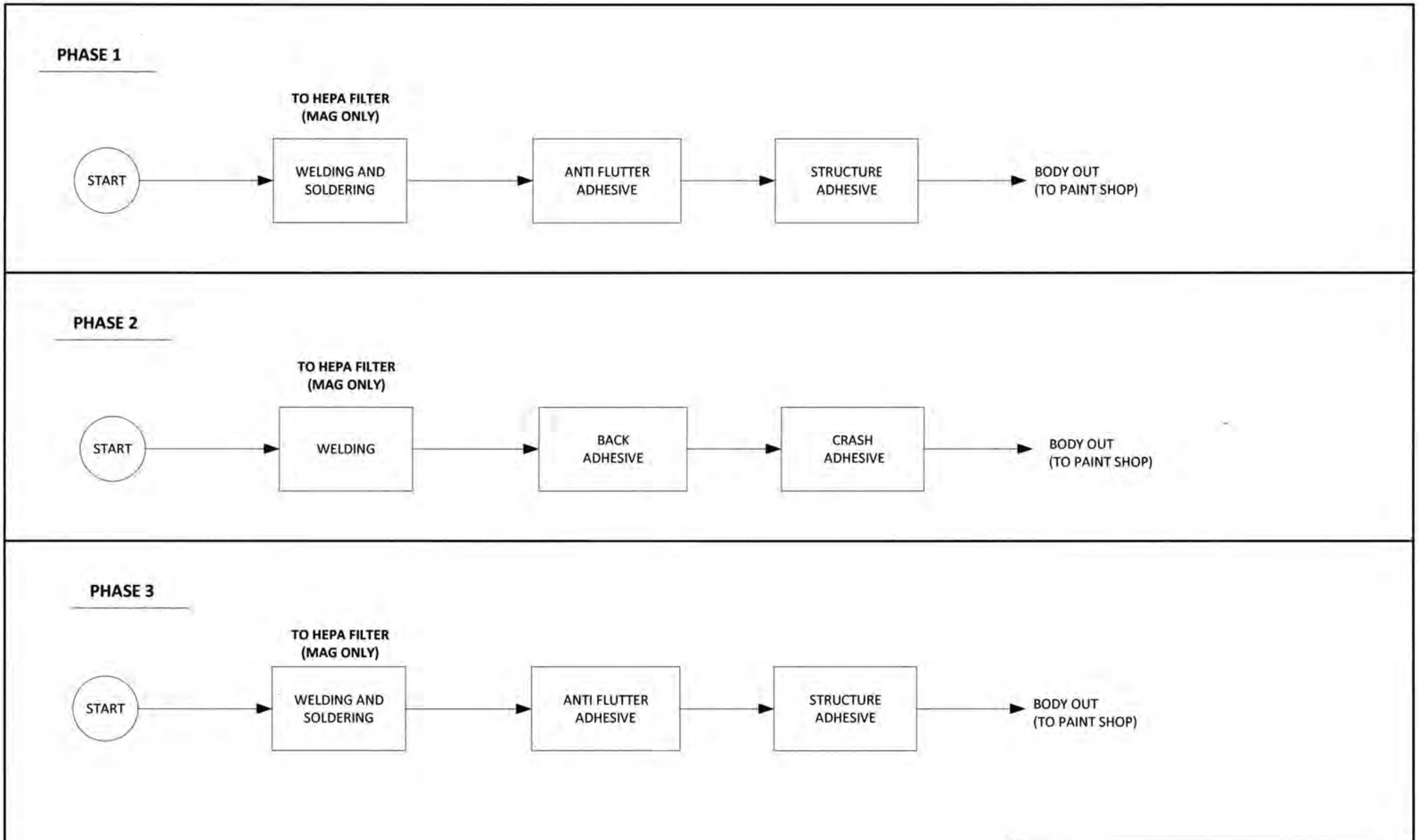


MERCEDES-BENZ VANS
Charleston Facility

Trinity Consultants

Facility
Block Flow Diagram
(All Phases)

February 2018

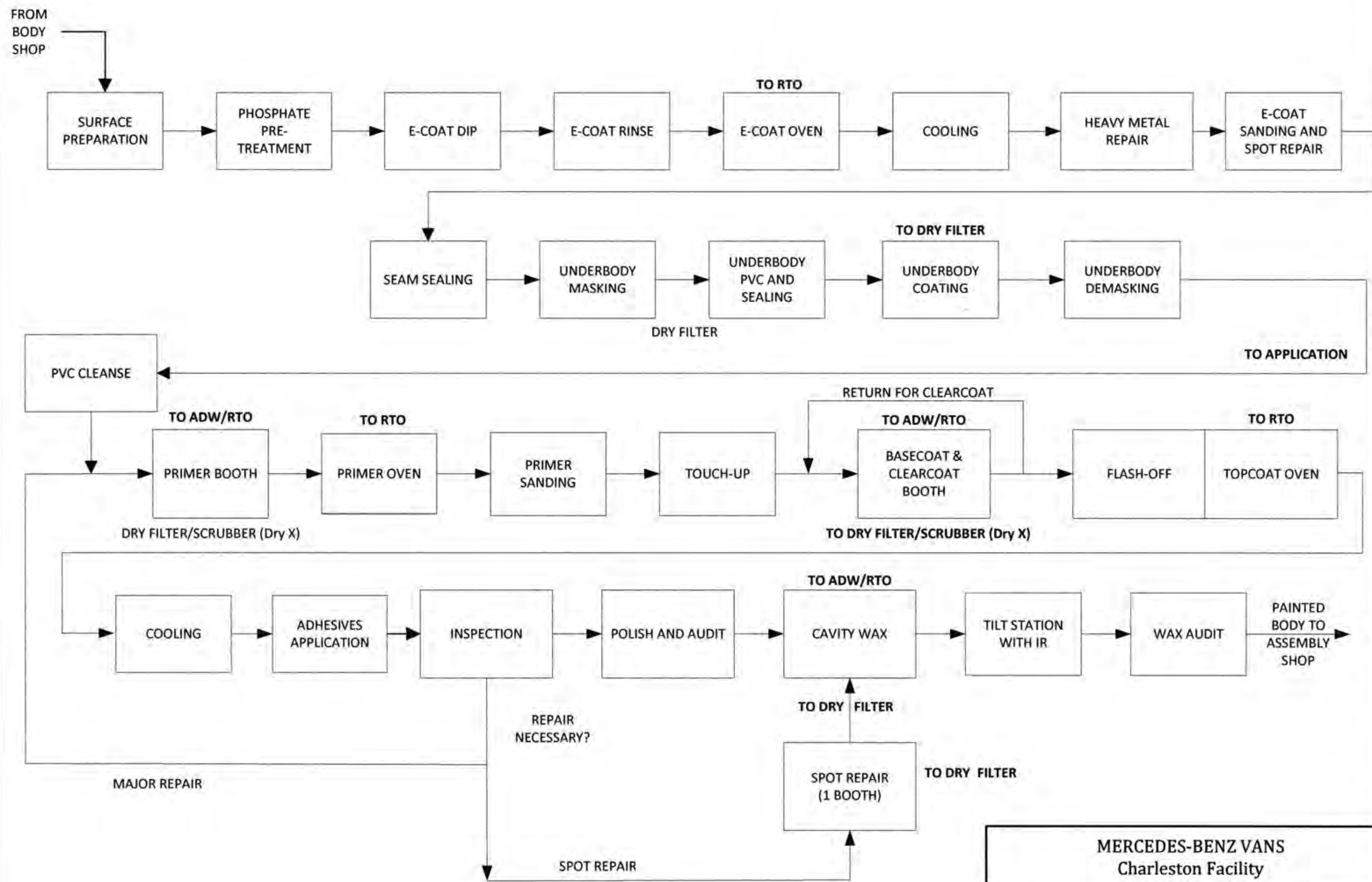


MERCEDES-BENZ VANS
Charleston Facility

Trinity Consultants

Body Shop
Block Flow Diagram
(All Phases)

February 201

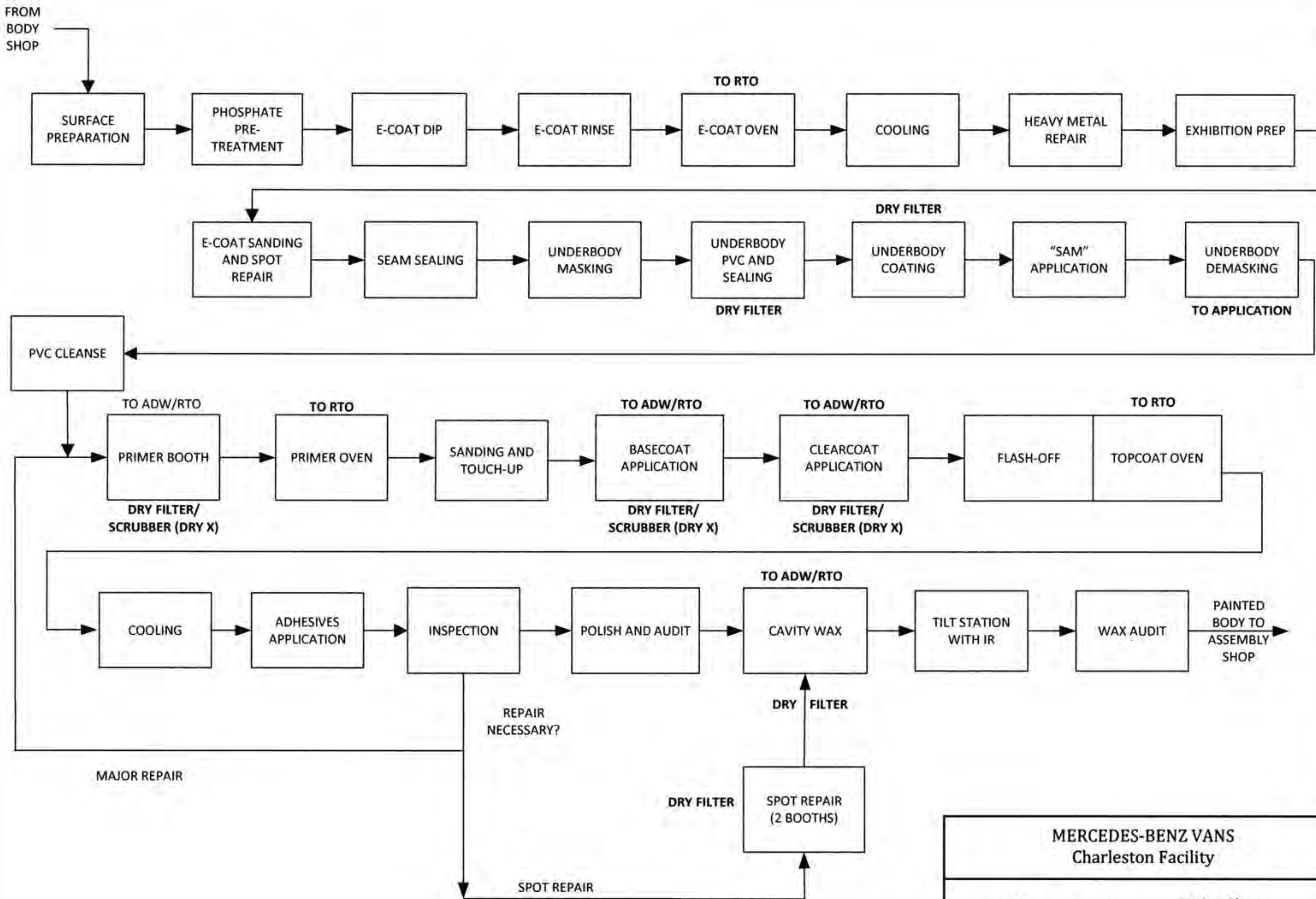


MERCEDES-BENZ VANS
Charleston Facility

Trinity Consultants

Paint Shop
Block Flow Diagram
(Phase 1)

February 2018

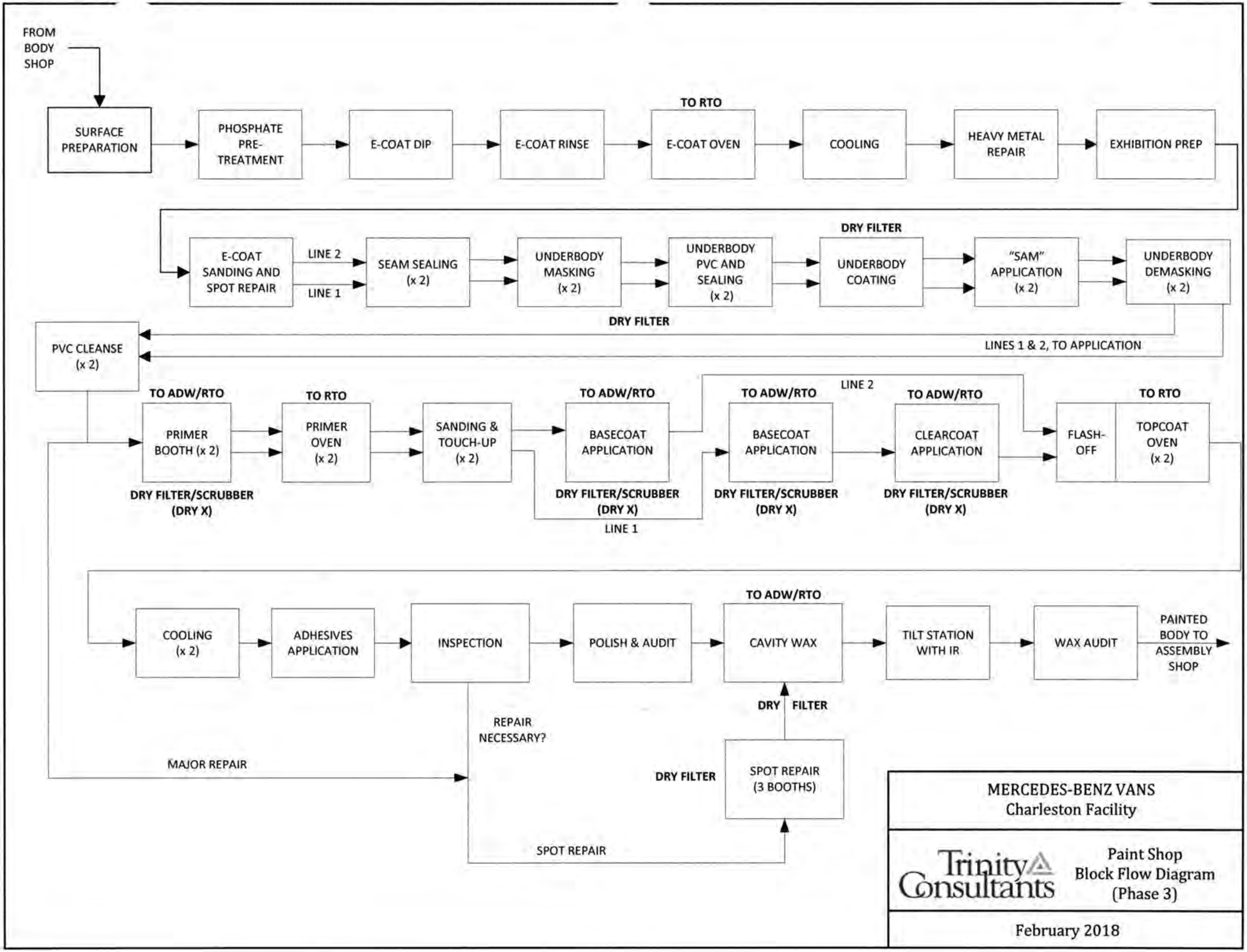


MERCEDES-BENZ VANS
Charleston Facility

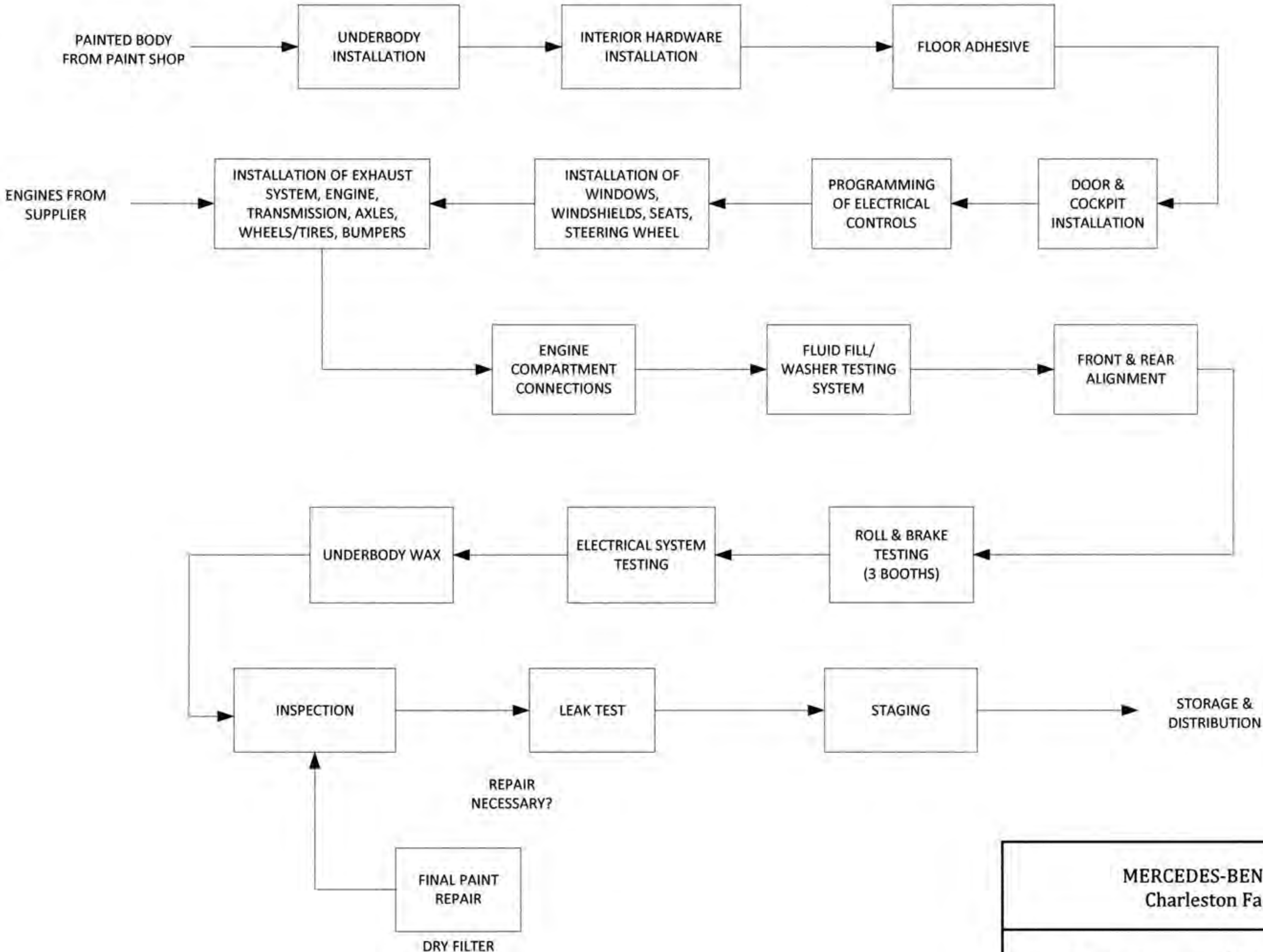
Trinity Consultants

Paint Shop
Block Flow Diagram
(Phase 2)

February 201



FROM BODY SHOP
SURFACE PREPARATION
PHOSPHATE PRE-TREATMENT
E-COAT DIP
E-COAT RINSE
TO RTO
E-COAT OVEN
COOLING
HEAVY METAL REPAIR
EXHIBITION PREP
E-COAT SANDING AND SPOT REPAIR
LINE 2
LINE 1
SEAM SEALING (x 2)
UNDERBODY MASKING (x 2)
UNDERBODY PVC AND SEALING (x 2)
DRY FILTER
DRY FILTER
UNDERBODY COATING
"SAM" APPLICATION (x 2)
UNDERBODY DEMASKING (x 2)
LINES 1 & 2, TO APPLICATION
PVC CLEANSE (x 2)
TO ADW/RTO
PRIMER BOOTH (x 2)
DRY FILTER/SCRUBBER (DRY X)
TO RTO
PRIMER OVEN (x 2)
SANDING & TOUCH-UP (x 2)
TO ADW/RTO
BASECOAT APPLICATION
DRY FILTER/SCRUBBER (DRY X)
LINE 2
LINE 1
TO ADW/RTO
BASECOAT APPLICATION
DRY FILTER/SCRUBBER (DRY X)
TO ADW/RTO
CLEARCOAT APPLICATION
DRY FILTER/SCRUBBER (DRY X)
FLASH-OFF
TO RTO
TOPCOAT OVEN (x 2)
COOLING (x 2)
ADHESIVES APPLICATION
INSPECTION
POLISH & AUDIT
TO ADW/RTO
CAVITY WAX
TILT STATION WITH IR
WAX AUDIT
PAINTED BODY TO ASSEMBLY SHOP
REPAIR NECESSARY?
MAJOR REPAIR
DRY FILTER
DRY FILTER
SPOT REPAIR (3 BOOTHS)
SPOT REPAIR
MERCEDES-BENZ VANS
Charleston Facility
Trinity Consultants
Paint Shop
Block Flow Diagram
(Phase 3)
February 2018

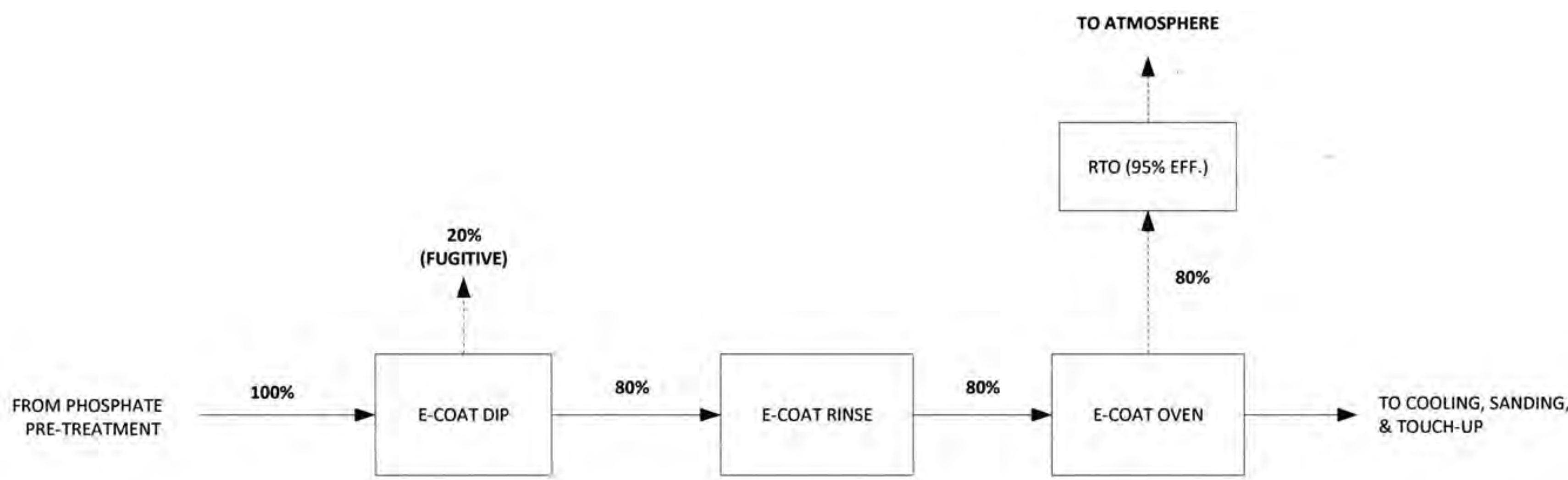


MERCEDES-BENZ VANS
Charleston Facility

Trinity Consultants

Assembly Shop Block Flow Diagram (All Phases)

February 201'

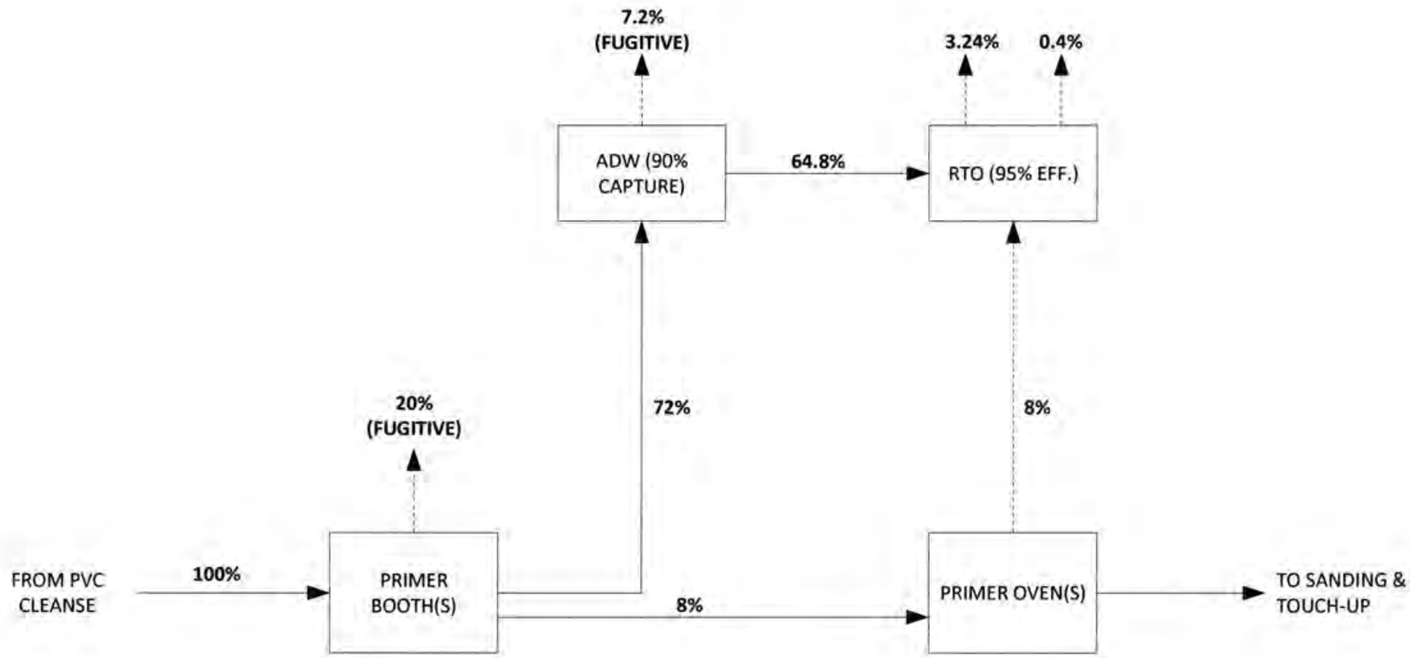


MERCEDES-BENZ VANS
Charleston Facility

Trinity Consultants

E-Coat VOC Capture and Control Block Flow Diagram (All Phases)

February 2018

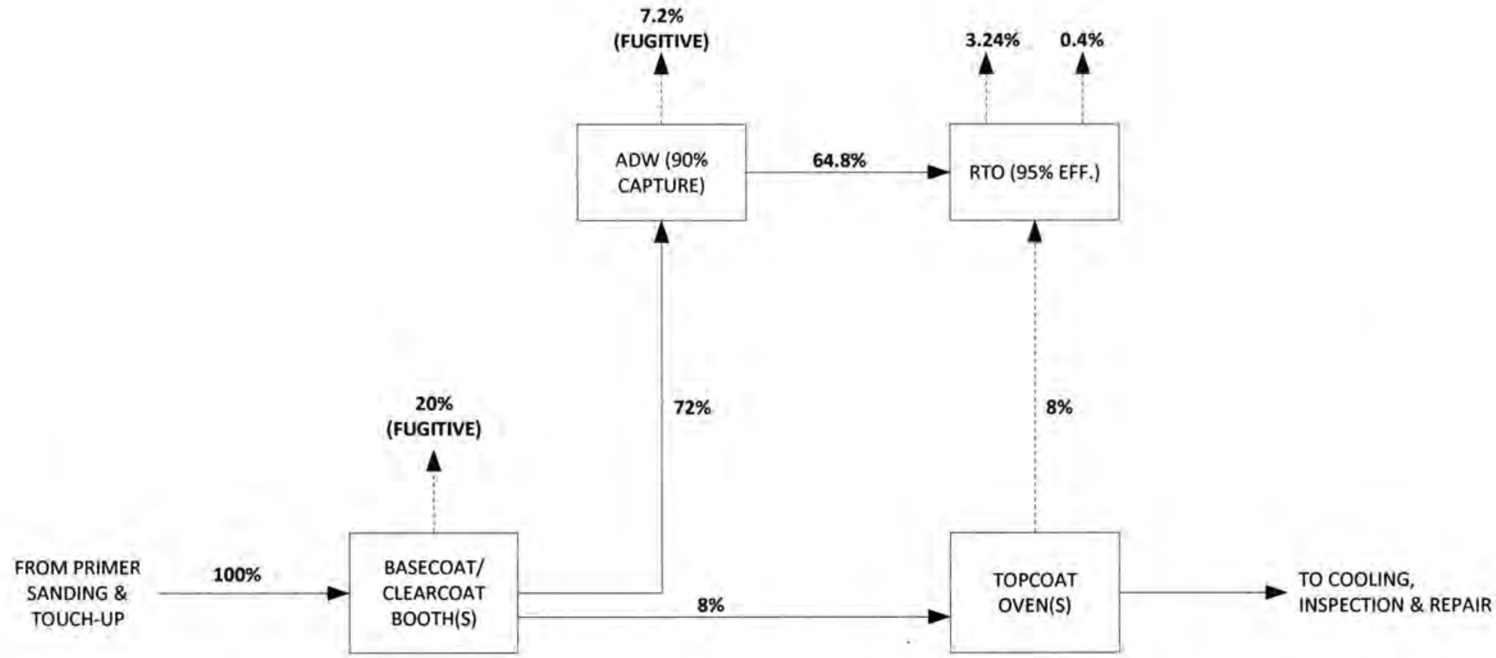


MERCEDES-BENZ VANS
Charleston Facility

Trinity Consultants

Primer VOC Capture and Control Block Flow Diagram (All Phases)

February 201

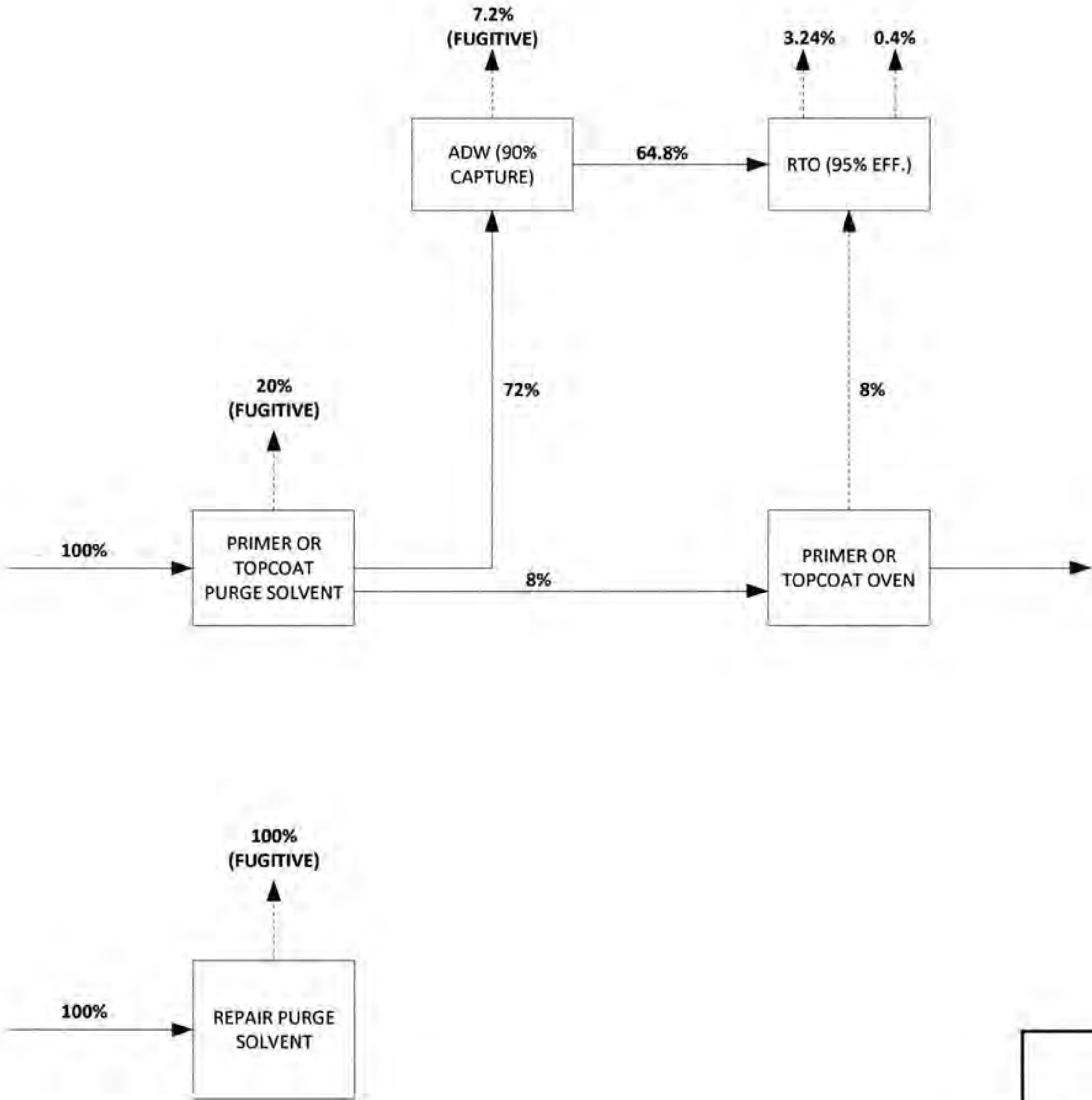


MERCEDES-BENZ VANS
Charleston Facility

Trinity Consultants

Basecoat/Clearcoat VOC Capture and Control Block Flow Diagram (All Phases)

February 2018

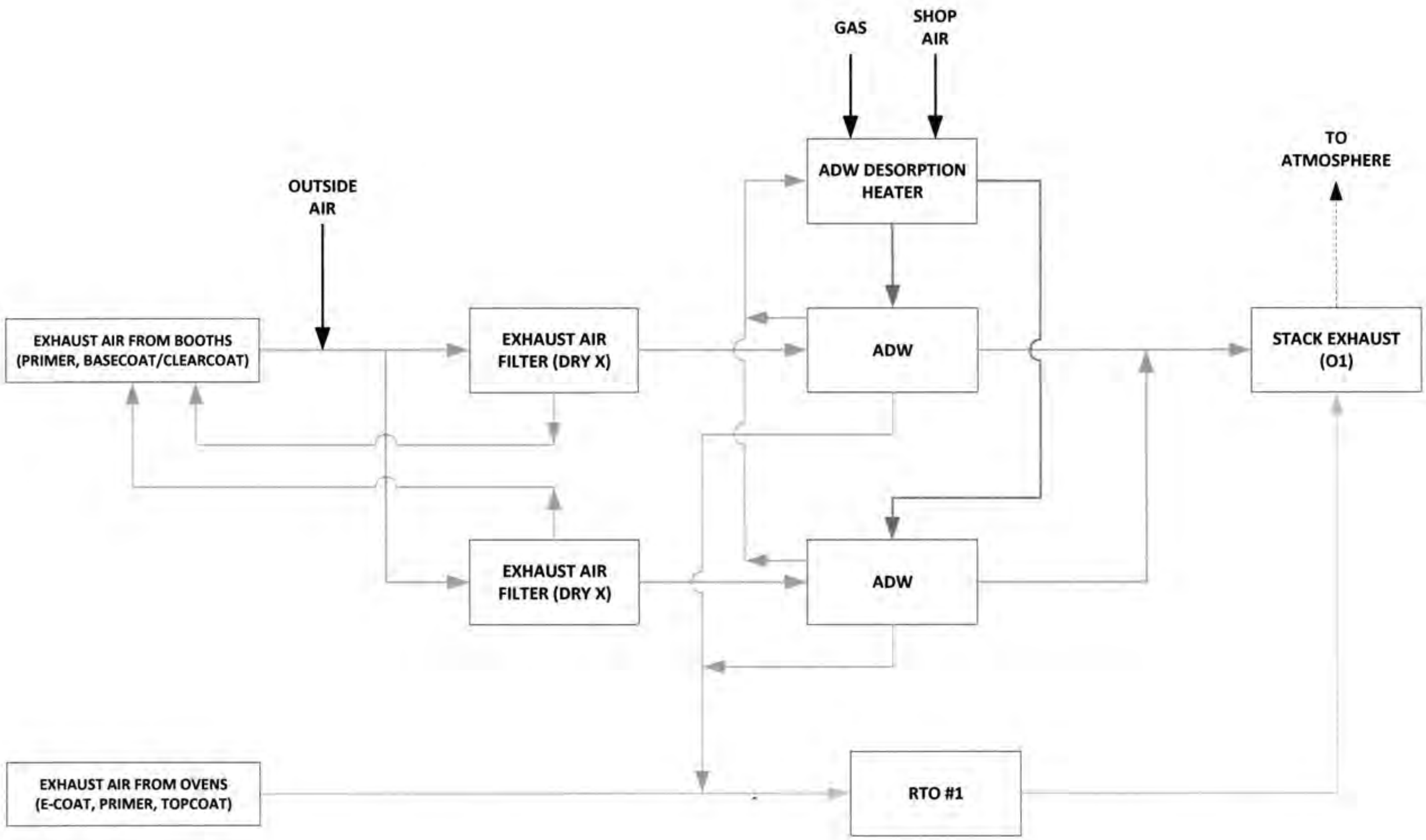


MERCEDES-BENZ VANS
Charleston Facility

Trinity Consultants

Purge/Cleaning Solvent VOC Capture and Control Block Flow Diagram (All Phases)

February 201



LEGEND:

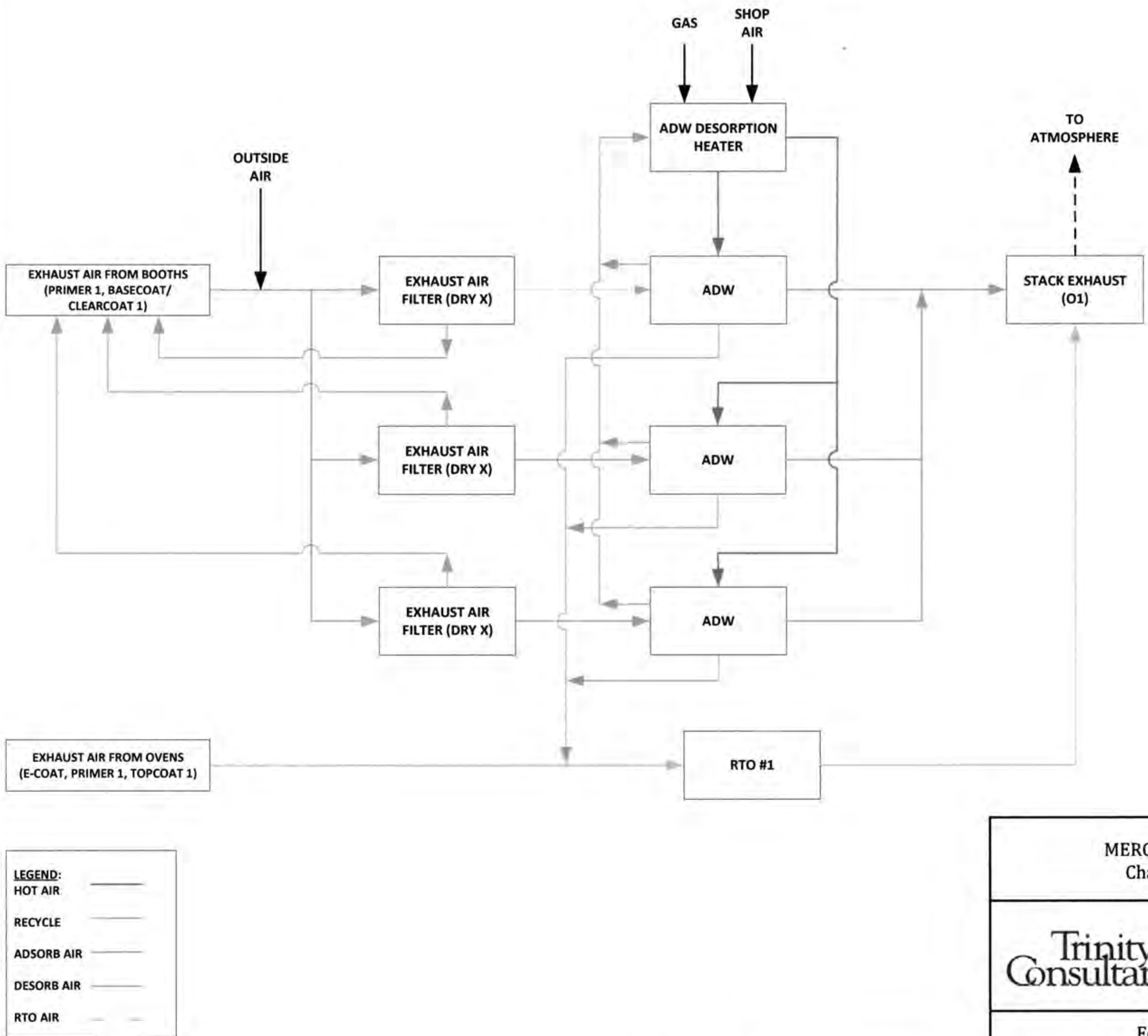
- HOT AIR
- RECYCLE
- ADSORB AIR
- DESORB AIR
- RTO AIR

MERCEDES-BENZ VANS
Charleston Facility

Trinity Consultants

Control and Exhaust Diagram (Phase 1)

February 2018



MERCEDES-BENZ VANS
Charleston Facility

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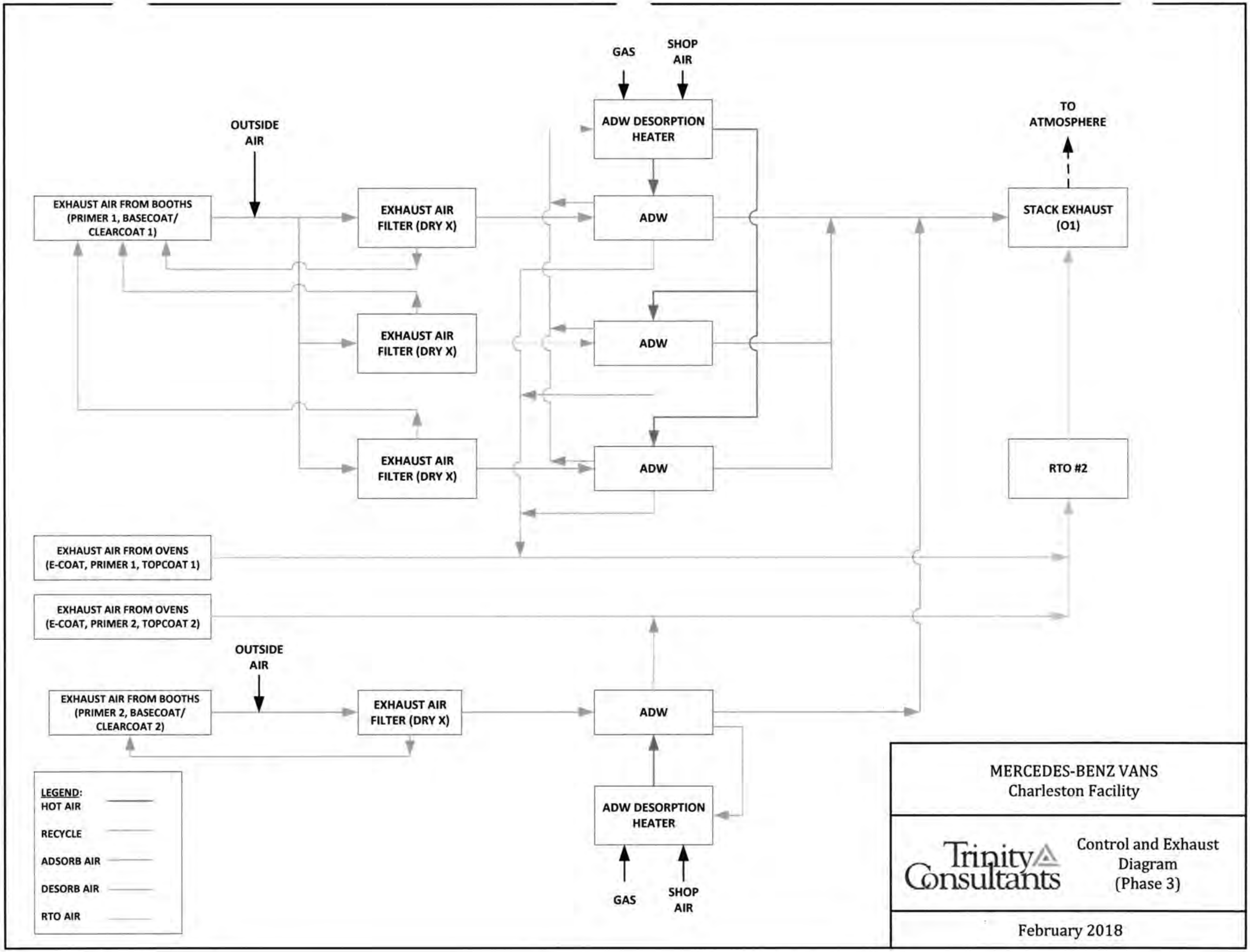
Control and Exhaust Diagram (Phase 2)

February 201



MERCEDES-BENZ VANS
Charleston Facility

Trinity Consultants

Control and Exhaust Diagram (Phase 3)

February 2018

APPENDIX B: DETAILED EMISSION CALCULATIONS

PSD Permit Application - Phase 3 Emission Calculations

Mercedes-Benz Vans, LLC
Charleston, South Carolina Facility

Facility-wide Potential Emissions

	Uncontrolled Emissions		Controlled Emissions	
Pollutants	lb/hr	tpy	lb/hr	tpy
PM	309.96	1,160.26	6.39	21.94
PM_{10}	308.29	1,153.06	4.73	14.73
$PM_{2.5}$	307.99	1,151.75	4.43	13.43
SO_2	1.79	0.79	1.79	0.79
CO	30.37	57.76	30.37	57.76
NO_X	30.78	35.42	30.78	35.42
VOC	809.12	2,950.29	274.72	955.85
Lead	9.69E-05	3.10E-04	9.69E-05	3.10E-04
CO_2e	24,187	74,999	24,187	74,999
CO_2	24,157	74,909	24,157	74,909
CH_4	0.56	1.81	0.56	1.81
N_2O	0.05	0.15	0.05	0.15

Facility-wide Potential HAP/TAP Emissions

	Total Emissions	
Pollutants	lb/hr	tpy
2-Methylnaphthalene	4.65E-06	1.49E-05
3-Methylchloranthrene	3.49E-07	1.12E-06
7,12-Dimethylbenz(a)anthracene	3.10E-06	9.92E-06
Acenaphthene	3.49E-07	1.12E-06
Acenaphthylene	3.49E-07	1.12E-06
Anthracene	4.65E-07	1.49E-06
Benz(a)anthracene	3.49E-07	1.12E-06
Benzene	5.29E-03	2.52E-03
Benzo(a)pyrene	2.33E-07	7.44E-07
Benzo(b)fluoranthene	3.49E-07	1.12E-06
Benzo(g,h,i)perylene	2.33E-07	7.44E-07
Benzo(k)fluoranthene	3.49E-07	1.12E-06
Butylglycol Acetate	4.65E-01	1.74E+00
Chrysene	3.49E-07	1.12E-06
Isopropylbenzene (Cumene)	1.55E-01	5.80E-01
Dibenzo(a,h)anthracene	2.33E-07	7.44E-07
Dichlorobenzene	2.33E-04	7.44E-04
Ethyl Benzene	3.10E-01	1.16E+00
Fluoranthene	5.81E-07	1.86E-06
Fluorene	5.43E-07	1.74E-06
Formaldehyde	1.95E-02	6.67E-02
Hexane	3.49E-01	1.12E+00
Indeno(1,2,3-cd)pyrene	3.49E-07	1.12E-06
Naphthalene	7.89E-04	5.46E-04
Phenanathrene	3.29E-06	1.05E-05
Pyrene	9.69E-07	3.10E-06
Toluene	2.57E-03	2.59E-03
Arsenic	3.88E-05	1.24E-04
Beryllium	2.33E-06	7.44E-06
Cadmium	2.13E-04	6.82E-04
Chromium	2.71E-04	8.68E-04
Cobalt	1.63E-05	5.21E-05
Lead	9.69E-05	3.10E-04
Manganese	6.39E-04	2.35E-03
Mercury	5.04E-05	1.61E-04
Nickel	4.07E-04	1.30E-03
Selenium	4.65E-06	1.49E-05
Xylene	1.09E+00	4.06E+00
Acetaldehyde	2.54E-04	6.35E-05
Acrolein	2.20E-04	5.51E-05
Total PAH	1.15E-03	2.89E-04
Methyl Ethyl Ketone	3.09E+00	1.35E+01
Acrylic acid	3.48E-02	1.53E-01
Methanol	7.59E-01	3.32E+00
Ethylene Glycol	1.06E+00	4.62E+00
Total HAP [a]	94.89	358.18

[a] Includes total HAP from paint shop and purge solvent.

Facility-wide Potential Emissions and PSD Applicability

Pollutants	Project Emissions (tpy)	PSD Significant Emission Rates (tpy)	PSD Permitting Required? (Yes/No)
PM	21.94	25	No
PM_{10}	14.73	15	No
$PM_{2.5}$	13.43	10	**Yes**
SO_2	0.79	40	No
CO	57.76	100	No
NO_X	35.42	40	No
VOC	955.85	40	**Yes**
H_2SO_4	0.00E+00	7	No
Fluorides	0.00E+00	3	No
Lead	3.10E-04	0.6	No
CO_2e	74,999	75,000	No

[a] Mercedes-Benz Vans has chosen to request a 75,000 tpy synthetic minor limit on greenhouse gas emissions (CO_2e) to remain below the PSD significant emission rate.

Inputs

Phase	Paint Shop Operation (days/yr)	Assembly Operation (days/yr)	Paint Shop/Body Shop Throughput			Assembly Throughput [a]		
			(units/hr)	(units/day)	(units/yr)	(units/hr)	(units/day)	(units/yr)
Phase 3	312	365	17	400	124,800	19	450	164,250

[a] Assembly throughput includes existing re-assembly throughput as well as proposed expansion throughput.

Daily Operation
24 hours/day

Combustion Average Utilization [b]	
Percent	Hours of Operation
69.3%	6,072

[b] Average combustion unit utilization for boiler, air supply units, and assembly oven is based on calculated utilization needed to remain below the proposed 75,000 tpy synthetic minor limit on greenhouse gas emissions (CO_2e). Paint shop RTO, ovens, and ADW desorb heater utilization is based on paint shop hours of operation. Mercedes-Benz Vans is not requesting utilization limits for individual emission units.

Hours of Operation [e] 6,072 hrs

Boiler Information

Equipment	Heat Input Capacity MMBtu/hr
Boiler 1 (B01)	14.27
Boiler 2 (B02)	14.27

Boiler Natural Gas Emission Factors

Pollutant		Emission Factor [a,b,c] lb/MMBtu
PM [d]		0.0074
SO_2		0.0006
CO		0.0819
NO_X		0.0360
VOC		0.0054
CO_2e		
	CO_2	117.00
	CH_4	2.21E-03
	N_2O	2.21E-04

[a] Emission factors are from AP-42, Table 1.4-1 and 1.4-2 for small boilers with low NO_X burners. NO_X emission factor is from SC Standard No. 5.2, Section III, Table 1.
[b] Emission factors calculated using the default natural gas heating value of 1,026 Btu/scf from 40 CFR 98.
[c] Emission factors from 40 CFR 98, Subpart C, Tables C-1 and C-2. Factors were converted to lb/MMBtu.
[d] PM_{10} and $PM_{2.5}$ are assumed to be equal to PM for natural gas combustion.

Boilers Non-HAP Potential Emissions

Pollutant		Emission Rates [e]					
		B01		B02		Total	
		lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
$PM/PM_{10}/PM_{2.5}$		0.11	0.32	0.11	0.32	0.21	0.64
SO_2		0.01	0.03	0.01	0.03	0.02	0.05
CO		1.17	3.55	1.17	3.55	2.34	7.09
NO_X		0.51	1.56	0.51	1.56	1.03	3.12
VOC		0.08	0.23	0.08	0.23	0.15	0.46
CO_2e		1,671	5,074	1,671	5,074	3,343	10,148
	CO_2	1,670	5,069	1670	5,069	3,339	10,138
	CH_4	0.03	0.10	0.03	0.10	0.06	0.19
	N_2O	0.003	0.01	0.00	0.01	0.01	0.02

[e] Annual emissions are based on calculated hours of operation needed to remain below the proposed 75,000 tpy synthetic minor limit on greenhouse gas emissions (CO_2e). Mercedes-Benz Vans is not requesting limits on hours of operation for individual emission units.

Appendix B.3.2 - Boilers

Mercedes-Benz Vans, LLC

Boilers HAP/TAP Potential Emissions

Pollutant	Emission Factor [a] lb/MMscf	Boilers Total lb/hr	Boilers Total tpy
2-Methylnaphthalene	2.4E-05	6.7E-07	2.0E-06
3-Methylchloranthrene	1.8E-06	5.0E-08	1.5E-07
7,12-Dimethylbenz(a)anthracene	1.6E-05	4.5E-07	1.4E-06
Acenaphthene	1.8E-06	5.0E-08	1.5E-07
Acenaphthylene	1.8E-06	5.0E-08	1.5E-07
Anthracene	2.4E-06	6.7E-08	2.0E-07
Benz(a)anthracene	1.8E-06	5.0E-08	1.5E-07
Benzene	2.1E-03	5.8E-05	1.8E-04
Benzo(a)pyrene	1.2E-06	3.3E-08	1.0E-07
Benzo(b)fluoranthene	1.8E-06	5.0E-08	1.5E-07
Benzo(g,h,i)perylene	1.2E-06	3.3E-08	1.0E-07
Benzo(k)fluoranthene	1.8E-06	5.0E-08	1.5E-07
Chrysene	1.8E-06	5.0E-08	1.5E-07
Dibenzo(a,h)anthracene	1.2E-06	3.3E-08	1.0E-07
Dichlorobenzene	1.2E-03	3.3E-05	1.0E-04
Fluoranthene	3.0E-06	8.3E-08	2.5E-07
Fluorene	2.8E-06	7.8E-08	2.4E-07
Formaldehyde	7.5E-02	2.1E-03	6.3E-03
Hexane	1.8E+00	5.0E-02	1.5E-01
Indeno(1,2,3-cd)pyrene	1.8E-06	5.0E-08	1.5E-07
Naphthalene	6.1E-04	1.7E-05	5.2E-05
Phenanathrene	1.7E-05	4.7E-07	1.4E-06
Pyrene	5.0E-06	1.4E-07	4.2E-07
Toluene	3.4E-03	9.5E-05	2.9E-04
Arsenic	2.0E-04	5.6E-06	1.7E-05
Beryllium	1.2E-05	3.3E-07	1.0E-06
Cadmium	1.1E-03	3.1E-05	9.3E-05
Chromium	1.4E-03	3.9E-05	1.2E-04
Cobalt	8.4E-05	2.3E-06	7.1E-06
Lead	5.0E-04	1.4E-05	4.2E-05
Manganese	3.8E-04	1.1E-05	3.2E-05
Mercury	2.6E-04	7.2E-06	2.2E-05
Nickel	2.1E-03	5.8E-05	1.8E-04
Selenium	2.4E-05	6.7E-07	2.0E-06

[a] Emission factors are from AP-42, Table 1.4-2, 1.4-3, and 1.4-4.

Air Supply and Rooftop Units - Natural Gas Emission Factors

Hours of Operation [e] 6,072 hrs

Pollutant	NG Emission Factors [a,b,c] (lb/MMBtu)
$PM/PM_{10}/PM_{2.5}$	0.0074
SO_2	0.0006
NO_X	0.0487
CO	0.0819
VOC	0.0054
CO_2e [d]	
CO_2	117.00
CH_4	2.21E-03
N_2O	2.21E-04

[a] PM, SO_2, and VOC natural gas emission factors are from AP-42, Table 1.4-2, 07/98.

[b] NO_X and CO natural gas emission factors are from AP-42, Table 1.4-1, 07/98, Small Boilers w/ Low NO_X Control.

[c] The heating value of natural gas is assumed to be 1,026 Btu/scf.

[d] Emission factors from 40 CFR 98, Subpart C, Tables C-1 and C-2. Factors were converted to lb/MMBtu.

[e] Annual emissions are based on calculated hours of operation needed to remain below the proposed 75,000 tpy synthetic minor limit on greenhouse gas emissions (CO_2e). Mercedes-Benz Vans is not requesting limits on hours of operation for individual emission units.

Air Supply Units Non-HAP Emissions

			Emission Rates [e]																	
		Rated Capacity	$PM/PM_{10}/PM_{2.5}$		SO_2		NO_X		CO		VOC		CO_2		CH_4		N_2O		CO_2e	
Description	Equipment	(MMBtu/hr)	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
ASU Primer/BC/CC	ASU P/BC/CC	6.49	Routed to Dry X. See Dry X PM Emissions Table.		0.004	0.012	0.32	0.96	0.53	1.61	0.03	0.11	759.31	2,305	0.014	0.043	0.001	0.004	760.10	2,308
ASU 2.1 Shop + Open WD	ASU 2.1	10.00	0.07	0.22	0.006	0.018	0.49	1.48	0.82	2.49	0.05	0.16	1,169.97	3,552	0.022	0.067	0.002	0.007	1,171.18	3,556
ASU 3 - UBP + Repair	ASU 3	7.44	0.06	0.17	0.004	0.013	0.36	1.10	0.61	1.85	0.04	0.12	870.46	2,643	0.016	0.050	0.002	0.005	871.36	2,646
ASU 2.2 Shop + Open WD	ASU 2.2	10.00	0.07	0.22	0.006	0.018	0.49	1.48	0.82	2.49	0.05	0.16	1,169.97	3,552	0.022	0.067	0.002	0.007	1,171.18	3,556
ASU 1 - Spot Repair	ASU 1	4.82	0.04	0.11	0.003	0.009	0.23	0.71	0.39	1.20	0.03	0.08	563.93	1,712	0.011	0.032	0.001	0.003	564.51	1,714
ASU 2.3 Shop	ASU 2.3	10.00	0.07	0.22	0.006	0.018	0.49	1.48	0.82	2.49	0.05	0.16	1,169.97	3,552	0.022	0.067	0.0022	0.007	1,171.18	3,556
ASU 4 - Wax	ASU 4	4.84	0.04	0.11	0.003	0.009	0.24	0.72	0.40	1.20	0.03	0.08	566.27	1,719	0.011	0.032	0.001	0.003	566.85	1,721
Workdecks ASU 6 (Phase 2)	ASU 6	8.54	0.06	0.19	0.005	0.015	0.42	1.26	0.70	2.12	0.05	0.14	999.16	3,034	0.019	0.057	0.002	0.006	1,000.19	3,037
Workdecks ASU 5 (Phase 2)	ASU 5	5.83	0.04	0.13	0.003	0.010	0.28	0.86	0.48	1.45	0.03	0.09	682.09	2,071	0.013	0.039	0.0013	0.004	682.80	2,073
ASU Cleanroom (Phase 2)	ASU CR2	1.26	0.01	0.03	0.001	0.002	0.06	0.19	0.10	0.31	0.01	0.02	147.42	448	0.003	0.008	0.000	0.001	147.57	448
Primer Booth Air Supply Unit Phase 3	ASU31	7.57	Routed to Dry X. See Dry X PM Emissions Table.		0.004	0.013	0.37	1.12	0.62	1.88	0.04	0.12	885.67	2,689	0.017	0.051	0.002	0.005	886.58	2,692
BC Booth Air Supply Unit Phase 3	ASU32	7.68			0.004	0.014	0.37	1.14	0.63	1.91	0.04	0.12	898.54	2,728	0.017	0.051	0.002	0.005	899.47	2,731
Workdecks Air Supply Unit 1 Phase 3	ASU33	4.96	0.04	0.11	0.003	0.009	0.24	0.73	0.41	1.23	0.03	0.08	580.31	1,762	0.011	0.033	0.001	0.003	580.91	1,764
Workdecks Air Supply Unit 2 Phase 3	ASU34	2.56	0.02	0.06	0.001	0.005	0.12	0.38	0.21	0.64	0.01	0.04	299.51	909	0.006	0.017	0.001	0.002	299.82	910
Workdecks Air Supply Unit 3 Phase 3	ASU35	8.05	0.06	0.18	0.005	0.014	0.39	1.19	0.66	2.00	0.04	0.13	941.83	2,859	0.018	0.054	0.002	0.005	942.80	2,862
Shop Ventilation Air Supply Unit Phase 3	ASU36	3.07	0.02	0.07	0.002	0.005	0.15	0.45	0.25	0.76	0.02	0.05	359.18	1,091	0.007	0.021	0.001	0.002	359.55	1,092
Social Rooms Air Supply Unit Phase 3	ASU37	1.53	0.01	0.03	0.001	0.003	0.07	0.23	0.13	0.38	0.01	0.02	179.01	543	0.003	0.010	0.000	0.001	179.19	544
ASU Total		**104.64**	**0.61**	**1.86**	**0.06**	**0.19**	**5.10**	**15.48**	**8.57**	**26.01**	**0.56**	**1.70**	**12,243**	**37,170**	**0.23**	**0.70**	**0.02**	**0.07**	**12,255**	**37,208**

Rooftop Units Non-HAP Emissions

Description	Equipment	Rated Capacity (MMBtu/hr)	Emission Rates [e]																	
			$PM/PM_{10}/PM_{2.5}$		SO_2		NO_X		CO		VOC		CO_2		CH_4		N_2O		CO_2e	
			lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
Assembly - Rooftop Unit 1	AS-RTU01	0.80	5.93E-03	1.80E-02	4.68E-04	1.42E-03	3.90E-02	1.18E-01	6.55E-02	1.99E-01	4.29E-03	1.30E-02	93.60	284	1.76E-03	5.36E-03	1.76E-04	5.36E-04	93.69	284
Assembly - Rooftop Unit 4	AS-RTU04	0.80	5.93E-03	1.80E-02	4.68E-04	1.42E-03	3.90E-02	1.18E-01	6.55E-02	1.99E-01	4.29E-03	1.30E-02	93.60	284	1.76E-03	5.36E-03	1.76E-04	5.36E-04	93.69	284
Assembly - Rooftop Unit 6	AS-RTU06	0.80	5.93E-03	1.80E-02	4.68E-04	1.42E-03	3.90E-02	1.18E-01	6.55E-02	1.99E-01	4.29E-03	1.30E-02	93.60	284	1.76E-03	5.36E-03	1.76E-04	5.36E-04	93.69	284
Assembly - Rooftop Unit 8	AS-RTU08	0.80	5.93E-03	1.80E-02	4.68E-04	1.42E-03	3.90E-02	1.18E-01	6.55E-02	1.99E-01	4.29E-03	1.30E-02	93.60	284	1.76E-03	5.36E-03	1.76E-04	5.36E-04	93.69	284
Assembly - Rooftop Unit 10	AS-RTU10	0.80	5.93E-03	1.80E-02	4.68E-04	1.42E-03	3.90E-02	1.18E-01	6.55E-02	1.99E-01	4.29E-03	1.30E-02	93.60	284	1.76E-03	5.36E-03	1.76E-04	5.36E-04	93.69	284
Assembly - Rooftop Unit 11	AS-RTU11	0.80	5.93E-03	1.80E-02	4.68E-04	1.42E-03	3.90E-02	1.18E-01	6.55E-02	1.99E-01	4.29E-03	1.30E-02	93.60	284	1.76E-03	5.36E-03	1.76E-04	5.36E-04	93.69	284
Assembly - Rooftop Unit 13	AS-RTU13	0.80	5.93E-03	1.80E-02	4.68E-04	1.42E-03	3.90E-02	1.18E-01	6.55E-02	1.99E-01	4.29E-03	1.30E-02	93.60	284	1.76E-03	5.36E-03	1.76E-04	5.36E-04	93.69	284
Body Shop - Rooftop Unit 1	BS-RTU01	0.80	5.93E-03	1.80E-02	4.68E-04	1.42E-03	3.90E-02	1.18E-01	6.55E-02	1.99E-01	4.29E-03	1.30E-02	93.60	284	1.76E-03	5.36E-03	1.76E-04	5.36E-04	93.69	284
Body Shop - Rooftop Unit 2	BS-RTU02	0.80	5.93E-03	1.80E-02	4.68E-04	1.42E-03	3.90E-02	1.18E-01	6.55E-02	1.99E-01	4.29E-03	1.30E-02	93.60	284	1.76E-03	5.36E-03	1.76E-04	5.36E-04	93.69	284
Body Shop - Rooftop Unit 4	BS-RTU04	0.80	5.93E-03	1.80E-02	4.68E-04	1.42E-03	3.90E-02	1.18E-01	6.55E-02	1.99E-01	4.29E-03	1.30E-02	93.60	284	1.76E-03	5.36E-03	1.76E-04	5.36E-04	93.69	284
Body Shop - Rooftop Unit 5	BS-RTU05	0.80	5.93E-03	1.80E-02	4.68E-04	1.42E-03	3.90E-02	1.18E-01	6.55E-02	1.99E-01	4.29E-03	1.30E-02	93.60	284	1.76E-03	5.36E-03	1.76E-04	5.36E-04	93.69	284
Body Shop - Rooftop Unit 6	BS-RTU06	0.80	5.93E-03	1.80E-02	4.68E-04	1.42E-03	3.90E-02	1.18E-01	6.55E-02	1.99E-01	4.29E-03	1.30E-02	93.60	284	1.76E-03	5.36E-03	1.76E-04	5.36E-04	93.69	284
Body Shop - Rooftop Unit 7	BS-RTU07	0.80	5.93E-03	1.80E-02	4.68E-04	1.42E-03	3.90E-02	1.18E-01	6.55E-02	1.99E-01	4.29E-03	1.30E-02	93.60	284	1.76E-03	5.36E-03	1.76E-04	5.36E-04	93.69	284
Body Shop - Rooftop Unit 10	BS-RTU10	0.80	5.93E-03	1.80E-02	4.68E-04	1.42E-03	3.90E-02	1.18E-01	6.55E-02	1.99E-01	4.29E-03	1.30E-02	93.60	284	1.76E-03	5.36E-03	1.76E-04	5.36E-04	93.69	284
Body Shop - Rooftop Unit 17	BS-RTU17	0.80	5.93E-03	1.80E-02	4.68E-04	1.42E-03	3.90E-02	1.18E-01	6.55E-02	1.99E-01	4.29E-03	1.30E-02	93.60	284	1.76E-03	5.36E-03	1.76E-04	5.36E-04	93.69	284
Body Shop - Rooftop Unit 18	BS-RTU18	0.80	5.93E-03	1.80E-02	4.68E-04	1.42E-03	3.90E-02	1.18E-01	6.55E-02	1.99E-01	4.29E-03	1.30E-02	93.60	284	1.76E-03	5.36E-03	1.76E-04	5.36E-04	93.69	284
Body Shop - Rooftop Unit 23	BS-RTU23	0.80	5.93E-03	1.80E-02	4.68E-04	1.42E-03	3.90E-02	1.18E-01	6.55E-02	1.99E-01	4.29E-03	1.30E-02	93.60	284	1.76E-03	5.36E-03	1.76E-04	5.36E-04	93.69	284
Body Shop - Rooftop Unit 25	BS-RTU25	0.80	5.93E-03	1.80E-02	4.68E-04	1.42E-03	3.90E-02	1.18E-01	6.55E-02	1.99E-01	4.29E-03	1.30E-02	93.60	284	1.76E-03	5.36E-03	1.76E-04	5.36E-04	93.69	284
Body Shop - Rooftop Unit 26	BS-RTU26	0.80	5.93E-03	1.80E-02	4.68E-04	1.42E-03	3.90E-02	1.18E-01	6.55E-02	1.99E-01	4.29E-03	1.30E-02	93.60	284	1.76E-03	5.36E-03	1.76E-04	5.36E-04	93.69	284
Body Shop - Rooftop Unit 30	BS-RTU30	0.80	5.93E-03	1.80E-02	4.68E-04	1.42E-03	3.90E-02	1.18E-01	6.55E-02	1.99E-01	4.29E-03	1.30E-02	93.60	284	1.76E-03	5.36E-03	1.76E-04	5.36E-04	93.69	284
Body Shop - Rooftop Unit 32	BS-RTU32	0.80	5.93E-03	1.80E-02	4.68E-04	1.42E-03	3.90E-02	1.18E-01	6.55E-02	1.99E-01	4.29E-03	1.30E-02	93.60	284	1.76E-03	5.36E-03	1.76E-04	5.36E-04	93.69	284
Body Shop - Rooftop Unit 33	BS-RTU33	0.80	5.93E-03	1.80E-02	4.68E-04	1.42E-03	3.90E-02	1.18E-01	6.55E-02	1.99E-01	4.29E-03	1.30E-02	93.60	284	1.76E-03	5.36E-03	1.76E-04	5.36E-04	93.69	284
Body Shop - Rooftop Unit 35	BS-RTU35	0.80	5.93E-03	1.80E-02	4.68E-04	1.42E-03	3.90E-02	1.18E-01	6.55E-02	1.99E-01	4.29E-03	1.30E-02	93.60	284	1.76E-03	5.36E-03	1.76E-04	5.36E-04	93.69	284
RTU Total		18.40	1.36E-01	4.14E-01	1.08E-02	3.27E-02	8.97E-01	2.72E+00	1.51E+00	4.57E+00	9.86E-02	2.99E-01	2,152.75	6,536	4.06E-02	1.23E-01	4.06E-03	1.23E-02	2,154.97	6,543
ASU + RTU Total		**123.04**	**7.50E-01**	**2.28**	**7.20E-02**	**2.18E-01**	**6.00E+00**	**1.82E+01**	**1.01E+01**	**3.06E+01**	**6.60E-01**	**2.00**	**14,395**	**43,706**	**2.71E-01**	**8.24E-01**	**2.71E-02**	**8.24E-02**	**14,410**	**43,751**

[e] Annual emissions are based on calculated hours of operation needed to remain below the proposed 75,000 tpy synthetic minor limit on greenhouse gas emissions (CO_2e). Mercedes-Benz Vans is not requesting limits on hours of operation for individual emission units.

Hours of Operation [a]	6,072	hrs
Total Rated Capacity	123.04	MMBtu/hr

Air Supply and Rooftop Units HAP/TAP Emissions

Pollutants	NG Emission Factor [b] lb/10^6 scf	HAP/TAP	
		lb/hr	tpy
2-Methylnaphthalene	2.40E-05	2.88E-06	8.74E-06
3-Methylchloranthrene	1.80E-06	2.16E-07	6.55E-07
7,12-Dimethylbenz(a)anthracene	1.60E-05	1.92E-06	5.83E-06
Acenaphthene	1.80E-06	2.16E-07	6.55E-07
Acenaphthylene	1.80E-06	2.16E-07	6.55E-07
Anthracene	2.40E-06	2.88E-07	8.74E-07
Benz(a)anthracene	1.80E-06	2.16E-07	6.55E-07
Benzene	2.10E-03	2.52E-04	7.65E-04
Benzo(a)pyrene	1.20E-06	1.44E-07	4.37E-07
Benzo(b)fluoranthene	1.80E-06	2.16E-07	6.55E-07
Benzo(g,h,i)perylene	1.20E-06	1.44E-07	4.37E-07
Benzo(k)fluoranthene	1.80E-06	2.16E-07	6.55E-07
Chrysene	1.80E-06	2.16E-07	6.55E-07
Dibenzo(a,h)anthracene	1.20E-06	1.44E-07	4.37E-07
Dichlorobenzene	1.20E-03	1.44E-04	4.37E-04
Fluoranthene	3.00E-06	3.60E-07	1.09E-06
Fluorene	2.80E-06	3.36E-07	1.02E-06
Formaldehyde	7.50E-02	8.99E-03	2.73E-02
Hexane	1.80E+00	2.16E-01	6.55E-01
Indeno(1,2,3-cd)pyrene	1.80E-06	2.16E-07	6.55E-07
Naphthalene	6.10E-04	7.32E-05	2.22E-04
Phenanathrene	1.70E-05	2.04E-06	6.19E-06
Pyrene	5.00E-06	6.00E-07	1.82E-06
Toluene	3.40E-03	4.08E-04	1.24E-03
Arsenic	2.00E-04	2.40E-05	7.28E-05
Beryllium	1.20E-05	1.44E-06	4.37E-06
Cadmium	1.10E-03	1.32E-04	4.01E-04
Chromium	1.40E-03	1.68E-04	5.10E-04
Cobalt	8.40E-05	1.01E-05	3.06E-05
Lead	5.00E-04	6.00E-05	1.82E-04
Manganese	3.80E-04	4.56E-05	1.38E-04
Mercury	2.60E-04	3.12E-05	9.47E-05
Nickel	2.10E-03	2.52E-04	7.65E-04
Selenium	2.40E-05	2.88E-06	8.74E-06

[a] Annual emissions are based on calculated hours of operation needed to remain below the proposed 75,000 tpy synthetic minor limit on greenhouse gas emissions (CO_2e). Mercedes-Benz Vans is not requesting limits on hours of operation for individual emission units.

[b] Natural Gas Emission Factors are from AP-42 Section 1.4, Tables 1.4-2, 1.4-3, and 1.4-4.

Paint Shop Combustion - Natural Gas Emission Factors

Hours of Operation [e] 7,488 hrs

Pollutant	NG Emission Factors [a,b,c] (lb/MMBtu)
$PM/PM_{10}/PM_{2.5}$	0.0074
SO_2	0.0006
NO_X	0.0487
CO	0.0819
VOC	0.0054
CO_2e [d]	
CO_2	117.00
CH_4	2.21E-03
N_2O	2.21E-04

[a] PM, SO_2, and VOC natural gas emission factors are from AP-42, Table 1.4-2, 07/98.
[b] NO_X and CO natural gas emission factors are from AP-42, Table 1.4-1, 07/98, Small Boilers w/ Low NO_X Control.
[c] The heating value of natural gas is assumed to be 1,026 Btu/scf.
[d] Emission factors from 40 CFR 98, Subpart C, Tables C-1 and C-2. Factors were converted to lb/MMBtu.

Paint Shop Combustion Non-HAP Emissions

			Emission Rates [e]																	
		Rated Capacity	$PM/PM_{10}/PM_{2.5}$		SO_2		NO_X		CO		VOC		CO_2		CH_4		N_2O		CO_2e	
Description	Equipment	(MMBtu/hr)	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
RTO #1	RTO1	8.00	0.06	0.22	0.005	0.018	0.39	1.46	0.65	2.45	0.04	0.16	935.98	3,504	0.018	0.066	0.002	0.007	936.95	3,508
RTO #1 (add) [f]	RTO1	8.00	0.06	0.22	0.005	0.018	0.39	1.46	0.65	2.45	0.04	0.16	935.98	3,504	0.018	0.066	0.002	0.007	936.95	3,508
ADW Desorption Heater #1	ADH1	3.50	0.03	0.10	0.002	0.008	0.17	0.64	0.29	1.07	0.02	0.07	409.49	1,533	0.008	0.029	0.001	0.003	409.91	1,535
ADW Desorption Heater #2	ADH2	2.13	0.02	0.06	0.001	0.005	0.10	0.39	0.17	0.65	0.01	0.04	249.20	933	0.005	0.018	0.000	0.002	249.46	934
E-Coat Oven	OV01	4.85	0.04	0.13	0.003	0.011	0.24	0.88	0.40	1.49	0.03	0.10	567.44	2,124	0.011	0.040	0.001	0.004	568.02	2,127
Primer (Guidecoat) Oven #1	OV02	4.30	0.03	0.12	0.003	0.009	0.21	0.78	0.35	1.32	0.02	0.09	503.09	1,884	0.009	0.035	0.001	0.004	503.61	1,886
Topcoat Oven #1	OV03	4.27	0.03	0.12	0.002	0.009	0.21	0.78	0.35	1.31	0.02	0.09	499.58	1,870	0.009	0.035	0.001	0.004	500.09	1,872
Primer (Guidecoat) Oven #2	OV22	5.12	0.04	0.14	0.003	0.011	0.25	0.93	0.42	1.57	0.03	0.10	599.03	2,243	0.011	0.042	0.001	0.004	599.64	2,245
Topcoat Oven #2	OV23	5.73	0.04	0.16	0.003	0.013	0.28	1.05	0.47	1.76	0.03	0.12	670.39	2,510	0.013	0.047	0.001	0.005	671.09	2,513
Total		**45.90**	**0.34**	**1.27**	**0.03**	**0.10**	**2.24**	**8.37**	**3.76**	**14.07**	**0.25**	**0.92**	**5,370.18**	**20,106**	**0.10**	**0.38**	**0.01**	**0.04**	**5,375.72**	**20,127**

[e] Annual emissions are based on paint shop hours of operation.
[f] Phase II or III RTO will replace Phase I RTO (RTO #1 @ 8 MMBtu/hr), with a new unit that has 8 MMBtu/hr additional heat input, for a total of 16 MMBtu/hr. Emissions include combustion emissions from both RTO #1 and RTO #1 (add).

Hours of Operation [a]	7,488	hrs
Total Rated Capacity	45.90	MMBtu/hr

Paint Shop Combustion HAP/TAP Emissions

Pollutants	NG Emission Factor [b] lb/10^6 scf	HAP/TAP lb/hr	HAP/TAP tpy
2-Methylnaphthalene	2.40E-05	1.07E-06	4.02E-06
3-Methylchloranthrene	1.80E-06	8.05E-08	3.01E-07
7,12-Dimethylbenz(a)anthracene	1.60E-05	7.16E-07	2.68E-06
Acenaphthene	1.80E-06	8.05E-08	3.01E-07
Acenaphthylene	1.80E-06	8.05E-08	3.01E-07
Anthracene	2.40E-06	1.07E-07	4.02E-07
Benz(a)anthracene	1.80E-06	8.05E-08	3.01E-07
Benzene	2.10E-03	9.39E-05	3.52E-04
Benzo(a)pyrene	1.20E-06	5.37E-08	2.01E-07
Benzo(b)fluoranthene	1.80E-06	8.05E-08	3.01E-07
Benzo(g,h,i)perylene	1.20E-06	5.37E-08	2.01E-07
Benzo(k)fluoranthene	1.80E-06	8.05E-08	3.01E-07
Chrysene	1.80E-06	8.05E-08	3.01E-07
Dibenzo(a,h)anthracene	1.20E-06	5.37E-08	2.01E-07
Dichlorobenzene	1.20E-03	5.37E-05	2.01E-04
Fluoranthene	3.00E-06	1.34E-07	5.02E-07
Fluorene	2.80E-06	1.25E-07	4.69E-07
Formaldehyde	7.50E-02	3.36E-03	1.26E-02
Hexane	1.80E+00	8.05E-02	3.01E-01
Indeno(1,2,3-cd)pyrene	1.80E-06	8.05E-08	3.01E-07
Naphthalene	6.10E-04	2.73E-05	1.02E-04
Phenanathrene	1.70E-05	7.61E-07	2.85E-06
Pyrene	5.00E-06	2.24E-07	8.37E-07
Toluene	3.40E-03	1.52E-04	5.69E-04
Arsenic	2.00E-04	8.95E-06	3.35E-05
Beryllium	1.20E-05	5.37E-07	2.01E-06
Cadmium	1.10E-03	4.92E-05	1.84E-04
Chromium	1.40E-03	6.26E-05	2.34E-04
Cobalt	8.40E-05	3.76E-06	1.41E-05
Lead	5.00E-04	2.24E-05	8.37E-05
Manganese	3.80E-04	1.70E-05	6.36E-05
Mercury	2.60E-04	1.16E-05	4.35E-05
Nickel	2.10E-03	9.39E-05	3.52E-04
Selenium	2.40E-05	1.07E-06	4.02E-06

[a] Annual emissions are based on paint shop hours of operation.

[b] Natural Gas Emission Factors are from AP-42 Section 1.4, Tables 1.4-2, 1.4-3, and 1.4-4.

Coating Throughput Information

	# of Units	Notes
Paint Shop Bodies per Year	**124,800**	Based on maximum daily throughput and days of operation per year
Major Repair Equivalent Bodies per Year	**12,480**	Major repair area assumed to be equivalent to 10% of the total vehicle throughput.
Total Paint Shop Equivalent Bodies per Year	**137,280**	Based on total of maximum daily throughput and major repair area throughput.
Total Parts per Year	**3,744**	Parts painted area assumed to be equivalent to 3% of the total vehicle throughput.
Assembly Bodies per Year	**164,250**	Based on maximum daily throughput and days of operation per year
Operating Hours per year	**7,488**	Based on facility operating 24 hours/day and days of operation per year.

Coating Emission Calculations

Process	Parts	Bodies		Material Data		VOC										PM/PM10/PM2.5							lb/GACS	
								Capture & Control			Emissions													
	Application Rate	Split	Application Rate	Coating Density	Coating Usage	VOC In		Dip Tank Split	Oven Split	RTO Eff.	Emissions from Dip Tank	Emissions from Oven	Controlled VOC Emissions			Volume Solids	Transfer Eff.	Uncontrolled PM Emissions		Control Eff.	Controlled PM Emissions		GACS per year	lbs VOC/ GACS
	A1		A2	B	C [a]	D	E=C x D	F	G	H	I [b]	J [c]	K [d]	L = I + J	M	N	O	P [d]	Q	R	S [d]	T [e]	U [f]	V [g]
	gal/unit		gal/unit	lb/gal	gal/yr	lb/gal	tpy	%	%	%	lb/yr	lb/yr	lb/hr	lb/yr	tpy	%	%	lb/hr	tpy	%	lb/hr	tpy		
E-Coat (Emulsion) [h]	2.910		2.910	8.84	410,380	0.1051	21.56	20%	80%	95%	8,622	1,724	1.38	10,346	5.17	32.1%	100%	0.00	0.00	0.0%	0.00	0.00	131,732	
E-Coat (Pigment Paste) [h]	0.780		0.780	10.59	109,999	1.2686	69.77	20%	80%	95%	27,910	5,582	4.47	33,491	16.75	31.13%	100%	0.00	0.00	0.0%	0.00	0.00	34,243	
E-Coat Total							**91.33**				**36,532**	**7,306**	**5.85**	**43,838**	**21.92**			**0.00**	**0.00**		**0.00**	**0.00**	**165,975**	**0.26**
HVLP Robots Interior [i]	0.00	40%	0.73	11.684	100,093	4.24	212.25	90%	10%	95%	129,220	1,698	17.48	130,918	65.46	50.9%	60%	41.74	156.28	See Dry X PM Emissions Table			30,568	
Manual Cut-Ins & Underhood [i]	0.00	20%	0.36	11.684	50,047	4.24	106.13	90%	10%	95%	64,610	849	8.74	65,459	32.73	50.9%	40%	31.31	117.21				10,189	
ESTA Robot Exterior [i]	1.82	40%	0.73	11.684	106,918	4.24	226.73	90%	10%	95%	138,031	1,814	18.68	139,844	69.92	50.9%	75%	27.87	104.34				40,816	
Primer-Surfacer Totals	**1.82**		**1.82**				**545.11**				**331,861**	**4,361**	**44.90**	**336,222**	**168.11**			**100.92**	**377.84**		**0.13**	**0.58**	**81,574**	**4.12**
UB-PVC	0.00		4.33	8.304	594,101	0.00	0.00	100%	0.0%	0.0%	0.0	0.0	0.00	0.0	0.00	100%	95%	32.94	123.33	98.5%	0.49	1.85	564,396	0.00
Seam Sealer	0.00		0.64	10.68	87,831	0.00	0.00	100%	0.0%	0.0%	0.0	0.0	0.00	0.0	0.00	100%	100%	0.00	0.00	0.0%	0.00	0.00	87,831	0.00
Sika Sealing	0.00		0.04	10.85	5,300	0.29	0.77	100%	0.0%	0.0%	1,541	0.0	0.21	1,541	0.77	97%	100%	0.00	0.00	0.0%	0.00	0.00	5,158	0.30
(SAM) Sound Deadener Adhesive	0.00		0.961	13.77	131,875	0.14	9.08	100%	0.0%	0.0%	18,159	0.0	2.43	18,159	9.08	99%	100%	0.00	0.00	0.0%	0.00	0.00	130,556	0.14
Sealers and Adhesives Totals	**5.97**		**5.97**				**9.85**				**19,700**	**0**	**2.63**	**19,700**	**9.85**			**32.94**	**123.33**		**0.49**	**1.85**	**787,941**	**0.03**
						Total	**646.29**						**53.39**	**399,760**	**199.88**			**133.86**	**501.17**		**0.63**	**2.43**	**1,035,489**	

Coating Throughput Information

	# of Units	Notes
Paint Shop Bodies per Year	**124,800**	Based on maximum daily throughput and days of operation per year
Major Repair Equivalent Bodies per Year	**12,480**	Major repair area assumed to be equivalent to 10% of the total vehicle throughput.
Total Paint Shop Equivalent Bodies per Year	**137,280**	Based on total of maximum daily throughput and major repair area throughput.
Total Parts per Year	**3,744**	Parts painted area assumed to be equivalent to 3% of the total vehicle throughput.
Assembly Bodies per Year	**164,250**	Based on maximum daily throughput and days of operation per year
Operating Hours per year	**7,488**	Based on facility operating 24 hours/day and days of operation per year.

Coating Emission Calculations

Process	Parts		Bodies	Material Data		VOC										PM/PM$_{10}$/PM$_{2.5}$							lb/GACS	
								Capture & Control			Emissions													
	Application Rate	Split	Application Rate	Coating Density	Coating Usage	VOC In		Booth Split	Oven Split	RTO Eff.	Emissions from Booth	Emissions from Oven	Controlled VOC Emissions			Volume Solids	Transfer Eff.	Uncontrolled PM Emissions		Control Eff.	Controlled PM Emissions		GACS per year	lbs VOC/ GACS
	A$_1$		A$_2$	B	C[a]	D	E=C x D	G	J	K	L[b]	M[c]	N[d]	O = L + M	P	R	S	T[d]	U[e]	V	W[d]	X[f]	Y[g]	Z[h]
	gal/unit		gal/unit	lb/gal	gal/yr	lb/gal	tpy	%	%	%	lb/yr	lb/yr	lb/hr	lb/yr	tpy	%	%	lb/hr	tpy	%	lb/hr	tpy		
HVLP Robots Interior[i]	0.00	40%	1.32		181,328	3.84	348.1	90%	10%	95%	211,901	2,785	28.67	214,686	107.34	43.7%	60%	61.65	230.80	See Dry X PM Emissions Table			47,544	
Manual Cut-Ins & Underhood[i]	0.00	20%	0.66		90,664	3.84	174.0	90%	10%	95%	105,951	1,392	14.34	107,343	53.67	43.7%	40%	46.23	173.10				15,848	
ESTA Robot Exterior[i]	3.30	40%	1.32		193,692	3.84	371.8	90%	10%	95%	226,349	2,974	30.63	229,323	114.66	43.7%	75%	41.16	154.09				63,482	
Topcoat (Monocoat) Totals	**3.30**		**3.30**	10.26	**465,684**		**893.9**				**544,201**	**7,151**	**73.63**	**551,352**	**275.68**			**149.04**	**557.99**				**126,875**	**4.35**
								Topcoat Scenario 1			**544,201**	**7,151**	**73.63**	**551,352**	**275.68**								**126,875**	**4.35**
HVLP Robots Interior[i]	0.00	40%	0.94		129,106	5.94	383.3	90%	10%	95%	233,345	3,066	31.57	236,412	118.21	26.4%	60%	20.87	78.14	See Dry X PM Emissions Table			20,450	
Manual Cut-Ins & Underhood[i]	0.00	20%	0.47		64,553	5.94	191.6	90%	10%	95%	116,673	1,533	15.79	118,206	59.10	26.4%	40%	15.65	58.60				6,817	
ESTA Robot Exterior[i]	2.35	40%	0.94		137,908	5.94	409.4	90%	10%	95%	249,255	3,275	33.72	252,531	126.27	26.4%	75%	13.93	52.16				27,306	
Basecoat Totals	**2.35**		**2.35**	8.18	**331,567**		**984.4**				**599,273**	**7,875**	**81.08**	**607,148**	**303.57**			**50.45**	**188.90**				**54,573**	
HVLP Robots Interior[i]	0.00	40%	1.26		173,495	4.13	358.4	90%	10%	95%	218,164	2,867	29.52	221,031	110.52	42.0%	60%	38.67	144.79				43,721	
Manual Cut-Ins & Underhood[i]	0.00	20%	0.63		86,747	4.13	179.2	90%	10%	95%	109,082	1,433	14.76	110,515	55.26	42.0%	40%	29.00	108.59				14,574	
ESTA Robot Exterior[i]	3.16	40%	1.26		185,324	4.13	382.8	90%	10%	95%	233,039	3,062	31.53	236,101	118.05	42.0%	75%	25.82	96.66				58,377	
Clearcoat Totals	**3.16**		**3.16**	8.35	**445,566**		**920.3**				**560,285**	**7,362**	**75.81**	**567,647**	**283.82**			**93.49**	**350.04**				**116,671**	
								Topcoat Scenario 2			**1,159,558**	**15,237**	**156.89**	**1,174,795**	**587.40**								**171,244**	**6.86**
(Maximum Scenario 1 or 2) Total							**1,904.66**						**156.89**	**1,174,795**	**587.40**			**149.04**	**557.99**		**0.27**	**1.19**	**171,244**	**6.86**
Spot Repair - Topcoat[j]	0.00		0.03	10.26	567	3.84	1.09	100%	0%	0.0%	2,175	0.00	0.29	2,175	1.09	43.7%	40%	0.29	1.08	98.5%	0.004	0.016	99.05	
Spot Repair - Basecoat[j]	0.00		0.02	8.18	403	5.94	1.20	100%	0%	0.0%	2,396	0.00	0.32	2,396	1.20	26.4%	40%	0.10	0.37	98.5%	0.001	0.005	42.60	
Spot Repair - Clearcoat[j]	0.00		0.03	8.35	542	4.13	1.12	100%	0%	0.0%	2,240	0.00	0.30	2,240	1.12	42.0%	40%	0.18	0.68	98.5%	0.003	0.010	91.08	
Worst Case Spot Repair[k]							**2.32**				**4,635**	**0.00**	**0.62**	**4,635**	**2.32**			**0.289**	**1.082**		**0.004**	**0.016**	**133.69**	
Assembly Spot Repair - Topcoat[j]	0.00		0.10	10.26	1,405	3.84	2.70	100%	0%	0.0%	5,395	0.00	0.72	5,395	2.70	43.7%	40%	0.72	2.68	98.5%	0.011	0.040	245.65	
Assembly Spot Repair - Basecoat[j]	0.00		0.07	8.18	1,001	5.94	2.97	100%	0%	0.0%	5,941	0.00	0.79	5,941	2.97	26.4%	40%	0.24	0.91	98.5%	0.004	0.014	105.66	
Assembly Spot Repair - Clearcoat[j]	0.00		0.10	8.35	1,345	4.13	2.78	100%	0%	0.0%	5,554	0.00	0.74	5,554	2.78	42.0%	40%	0.45	1.68	98.5%	0.007	0.025	225.89	
Worst Case Assembly Repair[k]							**5.75**				**11,495**	**0.00**	**1.54**	**11,495**	**5.75**			**0.717**	**2.683**		**0.011**	**0.040**	**331.55**	
Cavity Wax	0.00		0.72	9.83	98,515	1.67	82.32	100%	0%	0.0%	52,027	0.00	6.95	164,642	26.01	74.0%	96%	4.40	16.46	98.5%	0.066	0.247	69,985	
Worst Case Repair and Cavity Wax Totals							**90.39**				**68,158**	**0.00**	**9.10**	**180,773**	**34.08**			**5.40**	**20.23**		**0.08**	**0.30**	**70,450**	
Coating Total (tpy)							**2,641.33**						**219.38**	**1,755,328**	**821.36**			**288.30**	**1,079.38**		**0.98**	**3.93**	**1,277,184**	

[a] Coating usage is calculated as follows: C = (A_1 * total parts per year) + (A_2 * total bodies per year)
[b] VOC emissions from the booth are calculated as follows: I = E * F * 2,000 lb/ton
[c] VOC emissions from the oven are calculated as follows: J = E * G * (1 - H) * 2,000 lb/ton
[d] Hourly emissions are calculated by dividing the annual emissions in tons/yr by the operating hours/yr, and multiplying by 2000 lb/ton.
[e] Annual Controlled PM emissions are calculated as follows: T = Q * (1 - R)
[f] GACS per year is calculated as follows: U = C * N * O
[g] Lb VOC/GACS is calculated as follows: V = L/U
[h] A safety factor of 10% was added to the VOC content of the material.
[i] Spot repair application rates are assumed to be equal to 1% of the application rate of the corresponding coating for a full vehicle body for every eighth vehicle. Assembly repair rates are assumed to be equal to 3.1% of the application rate of the corresponding coating for a full vehicle body for every tenth vehicle.
[k] Worst case spot repair and assembly repair for VOC emissions comes from basecoat and clearcoat application. Worst case spot repair and assembly repair for PM emissions comes from topcoat (monocoat) application.

Paint Shop Coating HAP Emissions - Excluding E-Coat Spot Repair

Total VOC Entering Process [a] (lb/yr)	Solids Application [a] (GACS/yr)	Controlled VOC Emissions [a] (lb/yr)	Lbs HAP per GACS [b]	Uncont. HAP Emissions (lb/yr)	Annual Rate, Uncont. HAP [c] (tpy)	Controlled HAP Emissions (lb/yr)	Annual Rate, HAP Out [c] (tpy)
5,282,667	1,277,184	1,755,328	0.50	1,921,845	960.92	638,592	319.30

[a] Calculated in Paint Shop Coating Tab.

[b] Combined HAP emission limit for Paint Shop Primecoat (E-coat), Guidecoat, Topcoat, and Purge Solvent Operations per 40 CFR 63 Subpart IIII because emissions are routed to a control device with greater than a 95% destruction efficiency.

[c] Potential hours are based on operation 24 hrs/day, 365 days/yr.

Underbody Coating VOC Emissions

Area/Process	Material Usage per Vehicle [a] (gal/veh)	Material Density [b] (lb/gal)	Material VOC Content [b] %	Application Area Emissions [d] %	Oven Emissions [d] %	Oven RTO Control Efficiency %	Maximum Annual Production Phase 1 (veh/yr)	Maximum Annual Production Phase 2 (veh/yr)	Maximum Annual Production Phase 3 (veh/yr)	Application Area VOC Emission Rates Phase 1 (tpy)	Application Area VOC Emission Rates Phase 2 (tpy)	Application Area VOC Emission Rates Phase 3 (tpy)	Oven VOC Emission Rates Phase 1 (tpy)	Oven VOC Emission Rates Phase 2 (tpy)	Oven VOC Emission Rates Phase 3 (tpy)	Total Uncontrolled VOC Emission Rates Phase 1 (tpy)	Total Uncontrolled VOC Emission Rates Phase 2 (tpy)	Total Uncontrolled VOC Emission Rates Phase 3 (tpy)	Total Controlled VOC Emission Rates Phase 1 (tpy)	Total Controlled VOC Emission Rates Phase 2 (tpy)	Total Controlled VOC Emission Rates Phase 3 (tpy)
Underbody Coating	0.185	11.684	36%	40%	60%	95%	50,544	74,880	124,800	7.93	11.75	19.58	0.59	0.88	1.47	19.82	29.36	48.94	8.52	12.63	21.04
Total										**7.93**	**11.75**	**19.58**	**0.59**	**0.88**	**1.47**	**19.82**	**29.36**	**48.94**	**8.52**	**12.63**	**21.04**

Underbody Coating PM Emissions

Process	Material Usage per Vehicle [a] (gal/veh)	Material Density [b] (lb/gal)	Weight % Solids [b] %	Transfer Efficiency [c] %	Maximum Annual Production Phase 1 (veh/yr)	Maximum Annual Production Phase 2 (veh/yr)	Maximum Annual Production Phase 3 (veh/yr)	Filter Efficiency (%)	Uncontrolled $PM/PM_{10}/PM_{2.5}$ Emissions Phase 1 (tpy)	Uncontrolled $PM/PM_{10}/PM_{2.5}$ Emissions Phase 2 (tpy)	Uncontrolled $PM/PM_{10}/PM_{2.5}$ Emissions Phase 3 (tpy)	Controlled $PM/PM_{10}/PM_{2.5}$ Emissions[4] Phase 1 (tpy)	Controlled $PM/PM_{10}/PM_{2.5}$ Emissions[4] Phase 2 (tpy)	Controlled $PM/PM_{10}/PM_{2.5}$ Emissions[4] Phase 3 (tpy)
Underbody Coating	0.185	11.684	67%	50%	50,544	74,880	124,800	98.5%	18.24	27.03	45.04	0.27	0.41	0.68
Total									**18.24**	**27.03**	**45.04**	**0.27**	**0.41**	**0.68**

[a] Material usage per vehicle estimate was provided by Mercedes on 2/4/2017 as 0.7 L/vehicle. Value was converted to gallons per vehicle using a conversion factor of 0.264172 gal/L.
[b] Based on BASF Primer UniBloc Solventborne primer.
[c] Transfer efficiency is assumed based on industry knowledge of underbody coating.
[d] BASF provided the application area/oven emission breakdown to Mercedes which was relayed on 1/4/2017 to Trinity Consultants as 37.5% of VOC emitted during application, and 62.5% emitted in the oven. Mercedes conservatively estimates that 40% is emitted during application.
[e] Annual operating hours assumed to be 7,448 hours per year.

Underbody Coating HAP/TAP Emissions

Material Usage per vehicle [a]	Material Density [b]	Application Area Emissions [c]	Oven Emissions [c]	Oven RTO Control Efficiency	Maximum Annual Production		
					Phase 1	Phase 2	Phase 3
(gal/veh)	(lb/gal)	%	%	%	(veh/yr)	(veh/yr)	(veh/yr)
0.185	11.684	40%	60%	95%	50,544	74,880	124,800

Underbody Coating HAP/TAP Emissions

Pollutant	CAS Number	Emission Factor [d] (%)	HAP? (Y/N)	TAP? (Y/N)	Application Area HAP Emissions (tpy)			Controlled Oven HAP Emissions (tpy)			Controlled HAP Emissions (tpy)		
					Phase 1	Phase 2	Phase 3	Phase 1	Phase 2	Phase 3	Phase 1	Phase 2	Phase 3
Naphtha	64742956	10%	N	N	-	-	-	-	-	-	-	-	-
Xylene	1330207	7%	Y	Y	1.53	2.26	3.77	0.11	0.17	0.28	1.64	2.43	4.06
1,2,4-trimethylbenzene	95636	5%	N	N	-	-	-	-	-	-	-	-	-
n-Butylacetate	123864	5%	N	N	-	-	-	-	-	-	-	-	-
2-Butoxyethyl Acetate	112072	3%	Y	N	0.66	0.97	1.62	0.05	0.07	0.12	0.70	1.04	1.74
n-Butanol	71363	2.5%	N	N	-	-	-	-	-	-	-	-	-
Mesitylene	108678	2%	N	N	-	-	-	-	-	-	-	-	-
n-Propylbenzene	103651	2%	N	N	-	-	-	-	-	-	-	-	-
Ethyl Benzene	100414	2%	Y	Y	0.44	0.65	1.08	0.03	0.05	0.08	0.47	0.70	1.16
Isopropylbenzene (Cumene)	98828	1%	Y	Y	0.22	0.32	0.54	0.02	0.02	0.04	0.23	0.35	0.58
Cyclohexane	110827	0.3%	N	N	-	-	-	-	-	-	-	-	-
Total Underbody Coating HAP Emissions					**2.84**	**4.21**	**7.01**	**0.21**	**0.32**	**0.53**	**3.05**	**4.52**	**7.54**

[a] Material usage per vehicle estimate was provided by Mercedes on 2/4/2017 as 0.7 L/vehicle. Value was convetered to gallons per vehicle using a conversion factor of 0.264172 gal/L.
[b] Based on BASF Primer UniBloc Solventborne primer.
[c] BASF provided the application area/oven emission breakdown to Mercedes which was relayed on 1/4/2017 to Trinity Consultants as 37.5% of VOC emitted during application, and 62.5% emitted in the oven. Mercedes conservatively estimates that 40% is emitted during application.
[d] Emission factors are from Section 3 Composition/Information on Ingredients on BASF UniBloc MB7746 silvergrey SDS (Revised 02/23/2015). HAP/TAP emissions assume that the maximum amount of each component is emitted.

Controlled Particulate Emissions from Sources Routed to Dry X

Description	Exhaust Flow Rate (m^3/hr)	Hours of Operation (hr/yr)	Outlet PM Loading [a] mg/m^3	Percent Recycled (%)	Potential $PM/PM_{10}/PM_{2.5}$ Emissions [b,c] (lb/hr)	(tpy)
Primer-Surfacer	157,352	8,760	1	73%	0.09	0.41
Primer-Surfacer 2	64,721	8,760	1	73%	0.04	0.17
Basecoat/Clearcoat	324,643	8,760	1	73%	0.19	0.85
Basecoat/Clearcoat 2	133,529	8,760	1	73%	0.08	0.35

[a] Manufacturer specification for outlet of PM separation system (Dry X).

[b] All PM is assumed to be equal to PM_{10} and $PM_{2.5}$. Annual emissions are based on paint shop hours of operation.

[c] Emissions (lb/hr) = Exhaust Flow (m^3/hr) * Outlet Loading (mg/m^3) * Conversion Factor (1 lb/453,592 mg) * (1-Percent Recycled (%))

E-Coat Spot Repair VOC Emissions

Area/Process	Material Usage per Vehicle[a] (gal/veh)	Material Density[b] (lb/gal)	Material VOC Content[b] %	Application Area Emissions %	Maximum Annual Production Phase 1 (veh/yr)	Phase 2 (veh/yr)	Phase 3 (veh/yr)	Application Area VOC Emission Rates Phase 1 (tpy)	Phase 2 (tpy)	Phase 3 (tpy)	Phase 3 (lb/hr)[d]
E-Coat Spot Repair	3.71E-04	11.684	0.36	100%	50,544	74,880	124,800	0.04	0.06	0.10	0.03
Total								**0.04**	**0.06**	**0.10**	**0.03**

E-Coat Spot Repair PM Emissions

Process	Material Usage per Vehicle[a] (gal/veh)	Material Density[b] (lb/gal)	Weight % Solids[b] %	Volume % Solids %	Transfer Efficiency[c] %	Maximum Annual Production Phase 1 (veh/yr)	Phase 2 (veh/yr)	Phase 3 (veh/yr)	Uncontrolled $PM/PM_{10}/PM_{2.5}$ Emissions Phase 1 (tpy)	Phase 2 (tpy)	Phase 3 (lb/hr)[d]	Phase 3 (tpy)	GACS per Year Phase 1 (tpy)	Phase 2 (tpy)	Phase 3 (tpy)
E-Coat Spot Repair	3.71E-04	11.684	67%	50.9%	40%	50,544	74,880	124,800	0.04	0.07	0.03	0.11	3.81	5.65	9.42
Total									**0.04**	**0.07**	**0.03**	**0.11**	**3.81**	**5.65**	**9.42**

[a] The material usage per vehicle was provided by Jae Park (Plant Engineer) via e-mail on 1/30/2017. The material usage per vehicle includes a 10% safety factor.
[b] Material density, VOC and solids content are based on BASF Primer UniBloc Solventborne primer.
[c] Transfer efficiency is assumed based on industry knowledge.
[d] Annual operating hours is assumed to be 7,448 hours per year.

Paint Shop Coating HAP Emissions - E-Coat Spot Repair HAP/TAP

Total VOC Entering Process [a] (lb/yr)	Solids Application [a] (GACS/yr)	Controlled VOC Emissions [a] (lb/yr)	Lbs HAP per GACS [b]	Uncont. HAP Emissions (lb/yr)	Annual Rate, Uncont. HAP [c] (tpy)	Controlled HAP Emissions (lb/yr)	Annual Rate, HAP Out [c] (tpy)
196	9	196	0.50	5	0.00	5	2.35E-03

[a] Calculated in Paint Shop Coating Tab.

[b] Combined HAP emission limit for Paint Shop Primecoat (E-coat), Guidecoat, Topcoat, and Purge Solvent Operations per 40 CFR 63 Subpart IIII because emissions are routed to a control device with greater than a 95% destruction efficiency.

[c] Potential hours are based on operation 24 hrs/day, 365 days/yr.

Paint Shop Adhesive Application Emissions

Welding area	Material Usage per vehicle	Uncontrolled VOC Emission Factor [a]	Hourly Production Rate	Maximum Annual production	Uncontrolled VOC Emissions [b]		
	(lb/veh)	(%)	(veh/hr)	(veh/yr)	(lb/hr)	(lb/yr)	(tpy)
Anti-flutter adhesive	6.61	1%	17	124,800	1.10	8,254.02	4.13
Structure adhesive	4.41	1%	17	124,800	0.73	5,502.68	2.75
Total					**1.84**	**13,756.70**	**6.88**

[a] From manufacturer's SDS, all body shop adhesives have >99% solids content. Mercedes-Benz Vans conservatively assumes VOC content of 1% for all adhesives.

[b] Mercedes-Benz Vans assumes that adhesive applied following the topcoat oven will be performed on an open workdeck (i.e. without control).

Purge Solvent Emissions

Process	Usage Rate	Number of Units [a]	Hours of Operation	Annual Usage [b]	Recovery Rate	Non-Recovered Solvent	Solvent Density [c]	VOC Content [c]	HAP Content [c]	Capture & Control: Percent Lost	Capture & Control: Booth Capture	Capture & Control: ADW Capture	Capture & Control: Booth Control Eff.	Uncontrolled Total VOC		Controlled Total VOC		Total HAP	
	(gal/unit)	(units/yr)	(hrs/yr)	(gal/yr)	%	(gal/yr)	(lb/gal)	(lb/gal)	(lb/gal)	%	%		%	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
Primer	0.34	137,280	7,488	47,145	65%	16,501	7.26	7.26	0.76	20%	80%	90%	95%	16.00	59.90	5.06	18.93	0.53	1.99
Basecoat	0.40	137,280	7,488	54,398	65%	19,039	7.26	7.26	0.76	20%	80%	90%	95%	18.46	69.12	5.83	21.84	0.61	2.30
Clearcoat	0.40	137,280	7,488	54,398	65%	19,039	7.26	7.26	0.76	20%	80%	90%	95%	18.46	69.12	5.83	21.84	0.61	2.30
Repair	0.11	137,280	7,488	14,506	65%	5,077	7.26	7.26	0.76	0%	100%	0%	0%	4.92	18.43	4.92	18.43	0.52	1.94
Total														**57.84**	**216.57**	**21.65**	**81.04**	**2.28**	**8.52**

[a] The number of units for primer, basecoat, and clearcoat includes major repairs sent back through the paint shop equivalent to 10% of the maximum production per year.

[b] The annual usage conservatively assumes that the lines are purged after each unit in each booth.

[c] Information provided in purge solvent SDS.

Paint Shop Phosphate Cleaner Calculation Information [a]

Supply (Inlet) Air		
Temperature	75	°F
Humidity	50	% RH
Moisture Content	0.0092	lb H_2O/lb air
Exhaust (Outlet) Air		
Temperature	63	°F
Humidity	95	% RH
Moisture Content	0.012	lb H_2O/lb air
Flow Rate	21,761	ft^3/min
Density of Air at 63 °F	0.0757	lb/ft^3
Phosphate Cleaner		
Dissolved Solids	0.5	%
Hours of Operation [b]	7,488	hr/yr
Control Efficiency [c]	55	%

[a] Reduction in PM emissions through use of mist eliminators.
[b] Paint shop annual hours of operation.
[c] Mist eliminator control efficiency.

Paint Shop Phosphate Cleaner Emissions

Phosphate Cleaner Emissions	$PM/PM_{10}/PM_{2.5}$	
	Uncontrolled	Controlled
Hourly (lb/hr)	1.38	0.62
Annual (tpy)	5.18	2.33

Sample Calculation:

Uncontrolled PM Emissions = $\frac{(0.012 - 0.0092)\text{ lb } H_2O}{\text{lb air}} \left| \frac{0.5 \text{ lb solids}}{100 \text{ lb } H_2O} \right| \frac{12{,}000 \text{ ft}^3 \text{ air}}{\text{min}} \left| \frac{0.0757 \text{ lb air}}{\text{scf air}} \right| \frac{60 \text{ min}}{\text{hour}}$

Uncontrolled PM Emissions = 1.38 lb/hr

Controlled PM Emissions = $\frac{(0.76 \text{ lb PM})}{\text{hr}} \left| \frac{(100 - 55)}{100} \right. =$ 0.62 lb/hr

Paint Mix Room Emissions

Paint Shop Material Usage Rates

Process/Material	Usage (gal/yr)
E-coat	520,379
Seam Sealer	87,831
Underbody PVC	594,101
Sika Sealing	5,300
(SAM) Sound Deadener Adhesive	131,875
Primer-Surfacer	257,058
Basecoat	331,567
Clearcoat	445,566
Spot Repair	5,263
Cavity Wax	98,515
Purge Solvent	170,449
Facility Total	2,127,524

vapor (i.e. partial) pressure of toluene	0.468	psia	P_{atm}
molecular weight of toluene	92.130	lb/lb-mole	MW
atmosphereic vapor pressure	14.700	psia	$P_{toluene}$
ideal gas constant - R	10.730	ft^3-psia/lb-mole-°R	
absolute temperature	532	°R	T
vapor density = MW*n/V = MW*P/R*T	0.237	lb/ft^3	n = 1
volume of displaced toluene-saturated air	2,127,524	gallons	
volume of displaced toluene-saturated air	284,428	ft^3	vol. displaced air
volume of displaced toluene	9,055	ft^3	vol. displaced air * $P_{toluene}/P_{atm}$
vapor density = MW*n/V = MW*P/R*T	0.2373	lb/ft^3	

Paint Shop Hours of Operation	7,488	hr/yr
Total VOC Emissions	0.29	lb/hr
Total VOC Emissions	**1.07**	**tpy**

Workdecks - Insignificant Activity Emissions

Booth/Zone	Potential $PM/PM_{10}/PM_{2.5}$ Emissions				
	Exhaust Volume (scfm) [a,b]	PM Loading ($gr/10^3$ dscf) [c]	Hours of Operation (hr/yr)	Hourly (lb/hr)	Annual (ton/yr) [c]
E-coat Sand	62,978	0.1	7,488	0.05	0.20
Primer Sand	62,978	0.1	7,488	0.05	0.20
Metal/Body Repair #1	6,474	0.1	7,488	0.01	0.02
Metal/Body Repair #2	6,474	0.1	7,488	0.01	0.02
E-coat Touch-up	21,189	0.1	7,488	0.02	0.07
Primer Touch-up	21,189	0.1	7,488	0.02	0.07
Basecoat Touch-up	21,189	0.1	7,488	0.02	0.07
Inspect/Polish	84,167	0.1	7,488	0.07	0.27
Total				**0.25**	**0.92**

[a] Calculation assumes exhaust volume is on a dry basis.

[b] Exhaust volumes provided by equipment manufacturer.

[c] Estimated outlet PM loading for workdeck operations.

[d] Based on paint shop annual hours of operation: 7,488 hrs/yr

Sample Calculations (for E-Coat Sand)

PM Emissions (lb/hr) = $\frac{62{,}978 \text{ scf}}{\text{min}} \times \frac{0.1 \text{ grains}}{1000 \text{ dscf}} \times \frac{60 \text{ min}}{\text{hr}} \times \frac{1 \text{ lb}}{7{,}000 \text{ gr.}}$ = **0.05 lb/hr**

PM Emissions (tons/yr) = $\frac{0.05 \text{ lb}}{\text{hr}} \times \frac{7{,}488 \text{ hr}}{\text{yr}} \times \frac{\text{ton}}{2{,}000 \text{ lb}}$ = **0.20 ton/yr**

Mercedes-Benz Vans, LLC

Body Shop Welding Emissions

Area/Process	Welding Material Usage per Vehicle		Material Usage per vehicle	Uncontrolled PM Emission Factor [a]	Hourly Production Rate	Maximum Annual Production	Control Efficiency [b]	Building Capture Efficiency	Uncontrolled $PM/PM_{10}/PM_{2.5}$ Emissions [c]			Controlled $PM/PM_{10}/PM_{2.5}$ Emission [c]		
			(lb/veh)	(lb/1000 lb)	(veh/hr)	(veh/yr)	%	%	(lb/hr)	(lb/yr)	(tpy)	(lb/hr)	(lb/yr)	(tpy)
MAG Welding	8,000	mm	0.30	20	17	124,800	95%	90%	1.00E-02	7.52E+01	3.76E-02	5.02E-04	3.76E+00	1.88E-03
Spot Welding	9,000	spots	0.34	20	17	124,800	0%	90%	1.13E-02	8.46E+01	4.23E-02	1.13E-02	8.46E+01	4.23E-02
Laser Welding	28,000	mm	1.05	20	17	124,800	0%	90%	3.52E-02	2.63E+02	1.32E-01	3.52E-02	2.63E+02	1.32E-01
Laser Soldering	9,000	mm	0.34	20	17	124,800	0%	90%	1.13E-02	8.46E+01	4.23E-02	1.13E-02	8.46E+01	4.23E-02
Total									**6.78E-02**	**5.08E+02**	**2.54E-01**	**5.83E-02**	**4.36E+02**	**2.18E-01**

[a] Average emission factor for welding and soldering at the facility is conservatively assumed to be 20 lb/1, 000 lb.

[b] Based on HEPA filter control for MAG welding processes.

[c] A building capture efficiency of 90% is assumed for the body shop for both uncontrolled and controlled emissions based on building enclosure capture efficiency provided in Texas Commission on Environmental Quality, Rock Crushing Plants, Table 7, February, 2002. All welding and soldering operations are done inside the building.

Body Shop Welding HAP Emissions

Area/Process	Manganese		
	Content %	lb/hr	tpy
MAG Welding	1.45	7.28E-06	2.73E-05
Spot Welding	0.0	0.00E+00	0.00E+00
Laser Welding	1.2	4.22E-04	1.58E-03
Laser Soldering	1.2	1.36E-04	5.08E-04
	Total	5.65E-04	2.12E-03

Welding Shield Gas CO_2 Emissions

Usage per Vehicle (kg)	Hourly Production Rate	Maximum Annual Production	CO_2 Content [a]	CO_2 Emissions	
	(veh/hr)	(veh/yr)	%	(lb/hr)	(tpy)
2.00	17	124,800	15%	1.10E+01	4.13E+01

[a] Based on Mercedes-Benz Vans shield gas specification.

Body Shop Adhesive Bonding Emissions

Welding area		Material Usage per vehicle	Uncontrolled VOC Emission Factor [a]	Hourly Production Rate	Maximum Annual production	Uncontrolled VOC Emissions			Controlled VOC Emissions [b]		
		(lb/veh)	(%)	(veh/hr)	(veh/yr)	(lb/hr)	(lb/yr)	(tpy)	(lb/hr)	(lb/yr)	(tpy)
Anti-flutter adhesive		6.61	1%	17	124,800	1.10	8,254.02	4.13	0.06	412.70	0.21
Structure adhesive		4.41	1%	17	124,800	0.73	5,502.68	2.75	0.04	275.13	0.14
Total						**1.84**	**13,756.70**	**6.88**	**0.09**	**687.84**	**0.34**

[a] From manufacturer's SDS, all body shop adhesives have >99% solids content. Mercedes-Benz Vans conservatively assumes VOC content of 1% for all adhesives.

[b] Mercedes-Benz Vans assumes 95% reduction in VOC emissions when body shop adhesives volatilize in the E-Coat oven.

Sample Calculations (for MAG Welding)

Material Usage (lb/veh) = $\pi \times r^2 \times$ Weld Length (mm) $\div 10^3 \times$ Material Specific Gravity (g/cm^3) $\div$ 453.59 g/lb

Material Usage (lb/veh) = $\pi \times (0.8\ mm)^2 \times 8{,}000\ mm \div 10^3 \times (8.5\ g/cm^3) \div 453.59\ g/lb$ = **0.30** **lb/veh**

PM Emissions (lb/yr) = $\frac{0.30\ lb}{veh} \times \frac{20\ lb}{1{,}000\ lb} \times \frac{124{,}800\ veh}{yr} \times (1-95\%) \times (1-90\%)$ = **3.762** **lb/yr**

PM Emissions (tons/yr) = $\frac{3.762\ lb}{yr} \times \frac{1\ ton}{2{,}000\ lb}$ = **1.88E-03** **ton/yr**

Assembly Combustion - Natural Gas Emission Factors

Hours of Operation [e] 6,072 hrs

Pollutant		NG Emission Factors [a,b,c]	Units
$PM/PM_{10}/PM_{2.5}$		0.0074	lb/MMBtu
SO_2		0.0006	lb/MMBtu
NO_X		0.049	lb/MMBtu
CO		0.082	lb/MMBtu
VOC		0.0054	lb/MMBtu
CO_2e [d]			
	CO_2	117.00	lb/MMBtu
	CH_4	2.21E-03	lb/MMBtu
	N_2O	2.21E-04	lb/MMBtu

[a] PM, SO_2, and VOC natural gas emission factors are from AP-42, Table 1.4-2, 07/98.
[b] NO_X and CO natural gas emission factors are from AP-42, Table 1.4-1, 07/98, Small Boilers w/ Low NO_X Control.
[c] The heating value of natural gas is assumed to be 1,026 Btu/scf.
[d] Emission factors from 40 CFR 98, Subpart C, Tables C-1 and C-2. Factors were converted to lb/MMBtu.

Assembly Combustion Non-HAP Emissions

Description	Equipment	Rated Capacity (MMBtu/hr)	Emission Rates [e]																	
			$PM/PM_{10}/PM_{2.5}$		SO_2		NO_X		CO		VOC		CO_2		CH_4		N_2O		CO_2e	
			lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
Assembly Oven	OV04	1.36	0.01	0.03	0.001	0.002	0.07	0.20	0.11	0.34	0.01	0.02	159.68	484.82	0.003	0.009	0.0003	0.001	159.85	485.32
Total		**1.36**	**0.01**	**0.03**	**0.001**	**0.002**	**0.07**	**0.20**	**0.11**	**0.34**	**0.01**	**0.02**	**#####**	**484.82**	**0.003**	**0.009**	**0.0003**	**0.001**	**159.85**	**485.32**

[e] Annual emissions are based on calculated hours of operation needed to remain below the proposed 75,000 tpy synthetic minor limit on greenhouse gas emissions (CO_2e). Mercedes-Benz Vans is not requesting limits on hours of operation for individual emission units.

Assembly Combustion HAP/TAP Emissions

Pollutants	NG Emission Factor[a] lb/10^6 scf	Total Emissions[b] lb/hr	tpy
2-Methylnaphthalene	2.40E-05	3.19E-08	9.69E-08
3-Methylchloranthrene	1.80E-06	2.39E-09	7.27E-09
7,12-Dimethylbenz(a)anthracene	1.60E-05	2.13E-08	6.46E-08
Acenaphthene	1.80E-06	2.39E-09	7.27E-09
Acenaphthylene	1.80E-06	2.39E-09	7.27E-09
Anthracene	2.40E-06	3.19E-09	9.69E-09
Benz(a)anthracene	1.80E-06	2.39E-09	7.27E-09
Benzene	2.10E-03	2.79E-06	8.48E-06
Benzo(a)pyrene	1.20E-06	1.60E-09	4.85E-09
Benzo(b)fluoranthene	1.80E-06	2.39E-09	7.27E-09
Benzo(g,h,i)perylene	1.20E-06	1.60E-09	4.85E-09
Benzo(k)fluoranthene	1.80E-06	2.39E-09	7.27E-09
Chrysene	1.80E-06	2.39E-09	7.27E-09
Dibenzo(a,h)anthracene	1.20E-06	1.60E-09	4.85E-09
Dichlorobenzene	1.20E-03	1.60E-06	4.85E-06
Fluoranthene	3.00E-06	3.99E-09	1.21E-08
Fluorene	2.80E-06	3.72E-09	1.13E-08
Formaldehyde	7.50E-02	9.98E-05	3.03E-04
Hexane	1.80E+00	2.39E-03	7.27E-03
Indeno(1,2,3-cd)pyrene	1.80E-06	2.39E-09	7.27E-09
Naphthalene	6.10E-04	8.11E-07	2.46E-06
Phenanathrene	1.70E-05	2.26E-08	6.87E-08
Pyrene	5.00E-06	6.65E-09	2.02E-08
Toluene	3.40E-03	4.52E-06	1.37E-05
Arsenic	2.00E-04	2.66E-07	8.08E-07
Beryllium	1.20E-05	1.60E-08	4.85E-08
Cadmium	1.10E-03	1.46E-06	4.44E-06
Chromium	1.40E-03	1.86E-06	5.65E-06
Cobalt	8.40E-05	1.12E-07	3.39E-07
Lead	5.00E-04	6.65E-07	2.02E-06
Manganese	3.80E-04	5.06E-07	1.53E-06
Mercury	2.60E-04	3.46E-07	1.05E-06
Nickel	2.10E-03	2.79E-06	8.48E-06
Selenium	2.40E-05	3.19E-08	9.69E-08

Hours of Operation[b]	6,072	hrs
Total Rated Capacity	1.36	MMBtu/hr

[a] Natural Gas Emission Factors are from AP-42 Section 1.4, Tables 1.4-2, 1.4-3, and 1.4-4.
[b] Annual emissions are based on calculated hours of operation needed to remain below the proposed 75,000 tpy synthetic minor limit on greenhouse gas emissions (CO_2e). Mercedes-Benz Vans is not requesting limits on hours of operation for individual emission units.

Assembly Glazing VOC Emissions

Area/Process	Material Usage per vehicle		Uncontrolled VOC Emission Factor [a]	Hourly Production Rate	Maximum Annual Production	Product Usage	Potential VOC Emissions		
	(kg/veh)	(lb/veh)	(%)	(veh/hr)	(veh/yr)	(lb/yr)	(lb/hr)	(lb/yr)	(tpy)
Primer 1	0.04	0.09	65%	19	164,250	14,595	1.08	9,486.75	4.74
Primer 2	0.08	0.19	64%	19	164,250	30,510	2.23	19,526.34	9.76
Adhesive	2.75	6.06	0%	19	164,250	995,971	0.00	0.00	0.00
Total							**3.31**	**29,013.09**	**14.51**

HAP/TAP Potential Emissions

Area/Process	Material Usage per vehicle		Constituent Chemical Name	CAS#	Uncontrolled Component Emission Factor [a]	Hourly Production Rate	Maximum Annual Production	Potential Emission Rates		
	(kg/veh)	(lb/veh)			(%)	(veh/hr)	(veh/yr)	(lb/hr)	(lb/yr)	(tpy)
Primer 1	0.04	0.09	MEK	78-93-3	60%	19	164,250	1.00	8,757.00	4.38
	0.04	0.09	MDI	101-68-8	1%	19	164,250	0.02	145.95	0.07
Primer 2	0.08	0.19	MEK	78-93-3	60%	19	164,250	2.09	18,305.94	9.15
			Acrylic acid	79-10-7	1%	19	164,250	0.03	305.10	0.15
Adhesive	2.75	6.06	N/A					0.00	0.00	0.00
Total								**3.14**	**27,513.99**	**13.76**

[a] Information provided in SDS for each material.

Assembly Under Body Wax Emissions

Area/Process	Material Usage per vehicle (lb/veh)	Uncontrolled VOC Emission Factor (%)	Hourly Production Rate (veh/hr)	Maximum Annual Production (veh/yr)	Product Usage (lb/year)	Potential VOC Emission Rates (lb/hr)	(lb/yr)	(tpy)
Under body wax	1.94	0.0%	19	164,250	318,656	0.00	0.00	0.00
Total						**0.00**	**0.00**	**0.00**

Spray Deck PM Emissions

Process	Material Usage per vehicle (lb/veh)	Weight % Volatiles (%)	Weight % Solids (%)	%Transfer Efficiency (%)	Production Rates (units/hr)	Filter Efficiency (%)	Uncontrolled $PM/PM_{10}/PM_{2.5}$ Emissions (lb/hr)	(lb/yr)	(tpy)	Controlled $PM/PM_{10}/PM_{2.5}$ Emissions (lb/hr)	(lb/yr)	(tpy)
Under body wax	1.94	0.0%	100.0%	90%	19	98.0%	3.64	31,865.64	15.93	0.07	637.31	0.32
Total							**3.64**	**31,865.64**	**15.93**	**0.07**	**637.31**	**0.32**

Assembly Filling Emissions

Product	Material Usage per Vehicle (liter/veh)	True Vapor Pressure, VP (psia)	Molecular Weight (g/mol)	Vehicle Throughput (veh/hr)	Vehicle Throughput (veh/yr)	Uncontrolled VOC Emission Rates (lb/hr)	Uncontrolled VOC Emission Rates (lb/yr)	Uncontrolled VOC Emission Rates (tpy)	Controlled VOC Emission Rates [a] (lb/hr)	Controlled VOC Emission Rates [a] (lb/yr)	Controlled VOC Emission Rates [a] (tpy)
Gasoline	18.9	7.4	66	19	164,250	1.08E+00	9.49E+03	4.74E+00	5.42E-02	4.74E+02	2.37E-01
Diesel fuel	18.9	0.01	130	19	164,250	2.88E-03	2.53E+01	1.26E-02	2.88E-03	2.53E+01	1.26E-02
Brake fluid	1.2	0.02	75	19	164,250	2.13E-04	1.86E+00	9.32E-04	2.13E-04	1.86E+00	9.32E-04
Antifreeze	9.0	0.02	62	19	164,250	1.31E-03	1.15E+01	5.73E-03	1.31E-03	1.15E+01	5.73E-03
Windshield Cleaner [b]	4.0	0.77	28.14	19	164,250	1.02E-02	8.89E+01	4.45E-02	1.02E-02	8.89E+01	4.45E-02
Differential Gear Oil	0.5	0.02	75	19	164,250	8.79E-05	7.70E-01	3.85E-04	8.79E-05	7.70E-01	3.85E-04
Auto Transmission Fluid	0.7	0.02	150	19	164,250	2.40E-04	2.10E+00	1.05E-03	2.40E-04	2.10E+00	1.05E-03
Power Steering Fluid	0.8	0.02	76	19	164,250	1.42E-04	1.24E+00	6.20E-04	1.42E-04	1.24E+00	6.20E-04
Total						**1.10E+00**	**9.62E+03**	**4.81E+00**	**6.92E-02**	**6.06E+02**	**3.03E-01**

[a] Assumes 95% control from onboard refueling vapor recovery (ORVR) for gasoline.

[b] From windshield cleaner MSDS, material contains 23% volatiles (methanol and ethylene glycol). VOC emissions calculated based on vapor pressure provided in the MSDS and molecular weight calculated as the weighted average of 23% ethylene glycol and 77% water.

HAP/TAP Emissions from Assembly Filling

Pollutant	Material Usage per Vehicle (liter/veh)	Component Emission Factor [a] (liter/veh)	True Vapor Pressure, VP (psia)	Molecular Weight (g/mol)	Vehicle Throughput (veh/hr)	Vehicle Throughput (veh/yr)	Uncontrolled HAP/TAP Emission Rates (lb/hr)	Uncontrolled HAP/TAP Emission Rates (lb/yr)	Uncontrolled HAP/TAP Emission Rates (tpy)	Controlled HAP/TAP Emission Rates (lb/hr)	Controlled HAP/TAP Emission Rates (lb/yr)	Controlled HAP/TAP Emission Rates (tpy)
Windshield Cleaner	4.0											
Methanol		1.12	1.888	32.04	19	164,250	7.92E-03	6.94E+01	3.47E-02	7.92E-03	6.94E+01	3.47E-02
Ethylene Glycol		0.80	0.0725	62.07	19	164,250	4.19E-04	3.67E+00	1.84E-03	4.19E-04	3.67E+00	1.84E-03
Total							**8.34E-03**	**7.30E+01**	**3.65E-02**	**8.34E-03**	**7.30E+01**	**3.65E-02**

[a] From windshield cleaner MSDS, material is 23% volatile by mass. Windshield cleaner fluid was conservatively assumed to contain 23% methanol and 23% ethylene glycol.

Assembly Roll and Brake Testing Capacities

Hourly Production Rate	19	units/hr
Annual Production Rate	164,250	units/yr
Simulated Distance	3.0	miles/unit
Hours of Operation [a]	8,760	hr/yr

[a] Potential operating hours are based on operation 24 hours/day, 365 days/yr.

Assembly Roll and Brake Testing Emission Factors

Pollutant	Diesel g/mile [a]	Gasoline g/mile	Worst Case Fuel g/mile
PM	0.08	0.0	0.08
NO_X	0.3	0.3	0.3
CO	4.2	4.2	4.2
VOC	0.09	0.09	0.09
Formaldehyde	0.018	0.018	0.018
CO_2e [b,c]			
CO_2 [b]	417	417	417
CH_4 [d]	0.73	0.73	0.73
N_2O [d]	0.01	0.01	0.01

[a] Emission rates are based on 40 CFR 88 Subpart A Table A Table A104-2—Full Useful Life Standards (g/mi) for Light-Duty Vehicles, diesel vehicles.

[b] The CO_2 emission factor is from "Light-Duty Automotive Technology, Carbon Dioxide Emissions, and Fuel Economy Trends: 1975 Through 2010"

[c] When accounting for global warming potential, CO_2 is 95% of CO_2e. EPA Emission Facts: Greenhouse Gas Emissions from a Typical Passenger Vehicle, http://www.epa.gov/OMS/climate/420f05004.htm.

[d] 5% of CO_2e is assumed to be CH_4 and N_2O, when accounting for global warming potential. Emission factors for these pollutants are based on a ratio of CH_4 and N_2O emission factors for petroleum fuels from the GHG Mandatory Reporting Rule Subpart C, Table C-2.

Assembly Roll and Brake Testing Potential Emissions

Process	Potential Emissions																	
	$PM/PM_{10}/PM_{2.5}$		NO_X		CO		VOC		Formaldehyde		CO_2		CH_4		N_2O		CO_2e	
	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
Assembly Roll and Brake	0.010	0.043	0.037	0.163	0.521	2.281	0.011	0.049	0.002	0.010	51.71	226.50	0.091	0.40	0.002	0.01	54.43	238.42

Assembly Washer System Testing Compound Usage Data

Washer System Test [a]	mL/unit	% Ethylene Glycol [b]	Ethylene Glycol Density (lb/gal)	lb Ethylene Glycol/unit
Maximum Tested Windshield Cleaner Usage	100	23%	9.26	0.056

[a] Represents the maximum testing fluid usage per unit.

[b] From windshield cleaner MSDS, material contains 23% volatiles (methanol and ethylene glycol). Emissions from washer system testing calculated based on ethylene glycol density which represents the worst-case VOC emissions for the material.

Assembly Washer System Testing Emissions

	Production		VOC Emissions [a]			Maximum Ethylene Glycol Emissions [b]			Maximum Methanol Emissions [b]		
	(units/hr)	(units/yr)	(lb/hr)	(lb/yr)	(tpy)	(lb/hr)	(lb/yr)	(tpy)	(lb/hr)	(lb/yr)	(tpy)
Washer System Testing	19	164,250	1.06	9,244.66	4.62	1.06	9,244.66	4.62	0.75	6,579.53	3.29

[a] VOC emissions from washer system testing calculated based on ethylene glycol density which represents the worst-case VOC emissions for the material.

[b] Maximum HAP emissions are calculated assuming the maximum volatile content for both ethylene glycol and methanol. Therefore, the calculated VOC emissions are not equivalent to the sum c

Storage Tank Volumes

Tank ID	Consumption per Vehicle (gal/veh)	Max. Consumption per year[a] (gal/yr)	Fuel Type
TK-01	5.00	702,000	Gasoline
TK-02	5.00	702,000	Diesel
TK-03	----	100,000	Diesel

Storage Tank Emissions

Tank ID	Description [a]	Controls	Tank Size		Capacity	Throughput	Uncontrolled Emissions [b] (lb/yr)			Total VOC Emissions [c]	
			Shell Length (ft)	Diameter (ft)	(gal)	(gal/yr)	Working Loss	Breathing Loss	Total	Total (lb/hr)	Total (tpy)
TK-01	Gasoline	N/A	10.00	9.67	5,000	702,000	3,553.34	1,718.84	5,272.18	0.70	2.64
TK-02	Diesel fuel	N/A	15.08	11.00	10,000	702,000	10.79	2.27	13.06	0.002	0.01
TK-03	Diesel fuel	N/A	7.58	10.72	1,240	100,000	1.39	1.08	2.47	0.000	0.00
Tanks Total									**5,287.71**	**0.71**	**2.64**

[a] Max throughput for TK-01 and TK-02 based on the max. consumption per vehicle. TK-03 will be used to sources in the Marshalling yard.

[b] All the storage tanks are horizontal tanks.

[c] Storage Tank emissions taken from TANKS 4.09d output based on tank parameters and geographical information.

Emergency Generators and Fire Pumps Emission Factors [a,b]

Pollutant	Emergency Engines 19 ≤ kW < 37	Emergency Engines 37 ≤ kW < 75	Emergency Engines 225 ≤ kW < 450	Emergency Engines kW > 560	Fire Pumps 225 < kW < 450	Units
$PM/PM_{10}/PM_{2.5}$	0.45	0.30	0.15	0.15	0.15	g/hp-hr
SO_2 [c]	0.93	0.93	0.93	5.5E-03	0.93	g/hp-hr
NO_X	5.6	3.5	3.0	4.8	3.0	g/hp-hr
CO	4.1	3.7	2.6	2.6	2.6	g/hp-hr
VOC	5.6	3.5	3.0	4.8	3.0	g/hp-hr
CO_2e [d]						
CO_2	163.08	163.08	163.08	163.08	163.08	lb/MMBtu
CH_4	6.62E-03	6.62E-03	6.62E-03	6.62E-03	6.62E-03	lb/MMBtu
N_2O	1.32E-03	1.32E-03	1.32E-03	1.32E-03	1.32E-03	lb/MMBtu

[a] The emission factors are from 40 CFR 89.112(a), Table 1. VOC and NO_X emission factors are each assumed to be equivalent to NO_X + NMHC emission limit. The SO_2 emission factor is from AP-42, Table 3.4-1 for large diesel engines.

[b] The emission factors are from 40 CFR 89.112(a), Table 1. VOC and NO_X emission factors are each assumed to be equivalent to NO_X + NMHC emission limit. The SO_2 emission factor is from AP-42, Table 3.3-1.

[c] Sulfur content of diesel fuel equals the maximum sulfur content of 15 ppm, per 40 CFR 80.510(b).

[d] Emission factors from 40 CFR 98, Subpart C, Tables C-1 and C-2. Factors were converted to lb/MMBtu.

Emergency Generators and Fire Pumps Criteria Pollutant Emissions

Equipment ID	Fuel	Horsepower	Max. Rated Capacity	Max. hours per year [a]	$PM/PM_{10}/PM_{2.5}$		SO_2		NO_X		CO		VOC		CO_2		CH_4		N_2O		CO_2e	
		(hp)	(MMBtu/hr)	(hr/yr)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
EG01	Diesel	398	1.01	500	0.13	0.03	0.82	0.204	2.62	0.65	2.29	0.57	2.62	0.65	143.09	35.77	0.006	0.001	0.001	0.0003	143.59	35.90
EG02	Diesel	65	0.17	500	0.04	0.01	0.13	0.03	0.50	0.13	0.53	0.13	0.50	0.13	23.37	5.84	0.001	2E-04	0.0002	5E-05	23.45	5.86
EG03	Diesel	40	0.10	500	0.04	0.01	0.08	0.021	0.50	0.12	0.36	0.09	0.50	0.12	14.46	3.62	0.001	0.00	0.000	0.000	14.51	3.63
EG04	Diesel	1,500	3.82	500	0.49	0.12	0.02	0.005	15.78	3.95	8.63	2.16	15.78	3.95	539.30	134.83	0.022	0.01	0.004	0.001	541.15	135.29
FP01	Diesel	305	0.78	500	0.10	0.03	0.63	0.16	2.02	0.50	1.75	0.44	2.02	0.50	109.66	27.41	0.004	0.001	0.0009	0.0002	110.03	27.51
Total					**0.81**	**0.20**	**1.68**	**0.42**	**21.42**	**5.35**	**13.57**	**3.39**	**21.42**	**5.35**	**829.9**	**207.47**	**0.03**	**0.01**	**0.01**	**0.002**	**832.7**	**208.18**

[a] Potential hours of operation for emergency units.

Emergency Generators and Fire Pumps Combined Heat Input Capacities

	Large Units[a] (MMBtu/hr)
Total Large Diesel Heat Input	3.82
Total Diesel Heat Input	2.06

[a] Large diesel engines are those larger than 600 hp.

Emergency Generators and Fire Pumps HAP/TAP Emissions

Pollutant	Emission Factors (lb/MMBtu) Large Diesel[a]	Emission Factors (lb/MMBtu) Diesel[b]	Emergency Equipment Emissions (lb/hr)	(tpy)
Benzene	7.76E-04	9.33E-04	4.88E-03	1.22E-03
Toluene	2.81E-04	4.09E-04	1.91E-03	4.79E-04
Xylene	1.93E-04	2.85E-04	1.32E-03	3.31E-04
Formaldehyde	7.89E-05	1.18E-03	2.73E-03	6.82E-04
Acetaldehyde	2.52E-05	7.67E-05	2.54E-04	6.35E-05
Acrolein	7.88E-06	9.25E-05	2.20E-04	5.51E-05
Napthalene	1.30E-04	8.48E-05	6.71E-04	1.68E-04
Total PAH	2.12E-04	1.68E-04	1.15E-03	2.89E-04

[a] Emission factors from AP-42 Section 3.4 Large Stationary Diesel and All Stationary Duel-fuel Engines, Table 3.4-3 - 3.4-4.
[b] Emission factors from AP-42 Section 3.3 Gasoline and Diesel Industrial Engines, Table 3.3-2.

Cooling Tower Potential Emissions

Description	Circulating Water Flowrate (gal/hr)	Water Density (lb/gal)	Total Dissolved Solids [a] (ppm)	Drift Rate [b] (%)	Hours of Operation (hrs/yr)	Potential Emissions [c] PM (lb/hr)	PM (tpy)	PM_{10} (lb/hr)	PM_{10} (tpy)	$PM_{2.5}$ (lb/hr)	$PM_{2.5}$ (tpy)
Cooling Tower 1	412,500	8.34	650	0.001	7,488	2.24E-02	8.37E-02	3.33E-03	1.25E-02	2.00E-03	7.48E-03
Cooling Tower 2	412,500	8.34	650	0.001	7,488	2.24E-02	8.37E-02	3.33E-03	1.25E-02	2.00E-03	7.48E-03
Cooling Tower 3	412,500	8.34	650	0.001	7,488	2.24E-02	8.37E-02	3.33E-03	1.25E-02	2.00E-03	7.48E-03
Cooling Tower 4	73,800	8.34	650	0.001	7,488	4.00E-03	1.50E-02	5.96E-04	2.23E-03	3.58E-04	1.34E-03
Cooling Tower 5	484,900	8.34	650	0.001	7,488	2.63E-02	9.84E-02	3.92E-03	1.47E-02	2.35E-03	8.80E-03
Cooling Tower 6	484,900	8.34	650	0.001	7,488	2.63E-02	9.84E-02	3.92E-03	1.47E-02	2.35E-03	8.80E-03
Cooling Tower 7	484,900	8.34	650	0.001	7,488	2.63E-02	9.84E-02	3.92E-03	1.47E-02	2.35E-03	8.80E-03
Total						1.50E-01	5.61E-01	2.23E-02	8.36E-02	1.34E-02	5.02E-02

[a] TDS provided by Charleston Water System.

[b] Drift rate value supplied based on vendor guaranteed drift rate.

[c] PM emissions calculated using equation from AP-42 Chapter 13.4 - Wet Cooling Towers. PM_{10} emissions are 14.9% of PM emissions based on *Calculating Realistic PM_{10} Emissions from Cooling Towers* by Joel Reisman and Gordon Frisbie. $PM_{2.5}$ assumed to be 60% of PM_{10} based on California Emissions Inventory Development and Reporting System (CEIDARS).

Paved Roads - Emission Factor Equation[a]

$$E = [k\,(sL)^{0.91} * W^{1.02}] * (1 - 1.2*P/N)$$

where:	Value	Units	Data Source
k = particle size multiplier for PM	0.011	lb/VMT	AP-42, Table 13.2.1-1 [b]
k = particle size multiplier for PM_{10}	0.0022	lb/VMT	AP-42, Table 13.2.1-1 [b]
k = particle size multiplier for $PM_{2.5}$	0.00054	lb/VMT	AP-42, Table 13.2.1-1 [b]
sL = road surface silt loading	0.6	g/m^2	AP-42, Table 13.2.1-2 [c]
W_a = average weight of vehicles traveling the road	40.0	tons	SC DOT [d]
N = number of days in averaging period	365	days	AP-42, pg. 13.2.1-6
P = number of days in a year with at least 0.01 in of precipitation	120	days	AP-42, Fig. 13.2.1-2
E_a = PM emission factor	**0.18**	**lb/VMT**	**Calculation**
E_a = PM_{10} emission factor	**0.04**	**lb/VMT**	**Calculation**
E_a = $PM_{2.5}$ emission factor	**0.01**	**lb/VMT**	**Calculation**

[a] AP-42, Section 13.2.1.3, Equation 3.

[b] K value selected is for PM_{30}, PM_{10} and $PM_{2.5}$. The PM_{30} factor is used to calculate PM emissions.

[c] AP-42 Section 13.2.1, Table 13.2.1-2, Ubiquitous Silt Loading Default Values for sites with average daily traffic (ADT) for low volume roads, ADT category < 500 vehicles.

[d] Average weight conservatively set to maximum allowable gross vehicle weight rating is 80,000 lbs (40 tons), per SC §56-5-4140.

Paved Roads - Loads and Distance Inputs

Parameter	Value	Units
Distance traveled per load	1.71	VMT/load
Loads traveled	6	loads/hr
	150	loads/day
	54,750	loads/yr
Paved Vehicle Miles Traveled per Year [a]	93,349	VMT/yr
Paved Vehicle Miles Traveled per Hour [b]	10.66	VMT/hr

[a] Calculation: Paved Vehicle Miles Traveled per Year (VMT/yr) = (Potential Vehicle Production (tpy)) / Weight of Truck Load (tons/load) * Distance Traveled per Load (VMT/load).

[b] Calculation: Paved Vehicle Miles Traveled per Hour (VMT/hr) = (Potential Vehicle Production (tons/hr)) / Weight of Truck Load (tons/load) * Distance Traveled per Load (VMT/load).

Paved Roads - Potential Emissions

	PM		PM_{10}		$PM_{2.5}$	
	(lb/hr)	**(tpy)**	**(lb/hr)**	**(tpy)**	**(lb/hr)**	**(tpy)**
Paved Roads [a,b]	1.92	8.41	0.38	1.68	0.09	0.41

[a] Calculation: Potential Emissions (tpy) = Paved Vehicle Miles Traveled per Year (VMT/yr) * Emission Factor (lb/VMT) / (2,000 lb/ton).

[b] Calculation: Potential Emissions (lb/hr) = Paved Vehicle Miles Traveled per Year (VMT/hr) * Emission Factor (lb/VMT).

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification		
User Identification:	TK-01	
City:	Charleston	
State:	South Carolina	
Company:	Mercedes-Benz Vans, LLC	
Type of Tank:	Horizontal Tank	
Description:	5.000 gallon Gasoline Storage Tank	
Tank Dimensions		
Shell Length (ft):		10.00
Diameter (ft):		9.67
Volume (gallons):		5,000.00
Turnovers:		140.40
Net Throughput(gal/yr):		702,000.00
Is Tank Heated (y/n):	N	
Is Tank Underground (y/n):	N	
Paint Characteristics		
Shell Color/Shade:	White/White	
Shell Condition	Good	
Breather Vent Settings		
Vacuum Settings (psig):		-0.03
Pressure Settings (psig)		0.03

Meterological Data used in Emissions Calculations: Charleston AP, South Carolina (Avg Atmospheric Pressure = 14.75 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

TK-01 - Horizontal Tank
Charleston, South Carolina

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Gasoline (RVP 15.0)	All	67.43	62.24	72.62	65.60	9.3159	8.4871	10.2071	60.0000			92.00	Option 4: RVP=15, ASTM Slope=3

Emissions Report - Detail Format
Detail Calculations (AP-42)

TK-01 - Horizontal Tank
Charleston, South Carolina

Annual Emission Calcaulations	
Standing Losses (lb):	1,718.8435
Vapor Space Volume (cu ft):	467.7816
Vapor Density (lb/cu ft):	0.0988
Vapor Space Expansion Factor:	0.3451
Vented Vapor Saturation Factor:	0.2952
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	467.7816
Tank Diameter (ft):	9.6700
Effective Diameter (ft):	11.0989
Vapor Space Outage (ft):	4.8350
Tank Shell Length (ft):	10.0000
Vapor Density	
Vapor Density (lb/cu ft):	0.0988
Vapor Molecular Weight (lb/lb-mole):	60.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	9.3159
Daily Avg. Liquid Surface Temp. (deg. R):	527.0973
Daily Average Ambient Temp. (deg. F):	65.5833
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	525.2733
Tank Paint Solar Absorptance (Shell):	0.1700
Daily Total Solar Insulation Factor (Btu/sqft day):	1,364.6667
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.3451
Daily Vapor Temperature Range (deg. R):	20.7638
Daily Vapor Pressure Range (psia):	1.7200
Breather Vent Press. Setting Range(psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	9.3159
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	8.4871
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	10.2071
Daily Avg. Liquid Surface Temp. (deg R):	527.0973
Daily Min. Liquid Surface Temp. (deg R):	521.9063
Daily Max. Liquid Surface Temp. (deg R):	532.2882
Daily Ambient Temp. Range (deg. R):	19.8167
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.2952
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	9.3159
Vapor Space Outage (ft):	4.8350
Working Losses (lb):	3,553.3409
Vapor Molecular Weight (lb/lb-mole):	60.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	9.3159
Annual Net Throughput (gal/yr.):	702,000.0000
Annual Turnovers:	140.4000
Turnover Factor:	0.3803
Tank Diameter (ft):	9.6700
Working Loss Product Factor:	1.0000
Total Losses (lb):	5,272.1844

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

TK-01 - Horizontal Tank
Charleston, South Carolina

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Gasoline (RVP 15.0)	3,553.34	1,718.84	5,272.18

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	TK-02
City:	Charleston
State:	South Carolina
Company:	Mercedes-Benz Vans, LLC
Type of Tank:	Horizontal Tank
Description:	10,000 Gallon Diesel Storage Tank

Tank Dimensions

Shell Length (ft):	15.08
Diameter (ft):	11.00
Volume (gallons):	10,000.00
Turnovers:	70.20
Net Throughput(gal/yr):	702,000.00
Is Tank Heated (y/n):	N
Is Tank Underground (y/n):	N

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Charleston AP, South Carolina (Avg Atmospheric Pressure = 14.75 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

TK-02 - Horizontal Tank
Charleston, South Carolina

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Distillate fuel oil no. 2	All	67.43	62.24	72.62	65.60	0.0084	0.0071	0.0098	130.0000			188.00	Option 1: VP60 = .0065 VP70 = .009

TAI +.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

TK-02 - Horizontal Tank
Charleston, South Carolina

Annual Emission Calcaulations	
Standing Losses (lb):	2.2666
Vapor Space Volume (cu ft):	912.8028
Vapor Density (lb/cu ft):	0.0002
Vapor Space Expansion Factor:	0.0355
Vented Vapor Saturation Factor:	0.9976
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	912.8028
Tank Diameter (ft):	11.0000
Effective Diameter (ft):	14.5366
Vapor Space Outage (ft):	5.5000
Tank Shell Length (ft):	15.0800
Vapor Density	
Vapor Density (lb/cu ft):	0.0002
Vapor Molecular Weight (lb/lb-mole):	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0084
Daily Avg. Liquid Surface Temp. (deg. R):	527.0973
Daily Average Ambient Temp. (deg. F):	65.5833
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	525.2733
Tank Paint Solar Absorptance (Shell):	0.1700
Daily Total Solar Insulation Factor (Btu/sqft day):	1,364.6667
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.0355
Daily Vapor Temperature Range (deg. R):	20.7638
Daily Vapor Pressure Range (psia):	0.0027
Breather Vent Press. Setting Range(psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0084
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.0071
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.0098
Daily Avg. Liquid Surface Temp. (deg R):	527.0973
Daily Min. Liquid Surface Temp. (deg R):	521.9063
Daily Max. Liquid Surface Temp. (deg R):	532.2882
Daily Ambient Temp. Range (deg. R):	19.8167
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.9976
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0084
Vapor Space Outage (ft):	5.5000
Working Losses (lb):	10.7863
Vapor Molecular Weight (lb/lb-mole):	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0084
Annual Net Throughput (gal/yr.):	702,000.0000
Annual Turnovers:	70.2000
Turnover Factor:	0.5940
Tank Diameter (ft):	11.0000
Working Loss Product Factor:	1.0000
Total Losses (lb):	13.0529

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

TK-02 - Horizontal Tank
Charleston, South Carolina

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Distillate fuel oil no. 2	10.79	2.27	13.05

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	TK-03
City:	Charleston AP
State:	South Carolina
Company:	Mercedes-Benz Vans, LLC
Type of Tank:	Horizontal Tank
Description:	1,240 gallon Diesel Storage Tank

Tank Dimensions

Shell Length (ft):	7.58
Diameter (ft):	10.72
Volume (gallons):	1,240.00
Turnovers:	80.65
Net Throughput(gal/yr):	100,000.00
Is Tank Heated (y/n):	N
Is Tank Underground (y/n):	N

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Charleston AP, South Carolina (Avg Atmospheric Pressure = 14.75 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

TK-03 - Horizontal Tank
Charleston AP, South Carolina

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Distillate fuel oil no. 2	All	67.43	62.24	72.62	65.60	0.0084	0.0071	0.0098	130.0000			188.00	Option 1: VP60 = .0065 VP70 = .009

TANI 0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

TK-03 - Horizontal Tank
Charleston AP, South Carolina

Annual Emission Calcaulations	
Standing Losses (lb):	1.0821
Vapor Space Volume (cu ft):	435.7616
Vapor Density (lb/cu ft):	0.0002
Vapor Space Expansion Factor:	0.0355
Vented Vapor Saturation Factor:	0.9976
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	435.7616
Tank Diameter (ft):	10.7200
Effective Diameter (ft):	10.1741
Vapor Space Outage (ft):	5.3600
Tank Shell Length (ft):	7.5800
Vapor Density	
Vapor Density (lb/cu ft):	0.0002
Vapor Molecular Weight (lb/lb-mole):	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0084
Daily Avg. Liquid Surface Temp. (deg. R):	527.0973
Daily Average Ambient Temp. (deg. F):	65.5833
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	525.2733
Tank Paint Solar Absorptance (Shell):	0.1700
Daily Total Solar Insulation Factor (Btu/sqft day):	1,364.6667
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.0355
Daily Vapor Temperature Range (deg. R):	20.7638
Daily Vapor Pressure Range (psia):	0.0027
Breather Vent Press. Setting Range(psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0084
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.0071
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.0098
Daily Avg. Liquid Surface Temp. (deg R):	527.0973
Daily Min. Liquid Surface Temp. (deg R):	521.9063
Daily Max. Liquid Surface Temp. (deg R):	532.2882
Daily Ambient Temp. Range (deg. R):	19.8167
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.9976
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	0.0084
Vapor Space Outage (ft):	5.3600
Working Losses (lb):	1.3933
Vapor Molecular Weight (lb/lb-mole):	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0084
Annual Net Throughput (gal/yr.):	100,000.0000
Annual Turnovers:	80.6452
Turnover Factor:	0.5387
Tank Diameter (ft):	10.7200
Working Loss Product Factor:	1.0000
Total Losses (lb):	2.4755

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

TK-03 - Horizontal Tank
Charleston AP, South Carolina

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Distillate fuel oil no. 2	1.39	1.08	2.48

APPENDIX C: BACT SUPPORTING DOCUMENTATION

Table C.1.1 - RBLC Search Results - Motor Vehicles and Passenger Car Bodies - PM

RBLCID	FACILITY_NAME	COMPANY NAME	FACILITY STATE	PERMIT NUMBER	SIC CODE	PERMIT ISSUANCE DATE	PROCESS NAME	PROCCESS TYPE	THROUGHPUT	THROUGHPUT UNIT	POLLUTANT	CONTROL METHOD DESCRIPTION	EMISSION LIMIT 1	EMISSION LIMIT 1 UNIT	PERCENT EFFICIENCY	EMISSION LIMIT 2	EMISSION LIMIT 2 UNIT	COST EFFECTIVENESS	LIMIT (lb/MMscf)
Boilers - Table C.1.1.1																			
AL-0192	HONDA MANUFACTURING OF ALABAMA, LLC	HONDA MANUFACTURING OF ALABAMA, LLC	AL	309-0050 (X010-X014)	3711	10/18/2002	BOILERS, NATURAL GAS, (3)	13.31	30	MMBTU/H	Visible Emissions (VE)		10	% OPACITY	0	0		0	
AL-0192	HONDA MANUFACTURING OF ALABAMA, LLC	HONDA MANUFACTURING OF ALABAMA, LLC	AL	309-0050 (X010-X014)	3711	10/18/2002	BOILERS, NATURAL GAS, (3)	13.31	30	MMBTU/H	Particulate matter, filterable (FPM10)	CLEAN FUEL, GOOD COMBUSTION	0.228	LB/H	0	0.0076	LB/MMBTU	0	7.75
AL-0191	HYUNDAI MOTOR MANUFACTURING OF ALABAMA, LLC	HYUNDAI MOTOR MANUFACTURING OF ALABAMA, LLC	AL	209-0090-X001,X002,X003	3711	3/23/2004	BOILERS, NATURAL GAS, (3)	13.31	50	MMBTU/H	Particulate matter, filterable (FPM10)	CLEAN FUEL	0.38	LB/H	0	0.0075	LB/MMBTU	0	7.75
OH-0277	DAIMLER CHRYSLER CORPORATION BODY SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01357	3711	8/31/2004	HOT WATER BOILER, W/ NATURAL GAS, 2 UNITS	13.9	50	MMBTU/H	Particulate matter, filterable (FPM10)		0.38	LB/H	0	1.26	T/ROLLING 12-MO	0	7.75
OH-0277	DAIMLER CHRYSLER CORPORATION BODY SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01357	3711	8/31/2004	HOT WATER BOILER, W/ NATURAL GAS, 2 UNITS	13.9	50	MMBTU/H	Visible Emissions (VE)		5	% OPACITY	0	0		0	
OH-0279	DAIMLER CHRYSLER CORPORATION ASSEMBLY PLANT	DAIMLER CHRYSLER CORPORATION	OH	04-01359	3711	8/31/2004	HOT WATER BOILER, W/ NATURAL GAS, 2 UNITS	13.9	50	MMBTU/H	Particulate matter, filterable (FPM10)		0.38	LB/H	0	1.41	T/ROLLING 12-MO	0	7.75
OH-0279	DAIMLER CHRYSLER CORPORATION ASSEMBLY PLANT	DAIMLER CHRYSLER CORPORATION	OH	04-01359	3711	9/2/2004	HOT WATER BOILER, W/ NATURAL GAS, 2 UNITS	13.9	50	MMBTU/H	Visible Emissions (VE)		5	% OPACITY	0	0		0	
OH-0280	DAIMLER CHRYSLER CORPORATION PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	9/2/2004	HOT WATER BOILER, W/ NATURAL GAS, 2 UNITS	13.9	50	MMBTU/H	Visible Emissions (VE)		5	% OPACITY	0	0		0	
OH-0280	DAIMLER CHRYSLER CORPORATION PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	9/2/2004	HOT WATER BOILER, W/ NATURAL GAS, 2 UNITS	13.9	50	MMBTU/H	Particulate matter, filterable (FPM10)		0.38	LB/H	0	3.65	T/ROLLING 12-MO	0	7.75
OH-0309	TOLEDO SUPPLIER PARK- PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	5/3/2007	BOILER (2), NATURAL GAS	13.31	20.4	MMBTU/H	Visible Emissions (VE)		5	% OPACITY	0	0		0	
OH-0309	TOLEDO SUPPLIER PARK- PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	5/3/2007	BOILER (2), NATURAL GAS	13.31	20.4	MMBTU/H	Particulate Matter (PM)		0.04	LB/H	0	0.27	LB/YR	0	
OH-0309	TOLEDO SUPPLIER PARK- PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	5/3/2007	BOILER (2), NATURAL GAS	13.31	20.4	MMBTU/H	Particulate matter, filterable (FPM10)		0.15	LB/H	0	0.78	T/YR	0	7.50
AL-0191	HYUNDAI MOTOR MANUFACTURING OF ALABAMA, LLC	HYUNDAI MOTOR MANUFACTURING OF ALABAMA, LLC	AL	209-0090-X001,X002,X003	3711	3/23/2004	BOILERS, NATURAL GAS, (3)	13.31	50	MMBTU/H	Particulate matter, filterable (FPM10)	CLEAN FUEL	0.38	LB/H	0	0.0075	LB/MMBTU	0	7.75
AL-0192	HONDA MANUFACTURING OF ALABAMA, LLC	HONDA MANUFACTURING OF ALABAMA, LLC	AL	309-0050 (X010-X014)	3711	10/18/2002	BOILERS, NATURAL GAS, (3)	13.31	30	MMBTU/H	Visible Emissions (VE)		10	% OPACITY	0	0		0	
AL-0192	HONDA MANUFACTURING OF ALABAMA, LLC	HONDA MANUFACTURING OF ALABAMA, LLC	AL	309-0050 (X010-X014)	3711	10/18/2002	BOILERS, NATURAL GAS, (3)	13.31	30	MMBTU/H	Particulate matter, filterable (FPM10)	CLEAN FUEL, GOOD COMBUSTION	0.228	LB/H	0	0.0076	LB/MMBTU	0	7.75
OH-0277	DAIMLER CHRYSLER CORPORATION BODY SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01357	3711	8/31/2004	HOT WATER BOILER, W/ NATURAL GAS, 2 UNITS	13.9	50	MMBTU/H	Particulate matter, filterable (FPM10)		0.38	LB/H	0	1.26	T/ROLLING 12-MO	0	7.75
OH-0277	DAIMLER CHRYSLER CORPORATION BODY SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01357	3711	8/31/2004	HOT WATER BOILER, W/ NATURAL GAS, 2 UNITS	13.9	50	MMBTU/H	Visible Emissions (VE)		5	% OPACITY	0	0		0	
OH-0279	DAIMLER CHRYSLER CORPORATION ASSEMBLY PLANT	DAIMLER CHRYSLER CORPORATION	OH	04-01359	3711	9/2/2004	HOT WATER BOILER, W/ NATURAL GAS, 2 UNITS	13.9	50	MMBTU/H	Particulate matter, filterable (FPM10)		0.38	LB/H	0	1.41	T/ROLLING 12-MO	0	7.75
OH-0279	DAIMLER CHRYSLER CORPORATION ASSEMBLY PLANT	DAIMLER CHRYSLER CORPORATION	OH	04-01359	3711	9/2/2004	HOT WATER BOILER, W/ NATURAL GAS, 2 UNITS	13.9	50	MMBTU/H	Visible Emissions (VE)		5	% OPACITY	0	0		0	
OH-0280	DAIMLER CHRYSLER CORPORATION PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	9/2/2004	HOT WATER BOILER, W/ NATURAL GAS, 2 UNITS	13.9	50	MMBTU/H	Visible Emissions (VE)		5	% OPACITY	0	0		0	
OH-0280	DAIMLER CHRYSLER CORPORATION PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	9/2/2004	HOT WATER BOILER, W/ NATURAL GAS, 2 UNITS	13.9	50	MMBTU/H	Particulate matter, filterable (FPM10)		0.38	LB/H	0	3.65	T/ROLLING 12-MO	0	7.75

Table C.1.1 - RBLC Search Results - Motor Vehicles and Passenger Car Bodies - PM

RBLCID	FACILITY_NAME	COMPANY NAME	FACILITY STATE	PERMIT NUMBER	SIC CODE	PERMIT ISSUANCE DATE	PROCESS NAME	PROCCESS TYPE	THROUGHPUT	THROUGHPUT UNIT	POLLUTANT	CONTROL METHOD DESCRIPTION	EMISSION LIMIT 1	EMISSION LIMIT 1 UNIT	PERCENT EFFICIENCY	EMISSION LIMIT 2	EMISSION LIMIT 2 UNIT	COST EFFECTIVENESS	LIMIT (lb/MMscf)
Air Supply Units - Table C.1.1.2																			
OH-0277	DAIMLER CHRYSLER CORPORATION BODY SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01357	3711	8/31/2004	AIR SUPPLY MAKE UP UNITS (40 UNITS) AND BODY WASHERS (2 UNITS)	19.9	90	MMBTU/H	Particulate matter, filterable (FPM10)		0.68	LB/H	0	1.26	T/ROLLING 12-MO	0	7.71
OH-0277	DAIMLER CHRYSLER CORPORATION BODY SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01357	3711	8/31/2004	AIR SUPPLY MAKE UP UNITS (40 UNITS) AND BODY WASHERS (2 UNITS)	19.9	90	MMBTU/H	Visible Emissions (VE)		5	% OPACITY	0	0		0	
OH-0279	DAIMLER CHRYSLER CORPORATION ASSEMBLY PLANT	DAIMLER CHRYSLER CORPORATION	OH	04-01359	3711	9/2/2004	AIR SUPPLY MAKE UP UNITS	19.9	95	MMBTU/H	Particulate matter, filterable (FPM10)		0.72	LB/H	0	1.41	T/ROLLING 12-MO	0	7.73
OH-0279	DAIMLER CHRYSLER CORPORATION ASSEMBLY PLANT	DAIMLER CHRYSLER CORPORATION	OH	04-01359	3711	9/2/2004	AIR SUPPLY MAKE UP UNITS	19.9	95	MMBTU/H	Visible Emissions (VE)		5	% OPACITY	0	0		0	
OH-0280	DAIMLER CHRYSLER CORPORATION PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	9/2/2004	AIR SUPPLY MAKEUP UNITS (30 UNITS)	19.9	20	MMBTU/H	Visible Emissions (VE)		5	% OPACITY	0	0		0	
OH-0280	DAIMLER CHRYSLER CORPORATION PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	9/2/2004	AIR SUPPLY MAKEUP UNITS (30 UNITS)	19.9	20	MMBTU/H	Particulate matter, filterable (FPM10)		15	LB/H	0	3.65	T/ROLLING 12-MO	0	765.00
OH-0280	DAIMLER CHRYSLER CORPORATION PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	9/2/2004	AIR SUPPLY MAKE UP UNITS (17 UNITS)	19.9	10	MMBTU/H	Particulate matter, filterable (FPM10)		0.42	LB/H	0	3.65	T/ROLLING 12-MO	0	42.84
OH-0280	DAIMLER CHRYSLER CORPORATION PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	9/2/2004	AIR SUPPLY MAKE UP UNITS (17 UNITS)	19.9	10	MMBTU/H	Visible Emissions (VE)		5	% OPACITY	0	0		0	
OH-0309	TOLEDO SUPPLIER PARK- PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	5/3/2007	AIR SUPPLY MAKE UP UNITS (24)	19.9	20	MMBTU/H	Particulate matter, filterable (FPM10)		0.15	LB/H	0	0.66	T/YR	0	7.65
OH-0309	TOLEDO SUPPLIER PARK- PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	5/3/2007	AIR SUPPLY MAKE UP UNITS (24)	19.9	20	MMBTU/H	Particulate Matter (PM)		0.04	LB/H	0	0.18	T/YR	0	
OH-0309	TOLEDO SUPPLIER PARK- PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	5/3/2007	AIR SUPPLY MAKE UP UNITS (24)	19.9	20	MMBTU/H	Visible Emissions (VE)		5	% OPACITY	0	0		0	
OH-0309	TOLEDO SUPPLIER PARK- PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	5/3/2007	AIR SUPPLY MAKE UP UNITS	19.9	28.95	MMBTU/H	Particulate matter, filterable (FPM10)		0.22	LB/H	0	0.95	T/YR	0	7.75
OH-0309	TOLEDO SUPPLIER PARK- PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	5/3/2007	AIR SUPPLY MAKE UP UNITS	19.9	28.95	MMBTU/H	Particulate Matter (PM)		0.06	LB/H	0	0.24	T/YR	0	
OH-0309	TOLEDO SUPPLIER PARK- PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	5/3/2007	AIR SUPPLY MAKE UP UNITS	19.9	28.95	MMBTU/H	Visible Emissions (VE)		5	% OPACITY	0	0		0	
OH-0309	TOLEDO SUPPLIER PARK- PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	5/3/2007	AIR SUPPLY MAKE UP UNITS (6)	19.9	14	MMBTU/H	Particulate matter, filterable (FPM10)		0.11	LB/H	0	0.5	T/YR	0	8.01
OH-0309	TOLEDO SUPPLIER PARK- PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	5/3/2007	AIR SUPPLY MAKE UP UNITS (6)	19.9	14	MMBTU/H	Particulate Matter (PM)		0.03	LB/H	0	0.13	T/YR	0	
OH-0309	TOLEDO SUPPLIER PARK- PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	5/3/2007	AIR SUPPLY MAKE UP UNITS (6)	19.9	14	MMBTU/H	Visible Emissions (VE)		5	% OPACITY	0	0		0	
OH-0277	DAIMLER CHRYSLER CORPORATION BODY SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01357	3711	8/31/2004	AIR SUPPLY MAKE UP UNITS (40 UNITS) AND BODY WASHERS (2 UNITS)	19.9	90	MMBTU/H	Particulate matter, filterable (FPM10)		0.68	LB/H	0	1.26	T/ROLLING 12-MO	0	7.71
OH-0277	DAIMLER CHRYSLER CORPORATION BODY SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01357	3711	8/31/2004	AIR SUPPLY MAKE UP UNITS (40 UNITS) AND BODY WASHERS (2 UNITS)	19.9	90	MMBTU/H	Visible Emissions (VE)		5	% OPACITY	0	0		0	56.67
OH-0279	DAIMLER CHRYSLER CORPORATION ASSEMBLY PLANT	DAIMLER CHRYSLER CORPORATION	OH	04-01359	3711	9/2/2004	AIR SUPPLY MAKE UP UNITS	19.9	95	MMBTU/H	Particulate matter, filterable (FPM10)		0.72	LB/H	0	1.41	T/ROLLING 12-MO	0	

Table C.1.1 - RBLC Search Results - Motor Vehicles and Passenger Car Bodies - PM

RBLCID	FACILITY_NAME	COMPANY NAME	FACILITY STATE	PERMIT NUMBER	SIC CODE	PERMIT ISSUANCE DATE	PROCESS NAME	PROCCESS TYPE	THROUGHPUT	THROUGHPUT UNIT	POLLUTANT	CONTROL METHOD DESCRIPTION	EMISSION LIMIT 1	EMISSION LIMIT 1 UNIT	PERCENT EFFICIENCY	EMISSION LIMIT 2	EMISSION LIMIT 2 UNIT	COST EFFECTIVENESS	LIMIT (lb/MMscf)
OH-0279	DAIMLER CHRYSLER CORPORATION ASSEMBLY PLANT	DAIMLER CHRYSLER CORPORATION	OH	04-01359	3711	9/2/2004	AIR SUPPLY MAKE UP UNITS	19.9	95	MMBTU/H	Visible Emissions (VE)		5	% OPACITY	0	0		0	
OH-0280	DAIMLER CHRYSLER CORPORATION PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	9/2/2004	AIR SUPPLY MAKEUP UNITS (30 UNITS)	19.9	20	MMBTU/H	Visible Emissions (VE)		5	% OPACITY	0	0		0	
OH-0280	DAIMLER CHRYSLER CORPORATION PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	9/2/2004	AIR SUPPLY MAKEUP UNITS (30 UNITS)	19.9	20	MMBTU/H	Particulate matter, filterable (FPM10)		15	LB/H	0	3.65	T/ROLLING 12-MO	0	765.00
OH-0280	DAIMLER CHRYSLER CORPORATION PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	9/2/2004	AIR SUPPLY MAKE UP UNITS (17 UNITS)	19.9	10	MMBTU/H	Particulate matter, filterable (FPM10)		0.42	LB/H	0	3.65	T/ROLLING 12-MO	0	42.84
OH-0280	DAIMLER CHRYSLER CORPORATION PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	9/2/2004	AIR SUPPLY MAKE UP UNITS (17 UNITS)	19.9	10	MMBTU/H	Visible Emissions (VE)		5	% OPACITY	0	0		0	
OH-0309	TOLEDO SUPPLIER PARK- PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	5/3/2007	AIR SUPPLY MAKE UP UNITS (24)	19.9	20	MMBTU/H	Particulate matter, filterable (FPM10)		0.15	LB/H	0	0.66	T/YR	0	7.65
OH-0309	TOLEDO SUPPLIER PARK- PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	5/3/2007	AIR SUPPLY MAKE UP UNITS (24)	19.9	20	MMBTU/H	Particulate Matter (PM)		0.04	LB/H	0	0.18	T/YR	0	
OH-0309	TOLEDO SUPPLIER PARK- PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	5/3/2007	AIR SUPPLY MAKE UP UNITS (24)	19.9	20	MMBTU/H	Visible Emissions (VE)		5	% OPACITY	0	0		0	
OH-0309	TOLEDO SUPPLIER PARK- PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	5/3/2007	AIR SUPPLY MAKE UP UNITS	19.9	28.95	MMBTU/H	Particulate matter, filterable (FPM10)		0.22	LB/H	0	0.95	T/YR	0	7.75
OH-0309	TOLEDO SUPPLIER PARK- PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	5/3/2007	AIR SUPPLY MAKE UP UNITS	19.9	28.95	MMBTU/H	Particulate Matter (PM)		0.06	LB/H	0	0.24	T/YR	0	
OH-0309	TOLEDO SUPPLIER PARK- PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	5/3/2007	AIR SUPPLY MAKE UP UNITS	19.9	28.95	MMBTU/H	Visible Emissions (VE)		5	% OPACITY	0	0		0	
OH-0309	TOLEDO SUPPLIER PARK- PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	5/3/2007	AIR SUPPLY MAKE UP UNITS (6)	19.9	14	MMBTU/H	Particulate matter, filterable (FPM10)		0.11	LB/H	0	0.5	T/YR	0	8.01
OH-0309	TOLEDO SUPPLIER PARK- PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	5/3/2007	AIR SUPPLY MAKE UP UNITS (6)	19.9	14	MMBTU/H	Particulate Matter (PM)		0.03	LB/H	0	0.13	T/YR	0	
OH-0309	TOLEDO SUPPLIER PARK- PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	5/3/2007	AIR SUPPLY MAKE UP UNITS (6)	19.9	14	MMBTU/H	Visible Emissions (VE)		5	% OPACITY	0	0		0	
Body Shop - Table C.1.1.3																			
MS-0045	NISSAN NORTH AMERICA, INC.	NISSAN NORTH AMERICA, INC.	MS	1720-00073	3711	4/2/2001	BODY SHOP	41.002	500000	UNITS/YR	Particulate Matter (PM)	Electrostatic Precipitators with a control efficiency of 99%	99	% REDUCTION	99	0		0	
OH-0277	DAIMLER CHRYSLER CORPORATION BODY SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01357	3711	8/31/2004	BODY SHOP FINISH WELDING OPERATIONS	41.003	200064	JOBS/ROLLING 12-MO	Particulate matter, filterable (FPM10)		2.05	LB/H	0	2.5	T/ROLLING 12-MO	0	
OH-0277	DAIMLER CHRYSLER CORPORATION BODY SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01357	3711	8/31/2004	BODY SHOP FINISH WELDING OPERATIONS	41.003	200064	JOBS/ROLLING 12-MO	Visible Emissions (VE)		5	% OPACITY	0	0		0	
TX-0439	TOYOTA MOTOR MANUFACTURING TEXAS	TOYOTA MOTOR MANUFACTURING TEXAS INC	TX	P1036	3711	12/17/2003	STAMPING SHOP/BODY SHOP	41.003			Particulate matter, filterable (FPM10)		14.8	T/YR	0	0		0	

Table C.1.2 - RBLC Search Results - Motor Vehicle and Passenger Car Bodies - VOC

RBLCID	FACILITY NAME	COMPANY NAME	FACILITY STATE	PERMIT NUMBER	SIC CODE	PERMIT ISSUANCE DATE	PROCESS NAME	PROCCESS TYPE	THROUGHPUT	THROUGHPUT UNIT	CONTROL METHOD DESCRIPTION	EMISSION LIMIT 1	EMISSION LIMIT 1 UNIT	PERCENT EFFICIENCY	EMISSION LIMIT 2	EMISSION LIMIT 2 UNIT	COST EFFECTIVE NESS	LIMIT (lb/MMscf)
Boilers - Table C.1.2.1																		
OH-0277	DAIMLER CHRYSLER CORPORATION BODY SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01357	3711	8/31/2004	HOT WATER BOILER, W/ NATURAL GAS, 2 UNITS	13.9	50	MMBTU/H		0.27	LB/H	0	0.63	T/ROLLING 12-MO	0	5.51
OH-0279	DAIMLER CHRYSLER CORPORATION ASSEMBLY PLANT	DAIMLER CHRYSLER CORPORATION	OH	04-01359	3711	9/2/2004	HOT WATER BOILER, W/ NATURAL GAS, 2 UNITS	13.9	50	MMBTU/H		0.27	LB/H	0	0.74	T/ROLLING 12-MO	0	5.51
OH-0280	DAIMLER CHRYSLER CORPORATION PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	9/2/2004	HOT WATER BOILER, W/ NATURAL GAS, 2 UNITS	13.9	50	MMBTU/H		0.27	LB/H	0	2.36	T/ROLLING 12-MO	0	5.51
OH-0309	TOLEDO SUPPLIER PARK-PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	5/3/2007	BOILER (2), NATURAL GAS	13.31	20.4	MMBTU/H		0.11	LB/H	0	0.5	T/YR	0	5.50
OH-0277	DAIMLER CHRYSLER CORPORATION BODY SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01357	3711	8/31/2004	HOT WATER BOILER, W/ NATURAL GAS, 2 UNITS	13.9	50	MMBTU/H		0.27	LB/H	0	0.63	T/ROLLING 12-MO	0	5.51
OH-0279	DAIMLER CHRYSLER CORPORATION ASSEMBLY PLANT	DAIMLER CHRYSLER CORPORATION	OH	04-01359	3711	9/2/2004	HOT WATER BOILER, W/ NATURAL GAS, 2 UNITS	13.9	50	MMBTU/H		0.27	LB/H	0	0.74	T/ROLLING 12-MO	0	5.51
OH-0309	TOLEDO SUPPLIER PARK-PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	5/3/2007	BOILER (2), NATURAL GAS	13.31	20.4	MMBTU/H		0.11	LB/H	0	0.5	T/YR	0	5.50
OH-0280	DAIMLER CHRYSLER CORPORATION PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	9/2/2004	HOT WATER BOILER, W/ NATURAL GAS, 2 UNITS	13.9	50	MMBTU/H		0.27	LB/H	0	2.36	T/ROLLING 12-MO	0	5.51
Air Make-up Units - Table C.1.2.2																		
OH-0277	DAIMLER CHRYSLER CORPORATION BODY SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01357	3711	8/31/2004	AIR SUPPLY MAKE UP UNITS (40 UNITS) AND BODY WASHERS (2 UNITS)	19.9	90	MMBTU/H		0.49	LB/H	0	0.63	T/ROLLING 12-MO	0	5.55
IN-0149	SUBARU OF INDIANA AUTOTMOTIVE, INC.	SUBARU OF INDIANA AUTOMOTIVE, INC.	IN	157-31885-00050	3711	10/4/2012	BODY SHOP AIR HANDLING UNIT	41.002	1.73	MMBTU/H		0.0055	LB/MMBTU	0	0		0	5.56
OH-0280	DAIMLER CHRYSLER CORPORATION PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	9/2/2004	AIR SUPPLY MAKEUP UNITS (30 UNITS)	19.9	20	MMBTU/H		0.11	LB/H	0	2.36	T/ROLLING 12-MO	0	5.61
OH-0280	DAIMLER CHRYSLER CORPORATION PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	9/2/2004	AIR SUPPLY MAKE UP UNITS (17 UNITS)	19.9	10	MMBTU/H		0.3	LB/H	0	2.36	T/ROLLING 12-MO	0	30.60
OH-0309	TOLEDO SUPPLIER PARK-PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	5/3/2007	AIR SUPPLY MAKE UP UNITS (24)	19.9	20	MMBTU/H		0.11	LB/H	0	0.49	T/YR	0	5.61
OH-0309	TOLEDO SUPPLIER PARK-PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	5/3/2007	AIR SUPPLY MAKE UP UNITS	19.9	28.95	MMBTU/H		0.16	LB/H	0	0.68	T/YR	0	5.64
OH-0309	TOLEDO SUPPLIER PARK-PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	5/3/2007	AIR SUPPLY MAKE UP UNITS (6)	19.9	14	MMBTU/H		0.08	LB/H	0	0.35	T/YR	0	5.83
OH-0277	DAIMLER CHRYSLER CORPORATION BODY SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01357	3711	8/31/2004	AIR SUPPLY MAKE UP UNITS (40 UNITS) AND BODY WASHERS (2 UNITS)	19.9	90	MMBTU/H		0.49	LB/H	0	0.63	T/ROLLING 12-MO	0	5.55
OH-0279	DAIMLER CHRYSLER CORPORATION ASSEMBLY PLANT	DAIMLER CHRYSLER CORPORATION	OH	04-01359	3711	9/2/2004	AIR SUPPLY MAKE UP UNITS	19.9	95	MMBTU/H		0.52	LB/H	0	0.74	T/ROLLING 12-MO	0	5.58

Table C.1.2 - RBLC Search Results - Motor Vehicle and Passenger Car Bodies - VOC

RBLCID	FACILITY NAME	COMPANY NAME	FACILITY STATE	PERMIT NUMBER	SIC CODE	PERMIT ISSUANCE DATE	PROCESS NAME	PROCCESS TYPE	THROUGHPUT	THROUGHPUT UNIT	CONTROL METHOD DESCRIPTION	EMISSION LIMIT 1	EMISSION LIMIT 1 UNIT	PERCENT EFFICIENCY	EMISSION LIMIT 2	EMISSION LIMIT 2 UNIT	COST EFFECTIVE NESS	LIMIT (lb/MMscf)
OH-0280	DAIMLER CHRYSLER CORPORATION PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	9/2/2004	AIR SUPPLY MAKE UP UNITS (17 UNITS)	19.9	10	MMBTU/H		0.3	LB/H	0	2.36	T/ROLLING 12-MO	0	30.60
OH-0280	DAIMLER CHRYSLER CORPORATION PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	9/2/2004	AIR SUPPLY MAKEUP UNITS (30 UNITS)	19.9	20	MMBTU/H		0.11	LB/H	0	2.36	T/ROLLING 12-MO	0	5.61
OH-0309	TOLEDO SUPPLIER PARK-PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	5/3/2007	AIR SUPPLY MAKE UP UNITS (24)	19.9	20	MMBTU/H		0.11	LB/H	0	0.49	T/YR	0	5.61
OH-0309	TOLEDO SUPPLIER PARK-PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	5/3/2007	AIR SUPPLY MAKE UP UNITS	19.9	28.95	MMBTU/H		0.16	LB/H	0	0.68	T/YR	0	5.64
OH-0309	TOLEDO SUPPLIER PARK-PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	5/3/2007	AIR SUPPLY MAKE UP UNITS (6)	19.9	14	MMBTU/H		0.08	LB/H	0	0.35	T/YR	0	5.83
IN-0149	SUBARU OF INDIANA AUTOTMOTIVE, INC.	SUBARU OF INDIANA AUTOMOTIVE, INC.	IN	157-31885-00050	3711	10/4/2012	BODY SHOP AIR HANDLING UNIT	41.002	1.73	MMBTU/H		0.0055	LB/MMBTU	0	0		0	5.56

Table C.2.1 - Cost Analysis Assumptions

Number of Years	10
Interest Rate	7%
CRF [1]	0.142

[1] Based on 10 year equipment lifetime. Interest rate conservatively set at 7.00%, based on EPA's seven percent social interest rate from the OAQPS CCM Sixth Edition.

Table C.2.2 - Chemical Engineering Plant Cost Index

Year	CEPCI [1]
2002	395.6
2014	576.1
Cost Escalation Factor	1.46

[1] Available at http://www.scribd.com/doc/277921333/CEPCI-2015#scribd.

Table C.2.3 - Oxidation Catalyst Costs [1]

Oxidation Catalyst Costs	EPA $/scfm (2002 Basis)	EPA $/scfm (2014 Basis)
Capital Cost	35.00	50.97
O&M Cost	6.00	8.74

[1] Based on EPA Air Pollution Control Technology Fact Sheet for Regenerative Incinerator (EPA-452/F-03-021). Capital costs range from $35 to $140 per cfm and O&M costs range from $6 to $20 per cfm. Minimum costs for regnerative incinerators are assumed to be representative of oxidation catalyst.

Table C.2.4 - Cost Effectiveness Calculations

A Equipment	Heat Input Capacity (MMBtu/hr)	B Potential VOC Emissions (tpy)	C Control Efficiency (%)	D Potential VOC Reduced (tpy)	E Stack Flow (scfm) [1]	H Capital Cost ($)	I O&M Cost ($)	J Annualized Cost ($)	K Cost Effectiveness ($/ton) [2]
Boiler 1 (B01)	14.27	0.23	40	0.09	2,072	105,584.58	18,100.21	33,133.08	357,666.62
Boiler 2 (B02)	14.27	0.23	40	0.09	2,072	105,584.58	18,100.21	33,133.08	357,666.62
ASU Primer/BC/CC	6.49	0.11	40	0.04	942	48,019.90	8,231.98	15,068.94	357,666.62
ASU 2.1 Shop + Open WD	10.00	0.16	40	0.06	1,452	73,990.60	12,684.10	23,218.70	357,666.62
ASU 3 - UBP + Repair	7.44	0.12	40	0.05	1,080	55,049.01	9,436.97	17,274.71	357,666.62
ASU 2.2 Shop + Open WD	10.00	0.16	40	0.06	1,452	73,990.60	12,684.10	23,218.70	357,666.62
ASU 1 - Spot Repair	4.82	0.08	40	0.03	700	35,663.47	6,113.74	11,191.41	357,666.62
ASU 2.3 Shop	10.00	0.16	40	0.06	1,452	73,990.60	12,684.10	23,218.70	357,666.62
ASU 4 - Wax	4.84	0.08	40	0.03	703	35,811.45	6,139.11	11,237.85	357,666.62
Workdecks ASU 6 (Phase 2)	8.54	0.14	40	0.06	1,240	63,187.97	10,832.22	19,828.77	357,666.62
Workdecks ASU 5 (Phase 2)	5.83	0.09	40	0.04	846	43,136.52	7,394.83	13,536.50	357,666.62
ASU Cleanroom (Phase 2)	1.26	0.02	40	0.01	183	9,322.82	1,598.20	2,925.56	357,666.62
Primer Booth Air Supply Unit Phase 3	7.57	0.12	40	0.05	1,099	56,010.88	9,601.87	17,576.56	357,666.62
BC Booth Air Supply Unit Phase 3	7.68	0.12	40	0.05	1,115	56,824.78	9,741.39	17,831.96	357,666.62
Workdecks Air Supply Unit 1 Phase 3	4.96	0.08	40	0.03	720	36,699.34	6,291.31	11,516.47	357,666.62
Workdecks Air Supply Unit 2 Phase 3	2.56	0.04	40	0.02	372	18,941.59	3,247.13	5,943.99	357,666.62
Workdecks Air Supply Unit 3 Phase 3	8.05	0.13	40	0.05	1,169	59,562.43	10,210.70	18,691.05	357,666.62
Shop Ventilation Air Supply Unit Phase 3	3.07	0.05	40	0.02	446	22,715.11	3,894.02	7,128.14	357,666.62
Social Rooms Air Supply Unit Phase 3	1.53	0.02	40	0.01	222	11,320.56	1,940.67	3,552.46	357,666.62
Assembly - Rooftop Unit 1	0.80	0.01	40	0.01	116	5,919.25	1,014.73	1,857.50	357,666.62
Assembly - Rooftop Unit 4	0.80	0.01	40	0.01	116	5,919.25	1,014.73	1,857.50	357,666.62
Assembly - Rooftop Unit 6	0.80	0.01	40	0.01	116	5,919.25	1,014.73	1,857.50	357,666.62
Assembly - Rooftop Unit 8	0.80	0.01	40	0.01	116	5,919.25	1,014.73	1,857.50	357,666.62
Assembly - Rooftop Unit 10	0.80	0.01	40	0.01	116	5,919.25	1,014.73	1,857.50	357,666.62
Assembly - Rooftop Unit 11	0.80	0.01	40	0.01	116	5,919.25	1,014.73	1,857.50	357,666.62
Assembly - Rooftop Unit 13	0.80	0.01	40	0.01	116	5,919.25	1,014.73	1,857.50	357,666.62
Body Shop - Rooftop Unit 1	0.80	0.01	40	0.01	116	5,919.25	1,014.73	1,857.50	357,666.62
Body Shop - Rooftop Unit 2	0.80	0.01	40	0.01	116	5,919.25	1,014.73	1,857.50	357,666.62
Body Shop - Rooftop Unit 4	0.80	0.01	40	0.01	116	5,919.25	1,014.73	1,857.50	357,666.62
Body Shop - Rooftop Unit 5	0.80	0.01	40	0.01	116	5,919.25	1,014.73	1,857.50	357,666.62
Body Shop - Rooftop Unit 6	0.80	0.01	40	0.01	116	5,919.25	1,014.73	1,857.50	357,666.62
Body Shop - Rooftop Unit 7	0.80	0.01	40	0.01	116	5,919.25	1,014.73	1,857.50	357,666.62
Body Shop - Rooftop Unit 10	0.80	0.01	40	0.01	116	5,919.25	1,014.73	1,857.50	357,666.62
Body Shop - Rooftop Unit 17	0.80	0.01	40	0.01	116	5,919.25	1,014.73	1,857.50	357,666.62
Body Shop - Rooftop Unit 18	0.80	0.01	40	0.01	116	5,919.25	1,014.73	1,857.50	357,666.62
Body Shop - Rooftop Unit 23	0.80	0.01	40	0.01	116	5,919.25	1,014.73	1,857.50	357,666.62
Body Shop - Rooftop Unit 25	0.80	0.01	40	0.01	116	5,919.25	1,014.73	1,857.50	357,666.62
Body Shop - Rooftop Unit 26	0.80	0.01	40	0.01	116	5,919.25	1,014.73	1,857.50	357,666.62
Body Shop - Rooftop Unit 30	0.80	0.01	40	0.01	116	5,919.25	1,014.73	1,857.50	357,666.62
Body Shop - Rooftop Unit 32	0.80	0.01	40	0.01	116	5,919.25	1,014.73	1,857.50	357,666.62
Body Shop - Rooftop Unit 33	0.80	0.01	40	0.01	116	5,919.25	1,014.73	1,857.50	357,666.62
Body Shop - Rooftop Unit 35	0.80	0.01	40	0.01	116	5,919.25	1,014.73	1,857.50	357,666.62
Calculation				= B x C%				=(H x CRF) + I	=J/D

[1] Stack flows (scfm) were estimated using EPA Method 19 factor of 8,710 dscf/MMBtu.

[2] Exhaust temperatures were estimated by Mercedes-Benz Vans.

[3] Cost effectiveness values for paint shop combustion sources differ from values for all other combustion sources due to a difference in annual hours of operation and the impact on annual emissions.

APPENDIX D: EQUIPMENT BY PHASE

Installed Equipment By Phase

Unit ID	Equipment Description	Equipment ID	Phase 1	Phase 2	Phase 3
1	**Paint Shop Boiler**				
	Boiler 01	B01	X	X	X
	Boiler 02	B02	X	X	X
2	**Process Combustion Sources**				
	RTO #1	RTO1	X		
	RTO #1 (add)	RTO1		X	X
	ADW Desorption Heater #1	ADH01	X	X	X
	ADW Desorption Heater #2	ADH02			X
	E-Coat Oven Burners	OV01	X	X	X
	Primer (Guidecoat) Oven #1 Burners	OV02	X	X	X
	Topcoat Oven #1 Burners	OV03	X	X	X
	Primer (Guidecoat) Oven #2 Burners	OV22			X
	Topcoat Oven #2 Burners	OV23			X
	Assembly Oven Burners	OV04	X	X	X
3	**Paint Shop E-coat Operations**				
	E-coat Dip Tank	ED01	X	X	X
	E-coat Oven	EO01	X	X	X
4	**Paint Shop Guidecoat Operations**				
	Guidecoat Booth 1	GC01	X	X	X
	Guidecoat Oven #1	GO01	X	X	X
	Guidecoat Booth 2	GC21			X
	Guidecoat Oven #2	GO21			X
5	**Paint Shop Sealers and Adhesives Application**				
	Sound Deadener Adhesive (SAM) Area 1	SAM01	X	X	X
	Sound Deadener Adhesive (SAM) Area 2	SAM21			X
	Underbody (UB) PVC Sealer Deck 1	UBS01	X	X	X
	Underbody (UB) PVC Sealer Deck 2	UBS21			X
	Seam Sealing 1	SS01	X	X	X
	Seam Sealer Deck 2	SS21			X
	Sika Sealing 1	SKS01	X	X	X
	Sika Sealing 2	SKS21			X
	Paint Shop Adhesive Application	PSA	X	X	X
6	**Paint Shop Topcoat Operations**				
	Basecoat/Clearcoat Booth 1	BC01	X	X	X
	Clearcoat Booth 1	CC01		X	X
	Topcoat Oven #1	TO01	X	X	X
	Basecoat/Clearcoat Booth 2	BC21			X
	Topcoat Oven #2	TO21			X
	Spot Repair Booth 1	SR01	X	X	X
	Spot Repair Booth 2	SR02		X	X
	Spot Repair Booth 3	SR03			X
	Assembly Repair Booth 1	AR01	X	X	X
	Cavity Wax Operations	CW	X	X	X
	Underbody Coating Booth #1	UBC01	X	X	X
	Underbody Coating Booth #2	UBC21			X
7	**Paint Shop Purge Solvent Operations**				
	Purge solvent	PS01	X	X	X
8	**Body Shop Adhesives Application**				
	Body shop adhesives application	BS02	X	X	X
9	**Assembly Windshield Glazing Operations**				
	Window glazing	AW	X	X	X
10	**Assembly UB Wax Application**				
	Assembly UB Wax Application	AUW	X	X	X
PC	**Paint Shop Phosphate Cleaning Operations**				
	Phosphate Cleaning	PC	X	X	X
BS	**Body Shop Welding Areas**				
	Welding, Soldering	BS01	X	X	X
PMR	**Paint Shop Mixing Operations**				
	Paint Mix Room	PMR	X	X	X
RB	**Assembly Roll and Brake Testing**				
	Roll and brake testing 1	RB1	X	X	X
	Roll and brake testing 2	RB2		X	X
	Roll and brake testing 3	RB3			X

Installed Equipment By Phase

Unit ID	Equipment Description	Equipment ID	Phase 1	Phase 2	Phase 3
FF	**Assembly Fluid Fill Operations**				
	Fluid fill	AFF	X	X	X
WST	**Assembly Windshield Washer System Testing**				
	Washer system testing	AWT	X	X	X
WD	**Sand, Touch-up & Polish Operations**	WD			
	E-coat Sand & Spot Repair		X	X	X
	Primer Sand		X	X	X
	Metal/Body Repair		X	X	X
	E-coat Touch-up		X	X	X
	Primer Touch-up		X	X	X
	Basecoat Touch-up		X	X	X
	Inspect/Polish		X	X	X
ASU	**Air Supply Units**				
	ASU Primer/BC/CC	ASU P/BC/CC	X	X	X
	ASU 2.1 Shop + Open WD	ASU 2.1	X	X	X
	ASU 3 - UBP + Repair	ASU 3	X	X	X
	ASU 2.2 Shop + Open WD	ASU 2.2	X	X	X
	ASU 1 - Spot Repair	ASU 1	X	X	X
	ASU 2.3 Shop	ASU 2.3	X	X	X
	ASU 4 - Wax	ASU 4	X	X	X
	Workdecks ASU 6 (Phase 2)	ASU 6		X	X
	Workdecks ASU 5 (Phase 2)	ASU 5		X	X
	ASU Cleanroom (Phase 2)	ASU CR2		X	X
	Primer Booth Air Supply Unit Phase 3	ASU31			X
	BC Booth Air Supply Unit Phase 3	ASU32			X
	Workdecks Air Supply Unit 1 Phase 3	ASU33			X
	Workdecks Air Supply Unit 2 Phase 3	ASU34			X
	Workdecks Air Supply Unit 3 Phase 3	ASU35			X
	Shop Ventilation Air Supply Unit Phase 3	ASU36			X
	Social Rooms Air Supply Unit Phase 3	ASU37			X
	Assembly - Rooftop Unit 1	AS-RTU01	X	X	X
	Assembly - Rooftop Unit 4	AS-RTU04	X	X	X
	Assembly - Rooftop Unit 6	AS-RTU06	X	X	X
	Assembly - Rooftop Unit 8	AS-RTU08	X	X	X
	Assembly - Rooftop Unit 10	AS-RTU10	X	X	X
	Assembly - Rooftop Unit 11	AS-RTU11	X	X	X
	Assembly - Rooftop Unit 13	AS-RTU13	X	X	X
	Body Shop - Rooftop Unit 1	BS-RTU01	X	X	X
	Body Shop - Rooftop Unit 7	BS-RTU07	X	X	X
	Body Shop - Rooftop Unit 10	BS-RTU10	X	X	X
	Body Shop - Rooftop Unit 17	BS-RTU17	X	X	X
	Body Shop - Rooftop Unit 18	BS-RTU18	X	X	X
	Body Shop - Rooftop Unit 23	BS-RTU23	X	X	X
	Body Shop - Rooftop Unit 25	BS-RTU25	X	X	X
	Body Shop - Rooftop Unit 26	BS-RTU26	X	X	X
	Body Shop - Rooftop Unit 30	BS-RTU30	X	X	X
	Body Shop - Rooftop Unit 32	BS-RTU32	X	X	X
	Body Shop - Rooftop Unit 33	BS-RTU33	X	X	X
	Body Shop - Rooftop Unit 35	BS-RTU35	X	X	X
EE	**Emergency Generators**				
	Diesel-fired emergency generator 01	EG01	X	X	X
	Diesel-fired emergency generator 02	EG02	X	X	X
	Diesel-fired emergency generator 03	EG03	X	X	X
	Diesel-fired emergency generator 04	EG04			X
	Diesel-fired emergency fire pump 01	FP-01	X	X	X
CT	**Cooling Tower**				
	Cooling Tower 1	CT01	X	X	X
	Cooling Tower 2	CT02	X	X	X
	Cooling Tower 3	CT03	X	X	X
	Cooling Tower 4	CT04	X	X	X
	Cooling Tower 5	CT05	X	X	X
	Cooling Tower 6	CT06	X	X	X
	Cooling Tower 7	CT07	X	X	X
TK	**Storage Tanks**				
	Gasoline tank	TK01	X	X	X
	Diesel tank	TK02	X	X	X
	Diesel tank	TK03	X	X	X
RD	**Roads**				
	Paved Roads	RD	X	X	X

APPENDIX E: ELECTRONIC APPLICATION AND SUPPORTING DOCUMENTATION

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MERCEDES-BENZ VANS, LLC

Charleston Plant Expansion Revisions
Ladson, South Carolina

Construction and Operating Permit Application Addendum

April 2018

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BUREAU OF AIR QUALITY

Mercedes-Benz

Mercedes-Benz Vans, LLC

April 10, 2018

Steve McCaslin, P.E.
South Carolina DHEC
Bureau of Air Quality
2600 Bull Street
Columbia, SC 29201

RE: Mercedes-Benz Vans, LLC – Ladson, SC
PSD Permit Revision Application - Addendum

Dear Mr. McCaslin:

Mercedes-Benz Vans, LLC (Mercedes-Benz Vans) owns and operates a van assembly plant in Ladson, Charleston County, South Carolina (the Charleston plant). Mercedes-Benz Vans submitted a Prevention of Significant Deterioration (PSD) construction and operating permit application in October 2015 and later submitted a revised application in February 2016 for the expansion of existing assembly processes and addition of new processes, including a body shop, paint shop, and energy center. Construction Permit No. 0560-0385-CA was issued on April 15, 2016 for the initial permit application. Construction Permit No. 0560-0385-CA-R1 was issued on July 21, 2017 to include design changes and additional operations that will be needed at the Charleston plant that were not included in the previous permit application. Construction Permit No. 0560-0385-CA-R2 was issued on January 26, 2018 to include changes to the E-coat operations. Mercedes-Benz Vans submitted a PSD permit revision application in February 2018 to request changes to Construction Permit No. 0560-0385-CA-R2. Mercedes-Benz Vans is submitting this letter addendum to the February 2018 application to request additional changes to Construction Permit No. 0560-0385-CA-R2, including:

- Updating the NO_X emission factors for natural gas-fired combustion units based on vendor data;
- Correcting the heat input capacity of the existing assembly oven burners from (Equipment ID OV04) from 1.36 to 4.3 MMBtu/hr;
- Updating the VOC Best Available Control Technology (BACT) emission limit for E-coat spot repair operations; and
- Requesting an exemption from SC Standard No. 5.2 for Boilers B01 and B02.

The following sections of this permit application addendum includes all required elements to revise the PSD permit, including updated project emission calculations, Best Available Control Technology (BACT) analyses, and regulatory applicability reviews. Updated facility-wide emissions are provided in Appendix A, updated BACT cost analyses for E-coat spot repair operations are presenting in Appendix B, revised DHEC permit application forms have been provided in Appendix C, and additional supporting documentation has been provided in Appendix D.

1.1. UPDATE NO_X EMISSION FACTORS FOR NATURAL GAS-FIRED UNITS

With this addendum, facility-wide potential emissions for natural gas-fired combustion units have been updated based on oxides of nitrogen (NO_X) emissions data from combustion unit vendors. Based on the revised emission factors, the average combustion unit utilization (hours of operation per year) has been decreased to keep emissions less than the established greenhouse gas (CO_2e) and NO_X synthetic minor emission limits. Mercedes-Benz Vans is not requesting utilization limits for individual emission units.

Total emissions of other regulated pollutants from combustion units are slightly lower due to changes in the NO_X emission factors. There is no increase in short term emissions or annual emissions from combustion units, and the emission factor updates have not resulted in an increase of emissions of other pollutants. Therefore, no updated modeling demonstration is needed due to this change in emission factors.

Updated facility-wide emissions have been provided in Appendix A to this submittal.

1.2. UPDATE HEAT INPUT CAPACITY FOR THE ASSEMBLY OVEN BURNERS (EQUIPMENT ID OV04)

Construction Permit No. 0560-0385-CA-R2 includes natural gas-fired assembly oven burners. Mercedes-Benz Vans requests that the heat input capacity be updated from 1.36 to 4.3 MMBtu/hr. The assembly oven is an existing unit and has not been modified as part of this project. However, the heat input capacity in the original application was incorrect and requires revision. The increase in heat input capacity results in a 0.02 lb/hr increase in short term potential PM emissions. This increase is expected to have a negligible impact on the National Ambient Air Quality Standards (NAAQS) and increment modeling, as the emission increase is less than 1% of the facility-wide PM emissions. No long-term increase in PM emissions is expected since annual emissions are restricted by PSD avoidance limits.

Updated facility-wide emissions have been provided in Appendix A to this submittal. Updated equipment forms have been provided in Appendix C to this submittal.

1.3. UPDATE VOC BACT FOR E-COAT SPOT REPAIR

Construction Permit No. 0560-0385-CA-R2 includes a monthly average limit of 4.25 lb VOC/gal of material applied (VOC BACT) for E-coat spot repair operations. With this application, Mercedes-Benz Vans is proposing to revise the VOC BACT limit to allow flexibility of spot repair materials and to be consistent with the BACT limit established for other spot repair booths at the Charleston plant. Based on material currently selected for use at the Charleston plant and the spot repair booth VOC limits, Mercedes-Benz Vans is proposing to revise the BACT emission limit to 6.0 lb VOC/gal.

Mercedes-Benz Vans has revised the BACT analysis for the E-coat spot repair operations at the facility for PSD-regulated pollutants exceeding the major source threshold applicable to the spot repair (VOC only). There is no change to the PM emissions from the spot repair operations due to this change, therefore a revised BACT analysis for $PM/PM_{10}/PM_{2.5}$ is not included in this submittal.

The BACT analysis follows the "top-down" approach suggested by U.S. EPA. The top-down process begins by ranking all potentially relevant control technologies in descending order of control effectiveness. The most stringent or "top" control option is BACT unless the applicant demonstrates, and the permitting authority in its informed opinion agrees, that energy, environmental, and/or economic impacts justify the conclusion that the most stringent control option does not meet the definition of BACT. Where the top option is not determined to be BACT, the next most stringent alternative is evaluated in the same manner. This process continues until BACT is determined.

Based on the BACT review, Mercedes-Benz Vans proposes that the BACT limit for E-coat spot repair operations during periods of normal operation be revised as presented in Table 1.

Table 1. Proposed BACT Emission Limits Summary

Unit ID	Unit Description	$PM/PM_{10}/PM_{2.5}$ BACT Limit	Units	Avg. Period	VOC BACT Limit	Units	Avg. Period
WD	E-Coat Spot Repair Operations	N/A	N/A	N/A	6.0	lb/gal	Monthly

As required in Regulation 61-62.5, Standard No. 7, Section (aa)(11)(c), Mercedes-Benz Vans is including a revised BACT analysis for the proposed E-coat spot repair operations. This following sections provide a revised VOC "top-down" BACT analyses for the E-coat spot repair operations.

1.3.1. Identification of Potential Control Techniques (Step 1)

Candidate control options identified from the RBLC search, permit review, and the literature review include the following VOC reduction options:

- Coating materials
  - Powder coating material
  - Low VOC coating material
  - Waterborne coating material

- Coating application methods
  - High volume electrostatic
  - Low volume electrostatic
  - High volume low pressure (HVLP)
  - Low volume low pressure (LVLP)

- Add-on controls
  - RTO with or without ADW

1.3.2. Elimination of Technically Infeasible Control Options (Step 2)

Coating materials

As discussed in the original permit application for the facility, powder coatings are not technically feasible for the primer application process and traditional coatings will be used. Since there will be no curing between the E-coat spot repair operation and the primer application booth, it is not technically feasible to utilize powder coating for the E-coat spot repair operation and traditional coating materials in the primer booth and achieve the quality finish needed for the vehicles. Therefore, powder coatings are eliminated from consideration.

Coating application methods
Since repairs will occur in various areas of the vehicles, and it is not technically feasible to use ESTA technology for repairs in certain areas, Mercedes-Benz Vans does not consider ESTA technology technically feasible for the E-coat spot repair booth. Robotic application is also not technically feasible for the repair booth since the location of the repairs will be impossible to predict.

Add-on controls
The use of add-on controls such as an RTO or RCO is technically feasible, although it would not likely achieve any measurable reduction in VOC emissions due to the very low concentration of VOC emissions from the exhaust stream.

1.3.3. Rank of Remaining Control Technologies (Step 3)

Table 2. VOC Control Technologies (Spot Repair Operations**)**

Rank	Control Technology	Potential Control Efficiency of Captured VOC (%)
1	RTO/RCO with or without ADW	90-95
2	Aerosol Coating	Varies
2	HVLP Coating	Varies
2	Low-VOC materials	Varies

1.3.4. Evaluation of Most Stringent Controls (Step 4)

Because spot repairs are required for such small surface areas of the coated vehicle bodies, the spot repair operations use very little coating material. As such, emissions from spot repair operations are very low. Due to the very low concentration of VOC emissions from the exhaust stream, add-on VOC controls are not economically feasible. Mercedes-Benz Vans has completed annualized cost analyses of the operating costs associated with routing the emissions from the repair booths to the RTO. The cost analyses provided in Appendix B show that the annual natural gas and electricity operating costs for E-coat spot repair is approximately $477,577 per ton of VOC removed.

Because spot repairs are required for such small surface areas of the coated vehicle bodies, both aerosol (spray cans) and HVLP coating are appropriate coating technologies with minimal VOC emissions. Mercedes-Benz Vans will utilize low-VOC materials if possible.

The remaining control technologies (aerosol coating, HVLP coating, and low VOC materials) will be utilized to reduce VOC emissions to the extent possible.

1.3.5. Selection of BACT (Step 5)

As discussed in Step 4, Mercedes-Benz Vans will utilize aerosol coating, HVLP spraying technology and low VOC materials when possible to meet BACT requirements for the paint repair operations. Due to the very small quantities of materials used in these operations on an hourly basis, evaluating compliance with an emission limit with a short-term averaging period is very difficult. Therefore, Mercedes-Benz Vans is proposing a VOC content limit of 6.00 lb VOC/gal material on a monthly average basis. The proposed emission limit is included in Table 1.

Mercedes-Benz Vans conducted a review of the RBLC database and found no entries for E-coat spot repair operations. Based on the low emissions from the E-coat spot repair operations, add-on controls are economically infeasible. The proposed limit is based on the maximum coating VOC content included in the revised potential emission calculations.

1.4. STANDARD NO. 5.2 – BOILER EXEMPTION REQUEST

Mercedes-Benz Vans operates two (2) natural gas-fired boilers at the Charleston plant, B01 and B02. B01 and B02 each have a maximum heat input capacity of 14.27 MMBtu/hr and are each equipped with low NO_X burners and oxygen (O_2) trim systems. South Carolina Regulation 61-62.5 Standard No. 5.2 - Control of Oxides of Nitrogen (NO_X) applies to stationary sources that emit or have the potential to emit NO_X generated from fuel combustion. However, Section I(B)(16) of Standard 5.2 states that the Department can consider exemptions from this regulation on a case-by-case basis. Mercedes-Benz Vans requests that B01 and B02 be granted a case-by-case exemption from Standard 5.2 based on the information provided below.

Boilers B01 and B02 are equipped with low NO_X burners. Low NO_X burners limit NO_X formation by controlling both the stoichiometric and temperature profiles of the combustion process. This control is achieved with design features that regulate the aerodynamic distribution and mixing of the fuel and air, yielding reduced O_2 in the primary combustion zone, reduced flame temperature and reduced residence time at peak combustion temperatures. The combination of these techniques produces lower NO_X emissions during the combustion process. A review of the technical literature and the RBLC database indicates that low NO_X burners are one of the most commonly applied technologies for the control of NO_X from natural gas-fired boilers. There are no other available control technologies that are applied to boilers in this size range as part of a BACT determination. Therefore, low NO_X burners are considered BACT for small boilers.

Boilers B01 and B02 are also equipped with O_2 trim systems. O_2 trim systems are designed to continuously measure and maintain an optimum air-to-fuel ratio in the boiler combustion zone. Boilers B01 and B02 are also subject to the requirements of 40 CFR 63 Subpart DDDDD (Boiler MACT). Pursuant to §63.7540(a)(12), Mercedes-Benz Vans is required to conduct tune-ups once every 5 years for boilers with continuous O_2 trim systems. The oxygen level on the O_2 trim systems must be set no lower than the oxygen concentration measured during the most recent tune-up. The frequency of tune-ups is limited to once every 5 years because continuous O_2 trim systems are designed to maintain an optimum air-to-fuel ratio thereby reducing excess air and minimizing NO_X formation and fuel usage. Pursuant to the definition of "oxygen analyzer system" (which includes O_2 trim systems") in §63.7575, Mercedes-Benz Vans is required to install, calibrate, maintain, and operate the O_2 trim systems in accordance with the manufacturer's recommendations. Standard No. 5.2 does not contain any monitoring or testing requirements for natural gas-fired units rated less than 30 MMBtu/hr, therefore, the monitoring and work practice requirements contained in the Boiler MACT are equivalent or greater than the monitoring and work practice requirements contained in Standard No. 5.2.

As noted above, the low NO_X burners installed on boilers B01 and B02 meet BACT requirements for small boilers by lowering NO_X emissions during the combustion process. Boilers B01 and B02 are each equipped with O_2 trim systems that optimize the air-to-fuel ratio on a continuous basis in accordance with the provisions in the Boiler MACT. The monitoring and work practice requirements contained in the Boiler

MACT are equivalent or greater than the monitoring and work practice requirements contained in Standard No. 5.2. Therefore, Mercedes-Benz Vans requests that B01 and B02 be granted a case-by-case exemption from Standard 5.2.

****

If you have any questions or comments about the information presented in this submittal, please contact Jae Park of Mercedes-Benz Vans at (843) 695-5095 or Tony Jabon of Trinity Consultants at (704) 553-7747.

Sincerely,

MERCEDES-BENZ VANS, LLC.

Michael Balke
President/CEO

cc: Jae Park – Mercedes Benz Vans, LLC
Russell Revell – Mercedes-Benz Vans, LLC
Nicole Saniti, P.E. – Trinity Consultants, Inc.
Tony Jabon, P.E. – Trinity Consultants, Inc.

Enclosures

APPENDIX A: UPDATED FACILITY-WIDE EMISSION CALCULATIONS

PSD Permit Application - Phase 3 Emission Calculations

Mercedes-Benz Vans, LLC
Charleston, South Carolina Facility

Facility-wide Potential Emissions

	Uncontrolled Emissions		Controlled Emissions	
Pollutants	lb/hr	tpy	lb/hr	tpy
PM	309.97	1,159.64	6.41	21.32
PM_{10}	308.31	1,152.43	4.74	14.11
$PM_{2.5}$	308.01	1,151.13	4.44	12.81
SO_2	1.79	0.73	1.79	0.73
CO	30.61	49.63	30.61	49.63
NO_X	34.33	39.90	34.33	39.90
VOC	809.14	2,949.80	274.74	955.36
Lead	9.83E-05	2.62E-04	9.83E-05	2.62E-04
CO_2e	24,530	63,367	24,530	63,367
CO_2	24,500	63,290	24,500	63,290
CH_4	0.57	1.59	0.57	1.59
N_2O	0.05	0.13	0.05	0.13

Facility-wide Potential HAP/TAP Emissions

	Total Emissions	
Pollutants	lb/hr	tpy
2-Methylnaphthalene	4.72E-06	1.26E-05
3-Methylchloranthrene	3.54E-07	9.42E-07
7,12-Dimethylbenz(a)anthracene	3.15E-06	8.37E-06
Acenaphthene	3.54E-07	9.42E-07
Acenaphthylene	3.54E-07	9.42E-07
Anthracene	4.72E-07	1.26E-06
Benz(a)anthracene	3.54E-07	9.42E-07
Benzene	5.29E-03	2.32E-03
Benzo(a)pyrene	2.36E-07	6.28E-07
Benzo(b)fluoranthene	3.54E-07	9.42E-07
Benzo(g,h,i)perylene	2.36E-07	6.28E-07
Benzo(k)fluoranthene	3.54E-07	9.42E-07
Butylglycol Acetate	4.65E-01	1.74E+00
Chrysene	3.54E-07	9.42E-07
Isopropylbenzene (Cumene)	1.55E-01	5.80E-01
Dibenzo(a,h)anthracene	2.36E-07	6.28E-07
Dichlorobenzene	2.36E-04	6.28E-04
Ethyl Benzene	3.10E-01	1.16E+00
Fluoranthene	5.90E-07	1.57E-06
Fluorene	5.51E-07	1.47E-06
Formaldehyde	1.97E-02	5.95E-02
Hexane	3.54E-01	9.42E-01
Indeno(1,2,3-cd)pyrene	3.54E-07	9.42E-07
Naphthalene	7.91E-04	4.87E-04
Phenanathrene	3.34E-06	8.90E-06
Pyrene	9.83E-07	2.62E-06
Toluene	2.58E-03	2.26E-03
Arsenic	3.93E-05	1.05E-04
Beryllium	2.36E-06	6.28E-06
Cadmium	2.16E-04	5.76E-04
Chromium	2.75E-04	7.33E-04
Cobalt	1.65E-05	4.40E-05
Lead	9.83E-05	2.62E-04
Manganese	6.40E-04	2.31E-03
Mercury	5.11E-05	1.36E-04
Nickel	4.13E-04	1.10E-03
Selenium	4.72E-06	1.26E-05
Xylene	1.09E+00	4.06E+00
Acetaldehyde	2.54E-04	6.35E-05
Acrolein	2.20E-04	5.51E-05
Total PAH	1.15E-03	2.89E-04
Methyl Ethyl Ketone	3.09E+00	1.35E+01
Acrylic acid	3.48E-02	1.53E-01
Methanol	7.59E-01	3.32E+00
Ethylene Glycol	1.06E+00	4.62E+00
Total HAP [a]	94.90	358.00

[a] Includes total HAP from paint shop and purge solvent.

Facility-wide Potential Emissions and PSD Applicability

Pollutants	Project Emissions (tpy)	PSD Significant Emission Rates (tpy)	PSD Permitting Required? (Yes/No)
PM	21.32	25	No
PM_{10}	14.11	15	No
$PM_{2.5}$	12.81	10	**Yes**
SO_2	0.73	40	No
CO	49.63	100	No
NO_X	39.90	40	No
VOC	955.36	40	**Yes**
H_2SO_4	0.00E+00	7	No
Fluorides	0.00E+00	3	No
Lead	2.62E-04	0.6	No
CO_2e	63,367	75,000	No

[a] Mercedes-Benz Vans has chosen to request a 75,000 tpy synthetic minor limit on greenhouse gas emissions (CO_2e) to remain below the PSD significant emission rate.

Inputs

Phase	Paint Shop Operation (days/yr)	Assembly Operation (days/yr)	Paint Shop/Body Shop Throughput (units/hr)	Paint Shop/Body Shop Throughput (units/day)	Paint Shop/Body Shop Throughput (units/yr)	Assembly Throughput [a] (units/hr)	Assembly Throughput [a] (units/day)	Assembly Throughput [a] (units/yr)
Phase 3	312	365	17	400	124,800	19	450	164,250

[a] Assembly throughput includes existing re-assembly throughput as well as proposed expansion throughput.

Daily Operation
24 hours/day

Combustion Average Utilization [b] Percent	Hours of Operation
53.5%	4,684

[b] Average combustion unit utilization for boiler, air supply units, and assembly oven is based on calculated utilization needed to remain below the proposed 75,000 tpy synthetic minor limit on greenhouse gas emissions (CO_2e). Paint shop RTO, ovens, and ADW desorb heater utilization is based on paint shop hours of operation. Mercedes-Benz Vans is not requesting utilization limits for individual emission units.

Hours of Operation [e] 4,684 hrs

Boiler Information

Equipment	Heat Input Capacity MMBtu/hr
Boiler 1 (B01)	14.27
Boiler 2 (B02)	14.27

Boiler Natural Gas Emission Factors

Pollutant		Emission Factor [a,b,c] lb/MMBtu
PM [d]		0.0074
SO_2		0.0006
CO		0.0819
NO_X		0.0360
VOC		0.0054
CO_2e		
	CO_2	117.00
	CH_4	2.21E-03
	N_2O	2.21E-04

[a] Emission factors are from AP-42, Table 1.4-1 and 1.4-2 for small boilers with low NO_X burners. NO_X emission factor is from SC Standard No. 5.2, Section III, Table 1.
[b] Emission factors calculated using the default natural gas heating value of 1,026 Btu/scf from 40 CFR 98.
[c] Emission factors from 40 CFR 98, Subpart C, Tables C-1 and C-2. Factors were converted to lb/MMBtu.
[d] PM_{10} and $PM_{2.5}$ are assumed to be equal to PM for natural gas combustion.

Boilers Non-HAP Potential Emissions

Pollutant		Emission Rates [e]					
		B01		B02		Total	
		lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
$PM/PM_{10}/PM_{2.5}$		0.11	0.25	0.11	0.25	0.21	0.50
SO_2		0.01	0.02	0.01	0.02	0.02	0.04
CO		1.17	2.74	1.17	2.74	2.34	5.47
NO_X		0.51	1.20	0.51	1.20	1.03	2.41
VOC		0.08	0.18	0.08	0.18	0.15	0.36
CO_2e		1,671	3,914	1,671	3,914	3,343	7,828
	CO_2	1,670	3,910	1670	3,910	3,339	7,819
	CH_4	0.03	0.07	0.03	0.07	0.06	0.15
	N_2O	0.003	0.01	0.00	0.01	0.01	0.01

[e] Annual emissions are based on calculated hours of operation needed to remain below the proposed 75,000 tpy synthetic minor limit on greenhouse gas emissions (CO_2e). Mercedes-Benz Vans is not requesting limits on hours of operation for individual emission units.

Appendix B.3.2 - Boilers

Mercedes-Benz Vans, LLC

Boilers HAP/TAP Potential Emissions

Pollutant	Emission Factor [a] lb/MMscf	Boilers Total lb/hr	Boilers Total tpy
2-Methylnaphthalene	2.4E-05	6.7E-07	1.6E-06
3-Methylchloranthrene	1.8E-06	5.0E-08	1.2E-07
7,12-Dimethylbenz(a)anthracene	1.6E-05	4.5E-07	1.0E-06
Acenaphthene	1.8E-06	5.0E-08	1.2E-07
Acenaphthylene	1.8E-06	5.0E-08	1.2E-07
Anthracene	2.4E-06	6.7E-08	1.6E-07
Benz(a)anthracene	1.8E-06	5.0E-08	1.2E-07
Benzene	2.1E-03	5.8E-05	1.4E-04
Benzo(a)pyrene	1.2E-06	3.3E-08	7.8E-08
Benzo(b)fluoranthene	1.8E-06	5.0E-08	1.2E-07
Benzo(g,h,i)perylene	1.2E-06	3.3E-08	7.8E-08
Benzo(k)fluoranthene	1.8E-06	5.0E-08	1.2E-07
Chrysene	1.8E-06	5.0E-08	1.2E-07
Dibenzo(a,h)anthracene	1.2E-06	3.3E-08	7.8E-08
Dichlorobenzene	1.2E-03	3.3E-05	7.8E-05
Fluoranthene	3.0E-06	8.3E-08	2.0E-07
Fluorene	2.8E-06	7.8E-08	1.8E-07
Formaldehyde	7.5E-02	2.1E-03	4.9E-03
Hexane	1.8E+00	5.0E-02	1.2E-01
Indeno(1,2,3-cd)pyrene	1.8E-06	5.0E-08	1.2E-07
Naphthalene	6.1E-04	1.7E-05	4.0E-05
Phenanathrene	1.7E-05	4.7E-07	1.1E-06
Pyrene	5.0E-06	1.4E-07	3.3E-07
Toluene	3.4E-03	9.5E-05	2.2E-04
Arsenic	2.0E-04	5.6E-06	1.3E-05
Beryllium	1.2E-05	3.3E-07	7.8E-07
Cadmium	1.1E-03	3.1E-05	7.2E-05
Chromium	1.4E-03	3.9E-05	9.1E-05
Cobalt	8.4E-05	2.3E-06	5.5E-06
Lead	5.0E-04	1.4E-05	3.3E-05
Manganese	3.8E-04	1.1E-05	2.5E-05
Mercury	2.6E-04	7.2E-06	1.7E-05
Nickel	2.1E-03	5.8E-05	1.4E-04
Selenium	2.4E-05	6.7E-07	1.6E-06

[a] Emission factors are from AP-42, Table 1.4-2, 1.4-3, and 1.4-4.

Air Supply and Rooftop Units - Natural Gas Emission Factors

Hours of Operation [g] 4,684 hrs

Pollutant		NG Emission Factors [a,b,e] (lb/MMBtu)
$PM/PM_{10}/PM_{2.5}$		0.0074
SO_2		0.0006
ASU-Durr (low-NO_X) [c]		0.0073
Other ASU (NO_X) [c]		0.0971
RTU-NO_X [d]		0.0110
CO		0.0819
VOC		0.0054
CO_2e [f]		
	CO_2	117.00
	CH_4	2.21E-03
	N_2O	2.21E-04

[a] PM, SO_2, and VOC natural gas emission factors are from AP-42, Table 1.4-2, 07/98.
[b] CO natural gas emission factor is from AP-42, Table 1.4-1, 07/98, Small Boilers.
[c] The ASU-Durr Low NO_X emission factor (for units routed to Dry X) is based on vendor-specific data stating a maximum NO_X concentration of 6 ppm. The Other ASU (NO_X) emission factor is based on vendor-specific data stating a maximum NO_X concentration of 80 ppm.
[d] RTU Burners meet the Low NO_X requirements of California Air Resources Board (CARB) Rule 1146.1, Table 1146.1-1, Units Fired on Natural Gas.
[e] The heating value of natural gas is assumed to be 1,026 Btu/scf.
[f] Emission factors from 40 CFR 98, Subpart C, Tables C-1 and C-2. Factors were converted to lb/MMBtu.

Air Supply Units Non-HAP Emissions

			Emission Rates [g]																	
		Rated Capacity	$PM/PM_{10}/PM_{2.5}$		SO_2		NO_X		CO		VOC		CO_2		CH_4		N_2O		CO_2e	
Description	Equipment	(MMBtu/hr)	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
ASU Primer/BC/CC	ASU P/BC/CC	6.49	Routed to Dry X. See Dry X PM Emissions Table.		0.004	0.009	0.05	0.11	0.53	1.24	0.03	0.08	759.31	1,778	0.014	0.034	0.001	0.003	760.10	1,780
ASU 2.1 Shop + Open WD	ASU 2.1	10.00	0.07	0.17	0.006	0.014	0.97	2.27	0.82	1.92	0.05	0.13	1,169.97	2,740	0.022	0.052	0.002	0.005	1,171.18	2,743
ASU 3 - UBP + Repair	ASU 3	7.44	0.06	0.13	0.004	0.010	0.72	1.69	0.61	1.43	0.04	0.09	870.46	2,038	0.016	0.038	0.002	0.004	871.36	2,041
ASU 2.2 Shop + Open WD	ASU 2.2	10.00	0.07	0.17	0.006	0.014	0.97	2.27	0.82	1.92	0.05	0.13	1,169.97	2,740	0.022	0.052	0.002	0.005	1,171.18	2,743
ASU 1 - Spot Repair	ASU 1	4.82	0.04	0.08	0.003	0.007	0.47	1.10	0.39	0.92	0.03	0.06	563.93	1,321	0.011	0.025	0.001	0.002	564.51	1,322
ASU 2.3 Shop	ASU 2.3	10.00	0.07	0.17	0.006	0.014	0.97	2.27	0.82	1.92	0.05	0.13	1,169.97	2,740	0.022	0.052	0.0022	0.005	1,171.18	2,743
ASU 4 - Wax	ASU 4	4.84	0.04	0.08	0.003	0.007	0.47	1.10	0.40	0.93	0.03	0.06	566.27	1,326	0.011	0.025	0.001	0.002	566.85	1,327
Workdecks ASU 6 (Phase 2)	ASU 6	8.54	0.06	0.15	0.005	0.012	0.83	1.94	0.70	1.64	0.05	0.11	999.16	2,340	0.019	0.044	0.002	0.004	1,000.19	2,342
Workdecks ASU 5 (Phase 2)	ASU 5	5.83	0.04	0.10	0.003	0.008	0.57	1.33	0.48	1.12	0.03	0.07	682.09	1,597	0.013	0.030	0.0013	0.003	682.80	1,599
ASU Cleanroom (Phase 2)	ASU CR2	1.26	0.01	0.02	0.001	0.002	0.12	0.29	0.10	0.24	0.01	0.02	147.42	345	0.003	0.007	0.000	0.001	147.57	346
Primer Booth Air Supply Unit (Phase 3)	ASU31	7.57	Routed to Dry X. See Dry X PM Emissions Table.		0.004	0.010	0.06	0.13	0.62	1.45	0.04	0.10	885.67	2,074	0.017	0.039	0.002	0.004	886.58	2,076
BC Booth Air Supply Unit (Phase 3)	ASU32	7.68			0.004	0.011	0.06	0.13	0.63	1.47	0.04	0.10	898.54	2,104	0.017	0.040	0.002	0.004	899.47	2,106
Workdecks Air Supply Unit 1 Phase 3	ASU33	4.96	0.04	0.09	0.003	0.007	0.48	1.13	0.41	0.95	0.03	0.06	580.31	1,359	0.011	0.026	0.001	0.003	580.91	1,360
Workdecks Air Supply Unit 2 Phase 3	ASU34	2.56	0.02	0.04	0.001	0.004	0.25	0.58	0.21	0.49	0.01	0.03	299.51	701	0.006	0.013	0.001	0.001	299.82	702
Workdecks Air Supply Unit 3 Phase 3	ASU35	8.05	0.06	0.14	0.005	0.011	0.78	1.83	0.66	1.54	0.04	0.10	941.83	2,206	0.018	0.042	0.002	0.004	942.80	2,208
Shop Ventilation Air Supply Unit Phase 3	ASU36	3.07	0.02	0.05	0.002	0.004	0.30	0.70	0.25	0.59	0.02	0.04	359.18	841	0.007	0.016	0.001	0.002	359.55	842
Social Rooms Air Supply Unit Phase 3	ASU37	1.53	0.01	0.03	0.001	0.002	0.15	0.35	0.13	0.29	0.01	0.02	179.01	419	0.003	0.008	0.000	0.001	179.19	420
ASU Total		**104.64**	**0.61**	**1.44**	**0.06**	**0.14**	**8.21**	**19.23**	**8.57**	**20.06**	**0.56**	**1.31**	**12,243**	**28,670**	**0.23**	**0.54**	**0.02**	**0.05**	**12,255**	**28,699**

[g] Annual emissions are based on calculated hours of operation needed to remain below the proposed 75,000 tpy synthetic minor limit on greenhouse gas emissions (CO_2e). Mercedes-Benz Vans is not requesting limits on hours of operation for individual emission units.

Rooftop Units Non-HAP Emissions

		Rated	Emission Rates [g]																	
		Capacity	$PM/PM_{10}/PM_{2.5}$		SO_2		NO_X		CO		VOC		CO_2		CH_4		N_2O		CO_2e	
Description	Equipment	(MMBtu/hr)	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
Assembly - Rooftop Unit 1	AS-RTU01	0.80	5.93E-03	1.39E-02	4.68E-04	1.10E-03	8.80E-03	2.06E-02	6.55E-02	1.53E-01	4.29E-03	1.00E-02	93.60	219	1.76E-03	4.13E-03	1.76E-04	4.13E-04	93.69	219
Assembly - Rooftop Unit 4	AS-RTU04	0.80	5.93E-03	1.39E-02	4.68E-04	1.10E-03	8.80E-03	2.06E-02	6.55E-02	1.53E-01	4.29E-03	1.00E-02	93.60	219	1.76E-03	4.13E-03	1.76E-04	4.13E-04	93.69	219
Assembly - Rooftop Unit 6	AS-RTU06	0.80	5.93E-03	1.39E-02	4.68E-04	1.10E-03	8.80E-03	2.06E-02	6.55E-02	1.53E-01	4.29E-03	1.00E-02	93.60	219	1.76E-03	4.13E-03	1.76E-04	4.13E-04	93.69	219
Assembly - Rooftop Unit 8	AS-RTU08	0.80	5.93E-03	1.39E-02	4.68E-04	1.10E-03	8.80E-03	2.06E-02	6.55E-02	1.53E-01	4.29E-03	1.00E-02	93.60	219	1.76E-03	4.13E-03	1.76E-04	4.13E-04	93.69	219
Assembly - Rooftop Unit 10	AS-RTU10	0.80	5.93E-03	1.39E-02	4.68E-04	1.10E-03	8.80E-03	2.06E-02	6.55E-02	1.53E-01	4.29E-03	1.00E-02	93.60	219	1.76E-03	4.13E-03	1.76E-04	4.13E-04	93.69	219
Assembly - Rooftop Unit 11	AS-RTU11	0.80	5.93E-03	1.39E-02	4.68E-04	1.10E-03	8.80E-03	2.06E-02	6.55E-02	1.53E-01	4.29E-03	1.00E-02	93.60	219	1.76E-03	4.13E-03	1.76E-04	4.13E-04	93.69	219
Assembly - Rooftop Unit 13	AS-RTU13	0.80	5.93E-03	1.39E-02	4.68E-04	1.10E-03	8.80E-03	2.06E-02	6.55E-02	1.53E-01	4.29E-03	1.00E-02	93.60	219	1.76E-03	4.13E-03	1.76E-04	4.13E-04	93.69	219
Body Shop - Rooftop Unit 1	BS-RTU01	0.80	5.93E-03	1.39E-02	4.68E-04	1.10E-03	8.80E-03	2.06E-02	6.55E-02	1.53E-01	4.29E-03	1.00E-02	93.60	219	1.76E-03	4.13E-03	1.76E-04	4.13E-04	93.69	219
Body Shop - Rooftop Unit 2	BS-RTU02	0.80	5.93E-03	1.39E-02	4.68E-04	1.10E-03	8.80E-03	2.06E-02	6.55E-02	1.53E-01	4.29E-03	1.00E-02	93.60	219	1.76E-03	4.13E-03	1.76E-04	4.13E-04	93.69	219
Body Shop - Rooftop Unit 4	BS-RTU04	0.80	5.93E-03	1.39E-02	4.68E-04	1.10E-03	8.80E-03	2.06E-02	6.55E-02	1.53E-01	4.29E-03	1.00E-02	93.60	219	1.76E-03	4.13E-03	1.76E-04	4.13E-04	93.69	219
Body Shop - Rooftop Unit 5	BS-RTU05	0.80	5.93E-03	1.39E-02	4.68E-04	1.10E-03	8.80E-03	2.06E-02	6.55E-02	1.53E-01	4.29E-03	1.00E-02	93.60	219	1.76E-03	4.13E-03	1.76E-04	4.13E-04	93.69	219
Body Shop - Rooftop Unit 6	BS-RTU06	0.80	5.93E-03	1.39E-02	4.68E-04	1.10E-03	8.80E-03	2.06E-02	6.55E-02	1.53E-01	4.29E-03	1.00E-02	93.60	219	1.76E-03	4.13E-03	1.76E-04	4.13E-04	93.69	219
Body Shop - Rooftop Unit 7	BS-RTU07	0.80	5.93E-03	1.39E-02	4.68E-04	1.10E-03	8.80E-03	2.06E-02	6.55E-02	1.53E-01	4.29E-03	1.00E-02	93.60	219	1.76E-03	4.13E-03	1.76E-04	4.13E-04	93.69	219
Body Shop - Rooftop Unit 10	BS-RTU10	0.80	5.93E-03	1.39E-02	4.68E-04	1.10E-03	8.80E-03	2.06E-02	6.55E-02	1.53E-01	4.29E-03	1.00E-02	93.60	219	1.76E-03	4.13E-03	1.76E-04	4.13E-04	93.69	219
Body Shop - Rooftop Unit 17	BS-RTU17	0.80	5.93E-03	1.39E-02	4.68E-04	1.10E-03	8.80E-03	2.06E-02	6.55E-02	1.53E-01	4.29E-03	1.00E-02	93.60	219	1.76E-03	4.13E-03	1.76E-04	4.13E-04	93.69	219
Body Shop - Rooftop Unit 18	BS-RTU18	0.80	5.93E-03	1.39E-02	4.68E-04	1.10E-03	8.80E-03	2.06E-02	6.55E-02	1.53E-01	4.29E-03	1.00E-02	93.60	219	1.76E-03	4.13E-03	1.76E-04	4.13E-04	93.69	219
Body Shop - Rooftop Unit 23	BS-RTU23	0.80	5.93E-03	1.39E-02	4.68E-04	1.10E-03	8.80E-03	2.06E-02	6.55E-02	1.53E-01	4.29E-03	1.00E-02	93.60	219	1.76E-03	4.13E-03	1.76E-04	4.13E-04	93.69	219
Body Shop - Rooftop Unit 25	BS-RTU25	0.80	5.93E-03	1.39E-02	4.68E-04	1.10E-03	8.80E-03	2.06E-02	6.55E-02	1.53E-01	4.29E-03	1.00E-02	93.60	219	1.76E-03	4.13E-03	1.76E-04	4.13E-04	93.69	219
Body Shop - Rooftop Unit 26	BS-RTU26	0.80	5.93E-03	1.39E-02	4.68E-04	1.10E-03	8.80E-03	2.06E-02	6.55E-02	1.53E-01	4.29E-03	1.00E-02	93.60	219	1.76E-03	4.13E-03	1.76E-04	4.13E-04	93.69	219
Body Shop - Rooftop Unit 30	BS-RTU30	0.80	5.93E-03	1.39E-02	4.68E-04	1.10E-03	8.80E-03	2.06E-02	6.55E-02	1.53E-01	4.29E-03	1.00E-02	93.60	219	1.76E-03	4.13E-03	1.76E-04	4.13E-04	93.69	219
Body Shop - Rooftop Unit 32	BS-RTU32	0.80	5.93E-03	1.39E-02	4.68E-04	1.10E-03	8.80E-03	2.06E-02	6.55E-02	1.53E-01	4.29E-03	1.00E-02	93.60	219	1.76E-03	4.13E-03	1.76E-04	4.13E-04	93.69	219
Body Shop - Rooftop Unit 33	BS-RTU33	0.80	5.93E-03	1.39E-02	4.68E-04	1.10E-03	8.80E-03	2.06E-02	6.55E-02	1.53E-01	4.29E-03	1.00E-02	93.60	219	1.76E-03	4.13E-03	1.76E-04	4.13E-04	93.69	219
Body Shop - Rooftop Unit 35	BS-RTU35	0.80	5.93E-03	1.39E-02	4.68E-04	1.10E-03	8.80E-03	2.06E-02	6.55E-02	1.53E-01	4.29E-03	1.00E-02	93.60	219	1.76E-03	4.13E-03	1.76E-04	4.13E-04	93.69	219
RTU Total		18.40	1.36E-01	3.19E-01	1.08E-02	2.52E-02	2.02E-01	4.74E-01	1.51E+00	3.53E+00	9.86E-02	2.31E-01	2,152.75	5,041	4.06E-02	9.50E-02	4.06E-03	9.50E-03	2,154.97	5,046
ASU + RTU Total		**123.04**	**7.50E-01**	**1.76**	**7.20E-02**	**1.68E-01**	**8.41E+00**	**1.97E+01**	**1.01E+01**	**2.36E+01**	**6.60E-01**	**1.54**	**14,395**	**33,711**	**2.71E-01**	**6.35E-01**	**2.71E-02**	**6.35E-02**	**14,410**	**33,746**

[g] Annual emissions are based on calculated hours of operation needed to remain below the proposed 75,000 tpy synthetic minor limit on greenhouse gas emissions (CO_2e). Mercedes-Benz Vans is not requesting limits on hours of operation for individual emission units.

Hours of Operation [a]	4,684	hrs
Total Rated Capacity	123.04	MMBtu/hr

Air Supply and Rooftop Units HAP/TAP Emissions

Pollutants	NG Emission Factor [b] lb/10^6 scf	HAP/TAP	
		lb/hr	tpy
2-Methylnaphthalene	2.40E-05	2.88E-06	6.74E-06
3-Methylchloranthrene	1.80E-06	2.16E-07	5.05E-07
7,12-Dimethylbenz(a)anthracene	1.60E-05	1.92E-06	4.49E-06
Acenaphthene	1.80E-06	2.16E-07	5.05E-07
Acenaphthylene	1.80E-06	2.16E-07	5.05E-07
Anthracene	2.40E-06	2.88E-07	6.74E-07
Benz(a)anthracene	1.80E-06	2.16E-07	5.05E-07
Benzene	2.10E-03	2.52E-04	5.90E-04
Benzo(a)pyrene	1.20E-06	1.44E-07	3.37E-07
Benzo(b)fluoranthene	1.80E-06	2.16E-07	5.05E-07
Benzo(g,h,i)perylene	1.20E-06	1.44E-07	3.37E-07
Benzo(k)fluoranthene	1.80E-06	2.16E-07	5.05E-07
Chrysene	1.80E-06	2.16E-07	5.05E-07
Dibenzo(a,h)anthracene	1.20E-06	1.44E-07	3.37E-07
Dichlorobenzene	1.20E-03	1.44E-04	3.37E-04
Fluoranthene	3.00E-06	3.60E-07	8.42E-07
Fluorene	2.80E-06	3.36E-07	7.86E-07
Formaldehyde	7.50E-02	8.99E-03	2.11E-02
Hexane	1.80E+00	2.16E-01	5.05E-01
Indeno(1,2,3-cd)pyrene	1.80E-06	2.16E-07	5.05E-07
Naphthalene	6.10E-04	7.32E-05	1.71E-04
Phenanathrene	1.70E-05	2.04E-06	4.77E-06
Pyrene	5.00E-06	6.00E-07	1.40E-06
Toluene	3.40E-03	4.08E-04	9.55E-04
Arsenic	2.00E-04	2.40E-05	5.62E-05
Beryllium	1.20E-05	1.44E-06	3.37E-06
Cadmium	1.10E-03	1.32E-04	3.09E-04
Chromium	1.40E-03	1.68E-04	3.93E-04
Cobalt	8.40E-05	1.01E-05	2.36E-05
Lead	5.00E-04	6.00E-05	1.40E-04
Manganese	3.80E-04	4.56E-05	1.07E-04
Mercury	2.60E-04	3.12E-05	7.30E-05
Nickel	2.10E-03	2.52E-04	5.90E-04
Selenium	2.40E-05	2.88E-06	6.74E-06

[a] Annual emissions are based on calculated hours of operation needed to remain below the proposed 75,000 tpy synthetic minor limit on greenhouse gas emissions (CO_2e). Mercedes-Benz Vans is not requesting limits on hours of operation for individual emission units.

[b] Natural Gas Emission Factors are from AP-42 Section 1.4, Tables 1.4-2, 1.4-3, and 1.4-4.

Paint Shop Combustion - Natural Gas Emission Factors

Hours of Operation [e] 7,488 hrs

Pollutant		NG Emission Factors [a,b,c] (lb/MMBtu)
$PM/PM_{10}/PM_{2.5}$		0.0074
SO_2		0.0006
NO_X (low-NO_X)		0.0487
NO_X		0.0975
CO		0.0819
VOC		0.0054
CO_2e [d]		
	CO_2	117.00
	CH_4	2.21E-03
	N_2O	2.21E-04

[a] PM, SO_2, and VOC natural gas emission factors are from AP-42, Table 1.4-2, 07/98.
[b] NO_X and CO natural gas emission factors are from AP-42, Table 1.4-1, 07/98.
[c] The heating value of natural gas is assumed to be 1,026 Btu/scf.
[d] Emission factors from 40 CFR 98, Subpart C, Tables C-1 and C-2. Factors were converted to lb/MMBtu.

Paint Shop Combustion Non-HAP Emissions

Description	Equipment	Rated Capacity (MMBtu/hr)	Emission Rates [e]																	
			$PM/PM_{10}/PM_{2.5}$		SO_2		NO_X		CO		VOC		CO_2		CH_4		N_2O		CO_2e	
			lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
RTO #1 [f]	RTO1	8.00	0.06	0.22	0.005	0.018	0.78	2.92	0.65	2.45	0.04	0.16	935.98	3,504	0.018	0.066	0.002	0.007	936.95	3,508
RTO #1 (add) [f,g]	RTO1	8.00	0.06	0.22	0.005	0.018	0.78	2.92	0.65	2.45	0.04	0.16	935.98	3,504	0.018	0.066	0.002	0.007	936.95	3,508
ADW Desorption Heater #1	ADH1	3.50	0.03	0.10	0.002	0.008	0.17	0.64	0.29	1.07	0.02	0.07	409.49	1,533	0.008	0.029	0.001	0.003	409.91	1,535
ADW Desorption Heater #2	ADH2	2.13	0.02	0.06	0.001	0.005	0.10	0.39	0.17	0.65	0.01	0.04	249.20	933	0.005	0.018	0.000	0.002	249.46	934
E-Coat Oven	OV01	4.85	0.04	0.13	0.003	0.011	0.24	0.88	0.40	1.49	0.03	0.10	567.44	2,124	0.011	0.040	0.001	0.004	568.02	2,127
Primer (Guidecoat) Oven #1	OV02	4.30	0.03	0.12	0.003	0.009	0.21	0.78	0.35	1.32	0.02	0.09	503.09	1,884	0.009	0.035	0.001	0.004	503.61	1,886
Topcoat Oven #1	OV03	4.27	0.03	0.12	0.002	0.009	0.21	0.78	0.35	1.31	0.02	0.09	499.58	1,870	0.009	0.035	0.001	0.004	500.09	1,872
Primer (Guidecoat) Oven #2	OV22	5.12	0.04	0.14	0.003	0.011	0.25	0.93	0.42	1.57	0.03	0.10	599.03	2,243	0.011	0.042	0.001	0.004	599.64	2,245
Topcoat Oven #2	OV23	5.73	0.04	0.16	0.003	0.013	0.28	1.05	0.47	1.76	0.03	0.12	670.39	2,510	0.013	0.047	0.001	0.005	671.09	2,513
Total		**45.90**	**0.34**	**1.27**	**0.03**	**0.10**	**3.02**	**11.29**	**3.76**	**14.07**	**0.25**	**0.92**	**5,370.18**	**20,106**	**0.10**	**0.38**	**0.01**	**0.04**	**5,375.72**	**20,127**

[e] Annual emissions are based on paint shop hours of operation.
[f] NO_X emissions for RTOs calculated using the natural gas emission factors from AP-42, Table 1.4-1, 07/98, Small Boilers (uncontrolled). NO_X emissions from the remaining combustion units are calculated using the AP-42, Table 1.4-1 factor for small boilers (controlled - Low NOx burners).
[g] Phase II or III RTO will replace Phase I RTO (RTO #1 @ 8 MMBtu/hr), with a new unit that has 8 MMBtu/hr additional heat input, for a total of 16 MMBtu/hr. Emissions include combustion emissions from both RTO #1 and RTO #1 (add).

Hours of Operation [a]	7,488	hrs
Total Rated Capacity	45.90	MMBtu/hr

Paint Shop Combustion HAP/TAP Emissions

Pollutants	NG Emission Factor [b]	HAP/TAP	
	$lb/10^6$ scf	lb/hr	tpy
2-Methylnaphthalene	2.40E-05	1.07E-06	4.02E-06
3-Methylchloranthrene	1.80E-06	8.05E-08	3.01E-07
7,12-Dimethylbenz(a)anthracene	1.60E-05	7.16E-07	2.68E-06
Acenaphthene	1.80E-06	8.05E-08	3.01E-07
Acenaphthylene	1.80E-06	8.05E-08	3.01E-07
Anthracene	2.40E-06	1.07E-07	4.02E-07
Benz(a)anthracene	1.80E-06	8.05E-08	3.01E-07
Benzene	2.10E-03	9.39E-05	3.52E-04
Benzo(a)pyrene	1.20E-06	5.37E-08	2.01E-07
Benzo(b)fluoranthene	1.80E-06	8.05E-08	3.01E-07
Benzo(g,h,i)perylene	1.20E-06	5.37E-08	2.01E-07
Benzo(k)fluoranthene	1.80E-06	8.05E-08	3.01E-07
Chrysene	1.80E-06	8.05E-08	3.01E-07
Dibenzo(a,h)anthracene	1.20E-06	5.37E-08	2.01E-07
Dichlorobenzene	1.20E-03	5.37E-05	2.01E-04
Fluoranthene	3.00E-06	1.34E-07	5.02E-07
Fluorene	2.80E-06	1.25E-07	4.69E-07
Formaldehyde	7.50E-02	3.36E-03	1.26E-02
Hexane	1.80E+00	8.05E-02	3.01E-01
Indeno(1,2,3-cd)pyrene	1.80E-06	8.05E-08	3.01E-07
Naphthalene	6.10E-04	2.73E-05	1.02E-04
Phenanathrene	1.70E-05	7.61E-07	2.85E-06
Pyrene	5.00E-06	2.24E-07	8.37E-07
Toluene	3.40E-03	1.52E-04	5.69E-04
Arsenic	2.00E-04	8.95E-06	3.35E-05
Beryllium	1.20E-05	5.37E-07	2.01E-06
Cadmium	1.10E-03	4.92E-05	1.84E-04
Chromium	1.40E-03	6.26E-05	2.34E-04
Cobalt	8.40E-05	3.76E-06	1.41E-05
Lead	5.00E-04	2.24E-05	8.37E-05
Manganese	3.80E-04	1.70E-05	6.36E-05
Mercury	2.60E-04	1.16E-05	4.35E-05
Nickel	2.10E-03	9.39E-05	3.52E-04
Selenium	2.40E-05	1.07E-06	4.02E-06

[a] Annual emissions are based on paint shop hours of operation.

[b] Natural Gas Emission Factors are from AP-42 Section 1.4, Tables 1.4-2, 1.4-3, and 1.4-4.

Appendix B.3.4 - Paint Shop
Mercedes-Benz Vans, LLC

Coating Throughput Information

	# of Units	Notes
Paint Shop Bodies per Year	**124,800**	Based on maximum daily throughput and days of operation per year
Major Repair Equivalent Bodies per Year	**12,480**	Major repair area assumed to be equivalent to 10% of the total vehicle throughput.
Total Paint Shop Equivalent Bodies per Year	**137,280**	Based on total of maximum daily throughput and major repair area throughput.
Total Parts per Year	**3,744**	Parts painted area assumed to be equivalent to 3% of the total vehicle throughput.
Assembly Bodies per Year	**164,250**	Based on maximum daily throughput and days of operation per year
Operating Hours per year	**7,488**	Based on facility operating 24 hours/day and days of operation per year.

Coating Emission Calculations

Process	Parts		Bodies	Material Data		VOC										PM/PM$_{10}$/PM$_{2.5}$							lb/GACS	
								Capture & Control			Emissions													
	Application Rate	Split	Application Rate	Coating Density	Coating Usage	VOC In		Dip Tank Split	Oven Split	RTO Eff.	Emissions from Dip Tank	Emissions from Oven	Controlled VOC Emissions			Volume Solids	Transfer Eff.	Uncontrolled PM Emissions		Control Eff.	Controlled PM Emissions		GACS per year	lbs VOC/ GACS
	A_1		A_2	B	C [a]	D	E=C x D	F	G	H	I [b]	J [c]	K [d]	L = I + J	M	N	O	P [d]	Q	R	S [d]	T [e]	U [f]	V [g]
	gal/unit		gal/unit	lb/gal	gal/yr	lb/gal	tpy	%	%	%	lb/yr	lb/yr	lb/hr	lb/yr	tpy	%	%	lb/hr	tpy	%	lb/hr	tpy		
E-Coat (Emulsion) [h]	2.910		2.910	8.84	410,380	0.1051	21.56	20%	80%	95%	8,622	1,724	1.38	10,346	5.17	32.1%	100%	0.00	0.00	0.0%	0.00	0.00	131,732	
E-Coat (Pigment Paste) [h]	0.780		0.780	10.59	109,999	1.2686	69.77	20%	80%	95%	27,910	5,582	4.47	33,491	16.75	31.13%	100%	0.00	0.00	0.0%	0.00	0.00	34,243	
E-Coat Total							**91.33**				**36,532**	**7,306**	**5.85**	**43,838**	**21.92**			**0.00**	**0.00**		**0.00**	**0.00**	**165,975**	**0.26**
HVLP Robots Interior [i]	0.00	40%	0.73	11.684	100,093	4.24	212.25	90%	10%	95%	129,220	1,698	17.48	130,918	65.46	50.9%	60%	41.74	156.28	See Dry X PM Emissions Table			30,568	
Manual Cut-Ins & Underhood [i]	0.00	20%	0.36	11.684	50,047	4.24	106.13	90%	10%	95%	64,610	849	8.74	65,459	32.73	50.9%	40%	31.31	117.21				10,189	
ESTA Robot Exterior [i]	1.82	40%	0.73	11.684	106,918	4.24	226.73	90%	10%	95%	138,031	1,814	18.68	139,844	69.92	50.9%	75%	27.87	104.34				40,816	
Primer-Surfacer Totals	**1.82**		**1.82**				**545.11**				**331,861**	**4,361**	**44.90**	**336,222**	**168.11**			**100.92**	**377.84**		**0.13**	**0.58**	**81,574**	**4.12**
UB-PVC	0.00		4.33	8.304	594,101	0.00	0.00	100%	0.0%	0.0%	0.0	0.0	0.00	0.0	0.00	100%	95%	32.94	123.33	98.5%	0.49	1.85	564,396	0.00
Seam Sealer	0.00		0.64	10.68	87,831	0.00	0.00	100%	0.0%	0.0%	0.0	0.0	0.00	0.0	0.00	100%	100%	0.00	0.00	0.0%	0.00	0.00	87,831	0.00
Sika Sealing	0.00		0.04	10.85	5,300	0.29	0.77	100%	0.0%	0.0%	1,541	0.0	0.21	1,541	0.77	97%	100%	0.00	0.00	0.0%	0.00	0.00	5,158	0.30
(SAM) Sound Deadener Adhesive	0.00		0.961	13.77	131,875	0.14	9.08	100%	0.0%	0.0%	18,159	0.0	2.43	18,159	9.08	99%	100%	0.00	0.00	0.0%	0.00	0.00	130,556	0.14
Sealers and Adhesives Totals	**5.97**		**5.97**				**9.85**				**19,700**	**0**	**2.63**	**19,700**	**9.85**			**32.94**	**123.33**		**0.49**	**1.85**	**787,941**	**0.03**
						Total	**646.29**						**53.39**	**399,760**	**199.88**			**133.86**	**501.17**		**0.63**	**2.43**	**1,035,489**	

Coating Throughput Information

	# of Units	Notes
Paint Shop Bodies per Year	124,800	Based on maximum daily throughput and days of operation per year
Major Repair Equivalent Bodies per Year	12,480	Major repair area assumed to be equivalent to 10% of the total vehicle throughput.
Total Paint Shop Equivalent Bodies per Year	137,280	Based on total of maximum daily throughput and major repair area throughput.
Total Parts per Year	3,744	Parts painted area assumed to be equivalent to 3% of the total vehicle throughput.
Assembly Bodies per Year	164,250	Based on maximum daily throughput and days of operation per year
Operating Hours per year	7,488	Based on facility operating 24 hours/day and days of operation per year.

Coating Emission Calculations

Process	Parts	Bodies		Material Data		VOC										PM/PM10/PM2.5							lb/GACS	
								Capture & Control			Emissions													
	Application Rate	Split	Application Rate	Coating Density	Coating Usage	VOC In		Booth Split	Oven Split	RTO Eff.	Emissions from Booth	Emissions from Oven	Controlled VOC Emissions			Volume Solids	Transfer Eff.	Uncontrolled PM Emissions		Control Eff.	Controlled PM Emissions		GACS per year	lbs VOC/ GACS
	A_1		A_2	B	C [a]	D	E=C x D	G	J	K	L [b]	M [c]	N [d]	O = L + M	P	R	S	T [d]	U [e]	V	W [d]	X [f]	Y [g]	Z [h]
	gal/unit		gal/unit	lb/gal	gal/yr	lb/gal	tpy	%	%	%	lb/yr	lb/yr	lb/hr	lb/yr	tpy	%	%	lb/hr	tpy	%	lb/hr	tpy		
HVLP Robots Interior [i]	0.00	40%	1.32		181,328	3.84	348.1	90%	10%	95%	211,901	2,785	28.67	214,686	107.34	43.7%	60%	61.65	230.80				47,544	
Manual Cut-Ins & Underhood [i]	0.00	20%	0.66		90,664	3.84	174.0	90%	10%	95%	105,951	1,392	14.34	107,343	53.67	43.7%	40%	46.23	173.10	See Dry X PM Emissions Table			15,848	
ESTA Robot Exterior [i]	3.30	40%	1.32		193,692	3.84	371.8	90%	10%	95%	226,349	2,974	30.63	229,323	114.66	43.7%	75%	41.16	154.09				63,482	
Topcoat (Monocoat) Totals	**3.30**		**3.30**	10.26	**465,684**		**893.9**				**544,201**	**7,151**	**73.63**	**551,352**	**275.68**			**149.04**	**557.99**				**126,875**	**4.35**
								Topcoat Scenario 1			**544,201**	**7,151**	**73.63**	**551,352**	**275.68**								**126,875**	**4.35**
HVLP Robots Interior [i]	0.00	40%	0.94		129,106	5.94	383.3	90%	10%	95%	233,345	3,066	31.57	236,412	118.21	26.4%	60%	20.87	78.14				20,450	
Manual Cut-Ins & Underhood [i]	0.00	20%	0.47		64,553	5.94	191.6	90%	10%	95%	116,673	1,533	15.79	118,206	59.10	26.4%	40%	15.65	58.60				6,817	
ESTA Robot Exterior [i]	2.35	40%	0.94		137,908	5.94	409.4	90%	10%	95%	249,255	3,275	33.72	252,531	126.27	26.4%	75%	13.93	52.16				27,306	
Basecoat Totals	**2.35**		**2.35**	8.18	**331,567**		**984.4**				**599,273**	**7,875**	**81.08**	**607,148**	**303.57**			**50.45**	**188.90**	See Dry X PM Emissions Table			**54,573**	
HVLP Robots Interior [i]	0.00	40%	1.26		173,495	4.13	358.4	90%	10%	95%	218,164	2,867	29.52	221,031	110.52	42.0%	60%	38.67	144.79				43,721	
Manual Cut-Ins & Underhood [i]	0.00	20%	0.63		86,747	4.13	179.2	90%	10%	95%	109,082	1,433	14.76	110,515	55.26	42.0%	40%	29.00	108.59				14,574	
ESTA Robot Exterior [i]	3.16	40%	1.26		185,324	4.13	382.8	90%	10%	95%	233,039	3,062	31.53	236,101	118.05	42.0%	75%	25.82	96.66				58,377	
Clearcoat Totals	**3.16**		**3.16**	8.35	**445,566**		**920.3**				**560,285**	**7,362**	**75.81**	**567,647**	**283.82**			**93.49**	**350.04**				**116,671**	
								Topcoat Scenario 2			**1,159,558**	**15,237**	**156.89**	**1,174,795**	**587.40**								**171,244**	**6.86**
(Maximum Scenario 1 or 2) Total							**1,904.66**						**156.89**	**1,174,795**	**587.40**			**149.04**	**557.99**		**0.27**	**1.19**	**171,244**	**6.86**
Spot Repair - Topcoat [j]	0.00		0.03	10.26	567	3.84	1.09	100%	0%	0.0%	2,175	0.00	0.29	2,175	1.09	43.7%	40%	0.29	1.08	98.5%	0.004	0.016	99.05	
Spot Repair - Basecoat [j]	0.00		0.02	8.18	403	5.94	1.20	100%	0%	0.0%	2,396	0.00	0.32	2,396	1.20	26.4%	40%	0.10	0.37	98.5%	0.001	0.005	42.60	
Spot Repair - Clearcoat [j]	0.00		0.03	8.35	542	4.13	1.12	100%	0%	0.0%	2,240	0.00	0.30	2,240	1.12	42.0%	40%	0.18	0.68	98.5%	0.003	0.010	91.08	
Worst Case Spot Repair [k]							**2.32**				**4,635**	**0.00**	**0.62**	**4,635**	**2.32**			**0.289**	**1.082**		**0.004**	**0.016**	**133.69**	
Assembly Spot Repair - Topcoat [j]	0.00		0.10	10.26	1,405	3.84	2.70	100%	0%	0.0%	5,395	0.00	0.72	5,395	2.70	43.7%	40%	0.72	2.68	98.5%	0.011	0.040	245.65	
Assembly Spot Repair - Basecoat [j]	0.00		0.07	8.18	1,001	5.94	2.97	100%	0%	0.0%	5,941	0.00	0.79	5,941	2.97	26.4%	40%	0.24	0.91	98.5%	0.004	0.014	105.66	
Assembly Spot Repair - Clearcoat [j]	0.00		0.10	8.35	1,345	4.13	2.78	100%	0%	0.0%	5,554	0.00	0.74	5,554	2.78	42.0%	40%	0.45	1.68	98.5%	0.007	0.025	225.89	
Worst Case Assembly Repair [k]							**5.75**				**11,495**	**0.00**	**1.54**	**11,495**	**5.75**			**0.717**	**2.683**		**0.011**	**0.040**	**331.55**	
Cavity Wax	0.00		0.72	9.83	98,515	1.67	82.32	100%	0%	0.0%	52,027	0.00	6.95	164,642	26.01	74.0%	96%	4.40	16.46	98.5%	0.066	0.247	69,985	
Worst Case Repair and Cavity Wax Totals							**90.39**				**68,158**	**0.00**	**9.10**	**180,773**	**34.08**			**5.40**	**20.23**		**0.08**	**0.30**	**70,450**	
Coating Total (tpy)							**2,641.33**						**219.38**	**1,755,328**	**821.36**			**288.30**	**1,079.38**		**0.98**	**3.93**	**1,277,184**	

[a] Coating usage is calculated as follows: C = (A_1 * total parts per year) + (A_2 * total bodies per year)
[b] VOC emissions from the booth are calculated as follows: I = E * F * 2,000 lb/ton
[c] VOC emissions from the oven are calculated as follows: J = E * G * (1 - H) * 2,000 lb/ton
[d] Hourly emissions are calculated by dividing the annual emissions in tons/yr by the operating hours/yr, and multiplying by 2000 lb/ton.
[e] Annual Controlled PM emissions are calculated as follows: T = Q * (1 - R)
[f] GACS per year is calculated as follows: U = C * N * O
[g] Lb VOC/GACS is calculated as follows: V = L/U
[h] A safety factor of 10% was added to the VOC content of the material.
[i] Spot repair application rates are assumed to be equal to 1% of the application rate of the corresponding coating for a full vehicle body for every eighth vehicle. Assembly repair rates are assumed to be equal to 3.1% of the application rate of the corresponding coating for a full vehicle body for every tenth vehicle.
[k] Worst case spot repair and assembly repair for VOC emissions comes from basecoat and clearcoat application. Worst case spot repair and assembly repair for PM emissions comes from topcoat (monocoat) application.

Paint Shop Coating HAP Emissions - Excluding E-Coat Spot Repair

Total VOC Entering Process [a] (lb/yr)	Solids Application [a] (GACS/yr)	Controlled VOC Emissions [a] (lb/yr)	Lbs HAP per GACS [b]	Uncont. HAP Emissions (lb/yr)	Annual Rate, Uncont. HAP [c] (tpy)	Controlled HAP Emissions (lb/yr)	Annual Rate, HAP Out [c] (tpy)
5,282,667	1,277,184	1,755,328	0.50	1,921,845	960.92	638,592	319.30

[a] Calculated in Paint Shop Coating Tab.

[b] Combined HAP emission limit for Paint Shop Primecoat (E-coat), Guidecoat, Topcoat, and Purge Solvent Operations per 40 CFR 63 Subpart IIII because emissions are routed to a control device with greater than a 95% destruction efficiency.

[c] Potential hours are based on operation 24 hrs/day, 365 days/yr.

Underbody Coating VOC Emissions

Area/Process	Material Usage per Vehicle [a] (gal/veh)	Material Density [b] (lb/gal)	Material VOC Content [b] %	Application Area Emissions [d] %	Oven Emissions [d] %	Oven RTO Control Efficiency %	Maximum Annual Production Phase 1 (veh/yr)	Maximum Annual Production Phase 2 (veh/yr)	Maximum Annual Production Phase 3 (veh/yr)	Application Area VOC Emission Rates Phase 1 (tpy)	Application Area VOC Emission Rates Phase 2 (tpy)	Application Area VOC Emission Rates Phase 3 (tpy)	Oven VOC Emission Rates Phase 1 (tpy)	Oven VOC Emission Rates Phase 2 (tpy)	Oven VOC Emission Rates Phase 3 (tpy)	Total Uncontrolled VOC Emission Rates Phase 1 (tpy)	Total Uncontrolled VOC Emission Rates Phase 2 (tpy)	Total Uncontrolled VOC Emission Rates Phase 3 (tpy)	Total Controlled VOC Emission Rates Phase 1 (tpy)	Total Controlled VOC Emission Rates Phase 2 (tpy)	Total Controlled VOC Emission Rates Phase 3 (tpy)
Underbody Coating	0.185	11.684	36%	40%	60%	95%	50,544	74,880	124,800	7.93	11.75	19.58	0.59	0.88	1.47	19.82	29.36	48.94	8.52	12.63	21.04
Total										**7.93**	**11.75**	**19.58**	**0.59**	**0.88**	**1.47**	**19.82**	**29.36**	**48.94**	**8.52**	**12.63**	**21.04**

Underbody Coating PM Emissions

Process	Material Usage per Vehicle [a] (gal/veh)	Material Density [b] (lb/gal)	Weight % Solids [b] %	Transfer Efficiency [c] %	Maximum Annual Production Phase 1 (veh/yr)	Maximum Annual Production Phase 2 (veh/yr)	Maximum Annual Production Phase 3 (veh/yr)	Filter Efficiency (%)	Uncontrolled $PM/PM_{10}/PM_{2.5}$ Emissions Phase 1 (tpy)	Uncontrolled $PM/PM_{10}/PM_{2.5}$ Emissions Phase 2 (tpy)	Uncontrolled $PM/PM_{10}/PM_{2.5}$ Emissions Phase 3 (tpy)	Controlled $PM/PM_{10}/PM_{2.5}$ Emissions [e] Phase 1 (tpy)	Controlled $PM/PM_{10}/PM_{2.5}$ Emissions [e] Phase 2 (tpy)	Controlled $PM/PM_{10}/PM_{2.5}$ Emissions [e] Phase 3 (tpy)
Underbody Coating	0.185	11.684	67%	50%	50,544	74,880	124,800	98.5%	18.24	27.03	45.04	0.27	0.41	0.68
Total									**18.24**	**27.03**	**45.04**	**0.27**	**0.41**	**0.68**

[a] Material usage per vehicle estimate was provided by Mercedes on 2/4/2017 as 0.7 L/vehicle. Value was converted to gallons per vehicle using a conversion factor of 0.264172 gal/L.
[b] Based on BASF Primer UniBloc Solventborne primer.
[c] Transfer efficiency is assumed based on industry knowledge of underbody coating.
[d] BASF provided the application area/oven emission breakdown to Mercedes which was relayed on 1/4/2017 to Trinity Consultants as 37.5% of VOC emitted during application, and 62.5% emitted in the oven. Mercedes conservatively estimates that 40% is emitted during application.
[e] Annual operating hours assumed to be 7,448 hours per year.

Underbody Coating HAP/TAP Emissions

Material Usage per vehicle [a]	Material Density [b]	Application Area Emissions [c]	Oven Emissions [c]	Oven RTO Control Efficiency	Maximum Annual Production Phase 1	Phase 2	Phase 3
(gal/veh)	(lb/gal)	%	%	%	(veh/yr)	(veh/yr)	(veh/yr)
0.185	11.684	40%	60%	95%	50,544	74,880	124,800

Underbody Coating HAP/TAP Emissions

Pollutant	CAS Number	Emission Factor [d] (%)	HAP? (Y/N)	TAP? (Y/N)	Application Area HAP Emissions (tpy) Phase 1	Phase 2	Phase 3	Controlled Oven HAP Emissions (tpy) Phase 1	Phase 2	Phase 3	Controlled HAP Emissions (tpy) Phase 1	Phase 2	Phase 3
Naphtha	64742956	10%	N	N	-	-	-	-	-	-	-	-	-
Xylene	1330207	7%	Y	Y	1.53	2.26	3.77	0.11	0.17	0.28	1.64	2.43	4.06
1,2,4-trimethylbenzene	95636	5%	N	N	-	-	-	-	-	-	-	-	-
n-Butylacetate	123864	5%	N	N	-	-	-	-	-	-	-	-	-
2-Butoxyethyl Acetate	112072	3%	Y	N	0.66	0.97	1.62	0.05	0.07	0.12	0.70	1.04	1.74
n-Butanol	71363	2.5%	N	N	-	-	-	-	-	-	-	-	-
Mesitylene	108678	2%	N	N	-	-	-	-	-	-	-	-	-
n-Propylbenzene	103651	2%	N	N	-	-	-	-	-	-	-	-	-
Ethyl Benzene	100414	2%	Y	Y	0.44	0.65	1.08	0.03	0.05	0.08	0.47	0.70	1.16
Isopropylbenzene (Cumene)	98828	1%	Y	Y	0.22	0.32	0.54	0.02	0.02	0.04	0.23	0.35	0.58
Cyclohexane	110827	0.3%	N	N	-	-	-	-	-	-	-	-	-
Total Underbody Coating HAP Emissions					**2.84**	**4.21**	**7.01**	**0.21**	**0.32**	**0.53**	**3.05**	**4.52**	**7.54**

[a] Material usage per vehicle estimate was provided by Mercedes on 2/4/2017 as 0.7 L/vehicle. Value was convetered to gallons per vehicle using a conversion factor of 0.264172 gal/L.

[b] Based on BASF Primer UniBloc Solventborne primer.

[c] BASF provided the application area/oven emission breakdown to Mercedes which was relayed on 1/4/2017 to Trinity Consultants as 37.5% of VOC emitted during application, and 62.5% emitted in the oven. Mercedes conservatively estimates that 40% is emitted during application.

[d] Emission factors are from Section 3 Composition/Information on Ingredients on BASF UniBloc MB7746 silvergrey SDS (Revised 02/23/2015). HAP/TAP emissions assume that the maximum amount of each component is emitted.

Controlled Particulate Emissions from Sources Routed to Dry X

Description	Exhaust Flow Rate (m^3/hr)	Hours of Operation (hr/yr)	Outlet PM Loading [a] mg/m^3	Percent Recycled (%)	Potential $PM/PM_{10}/PM_{2.5}$ Emissions [b,c] (lb/hr)	(tpy)
Primer-Surfacer	157,352	8,760	1	73%	0.09	0.41
Primer-Surfacer 2	64,721	8,760	1	73%	0.04	0.17
Basecoat/Clearcoat	324,643	8,760	1	73%	0.19	0.85
Basecoat/Clearcoat 2	133,529	8,760	1	73%	0.08	0.35

[a] Manufacturer specification for outlet of PM separation system (Dry X).

[b] All PM is assumed to be equal to PM_{10} and $PM_{2.5}$. Annual emissions are based on paint shop hours of operation.

[c] Emissions (lb/hr) = Exhaust Flow (m^3/hr) * Outlet Loading (mg/m^3) * Conversion Factor (1 lb/453,592 mg) * (1-Percent Recycled (%))

E-Coat Spot Repair VOC Emissions

Area/Process	Material Usage per Vehicle[a] (gal/veh)	Material Density[b] (lb/gal)	Material VOC Content[b] (lb/gal)	Application Area Emissions %	Maximum Annual Production Phase 1 (veh/yr)	Phase 2 (veh/yr)	Phase 3 (veh/yr)	Application Area VOC Emission Rates Phase 1 (tpy)	Phase 2 (tpy)	Phase 3 (tpy)	Phase 3 (lb/hr)[d]
E-Coat Spot Repair	3.71E-04	11.684	6.00	100%	50,544	74,880	124,800	0.06	0.08	0.14	0.03
Total								**0.06**	**0.08**	**0.14**	**0.03**

E-Coat Spot Repair PM Emissions

Process	Material Usage per Vehicle[a] (gal/veh)	Material Density[b] (lb/gal)	Weight % Solids[b] %	Volume % Solids %	Transfer Efficiency[c] %	Maximum Annual Production Phase 1 (veh/yr)	Phase 2 (veh/yr)	Phase 3 (veh/yr)	Uncontrolled PM/PM_{10}/$PM_{2.5}$ Emissions Phase 1 (tpy)	Phase 2 (tpy)	Phase 3 (lb/hr)[d]	Phase 3 (tpy)	GACS per Year Phase 1 (tpy)	Phase 2 (tpy)	Phase 3 (tpy)
E-Coat Spot Repair	3.71E-04	11.684	67%	50.9%	40%	50,544	74,880	124,800	0.04	0.07	0.02	0.11	3.81	5.65	9.42
Total									**0.04**	**0.07**	**0.02**	**0.11**	**3.81**	**5.65**	**9.42**

[a] The material usage per vehicle was provided by Jae Park (Plant Engineer) via e-mail on 1/30/2017. The material usage per vehicle includes a 10% safety factor.
[b] Material density, VOC and solids content are based on BASF Primer UniBloc Solventborne primer.
[c] Transfer efficiency is assumed based on industry knowledge.
[d] Annual operating hours is assumed to be 8,760 hours per year.

Paint Shop Coating HAP Emissions - E-Coat Spot Repair HAP/TAP

Total VOC Entering Process [a] (lb/yr)	Solids Application [a] (GACS/yr)	Controlled VOC Emissions [a] (lb/yr)	Lbs HAP per GACS [b]	Uncont. HAP Emissions (lb/yr)	Annual Rate, Uncont. HAP [c] (tpy)	Controlled HAP Emissions (lb/yr)	Annual Rate, HAP Out [c] (tpy)
278	9	278	0.50	5	0.00	5	2.35E-03

[a] Calculated in Paint Shop Coating Tab.

[b] Combined HAP emission limit for Paint Shop Primecoat (E-coat), Guidecoat, Topcoat, and Purge Solvent Operations per 40 CFR 63 Subpart IIII because emissions are routed to a control device with greater than a 95% destruction efficiency.

[c] Potential hours are based on operation 24 hrs/day, 365 days/yr.

Paint Shop Adhesive Application Emissions

Adhesive Type	Material Usage per vehicle (lb/veh)	Uncontrolled VOC Emission Factor [a] (%)	Hourly Production Rate (veh/hr)	Maximum Annual production (veh/yr)	Uncontrolled VOC Emissions [b] (lb/hr)	(lb/yr)	(tpy)
Anti-flutter adhesive	6.61	1%	17	124,800	1.10	8,254.02	4.13
Structure adhesive	4.41	1%	17	124,800	0.73	5,502.68	2.75
Total					**1.84**	**13,756.70**	**6.88**

[a] From manufacturer's SDS, all body shop adhesives have >99% solids content. Mercedes-Benz Vans conservatively assumes VOC content of 1% for all adhesives.

[b] Mercedes-Benz Vans assumes that adhesive applied following the topcoat oven will be performed on an open workdeck (i.e. without control).

Appendix B.3.4 - Paint Shop
Mercedes-Benz Vans, LLC

Purge Solvent Emissions

Process	Usage Rate	Number of Units [a]	Hours of Operation	Annual Usage [b]	Recovery Rate	Non-Recovered Solvent	Solvent Density [c]	VOC Content [c]	HAP Content [c]	Capture & Control: Percent Lost	Capture & Control: Booth Capture	Capture & Control: ADW Capture	Capture & Control: Booth Control Eff.	Uncontrolled Total VOC		Controlled Total VOC		Total HAP	
	(gal/unit)	(units/yr)	(hrs/yr)	(gal/yr)	%	(gal/yr)	(lb/gal)	(lb/gal)	(lb/gal)	%	%		%	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
Primer	0.34	137,280	7,488	47,145	65%	16,501	7.26	7.26	0.76	20%	80%	90%	95%	16.00	59.90	5.06	18.93	0.53	1.99
Basecoat	0.40	137,280	7,488	54,398	65%	19,039	7.26	7.26	0.76	20%	80%	90%	95%	18.46	69.12	5.83	21.84	0.61	2.30
Clearcoat	0.40	137,280	7,488	54,398	65%	19,039	7.26	7.26	0.76	20%	80%	90%	95%	18.46	69.12	5.83	21.84	0.61	2.30
Repair	0.11	137,280	7,488	14,506	65%	5,077	7.26	7.26	0.76	0%	100%	0%	0%	4.92	18.43	4.92	18.43	0.52	1.94
Total														**57.84**	**216.57**	**21.65**	**81.04**	**2.28**	**8.52**

[a] The number of units for primer, basecoat, and clearcoat includes major repairs sent back through the paint shop equivalent to 10% of the maximum production per year.

[b] The annual usage conservatively assumes that the lines are purged after each unit in each booth.

[c] Information provided in purge solvent SDS.

Paint Shop Phosphate Cleaner Calculation Information [a]

<u>Supply (Inlet) Air</u>		
Temperature	75	°F
Humidity	50	% RH
Moisture Content	0.0092	lb H_2O/lb air
<u>Exhaust (Outlet) Air</u>		
Temperature	63	°F
Humidity	95	% RH
Moisture Content	0.012	lb H_2O/lb air
Flow Rate	21,761	ft^3/min
Density of Air at 63 °F	0.0757	lb/ft^3
<u>Phosphate Cleaner</u>		
Dissolved Solids	0.5	%
Hours of Operation [b]	7,488	hr/yr
Control Efficiency [c]	55	%

[a] Reduction in PM emissions through use of mist eliminators.
[b] Paint shop annual hours of operation.
[c] Mist eliminator control efficiency.

Paint Shop Phosphate Cleaner Emissions

Phosphate Cleaner Emissions	$PM/PM_{10}/PM_{2.5}$	
	Uncontrolled	Controlled
Hourly (lb/hr)	1.38	0.62
Annual (tpy)	5.18	2.33

Sample Calculation:

Uncontrolled PM Emissions = $\frac{(0.012 - 0.0092) \text{ lb } H_2O}{\text{lb air}} \left| \frac{0.5 \text{ lb solids}}{100 \text{ lb } H_2O} \right| \frac{12{,}000 \text{ ft}^3 \text{ air}}{\text{min}} \left| \frac{0.0757 \text{ lb air}}{\text{scf air}} \right| \frac{60 \text{ min}}{\text{hour}}$

Uncontrolled PM Emissions = 1.38 lb/hr

Controlled PM Emissions = $\frac{(0.76 \text{ lb PM})}{\text{hr}} \left| \frac{(100 - 55)}{100} \right.$ = 0.62 lb/hr

Paint Mix Room Emissions

Paint Shop Material Usage Rates

Process/Material	Usage (gal/yr)
E-coat	520,379
Seam Sealer	87,831
Underbody PVC	594,101
Sika Sealing	5,300
(SAM) Sound Deadener Adhesive	131,875
Primer-Surfacer	257,058
Basecoat	331,567
Clearcoat	445,566
Spot Repair	5,263
Cavity Wax	98,515
Purge Solvent	170,449
Facility Total	2,127,524

vapor (i.e. partial) pressure of toluene	0.468	psia	P_{atm}
molecular weight of toluene	92.130	lb/lb-mole	MW
atmosphereic vapor pressure	14.700	psia	$P_{toluene}$
ideal gas constant - R	10.730	ft^3-psia/lb-mole-°R	
absolute temperature	532	°R	T
vapor density = MW*n/V = MW*P/R*T	0.237	lb/ft^3	n = 1
volume of displaced toluene-saturated air	2,127,524	gallons	
volume of displaced toluene-saturated air	284,428	ft^3	vol. displaced air
volume of displaced toluene	9,055	ft^3	vol. displaced air * $P_{toluene}/P_{atm}$
vapor density = MW*n/V = MW*P/R*T	0.2373	lb/ft^3	

Paint Shop Hours of Operation	7,488	hr/yr
Total VOC Emissions	0.29	lb/hr
Total VOC Emissions	**1.07**	**tpy**

Workdecks - Insignificant Activity Emissions

Booth/Zone	Potential $PM/PM_{10}/PM_{2.5}$ Emissions				
	Exhaust Volume (scfm) [a,b]	PM Loading ($gr/10^3$ dscf) [c]	Hours of Operation (hr/yr)	Hourly (lb/hr)	Annual (ton/yr) [c]
E-coat Sand	62,978	0.1	7,488	0.05	0.20
Primer Sand	62,978	0.1	7,488	0.05	0.20
Metal/Body Repair #1	6,474	0.1	7,488	0.01	0.02
Metal/Body Repair #2	6,474	0.1	7,488	0.01	0.02
E-coat Touch-up	21,189	0.1	7,488	0.02	0.07
Primer Touch-up	21,189	0.1	7,488	0.02	0.07
Basecoat Touch-up	21,189	0.1	7,488	0.02	0.07
Inspect/Polish	84,167	0.1	7,488	0.07	0.27
Total				**0.25**	**0.92**

[a] Calculation assumes exhaust volume is on a dry basis.
[b] Exhaust volumes provided by equipment manufacturer.
[c] Estimated outlet PM loading for workdeck operations.
[d] Based on paint shop annual hours of operation: 7,488 hrs/yr

Sample Calculations (for E-Coat Sand)

$$\text{PM Emissions (lb/hr)} = \frac{62{,}978\ \text{scf}}{\text{min}} \left| \frac{0.1\ \text{grains}}{1000\ \text{dscf}} \right| \frac{60\ \text{min}}{\text{hr}} \left| \frac{1\ \text{lb}}{7{,}000\ \text{gr.}} \right. = \mathbf{0.05\ lb/hr}$$

$$\text{PM Emissions (tons/yr)} = \frac{0.05\ \text{lb}}{\text{hr}} \left| \frac{7{,}488\ \text{hr}}{\text{yr}} \right| \frac{\text{ton}}{2{,}000\ \text{lb}} = \mathbf{0.20\ ton/yr}$$

Mercedes-Benz Vans, LLC

Body Shop Welding Emissions

Area/Process	Welding Material Usage per Vehicle		Material Usage per vehicle (lb/veh)	Uncontrolled PM Emission Factor [a] (lb/1000 lb)	Hourly Production Rate (veh/hr)	Maximum Annual Production (veh/yr)	Control Efficiency [b] %	Building Capture Efficiency %	Uncontrolled $PM/PM_{10}/PM_{2.5}$ Emissions [c] (lb/hr)	(lb/yr)	(tpy)	Controlled $PM/PM_{10}/PM_{2.5}$ Emission [c] (lb/hr)	(lb/yr)	(tpy)
MAG Welding	8,000	mm	0.30	20	17	124,800	95%	90%	1.00E-02	7.52E+01	3.76E-02	5.02E-04	3.76E+00	1.88E-03
Spot Welding	9,000	spots	0.34	20	17	124,800	0%	90%	1.13E-02	8.46E+01	4.23E-02	1.13E-02	8.46E+01	4.23E-02
Laser Welding	28,000	mm	1.05	20	17	124,800	0%	90%	3.52E-02	2.63E+02	1.32E-01	3.52E-02	2.63E+02	1.32E-01
Laser Soldering	9,000	mm	0.34	20	17	124,800	0%	90%	1.13E-02	8.46E+01	4.23E-02	1.13E-02	8.46E+01	4.23E-02
Total									**6.78E-02**	**5.08E+02**	**2.54E-01**	**5.83E-02**	**4.36E+02**	**2.18E-01**

[a] Average emission factor for welding and soldering at the facility is conservatively assumed to be 20 lb/1, 000 lb.

[b] Based on HEPA filter control for MAG welding processes.

[c] A building capture efficiency of 90% is assumed for the body shop for both uncontrolled and controlled emissions based on building enclosure capture efficiency provided in Texas Commission on Environmental Quality, Rock Crushing Plants, Table 7, February, 2002. All welding and soldering operations are done inside the building.

Body Shop Welding HAP Emissions

Area/Process	Manganese Content %	lb/hr	tpy
MAG Welding	1.45	7.28E-06	2.73E-05
Spot Welding	0.0	0.00E+00	0.00E+00
Laser Welding	1.2	4.22E-04	1.58E-03
Laser Soldering	1.2	1.36E-04	5.08E-04
	Total	5.65E-04	2.12E-03

Welding Shield Gas CO_2 Emissions

Usage per Vehicle (kg)	Hourly Production Rate (veh/hr)	Maximum Annual Production (veh/yr)	CO_2 Content [a] %	CO_2 Emissions (lb/hr)	(tpy)
2.00	17	124,800	15%	1.10E+01	4.13E+01

[a] Based on Mercedes-Benz Vans shield gas specification.

Body Shop Adhesive Bonding Emissions

Adhesive Type		Material Usage per vehicle (lb/veh)	Uncontrolled VOC Emission Factor [a] (%)	Hourly Production Rate (veh/hr)	Maximum Annual production (veh/yr)	Uncontrolled VOC Emissions (lb/hr)	(lb/yr)	(tpy)	Controlled VOC Emissions [b] (lb/hr)	(lb/yr)	(tpy)
Anti-flutter adhesive		6.61	1%	17	124,800	1.10	8,254.02	4.13	0.06	412.70	0.21
Structure adhesive		4.41	1%	17	124,800	0.73	5,502.68	2.75	0.04	275.13	0.14
Total						**1.84**	**13,756.70**	**6.88**	**0.09**	**687.84**	**0.34**

[a] From manufacturer's SDS, all body shop adhesives have >99% solids content. Mercedes-Benz Vans conservatively assumes VOC content of 1% for all adhesives.

[b] Mercedes-Benz Vans assumes 95% reduction in VOC emissions when body shop adhesives volatilize in the E-Coat oven.

Sample Calculations (for MAG Welding)

Material Usage (lb/veh) = $\pi \times r^2 \times$ Weld Length (mm) ÷ $10^3 \times$ Material Specific Gravity (g/cm^3) ÷ 453.59 g/lb

Material Usage (lb/veh) = $\pi \times (0.8\ mm)^2 \times 8{,}000\ mm \div 10^3 \times (8.5\ g/cm^3) \div 453.59\ g/lb$ = **0.30** **lb/veh**

PM Emissions (lb/yr) = $\frac{0.30\ lb}{veh} \times \frac{20\ lb}{1{,}000\ lb} \times \frac{124{,}800\ veh}{yr} \times (1-95\%) \times (1-90\%)$ = **3.762** **lb/yr**

PM Emissions (tons/yr) = $\frac{3.762\ lb}{yr} \times \frac{1\ ton}{2{,}000\ lb}$ = **1.88E-03** **ton/yr**

Assembly Combustion - Natural Gas Emission Factors

Hours of Operation [e] 4,684 hrs

Pollutant		NG Emission Factors [a,b,c]	Units
$PM/PM_{10}/PM_{2.5}$		0.0074	lb/MMBtu
SO_2		0.0006	lb/MMBtu
NO_X		0.097	lb/MMBtu
CO		0.082	lb/MMBtu
VOC		0.0054	lb/MMBtu
CO_2e [d]			
	CO_2	117.00	lb/MMBtu
	CH_4	2.21E-03	lb/MMBtu
	N_2O	2.21E-04	lb/MMBtu

[a] PM, SO_2, and VOC natural gas emission factors are from AP-42, Table 1.4-2, 07/98.
[b] NO_X and CO natural gas emission factors are from AP-42, Table 1.4-1, 07/98, Small Boilers (uncontrolled).
[c] The heating value of natural gas is assumed to be 1,026 Btu/scf.
[d] Emission factors from 40 CFR 98, Subpart C, Tables C-1 and C-2. Factors were converted to lb/MMBtu.

Assembly Combustion Non-HAP Emissions

Description	Equipment	Rated Capacity (MMBtu/hr)	Emission Rates [e]																	
			$PM/PM_{10}/PM_{2.5}$		SO_2		NO_X		CO		VOC		CO_2		CH_4		N_2O		CO_2e	
			lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
Assembly Oven	OV04	4.30	0.03	0.07	0.003	0.006	0.42	0.98	0.35	0.82	0.02	0.05	503.09	1,178.13	0.009	0.022	0.0009	0.002	503.61	1,179.34
Total		**4.30**	**0.03**	**0.07**	**0.003**	**0.006**	**0.42**	**0.98**	**0.35**	**0.82**	**0.02**	**0.05**	**503.09**	**1,178.13**	**0.009**	**0.022**	**0.0009**	**0.002**	**503.61**	**1,179.34**

[e] Annual emissions are based on calculated hours of operation needed to remain below the proposed 75,000 tpy synthetic minor limit on greenhouse gas emissions (CO_2e). Mercedes-Benz Vans is not requesting limits on hours of operation for individual emission units.

Assembly Combustion HAP/TAP Emissions

Pollutants	NG Emission Factor [a] lb/10^6 scf	Total Emissions [b] lb/hr	tpy
2-Methylnaphthalene	2.40E-05	1.01E-07	2.36E-07
3-Methylchloranthrene	1.80E-06	7.54E-09	1.77E-08
7,12-Dimethylbenz(a)anthracene	1.60E-05	6.71E-08	1.57E-07
Acenaphthene	1.80E-06	7.54E-09	1.77E-08
Acenaphthylene	1.80E-06	7.54E-09	1.77E-08
Anthracene	2.40E-06	1.01E-08	2.36E-08
Benz(a)anthracene	1.80E-06	7.54E-09	1.77E-08
Benzene	2.10E-03	8.80E-06	2.06E-05
Benzo(a)pyrene	1.20E-06	5.03E-09	1.18E-08
Benzo(b)fluoranthene	1.80E-06	7.54E-09	1.77E-08
Benzo(g,h,i)perylene	1.20E-06	5.03E-09	1.18E-08
Benzo(k)fluoranthene	1.80E-06	7.54E-09	1.77E-08
Chrysene	1.80E-06	7.54E-09	1.77E-08
Dibenzo(a,h)anthracene	1.20E-06	5.03E-09	1.18E-08
Dichlorobenzene	1.20E-03	5.03E-06	1.18E-05
Fluoranthene	3.00E-06	1.26E-08	2.94E-08
Fluorene	2.80E-06	1.17E-08	2.75E-08
Formaldehyde	7.50E-02	3.14E-04	7.36E-04
Hexane	1.80E+00	7.54E-03	1.77E-02
Indeno(1,2,3-cd)pyrene	1.80E-06	7.54E-09	1.77E-08
Naphthalene	6.10E-04	2.56E-06	5.99E-06
Phenanathrene	1.70E-05	7.12E-08	1.67E-07
Pyrene	5.00E-06	2.10E-08	4.91E-08
Toluene	3.40E-03	1.42E-05	3.34E-05
Arsenic	2.00E-04	8.38E-07	1.96E-06
Beryllium	1.20E-05	5.03E-08	1.18E-07
Cadmium	1.10E-03	4.61E-06	1.08E-05
Chromium	1.40E-03	5.87E-06	1.37E-05
Cobalt	8.40E-05	3.52E-07	8.24E-07
Lead	5.00E-04	2.10E-06	4.91E-06
Manganese	3.80E-04	1.59E-06	3.73E-06
Mercury	2.60E-04	1.09E-06	2.55E-06
Nickel	2.10E-03	8.80E-06	2.06E-05
Selenium	2.40E-05	1.01E-07	2.36E-07

Hours of Operation [b]	4,684	hrs
Total Rated Capacity	4.30	MMBtu/hr

[a] Natural Gas Emission Factors are from AP-42 Section 1.4, Tables 1.4-2, 1.4-3, and 1.4-4.
[b] Annual emissions are based on calculated hours of operation needed to remain below the proposed 75,000 tpy synthetic minor limit on greenhouse gas emissions (CO_2e). Mercedes-Benz Vans is not requesting limits on hours of operation for individual emission units.

Assembly Glazing VOC Emissions

Area/Process	Material Usage per vehicle		Uncontrolled VOC Emission Factor [a]	Hourly Production Rate	Maximum Annual Production	Product Usage	Potential VOC Emissions		
	(kg/veh)	(lb/veh)	(%)	(veh/hr)	(veh/yr)	(lb/yr)	(lb/hr)	(lb/yr)	(tpy)
Primer 1	0.04	0.09	65%	19	164,250	14,595	1.08	9,486.75	4.74
Primer 2	0.08	0.19	64%	19	164,250	30,510	2.23	19,526.34	9.76
Adhesive	2.75	6.06	0%	19	164,250	995,971	0.00	0.00	0.00
Total							**3.31**	**29,013.09**	**14.51**

HAP/TAP Potential Emissions

Area/Process	Material Usage per vehicle		Constituent Chemical Name	CAS#	Uncontrolled Component Emission Factor [a]	Hourly Production Rate	Maximum Annual Production	Potential Emission Rates		
	(kg/veh)	(lb/veh)			(%)	(veh/hr)	(veh/yr)	(lb/hr)	(lb/yr)	(tpy)
Primer 1	0.04	0.09	MEK	78-93-3	60%	19	164,250	1.00	8,757.00	4.38
	0.04	0.09	MDI	101-68-8	1%	19	164,250	0.02	145.95	0.07
Primer 2	0.08	0.19	MEK	78-93-3	60%	19	164,250	2.09	18,305.94	9.15
			Acrylic acid	79-10-7	1%	19	164,250	0.03	305.10	0.15
Adhesive	2.75	6.06	N/A					0.00	0.00	0.00
Total								**3.14**	**27,513.99**	**13.76**

[a] Information provided in SDS for each material.

Assembly Under Body Wax Emissions

Area/Process	Material Usage per vehicle (lb/veh)	Uncontrolled VOC Emission Factor (%)	Hourly Production Rate (veh/hr)	Maximum Annual Production (veh/yr)	Product Usage (lb/year)	Potential VOC Emission Rates (lb/hr)	(lb/yr)	(tpy)
Under body wax	1.94	0.0%	19	164,250	318,656	0.00	0.00	0.00
Total						**0.00**	**0.00**	**0.00**

Spray Deck PM Emissions

Process	Material Usage per vehicle (lb/veh)	Weight % Volatiles (%)	Weight % Solids (%)	%Transfer Efficiency (%)	Production Rates (units/hr)	Filter Efficiency (%)	Uncontrolled $PM/PM_{10}/PM_{2.5}$ Emissions (lb/hr)	(lb/yr)	(tpy)	Controlled $PM/PM_{10}/PM_{2.5}$ Emissions (lb/hr)	(lb/yr)	(tpy)
Under body wax	1.94	0.0%	100.0%	90%	19	98.0%	3.64	31,865.64	15.93	0.07	637.31	0.32
Total							**3.64**	**31,865.64**	**15.93**	**0.07**	**637.31**	**0.32**

Assembly Filling Emissions

Product	Material Usage per Vehicle	True Vapor Pressure, VP	Molecular Weight	Vehicle Throughput		Uncontrolled VOC Emission Rates			Controlled VOC Emission Rates [a]		
	(liter/veh)	(psia)	(g/mol)	(veh/hr)	(veh/yr)	(lb/hr)	(lb/yr)	(tpy)	(lb/hr)	(lb/yr)	(tpy)
Gasoline	18.9	7.4	66	19	164,250	1.08E+00	9.49E+03	4.74E+00	5.42E-02	4.74E+02	2.37E-01
Diesel fuel	18.9	0.01	130	19	164,250	2.88E-03	2.53E+01	1.26E-02	2.88E-03	2.53E+01	1.26E-02
Brake fluid	1.2	0.02	75	19	164,250	2.13E-04	1.86E+00	9.32E-04	2.13E-04	1.86E+00	9.32E-04
Antifreeze	9.0	0.02	62	19	164,250	1.31E-03	1.15E+01	5.73E-03	1.31E-03	1.15E+01	5.73E-03
Windshield Cleaner [b]	4.0	0.77	28.14	19	164,250	1.02E-02	8.89E+01	4.45E-02	1.02E-02	8.89E+01	4.45E-02
Differential Gear Oil	0.5	0.02	75	19	164,250	8.79E-05	7.70E-01	3.85E-04	8.79E-05	7.70E-01	3.85E-04
Auto Transmission Fluid	0.7	0.02	150	19	164,250	2.40E-04	2.10E+00	1.05E-03	2.40E-04	2.10E+00	1.05E-03
Power Steering Fluid	0.8	0.02	76	19	164,250	1.42E-04	1.24E+00	6.20E-04	1.42E-04	1.24E+00	6.20E-04
Total						**1.10E+00**	**9.62E+03**	**4.81E+00**	**6.92E-02**	**6.06E+02**	**3.03E-01**

[a] Assumes 95% control from onboard refueling vapor recovery (ORVR) for gasoline.

[b] From windshield cleaner MSDS, material contains 23% volatiles (methanol and ethylene glycol). VOC emissions calculated based on vapor pressure provided in the MSDS and molecular weight calculated as the weighted average of 23% ethylene glycol and 77% water.

HAP/TAP Emissions from Assembly Filling

Pollutant	Material Usage per Vehicle	Component Emission Factor [a]	True Vapor Pressure, VP	Molecular Weight	Vehicle Throughput		Uncontrolled HAP/TAP Emission Rates			Controlled HAP/TAP Emission Rates		
	(liter/veh)	(liter/veh)	(psia)	(g/mol)	(veh/hr)	(veh/yr)	(lb/hr)	(lb/yr)	(tpy)	(lb/hr)	(lb/yr)	(tpy)
Windshield Cleaner	4.0											
Methanol		1.12	1.888	32.04	19	164,250	7.92E-03	6.94E+01	3.47E-02	7.92E-03	6.94E+01	3.47E-02
Ethylene Glycol		0.80	0.0725	62.07	19	164,250	4.19E-04	3.67E+00	1.84E-03	4.19E-04	3.67E+00	1.84E-03
Total							**8.34E-03**	**7.30E+01**	**3.65E-02**	**8.34E-03**	**7.30E+01**	**3.65E-02**

[a] From windshield cleaner MSDS, material is 23% volatile by mass. Windshield cleaner fluid was conservatively assumed to contain 23% methanol and 23% ethylene glycol.

Assembly Roll and Brake Testing Capacities

Hourly Production Rate	19	units/hr
Annual Production Rate	164,250	units/yr
Simulated Distance	3.0	miles/unit
Hours of Operation [a]	8,760	hr/yr

[a] Potential operating hours are based on operation 24 hours/day, 365 days/yr.

Assembly Roll and Brake Testing Emission Factors

Pollutant	Diesel g/mile [a]	Gasoline g/mile	Worst Case Fuel g/mile
PM	0.08	0.0	0.08
NO_X	0.3	0.3	0.3
CO	4.2	4.2	4.2
VOC	0.09	0.09	0.09
Formaldehyde	0.018	0.018	0.018
CO_2e [b,c]			
CO_2 [b]	417	417	417
CH_4 [d]	0.73	0.73	0.73
N_2O [d]	0.01	0.01	0.01

[a] Emission rates are based on 40 CFR 88 Subpart A Table A Table A104-2—Full Useful Life Standards (g/mi) for Light-Duty Vehicles, diesel vehicles.

[b] The CO_2 emission factor is from "Light-Duty Automotive Technology, Carbon Dioxide Emissions, and Fuel Economy Trends: 1975 Through 2010"

[c] When accounting for global warming potential, CO_2 is 95% of CO_2e. EPA Emission Facts: Greenhouse Gas Emissions from a Typical Passenger Vehicle, http://www.epa.gov/OMS/climate/420f05004.htm.

[d] 5% of CO_2e is assumed to be CH_4 and N_2O, when accounting for global warming potential. Emission factors for these pollutants are based on a ratio of CH_4 and N_2O emission factors for petroleum fuels from the GHG Mandatory Reporting Rule Subpart C, Table C-2.

Assembly Roll and Brake Testing Potential Emissions

Process	Potential Emissions																	
	$PM/PM_{10}/PM_{2.5}$		NO_X		CO		VOC		Formaldehyde		CO_2		CH_4		N_2O		CO_2e	
	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
Assembly Roll and Brake	0.010	0.043	0.037	0.163	0.521	2.281	0.011	0.049	0.002	0.010	51.71	226.50	0.091	0.40	0.002	0.01	54.43	238.42

Assembly Washer System Testing Compound Usage Data

Washer System Test [a]	mL/unit	% Ethylene Glycol [b]	Ethylene Glycol Density (lb/gal)	lb Ethylene Glycol/unit
Maximum Tested Windshield Cleaner Usage	100	23%	9.26	0.056

[a] Represents the maximum testing fluid usage per unit.

[b] From windshield cleaner MSDS, material contains 23% volatiles (methanol and ethylene glycol). Emissions from washer system testing calculated based on ethylene glycol density which represents the worst-case VOC emissions for the material.

Assembly Washer System Testing Emissions

	Production		VOC Emissions [a]			Maximum Ethylene Glycol Emissions [b]			Maximum Methanol Emissions [b]		
	(units/hr)	(units/yr)	(lb/hr)	(lb/yr)	(tpy)	(lb/hr)	(lb/yr)	(tpy)	(lb/hr)	(lb/yr)	(tpy)
Washer System Testing	19	164,250	1.06	9,244.66	4.62	1.06	9,244.66	4.62	0.75	6,579.53	3.29

[a] VOC emissions from washer system testing calculated based on ethylene glycol density which represents the worst-case VOC emissions for the material.

[b] Maximum HAP emissions are calculated assuming the maximum volatile content for both ethylene glycol and methanol. Therefore, the calculated VOC emissions are not equivalent to the sum c

Storage Tank Volumes

Tank ID	Consumption per Vehicle (gal/veh)	Max. Consumption per year[a] (gal/yr)	Fuel Type
TK-01	5.00	702,000	Gasoline
TK-02	5.00	702,000	Diesel
TK-03	----	100,000	Diesel

Storage Tank Emissions

Tank ID	Description[a]	Controls	Tank Size Shell Length (ft)	Tank Size Diameter (ft)	Capacity (gal)	Throughput (gal/yr)	Uncontrolled Emissions[b] (lb/yr) Working Loss	Uncontrolled Emissions[b] (lb/yr) Breathing Loss	Uncontrolled Emissions[b] (lb/yr) Total	Total VOC Emissions[c] Total (lb/hr)	Total VOC Emissions[c] Total (tpy)
TK-01	Gasoline	N/A	10.00	9.67	5,000	702,000	3,553.34	1,718.84	5,272.18	0.70	2.64
TK-02	Diesel fuel	N/A	15.08	11.00	10,000	702,000	10.79	2.27	13.06	0.002	0.01
TK-03	Diesel fuel	N/A	7.58	10.72	1,240	100,000	1.39	1.08	2.47	0.000	0.00
Tanks Total									**5,287.71**	**0.71**	**2.64**

[a] Max throughput for TK-01 and TK-02 based on the max. consumption per vehicle. TK-03 will be used to sources in the Marshalling yard.

[b] All the storage tanks are horizontal tanks.

[c] Storage Tank emissions taken from TANKS 4.09d output based on tank parameters and geographical information.

Emergency Generators and Fire Pumps Emission Factors [a,b]

Pollutant	Emergency Engines $19 \le kW < 37$	Emergency Engines $37 \le kW < 75$	Emergency Engines $225 \le kW < 450$	Emergency Engines $kW > 560$	Fire Pumps $225 < kW < 450$	Units
$PM/PM_{10}/PM_{2.5}$	0.45	0.30	0.15	0.15	0.15	g/hp-hr
SO_2 [c]	0.93	0.93	0.93	5.5E-03	0.93	g/hp-hr
NO_X	5.6	3.5	3.0	4.8	3.0	g/hp-hr
CO	4.1	3.7	2.6	2.6	2.6	g/hp-hr
VOC	5.6	3.5	3.0	4.8	3.0	g/hp-hr
CO_2e [d]						
CO_2	163.08	163.08	163.08	163.08	163.08	lb/MMBtu
CH_4	6.62E-03	6.62E-03	6.62E-03	6.62E-03	6.62E-03	lb/MMBtu
N_2O	1.32E-03	1.32E-03	1.32E-03	1.32E-03	1.32E-03	lb/MMBtu

[a] The emission factors are from 40 CFR 89.112(a), Table 1. VOC and NO_X emission factors are each assumed to be equivalent to NO_X + NMHC emission limit. The SO_2 emission factor is from AP-42, Table 3.4-1 for large diesel engines.
[b] The emission factors are from 40 CFR 89.112(a), Table 1. VOC and NO_X emission factors are each assumed to be equivalent to NO_X + NMHC emission limit. The SO_2 emission factor is from AP-42, Table 3.3-1.
[c] Sulfur content of diesel fuel equals the maximum sulfur content of 15 ppm, per 40 CFR 80.510(b).
[d] Emission factors from 40 CFR 98, Subpart C, Tables C-1 and C-2. Factors were converted to lb/MMBtu.

Emergency Generators and Fire Pumps Criteria Pollutant Emissions

Equipment ID	Fuel	Horsepower	Max. Rated Capacity	Max. hours per year [a]	$PM/PM_{10}/PM_{2.5}$		SO_2		NO_X		CO		VOC		CO_2		CH_4		N_2O		CO_2e	
		(hp)	(MMBtu/hr)	(hr/yr)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
EG01	Diesel	398	1.01	500	0.13	0.03	0.82	0.204	2.62	0.65	2.29	0.57	2.62	0.65	143.09	35.77	0.006	0.001	0.001	0.0003	143.59	35.90
EG02	Diesel	65	0.17	500	0.04	0.01	0.13	0.03	0.50	0.13	0.53	0.13	0.50	0.13	23.37	5.84	0.001	2E-04	0.0002	5E-05	23.45	5.86
EG03	Diesel	40	0.10	500	0.04	0.01	0.08	0.021	0.50	0.12	0.36	0.09	0.50	0.12	14.46	3.62	0.001	0.00	0.000	0.000	14.51	3.63
EG04	Diesel	1,500	3.82	500	0.49	0.12	0.02	0.005	15.78	3.95	8.63	2.16	15.78	3.95	539.30	134.83	0.022	0.01	0.004	0.001	541.15	135.29
FP01	Diesel	305	0.78	500	0.10	0.03	0.63	0.16	2.02	0.50	1.75	0.44	2.02	0.50	109.66	27.41	0.004	0.001	0.0009	0.0002	110.03	27.51
Total					**0.81**	**0.20**	**1.68**	**0.42**	**21.42**	**5.35**	**13.57**	**3.39**	**21.42**	**5.35**	**829.9**	**207.47**	**0.03**	**0.01**	**0.01**	**0.002**	**832.7**	**208.18**

[a] Potential hours of operation for emergency units.

Emergency Generators and Fire Pumps Combined Heat Input Capacities

	Large Units[a] (MMBtu/hr)
Total Large Diesel Heat Input	3.82
Total Diesel Heat Input	2.06

[a] Large diesel engines are those larger than 600 hp.

Emergency Generators and Fire Pumps HAP/TAP Emissions

Pollutant	Emission Factors (lb/MMBtu) Large Diesel[a]	Emission Factors (lb/MMBtu) Diesel[b]	Emergency Equipment Emissions (lb/hr)	Emergency Equipment Emissions (tpy)
Benzene	7.76E-04	9.33E-04	4.88E-03	1.22E-03
Toluene	2.81E-04	4.09E-04	1.91E-03	4.79E-04
Xylene	1.93E-04	2.85E-04	1.32E-03	3.31E-04
Formaldehyde	7.89E-05	1.18E-03	2.73E-03	6.82E-04
Acetaldehyde	2.52E-05	7.67E-05	2.54E-04	6.35E-05
Acrolein	7.88E-06	9.25E-05	2.20E-04	5.51E-05
Napthalene	1.30E-04	8.48E-05	6.71E-04	1.68E-04
Total PAH	2.12E-04	1.68E-04	1.15E-03	2.89E-04

[a] Emission factors from AP-42 Section 3.4 Large Stationary Diesel and All Stationary Duel-fuel Engines, Table 3.4-3 - 3.4-4.
[b] Emission factors from AP-42 Section 3.3 Gasoline and Diesel Industrial Engines, Table 3.3-2.

Cooling Tower Potential Emissions

Description	Circulating Water Flowrate	Water Density	Total Dissolved Solids [a]	Drift Rate [b]	Hours of Operation	Potential Emissions [c]					
						PM		PM_{10}		$PM_{2.5}$	
	(gal/hr)	(lb/gal)	(ppm)	(%)	(hrs/yr)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
Cooling Tower 1	412,500	8.34	650	0.001	7,488	2.24E-02	8.37E-02	3.33E-03	1.25E-02	2.00E-03	7.48E-03
Cooling Tower 2	412,500	8.34	650	0.001	7,488	2.24E-02	8.37E-02	3.33E-03	1.25E-02	2.00E-03	7.48E-03
Cooling Tower 3	412,500	8.34	650	0.001	7,488	2.24E-02	8.37E-02	3.33E-03	1.25E-02	2.00E-03	7.48E-03
Cooling Tower 4	73,800	8.34	650	0.001	7,488	4.00E-03	1.50E-02	5.96E-04	2.23E-03	3.58E-04	1.34E-03
Cooling Tower 5	484,900	8.34	650	0.001	7,488	2.63E-02	9.84E-02	3.92E-03	1.47E-02	2.35E-03	8.80E-03
Cooling Tower 6	484,900	8.34	650	0.001	7,488	2.63E-02	9.84E-02	3.92E-03	1.47E-02	2.35E-03	8.80E-03
Cooling Tower 7	484,900	8.34	650	0.001	7,488	2.63E-02	9.84E-02	3.92E-03	1.47E-02	2.35E-03	8.80E-03
Total						1.50E-01	5.61E-01	2.23E-02	8.36E-02	1.34E-02	5.02E-02

[a] TDS provided by Charleston Water System.

[b] Drift rate value supplied based on vendor guaranteed drift rate.

[c] PM emissions calculated using equation from AP-42 Chapter 13.4 - Wet Cooling Towers. PM_{10} emissions are 14.9% of PM emissions based on *Calculating Realistic PM_{10} Emissions from Cooling Towers* by Joel Reisman and Gordon Frisbie. $PM_{2.5}$ assumed to be 60% of PM_{10} based on California Emissions Inventory Development and Reporting System (CEIDARS).

Paved Roads - Emission Factor Equation[a]

$$E = [k\ (sL)^{0.91} * W^{1.02}] * (1 - 1.2*P/N)$$

where:	Value	Units	Data Source
k = particle size multiplier for PM	0.011	lb/VMT	AP-42, Table 13.2.1-1 [b]
k = particle size multiplier for PM_{10}	0.0022	lb/VMT	AP-42, Table 13.2.1-1 [b]
k = particle size multiplier for $PM_{2.5}$	0.00054	lb/VMT	AP-42, Table 13.2.1-1 [b]
sL = road surface silt loading	0.6	g/m^2	AP-42, Table 13.2.1-2 [c]
W_a = average weight of vehicles traveling the road	40.0	tons	SC DOT [d]
N = number of days in averaging period	365	days	AP-42, pg. 13.2.1-6
P = number of days in a year with at least 0.01 in of precipitation	120	days	AP-42, Fig. 13.2.1-2
E_a = PM emission factor	**0.18**	**lb/VMT**	**Calculation**
E_a = PM_{10} emission factor	**0.04**	**lb/VMT**	**Calculation**
E_a = $PM_{2.5}$ emission factor	**0.01**	**lb/VMT**	**Calculation**

[a] AP-42, Section 13.2.1.3, Equation 3.

[b] K value selected is for PM_{30}, PM_{10} and $PM_{2.5}$. The PM_{30} factor is used to calculate PM emissions.

[c] AP-42 Section 13.2.1, Table 13.2.1-2, Ubiquitous Silt Loading Default Values for sites with average daily traffic (ADT) for low volume roads, ADT category < 500 vehicles.

[d] Average weight conservatively set to maximum allowable gross vehicle weight rating is 80,000 lbs (40 tons), per SC §56-5-4140.

Paved Roads - Loads and Distance Inputs

Parameter	Value	Units
Distance traveled per load	1.71	VMT/load
Loads traveled	6	loads/hr
	150	loads/day
	54,750	loads/yr
Paved Vehicle Miles Traveled per Year [a]	93,349	VMT/yr
Paved Vehicle Miles Traveled per Hour [b]	10.66	VMT/hr

[a] Calculation: Paved Vehicle Miles Traveled per Year (VMT/yr) = (Potential Vehicle Production (tpy)) / Weight of Truck Load (tons/load) * Distance Traveled per Load (VMT/load).

[b] Calculation: Paved Vehicle Miles Traveled per Hour (VMT/hr) = (Potential Vehicle Production (tons/hr)) / Weight of Truck Load (tons/load) * Distance Traveled per Load (VMT/load).

Paved Roads - Potential Emissions

	PM		PM_{10}		$PM_{2.5}$	
	(lb/hr)	**(tpy)**	**(lb/hr)**	**(tpy)**	**(lb/hr)**	**(tpy)**
Paved Roads [a,b]	1.92	8.41	0.38	1.68	0.09	0.41

[a] Calculation: Potential Emissions (tpy) = Paved Vehicle Miles Traveled per Year (VMT/yr) * Emission Factor (lb/VMT) / (2,000 lb/ton).

[b] Calculation: Potential Emissions (lb/hr) = Paved Vehicle Miles Traveled per Year (VMT/hr) * Emission Factor (lb/VMT).

PSD Permit Application - Unrestricted Emission Calculations

Mercedes-Benz Vans, LLC
Charleston, South Carolina Facility

Facility-wide Potential Emissions

Pollutants	Unrestricted Uncontrolled Emissions tpy	Unrestricted Controlled Emissions tpy	Limited Emissions tpy
PM	1,354.08	24.74	21.32
PM_{10}	1,346.79	17.45	14.11
$PM_{2.5}$	1,345.49	16.15	12.81
SO_2	0.94	0.94	0.73
CO	78.03	78.03	49.63
NO_X	61.91	61.91	39.90
VOC	3,446.82	1,114.35	955.36
Lead	4.31E-04	4.31E-04	2.62E-04
CO_2e	104,003	104,003	63,367
Total HAP	415.61	415.61	358.00

Facility-wide Unrestricted Potential Emissions

	Uncontrolled Emissions		Controlled Emissions	
Pollutants	lb/hr	tpy	lb/hr	tpy
PM	309.91	1,354.08	6.41	24.74
PM_{10}	308.25	1,346.79	4.75	17.45
$PM_{2.5}$	307.95	1,345.49	4.45	16.15
SO_2	1.79	0.94	1.79	0.94
CO	30.61	78.03	30.61	78.03
NO_X	34.33	61.91	34.33	61.91
VOC	808.98	3,446.82	274.61	1114.35
Lead	9.83E-05	4.31E-04	9.83E-05	4.31E-04
CO_2e	24,530.29	104,003.48	24,530.29	104,003.48
CO_2	24,500.34	103,884.05	24,500.34	103,884.05
CH_4	0.57	2.35	0.57	2.35
N_2O	0.05	0.20	0.05	0.20

Facility-wide Unrestricted Potential HAP/TAP Emissions

	Total Emissions	
Pollutants	lb/hr	tpy
2-Methylnaphthalene	4.72E-06	2.07E-05
3-Methylchloranthrene	3.54E-07	1.55E-06
7,12-Dimethylbenz(a)anthracene	3.15E-06	1.38E-05
Acenaphthene	3.54E-07	1.55E-06
Acenaphthylene	3.54E-07	1.55E-06
Anthracene	4.72E-07	2.07E-06
Benz(a)anthracene	3.54E-07	1.55E-06
Benzene	5.29E-03	3.03E-03
Benzo(a)pyrene	2.36E-07	1.03E-06
Benzo(b)fluoranthene	3.54E-07	1.55E-06
Benzo(g,h,i)perylene	2.36E-07	1.03E-06
Benzo(k)fluoranthene	3.54E-07	1.55E-06
Butylglycol Acetate	4.65E-01	2.03E+00
Chrysene	3.54E-07	1.55E-06
Isopropylbenzene (Cumene)	1.55E-01	6.78E-01
Dibenzo(a,h)anthracene	2.36E-07	1.03E-06
Dichlorobenzene	2.36E-04	1.03E-03
Ethyl Benzene	3.10E-01	1.36E+00
Fluoranthene	5.90E-07	2.58E-06
Fluorene	5.51E-07	2.41E-06
Formaldehyde	1.97E-02	8.48E-02
Hexane	3.54E-01	1.55E+00
Indeno(1,2,3-cd)pyrene	3.54E-07	1.55E-06
Naphthalene	7.91E-04	6.93E-04
Phenanathrene	3.34E-06	1.46E-05
Pyrene	9.83E-07	4.31E-06
Toluene	2.58E-03	3.41E-03
Arsenic	3.93E-05	1.72E-04
Beryllium	2.36E-06	1.03E-05
Cadmium	2.16E-04	9.48E-04
Chromium	2.75E-04	1.21E-03
Cobalt	1.65E-05	7.24E-05
Lead	9.83E-05	4.31E-04
Manganese	6.40E-04	2.80E-03
Mercury	5.11E-05	2.24E-04
Nickel	4.13E-04	1.81E-03
Selenium	4.72E-06	2.07E-05
Xylene	1.09E+00	4.75E+00
Acetaldehyde	2.54E-04	6.35E-05
Acrolein	2.20E-04	5.51E-05
Total PAH	1.15E-03	2.89E-04
Methyl Ethyl Ketone	3.09E+00	1.35E+01
Acrylic acid	3.48E-02	1.53E-01
Methanol	7.59E-01	3.32E+00
Ethylene Glycol	1.06E+00	4.62E+00
Total HAP [a]	94.90	415.61

[a] Includes total HAP from paint shop and purge solvent.

Inputs

Phase	Paint Shop Operation (days/yr)	Assembly Operation (days/yr)	Paint Shop/Body Shop Throughput (units/hr)	Paint Shop/Body Shop Throughput (units/day)	Paint Shop/Body Shop Throughput (units/yr)	Assembly Throughput [a] (units/hr)	Assembly Throughput [a] (units/day)	Assembly Throughput [a] (units/yr)
Phase 3	365	365	17	400	146,000	19	450	164,250

[a] Assembly throughput includes existing re-assembly throughput as well as proposed expansion throughput.

Daily Operation
24 hours/day

Combustion Average Utilization [b] Percent	Hours of Operation
100.0%	8,760

[b] Calculations assume 8,760 hours of operation for unrestricted emission calculations.

Hours of Operation [e] 8,760 hrs

Boiler Information

Equipment	Heat Input Capacity MMBtu/hr
Boiler 1 (B01)	14.27
Boiler 2 (B02)	14.27

Boiler Natural Gas Emission Factors

Pollutant	Emission Factor [a,b,c] lb/MMBtu
PM [d]	0.0074
SO_2	0.0006
CO	0.0819
NO_X	0.0360
VOC	0.0054
CO_2e	
CO_2	117.00
CH_4	2.21E-03
N_2O	2.21E-04

[a] Emission factors are from AP-42, Table 1.4-1 and 1.4-2 for small boilers with low NO_X burners. NO_X emission factor is from SC Standard No. 5.2, Section III, Table 1.

[b] Emission factors calculated using the default natural gas heating value of 1,026 Btu/scf from 40 CFR 98.

[c] Emission factors from 40 CFR 98, Subpart C, Tables C-1 and C-2. Factors were converted to lb/MMBtu.

[d] PM_{10} and $PM_{2.5}$ are assumed to be equal to PM for natural gas combustion.

Boilers Non-HAP Unrestricted Potential Emissions

Pollutant	Emission Rates [e]					
	B01		B02		Total	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
$PM/PM_{10}/PM_{2.5}$	0.11	0.46	0.11	0.46	0.21	0.93
SO_2	0.01	0.04	0.01	0.04	0.02	0.07
CO	1.17	5.12	1.17	5.12	2.34	10.23
NO_X	0.51	2.25	0.51	2.25	1.03	4.50
VOC	0.08	0.34	0.08	0.34	0.15	0.67
CO_2e	1,671	7,320	1,671	7320.19	3,342.55	14,640
CO_2	1,670	7,313	1670	7312.64	3,339.10	14,625
CH_4	0.03	0.14	0.03	0.14	0.06	0.28
N_2O	0.003	0.01	0.00	0.01	0.01	0.03

[e] Hours of operation for unrestricted emission calculations are 8,760.

Boilers HAP/TAP Unrestricted Potential Emissions

Pollutant	Emission Factor [a] lb/MMscf	Boilers Total lb/hr	Boilers Total tpy
2-Methylnaphthalene	2.4E-05	6.7E-07	2.9E-06
3-Methylchloranthrene	1.8E-06	5.0E-08	2.2E-07
7,12-Dimethylbenz(a)anthracene	1.6E-05	4.5E-07	1.9E-06
Acenaphthene	1.8E-06	5.0E-08	2.2E-07
Acenaphthylene	1.8E-06	5.0E-08	2.2E-07
Anthracene	2.4E-06	6.7E-08	2.9E-07
Benz(a)anthracene	1.8E-06	5.0E-08	2.2E-07
Benzene	2.1E-03	5.8E-05	2.6E-04
Benzo(a)pyrene	1.2E-06	3.3E-08	1.5E-07
Benzo(b)fluoranthene	1.8E-06	5.0E-08	2.2E-07
Benzo(g,h,i)perylene	1.2E-06	3.3E-08	1.5E-07
Benzo(k)fluoranthene	1.8E-06	5.0E-08	2.2E-07
Chrysene	1.8E-06	5.0E-08	2.2E-07
Dibenzo(a,h)anthracene	1.2E-06	3.3E-08	1.5E-07
Dichlorobenzene	1.2E-03	3.3E-05	1.5E-04
Fluoranthene	3.0E-06	8.3E-08	3.7E-07
Fluorene	2.8E-06	7.8E-08	3.4E-07
Formaldehyde	7.5E-02	2.1E-03	9.1E-03
Hexane	1.8E+00	5.0E-02	2.2E-01
Indeno(1,2,3-cd)pyrene	1.8E-06	5.0E-08	2.2E-07
Naphthalene	6.1E-04	1.7E-05	7.4E-05
Phenanathrene	1.7E-05	4.7E-07	2.1E-06
Pyrene	5.0E-06	1.4E-07	6.1E-07
Toluene	3.4E-03	9.5E-05	4.1E-04
Arsenic	2.0E-04	5.6E-06	2.4E-05
Beryllium	1.2E-05	3.3E-07	1.5E-06
Cadmium	1.1E-03	3.1E-05	1.3E-04
Chromium	1.4E-03	3.9E-05	1.7E-04
Cobalt	8.4E-05	2.3E-06	1.0E-05
Lead	5.0E-04	1.4E-05	6.1E-05
Manganese	3.8E-04	1.1E-05	4.6E-05
Mercury	2.6E-04	7.2E-06	3.2E-05
Nickel	2.1E-03	5.8E-05	2.6E-04
Selenium	2.4E-05	6.7E-07	2.9E-06

[a] Emission factors are from AP-42, Table 1.4-2, 1.4-3, and 1.4-4.

Air Supply and Rooftop Units - Natural Gas Emission Factors

Hours of Operation [g] 8,760 hrs

Pollutant	NG Emission Factors [a,b,e] (lb/MMBtu)
$PM/PM_{10}/PM_{2.5}$	0.0074
SO_2	0.0006
ASU-Durr (low-NO_X) [c]	0.0073
Other ASU (NO_X) [c]	0.0971
RTU-NO_X [d]	0.0110
CO	0.0819
VOC	0.0054
CO_2e [f]	
CO_2	117.00
CH_4	2.21E-03
N_2O	2.21E-04

[a] PM, SO_2, and VOC natural gas emission factors are from AP-42, Table 1.4-2, 07/98.
[b] CO natural gas emission factor is from AP-42, Table 1.4-1, 07/98, Small Boilers.
[c] The ASU-Durr Low NO_X emission factor (for units routed to Dry X) is based on vendor-specific data stating a maximum NO_X concentration of 6 ppm. The Other ASU (NO_X) emission factor is based on vendor-specific data stating a maximum NO_X concentration of 80 ppm.
[d] RTU Burners meet the Low NO_X requirements of California Air Resources Board (CARB) Rule 1146.1, Table 1146.1-1, Units Fired on Natural Gas.
[e] The heating value of natural gas is assumed to be 1,026 Btu/scf.
[f] Emission factors from 40 CFR 98, Subpart C, Tables C-1 and C-2. Factors were converted to lb/MMBtu.

Air Supply Units Non-HAP Emissions

			Emission Rates [g]																	
		Rated Capacity	$PM/PM_{10}/PM_{2.5}$		SO_2		NO_X		CO		VOC		CO_2		CH_4		N_2O		CO_2e	
Description	Equipment	(MMBtu/hr)	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
ASU Primer/BC/CC	ASU P/BC/CC	6.49	Routed to Dry X. See Dry X PM Emissions Table.		0.004	0.017	0.05	0.207	0.531	2.327	0.035	0.152	759.31	3,326	0.014	0.063	0.001	0.006	760.10	3,329
ASU 2.1 Shop + Open WD	ASU 2.1	10.00	0.07	0.32	0.006	0.026	0.97	4.25	0.82	3.59	0.05	0.23	1,169.97	5,124	0.022	0.097	0.002	0.010	1,171.18	5,130
ASU 3 - UBP + Repair	ASU 3	7.44	0.06	0.24	0.004	0.019	0.72	3.17	0.61	2.67	0.04	0.17	870.46	3,813	0.016	0.072	0.002	0.007	871.36	3,817
ASU 2.2 Shop + Open WD	ASU 2.2	10.00	0.07	0.32	0.006	0.026	0.97	4.25	0.82	3.59	0.05	0.23	1,169.97	5,124	0.022	0.097	0.002	0.010	1,171.18	5,130
ASU 1 - Spot Repair	ASU 1	4.82	0.04	0.16	0.003	0.012	0.47	2.05	0.39	1.73	0.03	0.11	563.93	2,470	0.011	0.047	0.001	0.005	564.51	2,473
ASU 2.3 Shop	ASU 2.3	10.00	0.07	0.32	0.006	0.026	0.97	4.25	0.82	3.59	0.05	0.23	1,169.97	5,124	0.022	0.097	0.0022	0.010	1,171.18	5,130
ASU 4 - Wax	ASU 4	4.84	0.04	0.16	0.003	0.012	0.47	2.06	0.40	1.74	0.03	0.11	566.27	2,480	0.011	0.047	0.001	0.005	566.85	2,483
Workdecks ASU 6 (Phase 2)	ASU 6	8.54	0.06	0.28	0.005	0.022	0.83	3.63	0.70	3.06	0.05	0.20	999.16	4,376	0.019	0.082	0.002	0.008	1,000.19	4,381
Workdecks ASU 5 (Phase 2)	ASU 5	5.83	0.04	0.19	0.003	0.015	0.57	2.48	0.48	2.09	0.03	0.14	682.09	2,988	0.013	0.056	0.001	0.006	682.80	2,991
ASU Cleanroom (Phase 2)	ASU CR2	1.26	0.01	0.04	0.001	0.003	0.12	0.54	0.10	0.45	0.01	0.03	147.42	646	0.003	0.012	0.000	0.001	147.57	646
Primer Booth Air Supply Unit (Phase 3)	ASU31	7.57	Routed to Dry X. See Dry X PM Emissions Table.		0.004	0.019	0.06	0.24	0.62	2.71	0.04	0.18	885.67	3,879	0.017	0.073	0.002	0.007	886.58	3,883
BC Booth Air Supply Unit (Phase 3)	ASU32	7.68			0.004	0.020	0.06	0.24	0.63	2.75	0.04	0.18	898.54	3,936	0.017	0.074	0.002	0.007	899.47	3,940
Workdecks Air Supply Unit 1 Phase 3	ASU33	4.96	0.04	0.16	0.003	0.013	0.48	2.11	0.41	1.78	0.03	0.12	580.31	2,542	0.011	0.048	0.0011	0.005	580.91	2,544
Workdecks Air Supply Unit 2 Phase 3	ASU34	2.56	0.02	0.08	0.001	0.007	0.25	1.09	0.21	0.92	0.01	0.06	299.51	1,312	0.006	0.025	0.001	0.002	299.82	1,313
Workdecks Air Supply Unit 3 Phase 3	ASU35	8.05	0.06	0.26	0.005	0.021	0.78	3.42	0.66	2.89	0.04	0.19	941.83	4,125	0.018	0.078	0.002	0.008	942.80	4,129
Shop Ventilation Air Supply Unit Phase 3	ASU36	3.07	0.02	0.10	0.002	0.008	0.30	1.31	0.25	1.10	0.02	0.07	359.18	1,573	0.007	0.030	0.001	0.003	359.55	1,575
Social Rooms Air Supply Unit Phase 3	ASU37	1.53	0.01	0.05	0.001	0.004	0.15	0.65	0.13	0.55	0.01	0.04	179.01	784	0.003	0.015	0.000	0.001	179.19	785
ASU Total		**104.64**	**0.61**	**2.69**	**0.06**	**0.27**	**8.21**	**35.96**	**8.57**	**37.52**	**0.56**	**2.46**	**12,243**	**53,623**	**0.23**	**1.01**	**0.02**	**0.10**	**12,255**	**53,678**

[g] Hours of operation for unrestricted emission calculations are 8,760.

Rooftop Units Non-HAP Emissions

Description	Equipment	Rated Capacity (MMBtu/hr)	Emission Rates [g] PM/PM$_{10}$/PM$_{2.5}$ lb/hr	PM/PM$_{10}$/PM$_{2.5}$ tpy	SO_2 lb/hr	SO_2 tpy	NO_X lb/hr	NO_X tpy	CO lb/hr	CO tpy	VOC lb/hr	VOC tpy	CO_2 lb/hr	CO_2 tpy	CH_4 lb/hr	CH_4 tpy	N_2O lb/hr	N_2O tpy	CO_2e lb/hr	CO_2e tpy
Assembly - Rooftop Unit 1	AS-RTU01	0.80	5.93E-03	2.60E-02	4.68E-04	2.05E-03	8.80E-03	3.85E-02	6.55E-02	2.87E-01	4.29E-03	1.88E-02	93.60	410	1.76E-03	7.73E-03	1.76E-04	7.73E-04	93.69	410
Assembly - Rooftop Unit 4	AS-RTU04	0.80	5.93E-03	2.60E-02	4.68E-04	2.05E-03	8.80E-03	3.85E-02	6.55E-02	2.87E-01	4.29E-03	1.88E-02	93.60	410	1.76E-03	7.73E-03	1.76E-04	7.73E-04	93.69	410
Assembly - Rooftop Unit 6	AS-RTU06	0.80	5.93E-03	2.60E-02	4.68E-04	2.05E-03	8.80E-03	3.85E-02	6.55E-02	2.87E-01	4.29E-03	1.88E-02	93.60	410	1.76E-03	7.73E-03	1.76E-04	7.73E-04	93.69	410
Assembly - Rooftop Unit 8	AS-RTU08	0.80	5.93E-03	2.60E-02	4.68E-04	2.05E-03	8.80E-03	3.85E-02	6.55E-02	2.87E-01	4.29E-03	1.88E-02	93.60	410	1.76E-03	7.73E-03	1.76E-04	7.73E-04	93.69	410
Assembly - Rooftop Unit 10	AS-RTU10	0.80	5.93E-03	2.60E-02	4.68E-04	2.05E-03	8.80E-03	3.85E-02	6.55E-02	2.87E-01	4.29E-03	1.88E-02	93.60	410	1.76E-03	7.73E-03	1.76E-04	7.73E-04	93.69	410
Assembly - Rooftop Unit 11	AS-RTU11	0.80	5.93E-03	2.60E-02	4.68E-04	2.05E-03	8.80E-03	3.85E-02	6.55E-02	2.87E-01	4.29E-03	1.88E-02	93.60	410	1.76E-03	7.73E-03	1.76E-04	7.73E-04	93.69	410
Assembly - Rooftop Unit 13	AS-RTU13	0.80	5.93E-03	2.60E-02	4.68E-04	2.05E-03	8.80E-03	3.85E-02	6.55E-02	2.87E-01	4.29E-03	1.88E-02	93.60	410	1.76E-03	7.73E-03	1.76E-04	7.73E-04	93.69	410
Body Shop - Rooftop Unit 1	BS-RTU01	0.80	5.93E-03	2.60E-02	4.68E-04	2.05E-03	8.80E-03	3.85E-02	6.55E-02	2.87E-01	4.29E-03	1.88E-02	93.60	410	1.76E-03	7.73E-03	1.76E-04	7.73E-04	93.69	410
Body Shop - Rooftop Unit 2	BS-RTU02	0.80	5.93E-03	2.60E-02	4.68E-04	2.05E-03	8.80E-03	3.85E-02	6.55E-02	2.87E-01	4.29E-03	1.88E-02	93.60	410	1.76E-03	7.73E-03	1.76E-04	7.73E-04	93.69	410
Body Shop - Rooftop Unit 4	BS-RTU04	0.80	5.93E-03	2.60E-02	4.68E-04	2.05E-03	8.80E-03	3.85E-02	6.55E-02	2.87E-01	4.29E-03	1.88E-02	93.60	410	1.76E-03	7.73E-03	1.76E-04	7.73E-04	93.69	410
Body Shop - Rooftop Unit 5	BS-RTU05	0.80	5.93E-03	2.60E-02	4.68E-04	2.05E-03	8.80E-03	3.85E-02	6.55E-02	2.87E-01	4.29E-03	1.88E-02	93.60	410	1.76E-03	7.73E-03	1.76E-04	7.73E-04	93.69	410
Body Shop - Rooftop Unit 6	BS-RTU06	0.80	5.93E-03	2.60E-02	4.68E-04	2.05E-03	8.80E-03	3.85E-02	6.55E-02	2.87E-01	4.29E-03	1.88E-02	93.60	410	1.76E-03	7.73E-03	1.76E-04	7.73E-04	93.69	410
Body Shop - Rooftop Unit 7	BS-RTU07	0.80	5.93E-03	2.60E-02	4.68E-04	2.05E-03	8.80E-03	3.85E-02	6.55E-02	2.87E-01	4.29E-03	1.88E-02	93.60	410	1.76E-03	7.73E-03	1.76E-04	7.73E-04	93.69	410
Body Shop - Rooftop Unit 10	BS-RTU10	0.80	5.93E-03	2.60E-02	4.68E-04	2.05E-03	8.80E-03	3.85E-02	6.55E-02	2.87E-01	4.29E-03	1.88E-02	93.60	410	1.76E-03	7.73E-03	1.76E-04	7.73E-04	93.69	410
Body Shop - Rooftop Unit 17	BS-RTU17	0.80	5.93E-03	2.60E-02	4.68E-04	2.05E-03	8.80E-03	3.85E-02	6.55E-02	2.87E-01	4.29E-03	1.88E-02	93.60	410	1.76E-03	7.73E-03	1.76E-04	7.73E-04	93.69	410
Body Shop - Rooftop Unit 18	BS-RTU18	0.80	5.93E-03	2.60E-02	4.68E-04	2.05E-03	8.80E-03	3.85E-02	6.55E-02	2.87E-01	4.29E-03	1.88E-02	93.60	410	1.76E-03	7.73E-03	1.76E-04	7.73E-04	93.69	410
Body Shop - Rooftop Unit 23	BS-RTU23	0.80	5.93E-03	2.60E-02	4.68E-04	2.05E-03	8.80E-03	3.85E-02	6.55E-02	2.87E-01	4.29E-03	1.88E-02	93.60	410	1.76E-03	7.73E-03	1.76E-04	7.73E-04	93.69	410
Body Shop - Rooftop Unit 25	BS-RTU25	0.80	5.93E-03	2.60E-02	4.68E-04	2.05E-03	8.80E-03	3.85E-02	6.55E-02	2.87E-01	4.29E-03	1.88E-02	93.60	410	1.76E-03	7.73E-03	1.76E-04	7.73E-04	93.69	410
Body Shop - Rooftop Unit 26	BS-RTU26	0.80	5.93E-03	2.60E-02	4.68E-04	2.05E-03	8.80E-03	3.85E-02	6.55E-02	2.87E-01	4.29E-03	1.88E-02	93.60	410	1.76E-03	7.73E-03	1.76E-04	7.73E-04	93.69	410
Body Shop - Rooftop Unit 30	BS-RTU30	0.80	5.93E-03	2.60E-02	4.68E-04	2.05E-03	8.80E-03	3.85E-02	6.55E-02	2.87E-01	4.29E-03	1.88E-02	93.60	410	1.76E-03	7.73E-03	1.76E-04	7.73E-04	93.69	410
Body Shop - Rooftop Unit 32	BS-RTU32	0.80	5.93E-03	2.60E-02	4.68E-04	2.05E-03	8.80E-03	3.85E-02	6.55E-02	2.87E-01	4.29E-03	1.88E-02	93.60	410	1.76E-03	7.73E-03	1.76E-04	7.73E-04	93.69	410
Body Shop - Rooftop Unit 33	BS-RTU33	0.80	5.93E-03	2.60E-02	4.68E-04	2.05E-03	8.80E-03	3.85E-02	6.55E-02	2.87E-01	4.29E-03	1.88E-02	93.60	410	1.76E-03	7.73E-03	1.76E-04	7.73E-04	93.69	410
Body Shop - Rooftop Unit 35	BS-RTU35	0.80	5.93E-03	2.60E-02	4.68E-04	2.05E-03	8.80E-03	3.85E-02	6.55E-02	2.87E-01	4.29E-03	1.88E-02	93.60	410	1.76E-03	7.73E-03	1.76E-04	7.73E-04	93.69	410
RTU Total		18.40	1.36E-01	5.97E-01	1.08E-02	4.71E-02	2.02E-01	8.87E-01	1.51E+00	6.60E+00	9.86E-02	4.32E-01	2,152.75	9,429	4.06E-02	1.78E-01	4.06E-03	1.78E-02	2,154.97	9,439
ASU + RTU Total		**123.04**	**7.50E-01**	**3.29E+00**	**7.20E-02**	**3.15E-01**	**8.41E+00**	**3.68E+01**	**1.01E+01**	**4.41E+01**	**6.60E-01**	**2.89E+00**	**14,395**	**63,052**	**2.71E-01**	**1.19E+00**	**2.71E-02**	**1.19E-01**	**14,410**	**63,117**

[g] Hours of operation for unrestricted emission calculations are 8,760.

Hours of Operation [a]	8,760	hrs
Total Rated Capacity	123.04	MMBtu/hr

Air Supply and Rooftop Units HAP/TAP Emissions

Pollutants	NG Emission Factor [a] lb/10[6] scf	HAP/TAP lb/hr	HAP/TAP tpy
2-Methylnaphthalene	2.40E-05	2.88E-06	1.26E-05
3-Methylchloranthrene	1.80E-06	2.16E-07	9.45E-07
7,12-Dimethylbenz(a)anthracene	1.60E-05	1.92E-06	8.40E-06
Acenaphthene	1.80E-06	2.16E-07	9.45E-07
Acenaphthylene	1.80E-06	2.16E-07	9.45E-07
Anthracene	2.40E-06	2.88E-07	1.26E-06
Benz(a)anthracene	1.80E-06	2.16E-07	9.45E-07
Benzene	2.10E-03	2.52E-04	1.10E-03
Benzo(a)pyrene	1.20E-06	1.44E-07	6.30E-07
Benzo(b)fluoranthene	1.80E-06	2.16E-07	9.45E-07
Benzo(g,h,i)perylene	1.20E-06	1.44E-07	6.30E-07
Benzo(k)fluoranthene	1.80E-06	2.16E-07	9.45E-07
Chrysene	1.80E-06	2.16E-07	9.45E-07
Dibenzo(a,h)anthracene	1.20E-06	1.44E-07	6.30E-07
Dichlorobenzene	1.20E-03	1.44E-04	6.30E-04
Fluoranthene	3.00E-06	3.60E-07	1.58E-06
Fluorene	2.80E-06	3.36E-07	1.47E-06
Formaldehyde	7.50E-02	8.99E-03	3.94E-02
Hexane	1.80E+00	2.16E-01	9.45E-01
Indeno(1,2,3-cd)pyrene	1.80E-06	2.16E-07	9.45E-07
Naphthalene	6.10E-04	7.32E-05	3.20E-04
Phenanathrene	1.70E-05	2.04E-06	8.93E-06
Pyrene	5.00E-06	6.00E-07	2.63E-06
Toluene	3.40E-03	4.08E-04	1.79E-03
Arsenic	2.00E-04	2.40E-05	1.05E-04
Beryllium	1.20E-05	1.44E-06	6.30E-06
Cadmium	1.10E-03	1.32E-04	5.78E-04
Chromium	1.40E-03	1.68E-04	7.35E-04
Cobalt	8.40E-05	1.01E-05	4.41E-05
Lead	5.00E-04	6.00E-05	2.63E-04
Manganese	3.80E-04	4.56E-05	2.00E-04
Mercury	2.60E-04	3.12E-05	1.37E-04
Nickel	2.10E-03	2.52E-04	1.10E-03
Selenium	2.40E-05	2.88E-06	1.26E-05

[a] Unrestricted hours of operation (8,760 hr/yr).

[b] Natural Gas Emission Factors are from AP-42 Section 1.4, Tables 1.4-2, 1.4-3, and 1.4-4.

Coating Throughput Information

	# of Units	Notes
Paint Shop Bodies per Year	**146,000**	Based on maximum daily throughput and days of operation per year
Major Repair Equivalent Bodies per Year	**14,600**	Major repair area assumed to be equivalent to 10% of the total vehicle throughput.
Total Paint Shop Equivalent Bodies per Year	**160,600**	Major repair area assumed to be equivalent to 10% of the total vehicle throughput.
Total Parts per Year	**4,380**	Parts painted area assumed to be equivalent to 3% of the total vehicle throughput.
Assembly Bodies per Year	**164,250**	Based on maximum daily throughput and days of operation per year
Operating Hours per year	**8,760**	Based on facility operating 24 hours/day and days of operation per year.

Coating Emission Calculations

Process	Parts	Bodies		Material Data		VOC							
								Capture & Control					
	Application Rate	Split	Application Rate	Coating Density	Coating Usage	VOC In		% Lost Booth and Oven	Booth Split	ADW Capture	RTO Eff.	Oven Split	RTO Eff.
	A_1		A_2	B	C[a]	D	E=C x D	F	G	H	I	J	K
	gal/unit		gal/unit	lb/gal	gal/yr	lb/gal	tpy	%	%	%	%	%	%
E-Coat (Emulsion)[i]	2.91		2.91	8.84	480,092	0.11	25.22	0.0%	20%	0.0%	0.0%	80%	95%
E-Coat (Pigment Paste)[i]	0.78		0.78	10.59	128,684	1.27	81.63	0.0%	20%	0.0%	0.0%	80%	95%
E-Coat Total							**106.84**						
HVLP Robots Interior[i]	0.00	40%	0.73	11.684	117,096	4.24	248.31	20%	90%	90%	95%	10%	95%
Manual Cut-Ins & Underhood[i]	0.00	20%	0.36	11.684	58,548	4.24	124.15	20%	90%	90%	95%	10%	95%
ESTA Robot Exterior[i]	1.82	40%	0.73	11.684	125,080	4.24	265.24	20%	90%	90%	95%	10%	95%
Primer-Surfacer Totals	**1.82**		**1.82**				**637.70**						
UB-PVC	0.00		4.33	8.304	695,022	0.00	0.00	0.0%	100%	0.0%	0.0%	0.0%	0.0%
Seam Sealer	0.00		0.64	10.68	102,751	0.00	0.00	0.0%	100%	0.0%	0.0%	0.0%	0.0%
Sika Sealing	0.00		0.04	10.85	6,201	0.29	0.90	0.0%	100%	0.0%	0.0%	0.0%	0.0%
(SAM) Sound Deadener Adhesive	0.00		0.961	13.77	154,277	0.14	10.62	0.0%	100%	0.0%	0.0%	0.0%	0.0%
Sealers and Adhesives Totals	**5.97**		**5.97**				**11.52**						
						Total	**756.07**						

Process	VOC					$PM/PM_{10}/PM_{2.5}$								lb/GACS	
	Emissions														
	Emissions from Booth	Emissions from Oven	Controlled VOC Emissions			Weight Solids	Volume Solids	Transfer Eff.	Uncontrolled PM Emissions		Control Eff.	Controlled PM Emissions		GACS per year	lbs VOC/ GACS
	L[b]	M[c]	N[d]	O = L + M	P	Q	R	S	T[d]	U[e]	V	W[d]	X[f]	Y[g]	Z[h]
	lb/yr	lb/yr	lb/hr	lb/yr	tpy	%	%	%	lb/hr	tpy	%	lb/hr	tpy		
E-Coat (Emulsion)[i]	10,087	2,017	1.38	12,104	6.05	36.3%	32.1%	100%	0.00	0.00	0.0%	0.00	0.00	154,109	
E-Coat (Pigment Paste)[i]	32,651	6,530	4.47	39,181	19.59	47.2%	31.1%	100%	0.00	0.00	0.0%	0.00	0.00	40,059	
E-Coat Total	**42,737**	**8,547**	**5.85**	**51,285**	**25.64**				**0.00**	**0.00**		**0.00**	**0.00**	**194,169**	**0.26**
HVLP Robots Interior[i]	151,171	1,986	17.48	153,157	76.58	67%	50.9%	60%	41.74	182.83	See Dry X PM Emissions Table			35,761	
Manual Cut-Ins & Underhood[i]	75,586	993	8.74	76,579	38.29	67%	50.9%	40%	31.31	137.12				11,920	
ESTA Robot Exterior[i]	161,478	2,122	18.68	163,600	81.80	67%	50.9%	75%	27.87	122.06				47,749	
Primer-Surfacer Totals	**388,235**	**5,102**	**44.90**	**393,336**	**196.67**				**100.92**	**442.02**		**0.13**	**0.58**	**95,431**	**4.12**
UB-PVC	0.0	0.0	0.00	0.0	0.00	100%	100%	95%	32.94	144.28	98.5%	0.49	2.16	660,270	0.00
Seam Sealer	0.0	0.0	0.00	0.0	0.00	100%	100%	100%	0.00	0.00	0.0%	0.00	0.00	102,751	0.00
Sika Sealing	1,803	0.0	0.21	1,803	0.90	97%	97%	100%	0.00	0.00	0.0%	0.00	0.00	6,035	0.30
(SAM) Sound Deadener Adhesive	21,244	0.0	2.43	21,244	10.62	99%	99%	100%	0.00	0.00	0.0%	0.00	0.00	152,734	0.14
Sealers and Adhesives Totals	**23,047**	**0**	**2.63**	**23,047**	**11.52**				**32.94**	**144.28**		**0.49**	**2.16**	**921,790**	**0.03**
Total			**53.39**	**467,668**	**233.83**				**133.86**	**586.30**		**0.63**	**2.74**	**1,211,390**	

Process	Parts		Bodies	Material Data		VOC													PM/PM_{10}/$PM_{2.5}$								lb/GACS	
								Capture & Control						Emissions														
	Application Rate	Split	Application Rate	Coating Density	Coating Usage	VOC In		% Lost Booth and Oven	Booth Split	ADW Capture	RTO Eff.	Oven Split	RTO Eff.	Emissions from Booth	Emissions from Oven	Controlled VOC Emissions			Weight Solids	Volume Solids	Transfer Eff.	Uncontrolled PM Emissions		Control Eff.	Controlled PM Emissions		GACS per year	lbs VOC/ GACS
	A_1		A_2	B	C [a]	D	E=C x D	F	G	H	I	J	K	L [b]	M [c]	N [d]	O = L + M	P	Q	R	S	T [d]	U [e]	V	W [d]	X [f]	Y [g]	Z [h]
	gal/unit		gal/unit	lb/gal	gal/yr	lb/gal	tpy	%	%	%	%	%	%	lb/yr	lb/yr	lb/hr	lb/yr	tpy	%	%	%	lb/hr	tpy	%	lb/hr	tpy		
HVLP Robots Interior [i]	0.00	40%	1.32		212,131	3.84	407.2	20%	90%	90%	95%	10%	95%	247,897	3,258	28.67	251,155	125.58	62%	43.7%	60%	61.65	270.01	See Dry X PM Emissions Table			55,621	
Manual Cut-Ins & Underhood [i]	0.00	20%	0.66		106,065	3.84	203.6	20%	90%	90%	95%	10%	95%	123,949	1,629	14.34	125,577	62.79	62%	43.7%	40%	46.23	202.51				18,540	
ESTA Robot Exterior [i]	3.30	40%	1.32		226,594	3.84	435.0	20%	90%	90%	95%	10%	95%	264,799	3,480	30.63	268,279	134.14	62%	43.7%	75%	41.16	180.26				74,266	
Topcoat (Monocoat) Totals	3.30		3.30	10.26	544,791		1,045.7							636,645	8,366	73.63	645,011	322.51				149.04	652.78				148,427	4.35
													Topcoat Scenario 1	636,645	8,366	73.63	645,011	322.51									148,427	4.35
HVLP Robots Interior [i]	0.00	40%	0.94		151,037	5.94	448.4	20%	90%	90%	95%	10%	95%	272,984	3,587	31.57	276,571	138.29	37%	26.4%	60%	20.87	91.41				23,924	
Manual Cut-Ins & Underhood [i]	0.00	20%	0.47		75,519	5.94	224.2	20%	90%	90%	95%	10%	95%	136,492	1,794	15.79	138,286	69.14	37%	26.4%	40%	15.65	68.56				7,975	
ESTA Robot Exterior [i]	2.35	40%	0.94		161,335	5.94	479.0	20%	90%	90%	95%	10%	95%	291,597	3,832	33.72	295,429	147.71	37%	26.4%	75%	13.93	61.03				31,944	
Basecoat Totals	2.35		2.35	8.18	387,891		1,151.6							701,073	9,213	81.08	710,286	355.14				50.45	220.99	See Dry X PM Emissions Table			63,843	
HVLP Robots Interior [i]	0.00	40%	1.26		202,967	4.13	419.2	20%	90%	90%	95%	10%	95%	255,224	3,354	29.52	258,578	129.29	50%	42.0%	60%	38.67	169.38				51,148	
Manual Cut-Ins & Underhood [i]	0.00	20%	0.63		101,483	4.13	209.6	20%	90%	90%	95%	10%	95%	127,612	1,677	14.76	129,289	64.64	50%	42.0%	40%	29.00	127.04				17,049	
ESTA Robot Exterior [i]	3.16	40%	1.26		216,805	4.13	447.8	20%	90%	90%	95%	10%	95%	272,625	3,582	31.53	276,208	138.10	50%	42.0%	75%	25.82	113.08				68,294	
Clearcoat Totals	3.16		3.16	8.35	521,256		1,076.6							655,461	8,613	75.81	664,074	332.04				93.49	409.50				136,491	
													Topcoat Scenario 2	1,356,534	17,826	156.89	1,374,360	687.18									200,334	6.86
(Maximum Scenario 1 or 2) Total							2,228.21									156.89	1,374,360	687.18				149.04	652.78		0.27	1.19	200,334	6.86
Spot Repair - Topcoat [j]	0.00		0.03	10.26	663	3.84	1.27	0.0%	100%	0.0%	0.0%	0%	0.0%	2,545	0.00	0.29	2,545	1.27	62%	43.7%	40%	0.29	1.27	98.5%	0.004	0.019	115.88	
Spot Repair - Basecoat [j]	0.00		0.02	8.18	472	5.94	1.40	0.0%	100%	0.0%	0.0%	0%	0.0%	2,802	0.00	0.32	2,802	1.40	37%	26.4%	40%	0.10	0.43	98.5%	0.001	0.006	49.84	
Spot Repair - Clearcoat [j]	0.00		0.03	8.35	634	4.13	1.31	0.0%	100%	0.0%	0.0%	0%	0.0%	2,620	0.00	0.30	2,620	1.31	50%	42.0%	40%	0.18	0.79	98.5%	0.003	0.012	106.56	
Worst Case Spot Repair [k]							2.71							5,423	0.00	0.62	5,423	2.71				0.289	1.266		0.004	0.019	156.40	
Assembly Spot Repair - Topcoat [j]	0.00		0.10	10.26	1,644	3.84	3.16	0.0%	100%	0.0%	0.0%	0%	0.0%	6,311	0.00	0.72	6,311	3.16	62%	43.7%	40%	0.72	3.14	98.5%	0.011	0.047	287.37	
Assembly Spot Repair - Basecoat [j]	0.00		0.07	8.18	1,171	5.94	3.48	0.0%	100%	0.0%	0.0%	0%	0.0%	6,950	0.00	0.79	6,950	3.48	37%	26.4%	40%	0.24	1.06	98.5%	0.004	0.016	123.61	
Assembly Spot Repair - Clearcoat [j]	0.00		0.10	8.35	1,573	4.13	3.25	0.0%	100%	0.0%	0.0%	0%	0.0%	6,498	0.00	0.74	6,498	3.25	50%	42.0%	40%	0.45	1.97	98.5%	0.007	0.030	264.26	
Worst Case Assembly Repair [k]							6.72							13,448	0.00	1.54	13,448	6.72				0.717	3.139		0.011	0.047	387.87	
Cavity Wax	0.00		0.72	9.83	115,249	1.67	96.31	20%	100%	90.0%	95%	0%	0.0%	60,865	0.00	6.95	192,610	30.43	85%	74.0%	96%	4.40	19.26	98.5%	0.066	0.289	81,873	
Worst Case Repair and Cavity Wax Totals							105.74							79,736	0.00	9.10	211,481	39.87				5.40	23.67		0.08	0.35	82,417	
Coating Total (tpy)							3,090.02									219.38	2,053,508	960.88				288.30	1,262.74		0.98	4.29	1,494,141	

[a] Coating usage is calculated as follows: C = (A_1 * total parts per year) + (A_2 * total bodies per year)
[b] VOC emissions from the booth are calculated as follows: L = C *D * (F + (1-F) * G * (H * (1 - I) + (1-H))
[c] VOC emissions from the oven are calculated as follows: M = C * D * (1 - F) * (J * (1 - K))
[d] Hourly emissions are calculated by dividing the annual emissions in tons/yr by the operating hours/yr, and multiplying by 2000 lb/ton.
[e] Annual Uncontrolled PM emissions are calculated as follows: U = (B * Q * C / 2000) * (1 - S)
[f] Annual Controlled PM emissions are calculated as follows: X = (B * Q * C / 2000) * (1 - V) * (1 - S)
[g] GACS per year is calculated as follows: Y = C * R * S
[h] Lb VOC/GACS is calculated as follows: Z = O / Y
[i] A safety factor of 10% was added to the VOC content of the material.
[j] Spot repair application rates are assumed to be equal to 1% of the application rate of the corresponding coating for a full vehicle body for every eighth vehicle. Assembly repair rates are assumed to be equal to 3.1% of the application rate of the corresponding coating for a full vehicle body for every tenth vehicle.
[k] Worst case spot repair and assembly repair for VOC emissions comes from basecoat and clearcoat application. Worst case spot repair and assembly repair for PM emissions comes from topcoat (monocoat) application.

gal/year = gal/unit x units/year
Before Controls (tpy) = gal/year x voc lbs/gal
After Controls (tpy) = Before Controls (tpy) x (1-(capture x destruction efficiency))
gacs/year = gal/year x volume solids x te
lbs voc/gacs =(lbs voc/year) / (gacs/year)

tpy = tons/year
te = (paint solids) transfer efficiency
cap -capture efficiency
gacs - gallon applied coating solids

Paint Shop Coating HAP Emissions - Excluding E-Coat Spot Repair

Total VOC Entering Process [a] (lb/yr)	Solids Application [a] (GACS/yr)	Controlled VOC Emissions [a] (lb/yr)	Lbs HAP per GACS [b]	Uncont. HAP Emissions (lb/yr)	Annual Rate, Uncont. HAP [c] (tpy)	Controlled HAP Emissions (lb/yr)	Annual Rate, HAP Out [c] (tpy)
6,180,043	1,494,141	2,053,508	0.50	2,248,313	1,124.16	747,071	373.54

[a] Calculated in Paint Shop Coating Tab.

[b] Combined HAP emission limit for Paint Shop Primecoat (E-coat), Guidecoat, Topcoat, and Purge Solvent Operations per 40 CFR 63 Subpart IIII because emissions are routed to a control device with greater than a 95% destruction efficiency.

[c] Potential hours are based on operation 24 hrs/day, 365 days/yr.

Underbody Coating VOC Emissions

Area/Process	Material Usage per Vehicle [a] (gal/veh)	Material Density [b] (lb/gal)	Material VOC Content [b] %	Application Area Emissions [d] %	Oven Emissions [d] %	Oven RTO Control Efficiency %	Maximum Annual Production Phase 1 (veh/yr)	Maximum Annual Production Phase 2 (veh/yr)	Maximum Annual Production Phase 3 (veh/yr)	Application Area VOC Emission Rates Phase 1 (tpy)	Application Area VOC Emission Rates Phase 2 (tpy)	Application Area VOC Emission Rates Phase 3 (tpy)	Oven VOC Emission Rates Phase 1 (tpy)	Oven VOC Emission Rates Phase 2 (tpy)	Oven VOC Emission Rates Phase 3 (tpy)	Total Uncontrolled VOC Emission Rates Phase 1 (tpy)	Total Uncontrolled VOC Emission Rates Phase 2 (tpy)	Total Uncontrolled VOC Emission Rates Phase 3 (tpy)	Total Controlled VOC Emission Rates Phase 1 (tpy)	Total Controlled VOC Emission Rates Phase 2 (tpy)	Total Controlled VOC Emission Rates Phase 3 (tpy)
Underbody Coating	0.185	11.684	36%	40%	60%	95%	50,544	74,880	146,000	7.93	11.75	22.90	0.59	0.88	1.72	19.82	29.36	57.25	8.52	12.63	24.62
Total										**7.93**	**11.75**	**22.90**	**0.59**	**0.88**	**1.72**	**19.82**	**29.36**	**57.25**	**8.52**	**12.63**	**24.62**

Underbody Coating PM Emissions

Process	Material Usage per Vehicle [a] (gal/veh)	Material Density [b] (lb/gal)	Weight % Solids [b] %	Transfer Efficiency [c] %	Maximum Annual Production Phase 1 (veh/yr)	Maximum Annual Production Phase 2 (veh/yr)	Maximum Annual Production Phase 3 (veh/yr)	Filter Efficiency (%)	Uncontrolled $PM/PM_{10}/PM_{2.5}$ Emissions Phase 1 (tpy)	Uncontrolled $PM/PM_{10}/PM_{2.5}$ Emissions Phase 2 (tpy)	Uncontrolled $PM/PM_{10}/PM_{2.5}$ Emissions Phase 3 (tpy)	Controlled $PM/PM_{10}/PM_{2.5}$ Emissions[4] Phase 1 (tpy)	Controlled $PM/PM_{10}/PM_{2.5}$ Emissions[4] Phase 2 (tpy)	Controlled $PM/PM_{10}/PM_{2.5}$ Emissions[4] Phase 3 (tpy)
Underbody Coating	0.185	11.684	67%	50%	50,544	74,880	146,000	98.5%	18.24	27.03	52.69	0.27	0.41	0.79
Total									**18.24**	**27.03**	**52.69**	**0.27**	**0.41**	**0.79**

[a] Material usage per vehicle estimate was provided by Mercedes on 2/4/2017 as 0.7 L/vehicle. Value was convetered to gallons per vehicle using a conversion factor of 0.264172 gal/L.
[b] Based on BASF Primer UniBloc Solventborne primer.
[c] Transfer efficiency is assumed based on industry knowledge of underbody coating.
[d] BASF provided the application area/oven emission breakdown to Mercedes which was relayed on 1/4/2017 to Trinity Consultants as 37.5% of VOC emitted during application, and 62.5% emitted in the oven. Mercedes conservatively estimates that 40% is emitted during application.
[e] Annual operating hours assumed to be 8,760 hours per year.

Underbody Coating HAP/TAP Emissions

Material Usage per vehicle [a]	Material Density [b]	Application Area Emissions [c]	Oven Emissions [c]	Oven RTO Control Efficiency	Maximum Annual Production		
					Phase 1	Phase 2	Phase 3
(gal/veh)	(lb/gal)	%	%	%	(veh/yr)	(veh/yr)	(veh/yr)
0.185	11.684	40%	60%	95%	50,544	74,880	146,000

Underbody Coating HAP/TAP Emissions

Pollutant	CAS Number	Emission Factor [d] (%)	HAP? (Y/N)	TAP? (Y/N)	Application Area HAP Emissions (tpy)			Controlled Oven HAP Emissions (tpy)			Controlled HAP Emissions (tpy)		
					Phase 1	Phase 2	Phase 3	Phase 1	Phase 2	Phase 3	Phase 1	Phase 2	Phase 3
Naphtha	64742956	10%	N	N	-	-	-	-	-	-	-	-	-
Xylene	1330207	7%	Y	Y	1.53	2.26	4.42	0.11	0.17	0.33	1.64	2.43	4.75
1,2,4-trimethylbenzene	95636	5%	N	N	-	-	-	-	-	-	-	-	-
n-Butylacetate	123864	5%	N	N	-	-	-	-	-	-	-	-	-
2-Butoxyethyl Acetate	112072	3%	Y	N	0.66	0.97	1.89	0.05	0.07	0.14	0.70	1.04	2.03
n-Butanol	71363	2.5%	N	N	-	-	-	-	-	-	-	-	-
Mesitylene	108678	2%	N	N	-	-	-	-	-	-	-	-	-
n-Propylbenzene	103651	2%	N	N	-	-	-	-	-	-	-	-	-
Ethyl Benzene	100414	2%	Y	Y	0.44	0.65	1.26	0.03	0.05	0.09	0.47	0.70	1.36
Isopropylbenzene (Cumene)	98828	1%	Y	Y	0.22	0.32	0.63	0.02	0.02	0.05	0.23	0.35	0.68
Cyclohexane	110827	0.3%	N	N	-	-	-	-	-	-	-	-	-
Total Underbody Coating HAP Emissions					**2.84**	**4.21**	**8.20**	**0.21**	**0.32**	**0.62**	**3.05**	**4.52**	**8.82**

[a] Material usage per vehicle estimate was provided by Mercedes on 2/4/2017 as 0.7 L/vehicle. Value was convetered to gallons per vehicle using a conversion factor of 0.264172 gal/L.
[b] Based on BASF Primer UniBloc Solventborne primer.
[c] BASF provided the application area/oven emission breakdown to Mercedes which was relayed on 1/4/2017 to Trinity Consultants as 37.5% of VOC emitted during application, and 62.5% emitted in the oven. Mercedes conservatively estimates that 40% is emitted during application.
[d] Emission factors are from Section 3 Composition/Information on Ingredients on BASF UniBloc MB7746 silvergrey SDS (Revised 02/23/2015). HAP/TAP emissions assume that the maximum amount of each component is emitted.

E-Coat Spot Repair VOC Emissions

Area/Process	Material Usage per Vehicle[a] (gal/veh)	Material Density[b] (lb/gal)	Material VOC Content[b] (lb/gal)	Application Area Emissions %	Maximum Annual Production			Application Area VOC Emission Rates		
					Phase 1 (veh/yr)	Phase 2 (veh/yr)	Phase 3 (veh/yr)	Phase 1 (tpy)	Phase 2 (tpy)	Phase 3 (tpy)
E-Coat Spot Repair	3.71E-04	11.684	6.00	100%	50,544	74,880	146,000	0.66	0.08	0.16
Total								**0.66**	**0.08**	**0.16**

E-Coat Spot Repair PM Emissions

Process	Material Usage per Vehicle[a] (gal/veh)	Material Density[b] (lb/gal)	Weight % Solids[b] %	Volume % Solids %	Transfer Efficiency[c] %	Maximum Annual Production			Uncontrolled $PM/PM_{10}/PM_{2.5}$ Emissions			GACS per Year		
						Phase 1 (veh/yr)	Phase 2 (veh/yr)	Phase 3 (veh/yr)	Phase 1 (tpy)	Phase 2 (tpy)	Phase 3 (tpy)	Phase 1 (tpy)	Phase 2 (tpy)	Phase 3 (tpy)
E-Coat Spot Repair	3.71E-04	11.684	67%	50.9%	40%	50,544	74,880	146,000	0.04	0.07	0.13	3.81	5.65	11.02
Total									**0.04**	**0.07**	**0.13**	**3.81**	**5.65**	**11.02**

[a] The material usage per vehicle was provided by Jae Park (Plant Engineer) via e-mail on 1/30/2017. The material usage per vehicle includes a 10% safety factor.

[b] Material density, VOC and solids content are based on BASF Primer UniBloc Solventborne primer.

[c] Transfer efficiency is assumed based on industry knowledge.

[d] Annual operating hours is assumed to be 8,760 hours per year.

Paint Shop Coating HAP Emissions - E-Coat Spot Repair HAP/TAP

Total VOC Entering Process [a] (lb/yr)	Solids Application [a] (GACS/yr)	Controlled VOC Emissions [a] (lb/yr)	Lbs HAP per GACS [b]	Uncont. HAP Emissions (lb/yr)	Annual Rate, Uncont. HAP [c] (tpy)	Controlled HAP Emissions (lb/yr)	Annual Rate, HAP Out [c] (tpy)
325	11	325	0.50	6	0.00	6	2.75E-03

[a] Calculated in Paint Shop Coating Tab.

[b] Combined HAP emission limit for Paint Shop Primecoat (E-coat), Guidecoat, Topcoat, and Purge Solvent Operations per 40 CFR 63 Subpart IIII because emissions are routed to a control device with greater than a 95% destruction efficiency.

[c] Potential hours are based on operation 24 hrs/day, 365 days/yr.

Paint Shop Adhesive Application Emissions

Welding area	Material Usage per vehicle	Uncontrolled VOC Emission Factor [a]	Hourly Production Rate	Maximum Annual production	Uncontrolled VOC Emissions [b]		
	(lb/veh)	(%)	(veh/hr)	(veh/yr)	(lb/hr)	(lb/yr)	(tpy)
Anti-flutter adhesive	6.61	1%	17	146,000	1.10	9,656.15	4.83
Structure adhesive	4.41	1%	17	146,000	0.73	6,437.43	3.22
Total					**1.84**	**16,093.58**	**8.05**

[a] From manufacturer's SDS, all body shop adhesives have >99% solids content. Mercedes-Benz Vans conservatively assumes VOC content of 1% for all adhesives.

[b] Mercedes-Benz Vans assumes that adhesive applied following the topcoat oven will be performed on an open workdeck (i.e. without control).

Paint Shop Combustion - Natural Gas Emission Factors

Hours of Operation [e] 8,760 hrs

Pollutant	NG Emission Factors [a,b,c] (lb/MMBtu)
$PM/PM_{10}/PM_{2.5}$	0.0074
SO_2	0.0006
NO_X (low-NO_X)	0.0487
NO_X	0.0975
CO	0.0819
VOC	0.0054
CO_2e [d]	
CO_2	117.00
CH_4	2.21E-03
N_2O	2.21E-04

[a] PM, SO_2, and VOC natural gas emission factors are from AP-42, Table 1.4-2, 07/98.
[b] NO_X and CO natural gas emission factors are from AP-42, Table 1.4-1, 07/98.
[c] The heating value of natural gas is assumed to be 1,026 Btu/scf.
[d] Emission factors from 40 CFR 98, Subpart C, Tables C-1 and C-2. Factors were converted to lb/MMBtu.

Paint Shop Combustion Non-HAP Emissions

			Emission Rates [e]																	
		Rated Capacity	$PM/PM_{10}/PM_{2.5}$		SO_2		NO_X		CO		VOC		CO_2		CH_4		N_2O		CO_2e	
Description	Equipment	(MMBtu/hr)	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
RTO #1 [f]	RTO1	8.00	0.06	0.26	0.005	0.020	0.78	3.42	0.65	2.87	0.04	0.19	935.98	4,100	0.018	0.077	0.002	0.008	936.95	4,104
RTO #1 (add) [f,g]	RTO1	8.00	0.06	0.26	0.005	0.020	0.78	3.42	0.65	2.87	0.04	0.19	935.98	4,100	0.018	0.077	0.002	0.008	936.95	4,104
ADW Desorption Heater #1	ADH1	3.50	0.03	0.11	0.002	0.009	0.17	0.75	0.29	1.26	0.02	0.08	409.49	1,794	0.008	0.034	0.001	0.003	409.91	1,795
ADW Desorption Heater #2	ADH2	2.13	0.02	0.07	0.001	0.005	0.10	0.45	0.17	0.76	0.01	0.05	249.20	1,092	0.005	0.021	0.000	0.002	249.46	1,093
E-Coat Oven	OV01	4.85	0.04	0.16	0.003	0.012	0.24	1.04	0.40	1.74	0.03	0.11	567.44	2,485	0.011	0.047	0.001	0.005	568.02	2,488
Primer (Guidecoat) Oven #1	OV02	4.30	0.03	0.14	0.003	0.011	0.21	0.92	0.35	1.54	0.02	0.10	503.09	2,204	0.009	0.042	0.001	0.004	503.61	2,206
Topcoat Oven #1	OV03	4.27	0.03	0.14	0.002	0.011	0.21	0.91	0.35	1.53	0.02	0.10	499.58	2,188	0.009	0.041	0.001	0.004	500.09	2,190
Primer (Guidecoat) Oven #2	OV22	5.12	0.04	0.17	0.003	0.013	0.25	1.09	0.42	1.84	0.03	0.12	599.03	2,624	0.011	0.049	0.001	0.005	599.64	2,626
Topcoat Oven #2	OV23	5.73	0.04	0.19	0.003	0.015	0.28	1.22	0.47	2.05	0.03	0.13	670.39	2,936	0.013	0.055	0.001	0.006	671.09	2,939
Total		**45.90**	**0.34**	**1.49**	**0.03**	**0.12**	**3.02**	**13.21**	**3.76**	**16.46**	**0.25**	**1.08**	**5,370.18**	**23,521**	**0.10**	**0.44**	**0.01**	**0.04**	**5,375.72**	**23,546**

[e] Annual emissions are based on paint shop hours of operation.
[f] NO_X emissions for RTOs calculated using the natural gas emission factors from AP-42, Table 1.4-1, 07/98, Small Boilers (uncontrolled). NO_X emissions from the remaining combustion units are calculated using the AP-42, Table 1.4-1 factor for small boilers (controlled - Low NOx burners).
[g] Phase II or III RTO will replace Phase I RTO (RTO #1 @ 8 MMBtu/hr), with a new unit that has 8 MMBtu/hr additional heat input, for a total of 16 MMBtu/hr. Emissions include combustion emissions from both RTO #1 and RTO #1 (add).

Hours of Operation [a]	8,760	hrs
Total Rated Capacity	45.90	MMBtu/hr

Paint Shop Combustion HAP/TAP Emissions

Pollutants	NG Emission Factor [b] $lb/10^6$ scf	HAP/TAP	
		lb/hr	tpy
2-Methylnaphthalene	2.40E-05	1.07E-06	4.70E-06
3-Methylchloranthrene	1.80E-06	8.05E-08	3.53E-07
7,12-Dimethylbenz(a)anthracene	1.60E-05	7.16E-07	3.14E-06
Acenaphthene	1.80E-06	8.05E-08	3.53E-07
Acenaphthylene	1.80E-06	8.05E-08	3.53E-07
Anthracene	2.40E-06	1.07E-07	4.70E-07
Benz(a)anthracene	1.80E-06	8.05E-08	3.53E-07
Benzene	2.10E-03	9.39E-05	4.11E-04
Benzo(a)pyrene	1.20E-06	5.37E-08	2.35E-07
Benzo(b)fluoranthene	1.80E-06	8.05E-08	3.53E-07
Benzo(g,h,i)perylene	1.20E-06	5.37E-08	2.35E-07
Benzo(k)fluoranthene	1.80E-06	8.05E-08	3.53E-07
Chrysene	1.80E-06	8.05E-08	3.53E-07
Dibenzo(a,h)anthracene	1.20E-06	5.37E-08	2.35E-07
Dichlorobenzene	1.20E-03	5.37E-05	2.35E-04
Fluoranthene	3.00E-06	1.34E-07	5.88E-07
Fluorene	2.80E-06	1.25E-07	5.49E-07
Formaldehyde	7.50E-02	3.36E-03	1.47E-02
Hexane	1.80E+00	8.05E-02	3.53E-01
Indeno(1,2,3-cd)pyrene	1.80E-06	8.05E-08	3.53E-07
Naphthalene	6.10E-04	2.73E-05	1.20E-04
Phenanathrene	1.70E-05	7.61E-07	3.33E-06
Pyrene	5.00E-06	2.24E-07	9.80E-07
Toluene	3.40E-03	1.52E-04	6.66E-04
Arsenic	2.00E-04	8.95E-06	3.92E-05
Beryllium	1.20E-05	5.37E-07	2.35E-06
Cadmium	1.10E-03	4.92E-05	2.16E-04
Chromium	1.40E-03	6.26E-05	2.74E-04
Cobalt	8.40E-05	3.76E-06	1.65E-05
Lead	5.00E-04	2.24E-05	9.80E-05
Manganese	3.80E-04	1.70E-05	7.45E-05
Mercury	2.60E-04	1.16E-05	5.09E-05
Nickel	2.10E-03	9.39E-05	4.11E-04
Selenium	2.40E-05	1.07E-06	4.70E-06

[a] Annual emissions are based on paint shop hours of operation.

[b] Natural Gas Emission Factors are from AP-42 Section 1.4, Tables 1.4-2, 1.4-3, and 1.4-4.

Controlled Particulate Emissions from Sources Routed to Dry X

Description	Exhaust Flow Rate (m^3/hr)	Hours of Operation (hr/yr)	Outlet PM Loading [a] (mg/m^3)	Percent Recycled (%)	Potential $PM/PM_{10}/PM_{2.5}$ Emissions [b] (lb/hr)	(tpy)
Primer-Surfacer	157,352	8,760	1	73%	0.09	0.41
Primer-Surfacer 2	64,721	8,760	1	73%	0.04	0.17
Basecoat/Clearcoat	324,643	8,760	1	73%	0.19	0.85
Basecoat/Clearcoat 2	133,529	8,760	1	73%	0.08	0.35

[a] Manufacturer specification for outlet of PM separation system (Dry X).

[b] All PM is assumed to be equal to PM_{10} and $PM_{2.5}$. Annual emissions are based on paint shop hours of operation.

[c] Emissions (lb/hr) = Exhaust Flow (m^3/hr) * Outlet Loading (mg/m^3) * Conversion Factor (1 lb/453,592 mg) * (1-Percent Recycled (%))

Appendix B.2.4 - Paint Shop
Mercedes-Benz Vans, LLC

Purge Solvent Emissions

Process	Usage Rate	Number of Units [a]	Hours of Operation	Annual Usage [b]	Recovery Rate	Non-Recovered Solvent	Solvent Density [c]	VOC Content [c]	HAP Content [c]	Capture & Control				Uncontrolled		Controlled			
										Percent Lost	Booth Capture	ADW Capture	Booth Control Eff.	Total VOC		Total VOC		Total HAP	
	(gal/unit)	(units/yr)	(hrs/yr)	(gal/yr)	%	(gal/yr)	(lb/gal)	(lb/gal)	(lb/gal)	%	%		%	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
Primer	0.34	160,600	8,760	55,154	65%	19,304	7.26	7.26	0.76	20%	80%	90%	95%	16.00	70.08	5.06	22.14	0.53	2.33
Basecoat	0.40	160,600	8,760	63,639	65%	22,274	7.26	7.26	0.76	20%	80%	90%	95%	18.46	80.86	5.83	25.55	0.61	2.69
Clearcoat	0.40	160,600	8,760	63,639	65%	22,274	7.26	7.26	0.76	20%	80%	90%	95%	18.46	80.86	5.83	25.55	0.61	2.69
Repair	0.11	160,600	8,760	16,970	65%	5,940	7.26	7.26	0.76	0%	100%	0%	0%	4.92	21.56	4.92	21.56	0.52	2.27
Total														**57.84**	**253.36**	**21.65**	**94.81**	**2.28**	**9.97**

[a] The number of units for primer, basecoat, and clearcoat includes major repairs sent back through the paint shop equivalent to 10% of the maximum production per year.

[b] The annual usage conservatively assumes that the lines are purged after each unit in each booth.

[c] Information provided in purge solvent SDS.

Paint Shop Phosphate Cleaner Calculation Information [a]

Supply (Inlet) Air		
Temperature	75	°F
Humidity	50	% RH
Moisture Content	0.0092	lb H_2O/lb air
Exhaust (Outlet) Air		
Temperature	63	°F
Humidity	95	% RH
Moisture Content	0.012	lb H_2O/lb air
Flow Rate	21,761	ft^3/min
Density of Air at 63 °F	0.0757	lb/ft^3
Phosphate Cleaner		
Dissolved Solids	0.5	%
Hours of Operation[b]	8,760	hr/yr
Control Efficiency [c]	55	%

[a] Reduction in PM emissions through use of mist eliminators.
[b] Paint shop annual hours of operation.
[c] Mist eliminator control efficiency.

Paint Shop Phosphate Cleaner Emissions

Phosphate Cleaner Emissions	$PM/PM_{10}/PM_{2.5}$ Uncontrolled	$PM/PM_{10}/PM_{2.5}$ Controlled
Hourly (lb/hr)	1.38	0.62
Annual (tpy)	6.06	2.73

Sample Calculation:

Uncontrolled PM Emissions = $\frac{(0.012 - 0.0092) \text{ lb } H_2O}{\text{lb air}} \left| \frac{0.5 \text{ lb solids}}{100 \text{ lb } H_2O} \right| \frac{12{,}000 \text{ ft}^3 \text{ air}}{\text{min}} \left| \frac{0.0757 \text{ lb air}}{\text{scf air}} \right| \frac{60 \text{ min}}{\text{hour}}$

Uncontrolled PM Emissions = 1.38 lb/hr

Controlled PM Emissions = $\frac{(0.76 \text{ lb PM})}{\text{hr}} \left| \frac{(100 - 55)}{100} \right.$ = 0.62 lb/hr

Paint Mix Room Emissions

Paint Shop Material Usage Rates

Process/Material	Usage (gal/yr)
E-coat	608,776
Seam Sealer	102,751
Underbody PVC	695,022
Sika Sealing	6,201
(SAM) Sound Deadener Adhesive	154,277
Primer-Surfacer	300,724
Basecoat	387,891
Clearcoat	521,256
Spot Repair	6,157
Cavity Wax	115,249
Purge Solvent	199,403
Facility Total	2,488,930

vapor (I.e. partial) pressure of toluene	0.468	psia	P_{atm}
molecular weight of toluene	92.130	lb/lb-mole	MW
atmosphereic vapor pressure	14.700	psia	$P_{toluene}$
ideal gas constant - R	10.730	ft^3-psia/lb-mole-°R	
absolute temperature	532	°R	T
vapor density = MW*n/V = MW*P/R*T	0.237	lb/ft^3	n = 1
volume of displaced toluene-saturated air	2,488,930	gallons	
volume of displaced toluene-saturated air	332,745	ft^3	vol. displaced air
volume of displaced toluene	10,594	ft^3	vol. displaced air * $P_{toluene}/P_{atm}$
vapor density = MW*n/V = MW*P/R*T	0.2373	lb/ft^3	

Paint Shop Hours of Operation	8,760	hr/yr
Total VOC Emissions	0.29	lb/hr
Total VOC Emissions	**1.26**	**tpy**

Workdecks - Insignificant Activity Emissions

Booth/Zone	Exhaust Volume (scfm) [a,b]	PM Loading ($gr/10^3$ dscf) [c]	Hours of Operation (hr/yr)	Hourly (lb/hr)	Annual (ton/yr) [c]
	Potential $PM/PM_{10}/PM_{2.5}$ Emissions				
E-coat Sand	62,978	0.1	8,760	0.05	0.24
Primer Sand	62,978	0.1	8,760	0.05	0.24
Metal/Body Repair #1	6,474	0.1	8,760	0.01	0.02
Metal/Body Repair #2	6,474	0.1	8,760	0.01	0.02
E-coat Touch-up	21,189	0.1	8,760	0.02	0.08
Primer Touch-up	21,189	0.1	8,760	0.02	0.08
Basecoat Touch-up	21,189	0.1	8,760	0.02	0.08
Inspect/Polish	84,167	0.1	8,760	0.07	0.32
Total				**0.25**	**1.08**

[a] Calculation assumes exhaust volume is on a dry basis.
[b] Exhaust volumes provided by equipment manufacturer.
[c] Estimated outlet PM loading for workdeck operations.
[d] Based on paint shop annual hours of operation: 8,760 hrs/yr

Sample Calculations (for E-Coat Sand)

$$\text{PM Emissions (lb/hr)} = \frac{62{,}978 \text{ scf}}{\text{min}} \left| \frac{0.1 \text{ grains}}{1000 \text{ dscf}} \right| \frac{60 \text{ min}}{\text{hr}} \left| \frac{1 \text{ lb}}{7000 \text{ gr.}} \right. = \mathbf{0.05 \text{ lb/hr}}$$

$$\text{PM Emissions (tons/yr)} = \frac{0.05398104 \text{ lb}}{\text{hr}} \left| \frac{8{,}760 \text{ hr}}{\text{yr}} \right| \frac{\text{ton}}{2000 \text{ lb}} = \mathbf{0.24 \text{ ton/yr}}$$

Body Shop Welding Emissions

Area/Process	Welding Material Usage per Vehicle		Material Usage per vehicle (lb/veh)	Uncontrolled PM Emission Factor [a] (lb/1000 lb)	Hourly Production Rate (veh/hr)	Maximum Annual Production (veh/yr)	Control Efficiency [b] %	Building Capture Efficiency %	Uncontrolled $PM/PM_{10}/PM_{2.5}$ Emissions [c] (lb/hr)	(lb/yr)	(tpy)	Controlled $PM/PM_{10}/PM_{2.5}$ Emission [c] (lb/hr)	(lb/yr)	(tpy)
MAG Welding	8,000	mm	0.30	20	17	146,000	95%	90%	1.00E-02	8.80E+01	4.40E-02	5.02E-04	4.40E+00	2.20E-03
Spot Welding	9,000	spots	0.34	20	17	146,000	0%	90%	1.13E-02	9.90E+01	4.95E-02	1.13E-02	9.90E+01	4.95E-02
Laser Welding	28,000	mm	1.05	20	17	146,000	0%	90%	3.52E-02	3.08E+02	1.54E-01	3.52E-02	3.08E+02	1.54E-01
Laser Soldering	9,000	mm	0.34	20	17	146,000	0%	90%	1.13E-02	9.90E+01	4.95E-02	1.13E-02	9.90E+01	4.95E-02
Total									**6.78E-02**	**5.94E+02**	**2.97E-01**	**5.83E-02**	**5.10E+02**	**2.55E-01**

[a] Average emission factor for welding and soldering at the facility is conservatively assumed to be 20 lb/1000 lb.

[b] Based on ESP control for MAG welding processes.

[c] A building capture efficiency of 90% is assumed for the body shop for both uncontrolled and controlled emissions based on building enclosure capture efficiency provided in Texas Commission on Environmental Quality, Rock Crushing Plants, Table 7, February, 2002. All welding and soldering operations are done inside the building.

Body Shop Welding HAP Emissions

Area/Process	Manganese Content %	Manganese lb/hr	Manganese tpy
MAG Welding	1.45	7.28E-06	3.19E-05
Spot Welding	0.0	0.00E+00	0.00E+00
Laser Welding	1.2	4.22E-04	1.85E-03
Laser Soldering	1.2	1.36E-04	5.94E-04
	Total	5.65E-04	2.47E-03

Welding Shield Gas CO_2 Emissions

Usage per Vehicle (kg)	Hourly Production Rate (veh/hr)	Maximum Annual Production (veh/yr)	CO_2 Content [a] %	CO_2 Emissions (lb/hr)	CO_2 Emissions (tpy)
2.00	17	146,000	15%	1.10E+01	4.83E+01

[a] Based on Mercedes-Benz Vans shield gas specification.

Body Shop Adhesive Bonding Emissions

Welding area		Material Usage per vehicle (lb/veh)	Uncontrolled VOC Emission Factor [a] (%)	Hourly Production Rate (veh/hr)	Maximum Annual production (veh/yr)	Uncontrolled VOC Emissions (lb/hr)	(lb/yr)	(tpy)	Controlled VOC Emissions [b] (lb/hr)	(lb/yr)	(tpy)
Anti-flutter adhesive		6.61	1%	17	146,000	1.10	9,656.15	4.83	0.06	482.81	0.24
Structure adhesive		4.41	1%	17	146,000	0.73	6,437.43	3.22	0.04	321.87	0.16
Total						**1.84**	**16,093.58**	**8.05**	**0.09**	**804.68**	**0.40**

[a] From manufacturer's SDS, all body shop adhesives have >99% solids content. Mercedes-Benz Vans conservatively assumes VOC content of 1% for all adhesives.

[b] Mercedes-Benz Vans assumes 95% reduction in VOC emissions when body shop adhesives volatilize in the E-Coat oven.

Sample Calculations (for MAG Welding)

Material Usage (lb/veh) = $\pi \times r^2 \times$ Weld Length (mm) $\div 10^3 \times$ Material Specific Gravity (g/cm^3) $\div$ 453.59 g/lb

Material Usage (lb/veh) = $\pi \times (0.8\ mm)^2 \times 8{,}000\ mm \div 10^3 \times (8.5\ g/cm^3) \div 453.59\ g/lb$ = **0.30** **lb/veh**

PM Emissions (lb/yr) = $\frac{0.30\ lb}{veh} \times \frac{20\ lb}{1000\ lb} \times \frac{146{,}000\ veh}{yr} \times (1\text{-}95\%) \times (1\text{-}90\%)$ = **4.401** **lb/yr**

PM Emissions (tons/yr) = $\frac{4.401\ lb}{yr} \times \frac{1\ ton}{2000\ lb}$ = **0.002** **ton/yr**

Assembly Combustion - Natural Gas Emission Factors

Hours of Operation [e] 8,760 hrs

Pollutant		NG Emission Factors [a,b,c]	Units
$PM/PM_{10}/PM_{2.5}$		0.0074	lb/MMBtu
SO_2		0.0006	lb/MMBtu
NO_X		0.097	lb/MMBtu
CO		0.082	lb/MMBtu
VOC		0.0054	lb/MMBtu
CO_2e [d]			
	CO_2	117.00	lb/MMBtu
	CH_4	2.21E-03	lb/MMBtu
	N_2O	2.21E-04	lb/MMBtu

[a] PM, SO_2, and VOC natural gas emission factors are from AP-42, Table 1.4-2, 07/98.
[b] NO_X and CO natural gas emission factors are from AP-42, Table 1.4-1, 07/98, Small Boilers (uncontrolled).
[c] The heating value of natural gas is assumed to be 1,026 Btu/scf.
[d] Emission factors from 40 CFR 98, Subpart C, Tables C-1 and C-2. Factors were converted to lb/MMBtu.

Assembly Combustion Non-HAP Emissions

			Emission Rates [e]																	
		Rated Capacity	$PM/PM_{10}/PM_{2.5}$		SO_2		NO_X		CO		VOC		CO_2		CH_4		N_2O		CO_2e	
Description	Equipment	(MMBtu/hr)	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
Assembly Oven	OV04	4.30	0.03	0.14	0.003	0.011	0.42	1.84	0.35	1.54	0.02	0.10	503.09	2,203.53	0.009	0.042	0.0009	0.004	503.61	2,205.80
Total		**4.30**	**0.03**	**0.14**	**0.003**	**0.011**	**0.42**	**1.84**	**0.35**	**1.54**	**0.02**	**0.10**	**503.09**	**2,203.53**	**0.009**	**0.042**	**0.0009**	**0.004**	**503.61**	**2,205.80**

[e] Hours of operation for unrestricted emission calculations are 8,760.

Assembly Combustion HAP/TAP Emissions

Pollutants	NG Emission Factor [a] lb/10^6 scf	Total Emissions [b] lb/hr	Total Emissions [b] tpy
2-Methylnaphthalene	2.40E-05	1.01E-07	4.41E-07
3-Methylchloranthrene	1.80E-06	7.54E-09	3.30E-08
7,12-Dimethylbenz(a)anthracene	1.60E-05	6.71E-08	2.94E-07
Acenaphthene	1.80E-06	7.54E-09	3.30E-08
Acenaphthylene	1.80E-06	7.54E-09	3.30E-08
Anthracene	2.40E-06	1.01E-08	4.41E-08
Benz(a)anthracene	1.80E-06	7.54E-09	3.30E-08
Benzene	2.10E-03	8.80E-06	3.85E-05
Benzo(a)pyrene	1.20E-06	5.03E-09	2.20E-08
Benzo(b)fluoranthene	1.80E-06	7.54E-09	3.30E-08
Benzo(g,h,i)perylene	1.20E-06	5.03E-09	2.20E-08
Benzo(k)fluoranthene	1.80E-06	7.54E-09	3.30E-08
Chrysene	1.80E-06	7.54E-09	3.30E-08
Dibenzo(a,h)anthracene	1.20E-06	5.03E-09	2.20E-08
Dichlorobenzene	1.20E-03	5.03E-06	2.20E-05
Fluoranthene	3.00E-06	1.26E-08	5.51E-08
Fluorene	2.80E-06	1.17E-08	5.14E-08
Formaldehyde	7.50E-02	3.14E-04	1.38E-03
Hexane	1.80E+00	7.54E-03	3.30E-02
Indeno(1,2,3-cd)pyrene	1.80E-06	7.54E-09	3.30E-08
Naphthalene	6.10E-04	2.56E-06	1.12E-05
Phenanathrene	1.70E-05	7.12E-08	3.12E-07
Pyrene	5.00E-06	2.10E-08	9.18E-08
Toluene	3.40E-03	1.42E-05	6.24E-05
Arsenic	2.00E-04	8.38E-07	3.67E-06
Beryllium	1.20E-05	5.03E-08	2.20E-07
Cadmium	1.10E-03	4.61E-06	2.02E-05
Chromium	1.40E-03	5.87E-06	2.57E-05
Cobalt	8.40E-05	3.52E-07	1.54E-06
Lead	5.00E-04	2.10E-06	9.18E-06
Manganese	3.80E-04	1.59E-06	6.98E-06
Mercury	2.60E-04	1.09E-06	4.77E-06
Nickel	2.10E-03	8.80E-06	3.85E-05
Selenium	2.40E-05	1.01E-07	4.41E-07

[a] Natural Gas Emission Factors are from AP-42 Section 1.4, Tables 1.4-2, 1.4-3, and 1.4-4.
[b] Hours of operation for unrestricted emission calculations are 8,760.

Hours of Operation [b]	8,760	hrs
Total Rated Capacity	4.30	MMBtu/hr

Appendix B.2.6 - Assembly Operations
Mercedes-Benz Vans, LLC

Assembly Glazing VOC Emissions

Area/Process	Material Usage per vehicle		Uncontrolled VOC Emission Factor [a]	Hourly Production Rate	Maximum Annual Production	Product Usage	Potential VOC Emissions		
	(kg/veh)	(lb/veh)	(%)	(veh/hr)	(veh/yr)	(lb/yr)	(lb/hr)	(lb/yr)	(tpy)
Primer 1	0.04	0.09	65%	19	164,250	14,595	1.08	9,486.75	4.74
Primer 2	0.08	0.19	64%	19	164,250	30,510	2.23	19,526.34	9.76
Adhesive	2.75	6.06	0%	19	164,250	995,971	0.00	0.00	0.00
Total							**3.31**	**29,013.09**	**14.51**

HAP/TAP Potential Emissions

Area/Process	Material Usage per vehicle		Constituent Chemical Name	CAS#	Uncontrolled Component Emission Factor [a]	Hourly Production Rate	Maximum Annual Production	Potential Emission Rates		
	(kg/veh)	(lb/veh)			(%)	(veh/hr)	(veh/yr)	(lb/hr)	(lb/yr)	(tpy)
Primer 1	0.04	0.09	MEK	78-93-3	60%	19	164,250	1.00	8,757.00	4.38
	0.04	0.09	MDI	101-68-8	1%	19	164,250	0.02	145.95	0.07
Primer 2	0.08	0.19	MEK	78-93-3	60%	19	164,250	2.09	18,305.94	9.15
			Acrylic acid	79-10-7	1%	19	164,250	0.03	305.10	0.15
Adhesive	2.75	6.06	N/A					0.00	0.00	0.00
Total								**3.14**	**27,513.99**	**13.76**

[a] Information provided in SDS for each material.

Appendix B.2.6 - Assembly Operations
Mercedes-Benz Vans, LLC

Assembly Under Body Wax Emissions

Area/Process	Material Usage per vehicle (lb/veh)	Uncontrolled VOC Emission Factor (%)	Hourly Production Rate (veh/hr)	Maximum Annual Production (veh/yr)	Product Usage (lb/year)	Potential VOC Emission Rates		
						(lb/hr)	(lb/yr)	(tpy)
Under body wax	1.94	0.0%	19	164,250	318,656	0.00	0.00	0.00
Total						**0.00**	**0.00**	**0.00**

Spray Deck PM Emissions

Process	Material Usage per vehicle (lb/veh)	Weight % Volatiles (%)	Weight % Solids (%)	%Transfer Efficiency (%)	Production Rates (units/hr)	Filter Efficiency (%)	Uncontrolled $PM/PM_{10}/PM_{2.5}$ Emissions			Controlled $PM/PM_{10}/PM_{2.5}$ Emissions		
							(lb/hr)	(lb/yr)	(tpy)	(lb/hr)	(lb/yr)	(tpy)
Under body wax	1.94	0.0%	100.0%	90%	19	98.0%	3.64	31,865.64	15.93	0.07	637.31	0.32
Total							**3.64**	**31,865.64**	**15.93**	**0.07**	**637.31**	**0.32**

Assembly Filling Emissions

Product	Material Usage per Vehicle (liter/veh)	True Vapor Pressure, VP (psia)	Molecular Weight (g/mol)	Vehicle Throughput (veh/hr)	Vehicle Throughput (veh/yr)	Uncontrolled VOC Emission Rates (lb/hr)	Uncontrolled VOC Emission Rates (lb/yr)	Uncontrolled VOC Emission Rates (tpy)	Controlled VOC Emission Rates [a] (lb/hr)	Controlled VOC Emission Rates [a] (lb/yr)	Controlled VOC Emission Rates [a] (tpy)
Gasoline	18.9	7.4	66	19	164,250	1.08E+00	9.49E+03	4.74E+00	5.42E-02	4.74E+02	2.37E-01
Diesel fuel	18.9	0.01	130	19	164,250	2.88E-03	2.53E+01	1.26E-02	2.88E-03	2.53E+01	1.26E-02
Brake fluid	1.2	0.02	75	19	164,250	2.13E-04	1.86E+00	9.32E-04	2.13E-04	1.86E+00	9.32E-04
Antifreeze	9.0	0.02	62	19	164,250	1.31E-03	1.15E+01	5.73E-03	1.31E-03	1.15E+01	5.73E-03
Windshield Cleaner [b]	4.0	0.77	28.14	19	164,250	1.02E-02	8.89E+01	4.45E-02	1.02E-02	8.89E+01	4.45E-02
Differential Gear Oil	0.5	0.02	75	19	164,250	8.79E-05	7.70E-01	3.85E-04	8.79E-05	7.70E-01	3.85E-04
Auto Transmission Fluid	0.7	0.02	150	19	164,250	2.40E-04	2.10E+00	1.05E-03	2.40E-04	2.10E+00	1.05E-03
Power Steering Fluid	0.8	0.02	76	19	164,250	1.42E-04	1.24E+00	6.20E-04	1.42E-04	1.24E+00	6.20E-04
Total						**1.10E+00**	**9.62E+03**	**4.81E+00**	**6.92E-02**	**6.06E+02**	**3.03E-01**

[a] Assumes 95% control from onboard refueling vapor recovery (ORVR) for gasoline.

[b] From windshield cleaner MSDS, material contains 23% volatiles (methanol and ethylene glycol). VOC emissions calculated based on vapor pressure provided in the MSDS and molecular weight calculated as the weighted average of 23% ethylene glycol and 77% water.

HAP/TAP Emissions from Assembly Filling

Pollutant	Material Usage per Vehicle (liter/veh)	Component Emission Factor [a] (liter/veh)	True Vapor Pressure, VP (psia)	Molecular Weight (g/mol)	Vehicle Throughput (veh/hr)	Vehicle Throughput (veh/yr)	Uncontrolled HAP/TAP Emission Rates (lb/hr)	Uncontrolled HAP/TAP Emission Rates (lb/yr)	Uncontrolled HAP/TAP Emission Rates (tpy)	Controlled HAP/TAP Emission Rates (lb/hr)	Controlled HAP/TAP Emission Rates (lb/yr)	Controlled HAP/TAP Emission Rates (tpy)
Windshield Cleaner	4.0											
Methanol		1.12	1.888	32.04	19	164,250	7.92E-03	6.94E+01	3.47E-02	7.92E-03	6.94E+01	3.47E-02
Ethylene Glycol		0.80	0.0725	62.07	19	164,250	4.19E-04	3.67E+00	1.84E-03	4.19E-04	3.67E+00	1.84E-03
Total							**8.34E-03**	**7.30E+01**	**3.65E-02**	**8.34E-03**	**7.30E+01**	**3.65E-02**

[a] From windshield cleaner MSDS, material is 23% volatile by mass. Windshield cleaner fluid was conservatively assumed to contain 23% methanol and 23% ethylene glycol.

Assembly Roll and Brake Testing Capacities

Hourly Production Rate	19	units/hr
Annual Production Rate	164,250	units/yr
Simulated Distance	3.0	miles/unit
Hours of Operation [a]	8,760	hr/yr

[a] Potential operating hours are based on operation 24 hours/day, 365 days/yr.

Assembly Roll and Brake Testing Emission Factors

Pollutant	Diesel g/mile [a]	Gasoline g/mile	Worst Case Fuel g/mile
PM	0.08	0.0	0.08
NO_X	0.3	0.3	0.3
CO	4.2	4.2	4.2
VOC	0.09	0.09	0.09
Formaldehyde	0.018	0.018	0.018
CO_2e [b,c]			
CO_2 [b]	417	417	417
CH_4 [d]	0.73	0.73	0.73
N_2O [d]	0.01	0.01	0.01

[a] Emission rates are based on 40 CFR 88 Subpart A Table A Table A104-2—Full Useful Life Standards (g/mi) for Light-Duty Vehicles, diesel vehicles.

[b] The CO_2 emission factor is from "Light-Duty Automotive Technology, Carbon Dioxide Emissions, and Fuel Economy Trends: 1975 Through 2010"

[c] When accounting for global warming potential, CO_2 is 95% of CO_2e. EPA Emission Facts: Greenhouse Gas Emissions from a Typical Passenger Vehicle, http://www.epa.gov/OMS/climate/420f05004.htm.

[d] 5% of CO_2e is assumed to be CH_4 and N_2O, when accounting for global warming potential. Emission factors for these pollutants are based on a ratio of CH_4 and N_2O emission factors for petroleum fuels from the GHG Mandatory Reporting Rule Subpart C, Table C-2.

Assembly Roll and Brake Testing Potential Emissions

Process	Potential Emissions																	
	$PM/PM_{10}/PM_{2.5}$		NO_X		CO		VOC		Formaldehyde		CO_2		CH_4		N_2O		CO_2e	
	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr	(tpy)	(lb/hr	(tpy)	(lb/hr	(tpy)	(lb/hr)	(tpy)
Assembly Roll and Brake	0.010	0.043	0.037	0.163	0.521	2.281	0.011	0.049	0.002	0.010	51.71	226.50	0.091	0.40	0.002	0.01	54.43	238.42

Assembly Washer System Testing Compound Usage Data

Washer System Test [a]	mL/unit	% Ethylene Glycol [b]	Density Ethylene Glycol (lb/gal)	lb Ethylene Glycol/unit
Maximum Tested Windshield Cleaner Usage	100	23%	9.26	0.056

[a] Represents the maximum testing fluid usage per unit.
[b] From windshield cleaner MSDS, material contains 23% volatiles (methanol and ethylene glycol). Emissions from washer system testing calculated based on ethylene glycol density which represents the worst-case VOC emissions for the material.

Assembly Washer System Testing Emissions

	Production		VOC Emissions [a]			Maximum Ethylene Glycol Emissions [b]			Maximum Methanol Emissions [b]		
	(units/hr)	(units/yr)	(lb/hr)	(lb/yr)	(tpy)	(lb/hr)	(lb/yr)	(tpy)	(lb/hr)	(lb/yr)	(tpy)
Washer System Testing	19	164,250	1.06	9,244.66	4.62	1.06	9,244.66	4.62	0.75	6,579.53	3.29

[a] VOC emissions from washer system testing calculated based on ethylene glycol density which represents the worst-case VOC emissions for the material.
[b] Maximum HAP emissions are calculated assuming the maximum volatile content for both ethylene glycol and methanol. Therefore, the calculated VOC emissions are not equivalent to the sum of the HAP emissions.

Storage Tank Volumes

Tank ID	Consumption per Vehicle (gal/veh)	Max. Consumption per year[a] (gal/yr)	Fuel Type
TK-01	5.00	821,250	Gasoline
TK-02	5.00	821,250	Diesel
TK-03	----	100,000	Diesel

Storage Tank Emissions

Tank ID	Description[a]	Controls	Tank Size		Capacity	Throughput	Uncontrolled Emissions[b] (lb/yr)			Total VOC Emissions[b]	
			Shell Length (ft)	Diameter (ft)	(gal)	(gal/yr)	Working Loss	Breathing Loss	Total	Total (lb/hr)	Total (tpy)
TK-01	Gasoline	N/A	10.00	9.67	5,000	821,250	3,553.34	1,718.84	5,272.18	0.60	2.64
TK-02	Diesel fuel	N/A	15.08	11.00	10,000	821,250	10.79	2.27	13.06	0.001	0.01
TK-03	Diesel fuel	N/A	7.58	2.92	1,240	100,000	1.39	1.08	2.47	0.000	0.00
Tanks Total									**5,287.71**	**0.60**	**2.64**

[a] Max throughput for TK-01 and TK-02 based on the max. consumption per vehicle. TK-03 will be used to fuel sources in the Marshalling yard.

[b] All the storage tanks are horizontal tanks.

[c] Storage Tank emissions taken from TANKS 4.09d output based on tank parameters and geographical information.

Emergency Generators and Fire Pumps Emission Factors [a,b]

Pollutant	Emergency Engines 19 ≤ kW < 37	Emergency Engines 37 ≤ kW < 75	Emergency Engines 225 ≤ kW < 450	Emergency Engines kW > 560	Fire Pumps 225 < kW < 450	Units
$PM/PM_{10}/PM_{2.5}$	0.45	0.30	0.15	0.15	0.15	g/hp-hr
SO_2 [c]	0.93	0.93	0.93	5.5E-03	0.93	g/hp-hr
NO_X	5.59	3.5	3.0	4.8	3.0	g/hp-hr
CO	4.10	3.7	2.6	2.6	2.6	g/hp-hr
VOC	5.6	3.5	3.0	4.8	3.0	g/hp-hr
CO_2e [d]						
CO_2	163.08	163.08	163.08	163.08	163.08	lb/MMBtu
CH_4	6.62E-03	6.62E-03	6.62E-03	6.62E-03	6.62E-03	lb/MMBtu
N_2O	1.32E-03	1.32E-03	1.32E-03	1.32E-03	1.32E-03	lb/MMBtu

[a] The emission factors are from 40 CFR 89.112(a), Table 1. VOC and NO_X emission factors are each assumed to be equivalent to NO_X + NMHC emission limit. The SO_2 emission factor is from AP-42, Table 3.4-1 for large diesel engines.
[b] The emission factors are from 40 CFR 89.112(a), Table 1. VOC and NO_X emission factors are each assumed to be equivalent to NO_X + NMHC emission limit. The SO_2 emission factor is from AP-42, Table 3.3-1.
[c] Sulfur content of diesel fuel equals the maximum sulfur content of 15 ppm, per 40 CFR 80.510(b).
[d] Emission factors from 40 CFR 98, Subpart C, Tables C-1 and C-2. Factors were converted to lb/MMBtu.

Emergency Generators and Fire Pumps Criteria Pollutant Emissions

Equipment ID	Fuel	Horsepower	Max. Rated Capacity	Max. hours per year [a]	$PM/PM_{10}/PM_{2.5}$		SO_2		NO_X		CO		VOC		CO_2		CH_4		N_2O		CO_2e	
		(hp)	(MMBtu/hr)	(hr)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
EG01	Diesel	398	1.01	500	0.13	0.03	0.82	0.204	2.62	0.65	2.29	0.57	2.62	0.65	143.09	35.77	0.006	0.001	0.001	0.0003	143.59	35.90
EG02	Diesel	65	0.17	500	0.04	0.01	0.13	0.03	0.50	0.13	0.53	0.13	0.50	0.13	23.37	5.84	0.001	2E-04	0.0002	5E-05	23.45	5.86
EG03	Diesel	40	0.10	500	0.04	0.01	0.08	0.021	0.50	0.12	0.36	0.09	0.50	0.12	14.46	3.62	0.001	0.00	0.000	0.000	14.51	3.63
EG04	Diesel	1,500	3.82	500	0.49	0.12	0.02	0.005	15.78	3.95	8.63	2.16	15.78	3.95	539.30	134.83	0.022	0.01	0.004	0.001	541.15	135.29
FP01	Diesel	305	0.78	500	0.10	0.03	0.63	0.16	2.02	0.50	1.75	0.44	2.02	0.50	109.66	27.41	0.004	0.001	0.0009	0.0002	110.03	27.51
Total					**0.81**	**0.20**	**1.68**	**0.42**	**21.42**	**5.35**	**13.57**	**3.39**	**21.42**	**5.35**	**829.9**	**207.47**	**0.03**	**0.01**	**0.01**	**0.002**	**832.7**	**208.18**

[a] Hours based on maximum allowable hours for maintenance and readiness testing under NSPS Subpart IIII.

Emergency Generators and Fire Pumps Combined Heat Input Capacities

	Capacity (MMBtu/hr)
Total Large Diesel Heat Input	3.82
Total Diesel Heat Input	2.06

[a] Large diesel engines are those larger than 600 hp.

Emergency Generators and Fire Pumps HAP/TAP Emissions

Pollutant	Emission Factors (lb/MMBtu) Large Diesel [a]	Emission Factors (lb/MMBtu) Diesel [b]	Emergency Equipment Emissions (lb/hr)	Emergency Equipment Emissions (tpy)
Benzene	7.76E-04	9.33E-04	4.88E-03	1.22E-03
Toluene	2.81E-04	4.09E-04	1.91E-03	4.79E-04
Xylene	1.93E-04	2.85E-04	1.32E-03	3.31E-04
Formaldehyde	7.89E-05	1.18E-03	2.73E-03	6.82E-04
Acetaldehyde	2.52E-05	7.67E-05	2.54E-04	6.35E-05
Acrolein	7.88E-06	9.25E-05	2.20E-04	5.51E-05
Napthalene	1.30E-04	8.48E-05	6.71E-04	1.68E-04
Total PAH	2.12E-04	1.68E-04	1.15E-03	2.89E-04

[a] Emission factors from AP-42 Section 3.4 Large Stationary Diesel and All Stationary Duel-fuel Engines, Table 3.4-3 - 3.4-4.
[b] Emission factors from AP-42 Section 3.3 Gasoline and Diesel Industrial Engines, Table 3.3-2.

Cooling Tower Potential Emissions

Description	Circulating Water Flowrate	Water Density	Total Dissolved Solids [a]	Drift Rate [b]	Hours of Operation	Potential Emissions [c]					
						PM		PM_{10}		$PM_{2.5}$	
	(gal/hr)	(lb/gal)	(ppm)	(%)	(hrs/yr)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
Cooling Tower 1	412,500	8.34	650	0.001	8,760	2.24E-02	9.79E-02	3.33E-03	1.46E-02	2.00E-03	8.76E-03
Cooling Tower 2	412,500	8.34	650	0.001	8,760	2.24E-02	9.79E-02	3.33E-03	1.46E-02	2.00E-03	8.76E-03
Cooling Tower 3	412,500	8.34	650	0.001	8,760	2.24E-02	9.79E-02	3.33E-03	1.46E-02	2.00E-03	8.76E-03
Cooling Tower 4	73,800	8.34	650	0.001	8,760	4.00E-03	1.75E-02	5.96E-04	2.61E-03	3.58E-04	1.57E-03
Cooling Tower 5	484,900	8.34	650	0.001	8,760	2.63E-02	1.15E-01	3.92E-03	1.72E-02	2.35E-03	1.03E-02
Cooling Tower 6	484,900	8.34	650	0.001	8,760	2.63E-02	1.15E-01	3.92E-03	1.72E-02	2.35E-03	1.03E-02
Cooling Tower 7	484,900	8.34	650	0.001	8,760	2.63E-02	1.15E-01	3.92E-03	1.72E-02	2.35E-03	1.03E-02
Total						1.50E-01	6.57E-01	2.23E-02	9.79E-02	1.34E-02	5.87E-02

[a] TDS provided by Charleston Water System.

[b] Drift rate value supplied based on vendor guaranteed drift rate.

[c] PM emissions calculated using equation from AP-42 Chapter 13.4 - Wet Cooling Towers. PM_{10} emissions are 14.9% of PM emissions based on *Calculating Realistic PM $_{10}$ Emissions from Cooling Towers* by Joel Reisman and Gordon Frisbie. $PM_{2.5}$ assumed to be 60% of PM_{10} based on California Emissions Inventory Development and Reporting System (CEIDARS).

Paved Roads - Emission Factor Equation[1]

$$E = [k (sL)^{0.91} * W^{1.02}] * (1 - 1.2*P/N)$$

where:	Value	Units	Data Source
k = particle size multiplier for PM	0.011	lb/VMT	AP-42, Table 13.2.1-1 [2]
k = particle size multiplier for PM_{10}	0.0022	lb/VMT	AP-42, Table 13.2.1-1 [2]
k = particle size multiplier for $PM_{2.5}$	0.00054	lb/VMT	AP-42, Table 13.2.1-1 [2]
sL = road surface silt loading	0.6	g/m^2	AP-42, Table 13.2.1-2 [3]
W_a = average weight of vehicles traveling the road	40.0	tons	SC DOT [4]
N = number of days in averaging period	365	days	AP-42, pg. 13.2.1-6
P = number of days in a year with at least 0.01 in of precipitation	120	days	AP-42, Fig. 13.2.1-2
E_a = PM emission factor	**0.18**	**lb/VMT**	**Calculation**
E_a = PM_{10} emission factor	**0.04**	**lb/VMT**	**Calculation**
E_a = $PM_{2.5}$ emission factor	**0.01**	**lb/VMT**	**Calculation**

[1] AP-42, Section 13.2.1.3, Equation 3.
[2] K value selected is for PM_{30}, PM_{10} and $PM_{2.5}$. The PM_{30} factor is used to calculate PM emissions.
[3] AP-42 Section 13.2.1, Table 13.2.1-2, Ubiquitous Silt Loading Default Values for sites with average daily traffic (ADT) for low volume roads, ADT category < 500 vehicles.
[4] Average weight conservatively set to maximum allowable gross vehicle weight rating is 80,000 lbs (40 tons), per SC §56-5-4140.

Paved Roads - Loads and Distance Inputs

Parameter	Value	Units
Distance traveled per load	1.71	VMT/load
Loads traveled	6	loads/hr
	150	loads/day
	54,750	loads/yr
Paved Vehicle Miles Traveled per Year [1]	93,349	VMT/yr
Paved Vehicle Miles Traveled per Hour [2]	10.66	VMT/hr

[1] Calculation: Paved Vehicle Miles Traveled per Year (VMT/yr) = (Potential Vehicle Production (tpy)) / Weight of Truck Load (tons/load) * Distance Traveled per Load (VMT/load).
[2] Calculation: Paved Vehicle Miles Traveled per Hour (VMT/hr) = (Potential Vehicle Production (tons/hr)) / Weight of Truck Load (tons/load) * Distance Traveled per Load (VMT/load).

Paved Roads - Potential Emissions

	PM		PM_{10}		$PM_{2.5}$	
	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
Paved Roads [1,2]	1.92	8.41	0.38	1.68	0.09	0.41

[1] Calculation: Potential Emissions (tpy) = Paved Vehicle Miles Traveled per Year (VMT/yr) * Emission Factor (lb/VMT) / (2,000 lb/ton).
[2] Calculation: Potential Emissions (lb/hr) = Paved Vehicle Miles Traveled per Year (VMT/hr) * Emission Factor (lb/VMT).

APPENDIX B: E-COAT SPOT REPAIR BACT COST ANALYSIS

Annualized RTO Cost Analysis to Control VOC from E-Coat Spot Repair
Based on 124,800 Units/Yr & 95% RTO Control

Annualized Costs for RTO to Control VOC: E-Coat Spot Repair		
Standard Temperature	68	°F
Density of Air	0.0026	lb-mole/scf
Specific Heat of Air	6.85	Btu/lb-mole F
Exhaust Gas Temperature	72	°F
Minimum RTO Temp	1,500	°F
Heat Input	25.24	Btu/acf
Fuel Cost Summary		
Exhaust Gas Flow Rate	12,939	acfm
Natural Gas Usage	171,657	MMBtu/yr
	168,292	1,000 cf/yr
Natural Gas Cost [1]	$6.11	dollars/1,000 cf
Heat Loss Rate	5.00%	
Total Natural Gas Cost	**$51,413**	**dollars/yr**
Electricity Cost Summary		
Cost of Electricity [2]	$0.05207	$/kWh
Electricity Required	12	kW/h
Hours of Operation	8,760	h/yr
Total Electricity Cost	**$5,256.39**	**dollars/yr**
Pollutant Removal Cost Summary		
Total Annual Cost - Fuel & Electricity	**$56,669.49**	**dollars/yr**
Pollutant to be Removed [VOC] (90% capture, 95% control, 124,800 bodies/yr)	**0.12**	**tpy**
Cost Control Effectiveness	**$477,557**	**dollars/ton**

1. Natural gas rates are based U.S. Energy Information Administration Industrial natural gas prices for 2014. *http://www.eia.gov/dnav/ng/ng_pri_sum_dcu_SSC_a.htm.*
2. Cost of Electricity is based on *https://www.sceg.com/docs/librariesprovider5/electric-gas-rates/rate23.pdf.*

Annualized RTO Cost Analysis to Control VOC from E-Coat Spot Repair
Based on 146,000 Units/Yr & 95% RTO Control

Annualized Costs for RTO to Control VOC: E-Coat Spot Repair

Standard Temperature	68	°F
Density of Air	0.0026	lb-mole/scf
Specific Heat of Air	6.85	Btu/lb-mole F
Exhaust Gas Temperature	72	°F
Minimum RTO Temp	1,500	°F
Heat Input	25.24	Btu/acf
Fuel Cost Summary		
Exhaust Gas Flow Rate	12,939	acfm
Natural Gas Usage	171,657	MMBtu/yr
	168,292	1,000 cf/yr
Natural Gas Cost[1]	$6.11	dollars/1,000 cf
Heat Loss Rate	5.00%	
Total Natural Gas Cost	**$51,413**	**dollars/yr**
Electricity Cost Summary		
Cost of Electricity[2]	$0.05207	$/kWh
Electricity Required	12	kW/h
Hours of Operation	8,760	h/yr
Total Electricity Cost	**$5,256.39**	**dollars/yr**
Pollutant Removal Cost Summary		
Total Annual Cost - Fuel & Electricity	**$56,669.49**	**dollars/yr**
Pollutant to be Removed [VOC]	**0.14**	**tpy**
(90% capture, 95% control, 146,000 bodies/yr)		
Cost Control Effectiveness	**$408,213**	**dollars/ton**

1. Natural gas rates are based U.S. Energy Information Administration Industrial natural gas prices for 2014. *http://www.eia.gov/dnav/ng/ng_pri_sum_dcu_SSC_a.htm.*
2. Cost of Electricity is based on *https://www.sceg.com/docs/librariesprovider5/electric-gas-rates/rate23.pdf.*

APPENDIX C: DHEC PERMIT APPLICATION FORMS

RECEIVED
APR 13 2018
BUREAU OF AIR QUALITY

dhec

Bureau of Air Quality
Construction Permit Application
Application Revision Request

CONSTRUCTION PERMIT IDENTIFICATION			
SC Air Permit Number *(8-digits only)* *(Leave blank if unknown or has never been assigned)*	Construction Permit ID	Date Construction Permit Issued	Revision Request Date
0560 - 0385	0560-0385-CA-R2	January 26, 2018	April 2018
Facility Name *(This should be the name used to identify the facility)*			
Mercedes-Benz Vans, LLC			

CONSTRUCTION PERMIT APPLICATION FORMS BEING REVISED
(Amended construction permit forms must be filled out completely and attached to this modification request.)

Form #	Date of Original Submittal	Brief Description of Revision
D-2566	February 2016	No change
D-2567	February 2016	No change
D-2569	February 2016	Revised facility-wide emission estimate as described in the application addendum. Calculations are provided in Appendix A.
D-2570	February 2016	No change
D-2573	February 2016	No change

OWNER OR OPERATOR

Title/Position: President/CEO	Salutation: Mr	First Name: Michael	Last Name: Balke
Mailing Address: 8501 Palmetto Commerce Parkway			
City: Ladson		State: SC	Zip Code: 29546
E-mail Address: Michael.balke@daimler.com		Phone No.: (843) 695-5142	Cell No.:

OWNER OR OPERATOR SIGNATURE

I certify, to the best of my knowledge and belief, that no applicable standards and/or regulations will be contravened or violated. I certify that any application form, report, or compliance certification submitted in this permit application is true, accurate, and complete based on information and belief formed after reasonable inquiry. I understand that any statements and/or descriptions, which are found to be incorrect, may result in the immediate revocation of any permit issued for this application.

[signature] 04-10-2018

Signature of Owner or Operator Date

Bureau of Air Quality
Construction Permit Application
Application Revision Request

AIR PERMIT CONSULTANT *(If not the same person as the Professional Engineer.)*			
Consulting Firm Name: Same as P.E. (see below)			
Title/Position:	Salutation:	First Name:	Last Name:
Mailing Address:			
City:		State:	Zip Code:
E-mail Address:		Phone No.:	Cell No.:
PROFESSIONAL ENGINEER INFORMATION			
Consulting Firm Name: Trinity Consultants, Inc.			
Title/Position: Managing Consultant	Salutation: Ms.	First Name: Nicole	Last Name: Saniti
Mailing Address: 325 Arlington Ave. Suite 500			
City: Charlotte		State: NC	Zip Code: 28203
E-mail Address: nsaniti@trinityconsultants.com		Phone No.: (704) 553-7747	Cell No.:
SC License/Registration No.: 30237			
PROFESSIONAL ENGINEER SIGNATURE			
I have placed my signature and seal on the engineering documents submitted, signifying that I have reviewed this construction permit application as it pertains to *South Carolina Regulation 61-62, Air Pollution Control Regulations and Standards.*			

Nicole Saniti 4/12/18

Signature of Professional Engineer Date

SOUTH CAROLINA LICENSED PROFESSIONAL ENGINEER No. 30237 NICOLE L. SANITI

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Bureau of Air Quality
Construction Permit Application
Facility Information

FACILITY IDENTIFICATION	
SC Air Permit Number (8-digits only) *(Leave blank if one has never been assigned)* 0560 - 0385	Application Date April 2018
Facility Name *(This should be the name used to identify the facility at the physical address listed below)* Mercedes-Benz Vans, LLC	Facility Federal Tax Identification Number *(Established by the U.S. Internal Revenue Service to identify a business entity)*

FACILITY PHYSICAL ADDRESS			
Physical Address: 8501 Palmetto Commerce Parkway			County: Charleston
City: Ladson		State: SC	Zip Code: 29456
Facility Coordinates *(Facility coordinates should be based at the front door or main entrance of the facility.)*			
Latitude: 32° 57' 50.25"	Longitude: 80° 06' 27.27"		☐ NAD27 *(North American Datum of 1927)* Or ☒ NAD83 *(North American Datum of 1983)*

CO-LOCATION DETERMINATION
Are there other facilities in close proximity that could be considered co-located? ☒ No ☐ Yes*
List potential co-located facilities, including air permit numbers if applicable: Not Applicable

**If yes, please submit co-location applicability determination details in an attachment to this application.*

COMMUNITY OUTREACH
What are the potential air issues and community concerns? Please provide a brief description of potential air issues and community concerns about the entire facility and/or specific project. Include how these issues and concerns are being addressed, if the community has been informed of the proposed construction project, and if so, how they have been informed.

FACILITY'S PRODUCTS / SERVICES	
Primary Products / Services *(List the primary product and/or service)* Automobile Manufacturing, Light Truck and Utility Vehicle Manufacturing	
Primary SIC Code *(Standard Industrial Classification Codes)* 3711	Primary NAICS Code *(North American Industry Classification System)* 336111
Other Products / Services *(List any other products and/or services)*	
Other SIC Code(s): 3713	Other NAICS Code(s): 336112

AIR PERMIT FACILITY CONTACT *(Person at the facility who can answer technical questions about the facility and permit application.)*			
Title/Position: Paint Engineer	Salutation: Mr.	First Name: Jae	Last Name: Park
Mailing Address: 8501 Palmetto Commerce Parkway			
City: Ladson		State: SC	Zip Code: 29456
E-mail Address: jae.park@daimler.com		Phone No.: (843) 695-5095	Cell No.:

The signed permit will be e-mailed to the designated Air Permit Contact.
If additional individuals need copies of the permit, please provide their names and e-mail addresses.

Name	E-mail Address
Russell Revell	russell.revell@daimler.com

CONFIDENTIAL INFORMATION / DATA
Does this application contain confidential information or data? ☒ No ☐ Yes*

If yes, include a sanitized version of the application for public review and* ***ONLY ONE COPY OF CONFIDENTIAL INFORMATION SHOULD BE SUBMITTED*

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Bureau of Air Quality
Construction Permit Application
Facility Information

LIST OF FORMS INCLUDED *(Identify all forms included in the application package)*	
Form Name	**Included (Y/N)**
Expedited Review Request (DHEC Form 2212)	☒ Yes ☐ No * This submittal is an addendum to the application submitted for expedited review in February 2018.
Equipment/Processes (DHEC Form 2567)	☒ Yes
Emissions (DHEC Form 2569)	☒ Yes
Regulatory Review (DHEC Form 2570)	☒ Yes
Emissions Point Information (DHEC Form 2573)	☒ Yes ☐ No (If No, Explain:)

OWNER OR OPERATOR			
Title/Position: President/CEO	Salutation: Mr.	First Name: Michael	Last Name: Balke
Mailing Address: 8501 Palmetto Commerce Parkway			
City: Ladson		State: SC	Zip Code: 29546
E-mail Address: Michael.balke@daimler.com		Phone No.: (843) 695-5142	Cell No.:

OWNER OR OPERATOR SIGNATURE

I certify, to the best of my knowledge and belief, that no applicable standards and/or regulations will be contravened or violated. I certify that any application form, report, or compliance certification submitted in this permit application is true, accurate, and complete based on information and belief formed after reasonable inquiry. I understand that any statements and/or descriptions, which are found to be incorrect, may result in the immediate revocation of any permit issued for this application.

[signature] 04-10-2018

Signature of Owner or Operator Date

PERSON AND/OR FIRM THAT PREPARED THIS APPLICATION *(If not the same person as the Professional Engineer who has reviewed and signed this application.)*			
Consulting Firm Name: Same as P.E - see below			
Title/Position:	Salutation:	First Name:	Last Name:
Mailing Address:			
City:		State:	Zip Code:
E-mail Address:		Phone No.:	Cell No.:
SC Professional Engineer License/Registration No. (if applicable):			

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Bureau of Air Quality
Construction Permit Application
Facility Information

PROFESSIONAL ENGINEER INFORMATION			
Consulting Firm Name: Trinity Consultants, Inc.			
Title/Position: Managing Consultant	Salutation: Ms.	First Name: Nicole	Last Name: Saniti
Mailing Address: 325 Arlington Ave. Suite 500			
City: Charlotte		State: NC	Zip Code: 28203
E-mail Address: nsaniti@trinityconsultants.com		Phone No.: (704) 553-7747	Cell No.:
SC License/Registration No.: 30237			
PROFESSIONAL ENGINEER SIGNATURE			
I have placed my signature and seal on the engineering documents submitted, signifying that I have reviewed this construction permit application as it pertains to the requirements of *South Carolina Regulation 61-62, Air Pollution Control Regulations and Standards.*			

Nicole Saniti 4/12/18

Signature of Professional Engineer Date

SOUTH CAROLINA LICENSED PROFESSIONAL ENGINEER No. 30237 NICOLE L. SANITI

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Bureau of Air Quality
Construction Permit Application
Equipment / Processes

APPLICATION IDENTIFICATION *(Please ensure that the information list in this table is the same on all of the forms and required information submitted in this construction permit application package.)*		
Facility Name *(This should be the name used to identify the facility)* Mercedes-Benz Vans, LLC	SC Air Permit Number (8-digits only) *(Leave blank if one has never been assigned)* 0560 - 0385	Application Date April 2018

PROJECT DESCRIPTION
Brief Project Description (What, why, how, etc.): Daimler Vans is proposing to expand current assembly operations at the Ladson plant to include a paint shop, body shop, and additional assembly areas, including all associated combustion equipment. This application revises information submitted to the Department for Construction Permit No. 0560-0385, 0560-0385-R1, and 0560-0385-R2.

ATTACHMENTS	
☒ Process Flow Diagram	Location in Application: Appendix A of the application submitted in February 2018
☒ Detailed Project Description	Location in Application: Application addendum, section 1.2

EQUIPMENT / PROCESS INFORMATION

Equipment ID Process ID	Action	Equipment / Process Description	Maximum Design Capacity (Units)	Control Device ID(s)	Pollutants Controlled (Include CAS#)	Capture System Efficiency and Description	Emission Point ID(s)
OV04	☐ Add ☐ Remove ☒ Modify ☐ Other	Assembly Oven Burners (natural gas fired)	4.30 MMBtu/hr	N/A	N/A	N/A	EP-AO01

CONTROL DEVICE INFORMATION

Control Device ID	Action	Control Device Description	Maximum Design Capacity (Units)	Inherent/Required/Voluntary (Explain)	Destruction/Removal Efficiency Determination
	☐ Add ☐ Remove ☐ Modify ☐ Other				

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Construction Permit Application
Equipment / Processes

RAW MATERIAL AND PRODUCT INFORMATION			
Equipment ID Process ID Control Device ID	Raw Material(s)	Product(s)	Fuels Combusted
OV04	N/A	Process Heat	Natural Gas

MONITORING AND REORTING INFORMATION					
Equipment ID Process ID Control Device ID	Pollutant(s)/Parameter(s) Monitored	Monitoring Frequency	Reporting Frequency	Monitoring/Reporting Basis	Averaging Period(s)
OV04	N/A	N/A	N/A	N/A	N/A

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Bureau of Air Quality
Construction Permit Application
Emissions

APPLICATION IDENTIFICATION *(Please ensure that the information list in this table is the same on all of the forms and required information submitted in this construction permit application package.)*		
Facility Name *(This should be the name used to identify the facility)*	SC Air Permit Number (8-digits only) *(Leave blank if one has never been assigned)*	Application Date
Mercedes-Benz Vans, LLC	0560 - 0385	April 2018

ATTACHMENTS *(Check all the appropriate checkboxes if included as an attachment)*	
☒ Sample Calculations, Emission Factors Used, etc.	☒ Detailed Explanation of Assumptions, Bottlenecks, etc.
☒ Supporting Information: Manufacturer's Data, etc.	☐ Source Test Information
☒ Details on Limits Being Taken for Limited Emissions	☒ NSR Analysis

SUMMARY OF PROJECTED CHANGE IN FACILITY WIDE POTENTIAL EMISSIONS
(Calculated at maximum design capacity.)

Pollutants	Emission Rates Prior to Construction / Modification (tons/year)			Emission Rates After Construction / Modification (tons/year)		
	Uncontrolled	Controlled	Limited	Uncontrolled	Controlled	Limited
Particulate Matter (PM)	1,353.39	29.51	26.97	1,354.08	24.74	21.32
Particulate Matter <10 Microns (PM_{10})	1,346.10	22.23	19.77	1,346.79	17.45	14.11
Particulate Matter <2.5 Microns ($PM_{2.5}$)	1,344.79	20.92	18.46	1,345.49	16.15	12.81
Sulfur Dioxide (SO_2)	0.72	0.72	0.59	0.94	0.94	0.73
Nitrogen Oxides (NO_x)	48.94	48.94	38.55	61.91	61.91	39.90
Carbon Monoxide (CO)	77.43	77.43	59.16	78.03	78.03	49.63
Volatile Organic Compounds (VOC)	3,442.84	1,110.37	952.04	3,446.82	1,114.35	955.36
Lead (Pb)	4.18E-04	4.18E-04	3.09E-04	4.31E-04	4.31E-04	2.62E-04
Highest HAP Prior to Construction (CAS #:)	Multiple >10	Multiple >10		Multiple >10	Multiple >10	
Highest HAP After Construction (CAS #:)						
Total HAP Emissions*	415.56	415.56	358.18	415.61	415.61	358.00
Carbon Dioxide Equivalent (CO_2e)	101,146	101,146	74,999	104,003	104,003	63,367

Include emissions from exempt equipment and emission increases from process changes that were exempt from construction permits.
(*All HAP emitted from the various equipment or processes must be listed in the appropriate "Potential Emission Rates at Maximum Design Capacity" Table)

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POTENTIAL EMISSION RATES AT MAXIMUM DESIGN CAPACITY									
Equipment ID / Process ID	**Emission Point ID**	**Pollutants** (Include CAS #)	**Calculation Methods / Limits Taken / Other Comments**	**Uncontrolled**		**Controlled**		**Limited**	
				lbs/hr	**tons/yr**	**lbs/hr**	**tons/yr**	**lbs/hr**	**tons/yr**
See Appendix A of the Application Addendum									

APPENDIX D: SUPPORTING DOCUMENTATION

Kimberly Teofilak

From: Kimberly Teofilak
Sent: Tuesday, April 10, 2018 12:55 PM
To: Kimberly Teofilak
Subject: FW: JDE_180404_DAI_SC_WG: GW_180404_DAI_ Documentation of Low NOx Burners - ASUs, RTUs, Ovens
Attachments: totemomail_info.html

6 ppm for Durr ASUs (everything routed to DryX)

Nicole Saniti, P.E.
Managing Consultant

Trinity Consultants
325 Arlington Ave., Suite 500 | Charlotte, North Carolina 28203

Office: **704-553-7747 x104** | Mobile: 518-461-8135
Email: nsaniti@trinityconsultants.com | LinkedIn: www.linkedin.com/in/nsanititrinityconsultants

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From: jae.park@daimler.com [mailto:jae.park@daimler.com]
Sent: Wednesday, April 04, 2018 10:50 AM
To: Nicole Saniti <NSaniti@trinityconsultants.com>
Cc: Tony Jabon <TJabon@trinityconsultants.com>
Subject: FW: JDE_180404_DAI_SC_WG: GW_180404_DAI_ Documentation of Low NOx Burners - ASUs, RTUs, Ovens

Hi Nicole,

Info on ASU burners from Durr on the NOx emission.

Kind Regards / Mit freundlichen Grüßen

Jae Park
Paint Engineer, VAN/OEC

Merecedes-Benz Vans,LLC
8501 Palmetto Commerce Parkway
Ladson, SC 29456

Phone +1 843 695 5095
Mobile +1 843 697 9478

Fax +1 843 695 5031
E-Mail jae.park@daimler.com

From: Denzinger, Joachim [mailto:Joachim.Denzinger@durr.com]
Sent: Wednesday, April 04, 2018 10:38 AM
To: Park, Jae (566) <jae.park@daimler.com>
Cc: Fein, Ronald <ronald.fein@durr.com>; Revell, Russell (566) <russell.revell@daimler.com>; Fleissner, Thomas (065) <thomas.fleissner@daimler.com>
Subject: JDE_180404_DAI_SC_WG: GW_180404_DAI_ Documentation of Low NOx Burners - ASUs, RTUs, Ovens

Hello Jae,

regarding ASU burners, according to burner supplier with proper commissioning following is possible:

NO max. 5 ppm
NO2 max. 1 ppm

Emissions are subject to the process conditions

Mit freundlichen Grüßen/Best regards

Joachim Denzinger
Senior Project Manager

Dürr Systems AG
Paint and Final Assembly Systems
Project Management
Carl-Benz-Str. 34
74321 Bietigheim-Bissingen
Germany

Phone +49 7142 78 1472
Mobile +49 172 751 0602
Fax +49 7142 78 55 1472
E-mail joachim.denzinger@durr.com
Internet www.durr-paint.com
Internet www.durr.com

Vorsitzender des Aufsichtsrats: Ralf Dieter
Vorstand: Dr. Jochen Weyrauch (Vors.), Dr. Hans Schumacher, Jaroslaw Baginski, Rainer Gausepohl
Sitz der Gesellschaft: Stuttgart; eingetragen im Amtsgericht Stuttgart HRB 757705

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DÜRR NEWS

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Kimberly Teofilak

From: Kimberly Teofilak
Sent: Thursday, April 12, 2018 2:54 PM
To: Kimberly Teofilak
Subject: FW: MBV - Burners

80 ppm on other ASUs.

So we have:

- 6 ppm on ASUs to DryX
- 80 ppm on all other ASUs
- AP-42 low NOx factors on oven burners
- AP-42 low NOx factors on ADW heaters
- California low NOx factors for all RTUs
- AP-42 conventional NOx factors on RTO
- AP-42 conventional NOx factor on assembly oven

Nicole Saniti, P.E.
Managing Consultant

Trinity Consultants
325 Arlington Ave., Suite 500 | Charlotte, North Carolina 28203

Office: 704-553-7747 x104 | Mobile: 518-461-8135
Email: nsaniti@trinityconsultants.com | LinkedIn: www.linkedin.com/in/nsanititrinityconsultants

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From: jae.park@daimler.com [mailto:jae.park@daimler.com]
Sent: Tuesday, April 03, 2018 10:18 AM
To: Tony Jabon <TJabon@trinityconsultants.com>; Nicole Saniti <NSaniti@trinityconsultants.com>
Cc: paul.hayes@daimler.com; russell.revell@daimler.com
Subject: FW: MBV - Burners

Hi Tony and Nicole,

NOx info on Paint Shop ASU burners for ASU 2.1, 2.2, and 2.3.

Kind Regards / Mit freundlichen Grüßen

Jae Park

Paint Engineer, VAN/OEC

Merecedes-Benz Vans,LLC
8501 Palmetto Commerce Parkway
Ladson, SC 29456

Phone +1 843 695 5095
Mobile +1 843 697 9478
Fax +1 843 695 5031
E-Mail jae.park@daimler.com

From: Brian Grundmeyer [mailto:bgrundmeyer@idom.com]
Sent: Tuesday, April 03, 2018 8:45 AM
To: Park, Jae (566) <jae.park@daimler.com>
Cc: Shah, Pranav (566) <pranav.shah@daimler.com>
Subject: FW: MBV - Burners

Hi Jae,

See below for the Paint shop ASU 2.1, 2.2, and 2.3 emissions.

Regards,
Brian

From: Andy.Stegner@bargedesign.com [mailto:Andy.Stegner@bargedesign.com]
Sent: Thursday, March 29, 2018 11:45 AM
To: Brian Grundmeyer <bgrundmeyer@idom.com>
Cc: Juan Luis Geijo Angulo <juan.geijo@idom.com>
Subject: FW: MBV - Burners

Brian,

See below from ClimateCraft regarding the NOx emissions from the ASU burners.

Best Regards,

Andy Stegner PE*
LEED AP
*TN, NC, SC, AK
MECHANICAL ENGINEER
andy.stegner@bargedesign.com

D 865-934-4197
O 865-637-2810
F 865-637-8554

520 West Summit Hill Drive, Suite 1202
Knoxville, TN 37902

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From: Johnson Mathew [mailto:jmathew@climatecraft.com]
Sent: Thursday, March 29, 2018 8:51 AM
To: Andy Stegner <Andy.Stegner@bargedesign.com>
Cc: Scott Sandberg <SSandberg@climatecraft.com>
Subject: FW: MBV - Burners

Andy,

The direct gas-fired modules at the Mercedes Benz facility are constructed with Midco HMA 2A burners. These burners are not considered Low NOx.
Please see below the NOx emission chart from their literature.

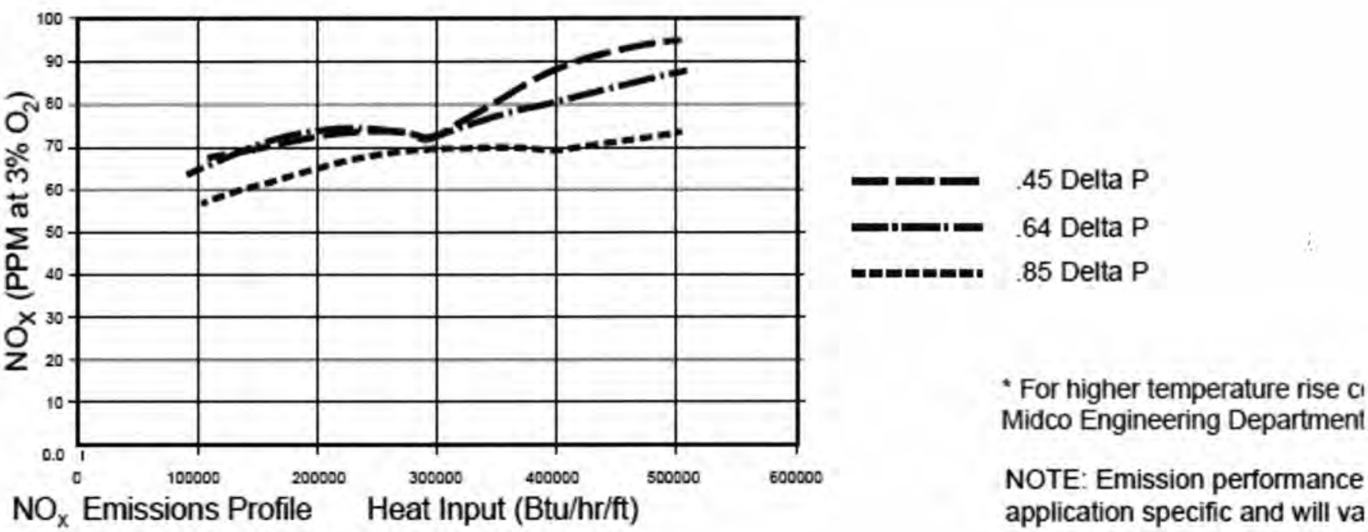

Chart 1 - CO and NO_2 Emissions Data

Based on the operating parameters of the Mercedes Benz job site:

505 Btu/hr/ft, 0.7" Delta P, you should expect around 80 ppm NOx.

Thanks
Johnson

If you are not the addressee, please inform us immediately that you have received this e-mail by mistake, and delete it.
We thank you for your support.

Kimberly Teofilak

From: Kimberly Teofilak
Sent: Tuesday, April 10, 2018 1:00 PM
To: Kimberly Teofilak
Subject: FW: Low NOx Burners - Ovens, ASUs, RTUs

From: Nicole Saniti
Sent: Monday, April 09, 2018 11:02 PM
To: Kimberly Teofilak <kteofilak@trinityconsultants.com>
Cc: Taylor Loftis <TLoftis@trinityconsultants.com>; Tony Jabon <TJabon@trinityconsultants.com>
Subject: FW: Low NOx Burners - Ovens, ASUs, RTUs

From: pranav.shah@daimler.com [mailto:pranav.shah@daimler.com]
Sent: Tuesday, March 27, 2018 7:47 AM
To: Nicole Saniti <NSaniti@trinityconsultants.com>
Cc: gregory.kunze@daimler.com
Subject: RE: Low NOx Burners - Ovens, ASUs, RTUs

Hi Nicole,

I found below statement from Trane RTU submittal (for AS & BS RTUs) regarding NOx emissions:

High/Low Modulating Gas Heat
The heating section shall have a drum and tube heat exchanger(s) design with primary and secondary surfaces of corrosion resistant aluminized steel or optional stainless steel (all modulating gas heat units shall have stainless steel). A forced combustion blower shall supply premixed fuel to a single burner ignited by a pilotless shot surface ignition system. In order to provide reliable operation, a regulated gas valve shall be used that requires blower operation to initiate gas flow. On an initial call for heat, the combustion blower shall purge the heat exchanger(s) 45 seconds before ignition. After three unsuccessful ignition attempts, the entire heating system shall be locked out until manually reset at the thermostat. Modulating gas turn down ratio on high fire units is accomplished by allowing the furnaces to act independently of one another. The modulating bank is activated first and is allowed to modulate itself to meet the heating needs. If the modulating bank is unable to meet the need at high fire, the second bank is turned on and then the first bank again modulates to the appropriate level.
This system creates a nearly seamless range of capacity from low fire on the modulating bank to high fire of both

FLD = Furnished by Trane U.S. Inc. dba Trane / Installed by Others | **Equipment Submittal** | *Page 7 of 22*

Mercedes Vans Manufacturing Facility December 06, 2016

furnaces together. Modulating gas heat units shall be suitable for use with natural gas only. All gas heat units comply with California requirements for low NOx emissions

I need to look over Paint shop ASUs submittal for NOx emission. Will look over it and confirm today.

Kind Regards/Mit Freundlichen Grüßen,

Pranav Shah

Utility Engineer, VAN/OECA

Mercedes-Benz Vans, LLC
8501 Palmetto Commerce Parkway
Ladson, SC, 29456

Office: +1 (854) 888-3220
Cell: +1 (843) 693-6226
Email: Pranav.Shah@Daimler.com
http://mbvcharleston.com/

From: Nicole Saniti [mailto:NSaniti@trinityconsultants.com]
Sent: Monday, March 26, 2018 8:37 PM
To: Shah, Pranav (566) <pranav.shah@daimler.com>
Subject: Low NOx Burners - Ovens, ASUs, RTUs

Pranav,

Is there any available documentation related to the NOx emissions from the oven burners, ASUs, or RTUs? I am wanting to verify whether these burners are low NOx burners.

Regards,

Nicole

Nicole Saniti, P.E.
Managing Consultant

Trinity Consultants
325 Arlington Ave., Suite 500 | Charlotte, North Carolina 28203

Office: 704-553-7747 x104 | Mobile: 518-461-8135
Email: nsaniti@trinityconsultants.com | LinkedIn: www.linkedin.com/in/nsanititrinityconsultants

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If you are not the addressee, please inform us immediately that you have received this e-mail by mistake, and delete it.
We thank you for your support.

Appendix C – Draft Construction Permit

Bureau of Air Quality
PSD Construction Permit

Mercedes-Benz Vans, LLC
8501 Palmetto Commerce Parkway
Ladson, South Carolina 29456
Charleston County

Pursuant to the provisions of the *Pollution Control Act*, Sections 48-1-50(5), 48-1-100(a) and 48-1-110(a), the 1976 *Code of Laws of South Carolina*, as amended, and *South Carolina Regulation 61-62*, *Air Pollution Control Regulations and Standards*, the Bureau of Air Quality authorizes the construction of this facility and the equipment specified herein in accordance with the plans, specifications, and other information submitted in the construction permit application received on November 2, 2015, as amended. All official correspondence, plans, permit applications, and written statements are an integral part of the permit. Any false information or misrepresentation in the application for a construction permit may be grounds for permit revocation.

The construction and subsequent operation of this facility is subject to and conditioned upon the terms, limitations, standards, and schedules contained herein or as specified by this permit and its accompanying attachments.

Permit Number: 0560-0385-CA
Issue Date: April 15, 2016

Steve McCaslin, P. E., Director
Air Permitting Division
Bureau of Air Quality

DRAFT

RECORD OF REVISIONS	
Date	**Description of Changes**
4/15/2016	Initial Issue.
7/21/2017	Revision included the following: • Addition of an E-coat spot repair operation within the permitted E-coat sanding area; • Addition of an underbody coating operation within the paint shop; • Incorporation of the option of applying side panel adhesive within the paint shop following coating application instead of within the body shop; and • Addition of a second boiler and revision of the heat input capacity of the permitted boiler.
1/26/2018	Revision included the following: • Revised E-coat materials based on latest availability and formulations; • Revised emission calculations corresponding to the latest E-coat materials; • Revised BACT emission limit for VOCs from E-coat operations; • Clarification that ORVR applies only to filling of gasoline vehicles; and • Clarification that Stage 1 vapor control only applies to the gasoline storage tank.
DATE	Revision included the following: • Modify dry filter monitoring requirements to include visual inspection and maintenance checks. • Modify adsorption wheel monitoring requirements for SC Regulation 61-62.5, Std 7 and 40 CFR 64. • Modify boiler tune up requirements for SC Regulation 61-62.5, Std 7 to be consistent with the 40 CFR 63, Subpart DDDDD. • Modify permit condition C.5 for natural gas only sources. • Remove natural gas sources from permit condition C.8 as it does not apply to sources that burn only natural gas. • Update the control device for MAG welding. • Add emergency generators and update sizes for previously permitted units. • Add a second diesel storage tank. • Modify the number and size of the RTOs. • Modify oven heat input capacity. • Modify the list of air supply and rooftop units. • Modify the window glazing vent. • Modify the cooling tower design capacity. • Update sources that are subject to SC Regulation 61-62.5, Standard 5.2. • Clarify Body Shop Adhesive locations. • Update CAM applicability for the E-coat process. • Update emission point IDs for the oven burners. • Clarified control device configuration for the booth filtration systems. • Revise BACT for E-Coat Spot Repair. • Standard 5.2 case by case monitoring request for the boilers.

DRAFT

A. PROJECT DESCRIPTION

Permission is hereby granted to construct an expansion of an automobile and van manufacturing facility at its existing assembly plant in Ladson, Charleston County, South Carolina (the Charleston plant). The proposed project at the facility includes the addition of a body shop, where parts and subassemblies are welded to form the body in white; a paint shop, which includes metal surface pretreatment, an electrodeposition coating operation, a sealing/underbody coating/sound deadener application operation, a guidecoat or primer operation, a top coat process consisting of base coat and clear coat operations, and finishing/spot repair/sealing/cavity waxing, and a paint mixing room; and an assembly shop, where final assembly, window glazing, fluid fill, roll and brake testing, underbody wax, and final paint repair operations are conducted. Additional support equipment includes a tank farm, boilers, air supply units, emergency generators, fire pumps and cooling towers.

B.1 EQUIPMENT

Equipment ID	Equipment Description	Control Device ID	Emission Point ID
B01	Boiler #1 (14.27 MMBtu/hr natural gas fired)	None	EP-B01
B02	Boiler #2 (14.27 MMBtu/hr natural gas fired)	None	EP-B02
ADH01	ADW Desorption Heater #1 (natural gas fired)	None	EP-ADH01
ADH02	ADW Desorption Heater #2 (natural gas fired)	None	EP-ADH02
OV01	E-Coat Oven Burners (natural gas fired)	None	EP-OV01A
OV02	Primer (Guidecoat) Oven #1 Burners (natural gas fired)	None	EP-OV02A
OV03	Topcoat Oven #1 Burners (natural gas fired)	None	EP-OV03A
OV22	Primer (Guidecoat) Oven #2 Burners (natural gas fired)	None	EP-OV22
OV23	Topcoat Oven #1 Burner (natural gas fired)s	None	EP-OV23
OV04	Assembly Oven Burners (natural gas fired)	None	EP-AO01
ED01	E-Coat Dip Tank	None	EP-RO3
EO01	E-Coat Oven	CD-RTO1	EP-O1
GC01	Guidecoat(Primer Booth) #1	CD-FS1 CD-ADW1 CD-ADW2 CD-RTO1	EP-O1
GC21	Guidecoat(Primer Booth) #2	CD-FS4 CD-ADW3 CD-RTO1	EP-O1
GO01	Guidecoat (Primer) Oven #1	CD-RTO1	EP-O1
GO21	Guidecoat (Primer) Oven #2	CD-RTO1	EP-O1
SAM01	Sound Deadener Adhesive (SAM) Area #1	None	EP-RO200-231
SAM21	Sound Deadener Adhesive (SAM) Area #2	None	EP-RO500-515
UBC01	Underbody Coating Booth #1	CD-DF	EP-UBC01 EP-RO41

B.1 EQUIPMENT

Equipment ID	Equipment Description	Control Device ID	Emission Point ID
UBC21	Underbody Coating Booth #2	CD-DF	EP-UBC21 EP-RO341
UBS01	Underbody PVC Booth #1	CD-DF	RO41
UBS21	Underbody PVC Booth #2	CD-DF	RO341
SS01	Seam Sealer Deck #1	None	EP-RO200-231
SS21	Seam Sealer Deck #2	None	EP-RO500-515
SKS01	Sika Sealing Deck	None	EP-RO200-231
SKS21	Sika Sealing Deck	None	EP-RO500-515
BC01	Basecoat/Clearcoat Booth #1	CD-FS2 CD-ADW1 CD-ADW2 CD-RTO1	EP-O1
BC21	Basecoat/Clearcoat Booth #2	CD-FS5 CD-ADW3 CD-RTO1	EP-O1
CC01	Clearcoat Booth #1	CD-FS3 CD-ADW1 CD-ADW2 CD-RTO1	EP-O1
TO01	Topcoat Oven #1	CD-RTO1	EP-O1
TO21	Topcoat Oven #2	CD-RTO1	EP-O1
PSA	Body Shop Adhesives Application (Paint Shop location)	None	EP-PS
ASA	Body Shop Adhesives Application (Assembly location)	None	EP-AS
SR01	Spot Repair Booth #1	CD-DF	EP-RO60
SR02	Spot Repair Booth #2	CD-DF	EP-RO60
SR03	Spot Repair Booth #3	CD-DF	EP-RO60
AR01	Assembly Repair Booth	CD-DF	EP-AR01
CW	Cavity Wax Booth	CD-DF CD-ADW1 CD-ADW2 CD-RTO1	EP-O1
PS01	Purge/Cleaning Solvent	CD-ADW1 CD-ADW2 CD-ADW3 CD-ADW4 CD-RTO1	EP-O1
BS02	Body Shop Adhesives Application	None	EP-BS

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B.1 EQUIPMENT

Equipment ID	Equipment Description	Control Device ID	Emission Point ID
AW	Assembly Glazing	None	EP-AW
AUW	Assembly UB Wax	CD-DF	EP-AUW
PC	Phosphate Cleaning	CD-ME	EP-RO1 EP-RO2
BS01	Body Shop Welding	CD-CF (MAG only)	EP-BS
PMR	Paint Mix Room	None	EP-RO120 EP-RO121 EP-RO420 EP-RO421
RB1	Assembly Roll and Brake	None	EP-RB01
RB2	Assembly Roll and Brake	None	EP-RB02
RB3	Assembly Roll and Brake	None	EP-RB03
AFF	Fluid Fill	CD-ORVR (gasoline only)	EP-AFF
AWT	Assembly Washer System Testing	None	EP-AB
WD	E-Coat Sand/Spot Repair	None	EP-RO41
WD	Primer Sand	None	EP-RO51
WD	Metal/Body Repair	None	EP-RO41
WD	E-Coat Touch Up	None	EP-RO40
WD	Primer Touch Up	None	EP-RO50
WD	Basecoat Touch Up	None	EP-RO50
WD	Inspect/Polish	None	EP-RO50
ASU P/BC/CC	Air Supply Unit for Primer Booth, BC Booth and CC Booth (natural gas fired)	None	EP-O1
ASU 2.1	Air Supply Unit 2.1 – Shop + Open Workdecks (natural gas fired)	None	EP-O1
ASU 3	Air Supply Unit 3 – UBS + Repair (natural gas fired)	None	EP-ASU 3
ASU 2.2	Air Supply Unit 2.2 – Shop + Open Workdecks (natural gas fired)	None	EP-ASU 2.2
ASU 1	Air Supply Unit 1 – Spot Repair (natural gas fired)	None	EP-ASU 1
ASU 2.3	Air Supply Unit 2.3 - Shop (natural gas fired)	None	EP-ASU 2.3
ASU 4	Air Supply Unit 4 - Wax (natural gas fired)	None	EP-ASU 4
ASU 6	Workdecks Air Supply Unit 6 Phase 2 (natural gas fired)	None	EP-ASU 6
ASU 5	Workdecks Air Supply Unit 5 Phase 2 (natural gas fired)	None	EP-ASU 5
ASU 31	Primer Booth Air Supply Unit Phase 3 (natural gas fired)	None	EP-ASU 31
ASU32	BC Booth Air Supply Unit Phase 3 (natural gas fired)	None	EP-ASU21
ASU33	Workdecks Air Supply Unit 1 Phase 3(natural gas fired)	None	EP-ASU33
ASU34	Workdecks Air Supply Unit 2 Phase 3 (natural gas fired)	None	EP-ASU34
ASU35	Workdecks Air Supply Unit 3 Phase 3 (natural gas fired)	None	EP-ASU35
ASU CR2	Air Supply Unit Clean Room Phase 2 (natural gas fired)	None	EP-ASU CR2

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B.1 EQUIPMENT

Equipment ID	Equipment Description	Control Device ID	Emission Point ID
ASU36	Shop Ventilation Air Supply Unit Phase 3 (natural gas fired)	None	EP-ASU36
ASU37	Social Rooms Air Supply Unit Phase 3 (natural gas fired)	None	EP-ASU37
AS-RTU01	Assembly Rooftop Unit 01 (natural gas fired)	None	EP-AS-RTU01
AS-RTU04	Assembly Rooftop Unit 04 (natural gas fired)	None	EP-AS-RTU04
AS-RTU06	Assembly Rooftop Unit 06 (natural gas fired)	None	EP-AS-RTU06
AS-RTU08	Assembly Rooftop Unit 08 (natural gas fired)	None	EP-AS-RTU08
AS-RTU10	Assembly Rooftop Unit 10 (natural gas fired)	None	EP-AS-RTU10
AS-RTU11	Assembly Rooftop Unit 11 (natural gas fired)	None	EP-AS-RTU11
AS-RTU13	Assembly Rooftop Unit 13 (natural gas fired)	None	EP-AS-RTU13
BS-RTU01	Body Shop Rooftop Unit 01 (natural gas fired)	None	EP-BS-RTU01
BS-RTU02	Body Shop Rooftop Unit025 (natural gas fired)	None	EP-BS-RTU02
BS-RTU04	Body Shop Rooftop Unit 04 (natural gas fired)	None	EP-BS-RTU04
BS-RTU05	Body Shop Rooftop Unit 05 (natural gas fired)	None	EP—BS—RTU05
BS-RTU06	Body Shop Rooftop Unit 06 (natural gas fired)	None	EP-BS-RTU06
BS-RTU07	Body Shop Rooftop Unit 07 (natural gas fired)	None	EP-BSRTU07
BS-RTU10	Body Shop Rooftop Unit 10 (natural gas fired)	None	EP-BS-RTU10
BS-RTU17	Body Shop Rooftop Unit 17 (natural gas fired)	None	EP-BS-RTU17
BS-RTU18	Body Shop Rooftop Unit 18 (natural gas fired)	None	EP-BSRTU18
BS-RTU23	Body Shop Rooftop Unit 23 (natural gas fired)	None	EP-BS-RTU23
BS-RTU25	Body Shop Rooftop Unit 25 (natural gas fired)	None	EP-BS-RTU25
BS-RTU26	Body Shop Rooftop Unit 26 (natural gas fired)	None	EP-BS-RTU26

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B.1 EQUIPMENT

Equipment ID	Equipment Description	Control Device ID	Emission Point ID
BS-RTU30	Body Shop Rooftop Unit 30 (natural gas fired)	None	EP-BSRTU30
BS-RTU32	Body Shop Rooftop Unit 32 (natural gas fired)	None	EP-BS-RTU32
BS-RTU33	Body Shop Rooftop Unit 33 (natural gas fired)	None	EP-BS-RTU33
BS-RTU35	Body Shop Rooftop Unit 35 (natural gas fired)	None	EP-BS-RTU35
CT01	Cooling Tower #1	None	EP-CT01
CT02	Cooling Tower #2	None	EP-CT02
CT03	Cooling Tower #3	None	EP-CT03
CT04	Cooling Tower #4	None	EP-CT04
CT05	Cooling Tower #5	None	EP-CT05
CT06	Cooling Tower #6	None	EP-CT06
CT07	Cooling Tower #7	None	EP-CT07
TK01	Gasoline Storage Tank	None	EP-TK01
TK02	Diesel Storage Tank	None	EP-TK02
TK03	Diesel Storage Tank	None	EP-TK03
EG01	Emergency Generator 01	None	EP-EG01
EG02	Emergency Generator 02	None	EP-EG02
EG03	Emergency Generator 03	None	EP-EG03
EG04	Emergency Generator 04	None	EP-EG04
FP01	Emergency Fire Pump 01	None	EP-FP01
RD	Roads	None	EP-RD

B.2 CONTROL DEVICES

Control Device ID	Control Device Description	Pollutant(s) Controlled
CD-RTO1	Regenerative Thermal Oxidizer (RTO) #1	VOCs, HAPs, TAPs
CD-FS1	Dry Filtration System #1	PM. PM_{10}, $PM_{2.5}$
CD-FS2	Dry Filtration System #2	PM. PM_{10}, $PM_{2.5}$
CD-FS3	Dry Filtration System #3	PM. PM_{10}, $PM_{2.5}$
CD-FS4	Dry Filtration System #4	PM. PM_{10}, $PM_{2.5}$
CD-FS5	Dry Filtration System #5	PM. PM_{10}, $PM_{2.5}$
CD-ADW1	Adsorption Wheel System #1	VOCs, HAPs, TAPs
CD-ADW2	Adsorption Wheel System #2	VOCs, HAPs, TAPs
CD-ADW3	Adsorption Wheel System #3	VOCs, HAPs, TAPs
CD-ADW4	Adsorption Wheel System #4	VOCs, HAPs, TAPs

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B.2 CONTROL DEVICES

Control Device ID	Control Device Description	Pollutant(s) Controlled
CD-DF	Dry Filters	PM. PM_{10}, $PM_{2.5}$
CD-ME	Mist Eliminator	PM. PM_{10}, $PM_{2.5}$
CD-CF	Cartridge Filter (MAG Only)	PM. PM_{10}, $PM_{2.5}$
CD-ORVR	Onboard Refueling Vapor Recovery	VOCs

C. LIMITATIONS, MONITORING AND REPORTING CONDITIONS

Condition Number	Conditions
C.1	**Equipment/Control Device ID:** All (S.C. Regulation 61-62.1, Section II.J.1.g) A copy of the Department issued construction and/or operating permit must be kept readily available at the facility at all times. The owner or operator shall maintain such operational records; make reports; install, use, and maintain monitoring equipment or methods; sample and analyze emissions or discharges in accordance with prescribed methods at locations, intervals, and procedures as the Department shall prescribe; and provide such other information as the Department reasonably may require. All records required to demonstrate compliance with the limits established under this permit shall be maintained on site for a period of at least 5 years from the date the record was generated and shall be made available to a Department representative upon request.
C.2	**Equipment/Control Device ID:** CD-RTO1, CD-FS1, CD-FS2, CD-FS3, CD-FS4, CD-FS5, CD-ADW1, CD-ADW2, CD-ADW3, CD-ADW4, CD-DF, CD-ME, CD-CF, CD-ORVR The owner/operator shall inspect, calibrate, adjust, and maintain continuous monitoring systems, monitoring devices, and gauges in accordance with manufacturer's specifications or good engineering practices. The owner/operator shall maintain on file all measurements including continuous monitoring system or monitoring device performance measurements; all continuous monitoring system performance evaluations; all continuous monitoring system or monitoring device calibration checks; adjustments and maintenance performed on these systems or devices; and all other information required in a permanent form suitable for inspection by Department personnel.
C.3	**Equipment/Control Device ID:** CD-RTO1, CD-FS1, CD-FS2, CD-FS3, CD-FS4, CD-FS5, CD-ADW1, CD-ADW2, CD-ADW3, CD-ADW4, CD-DF, CD-ME, CD-CF, CD-ORVR All gauges shall be readily accessible and easily read by operating personnel and Department personnel (i.e. on ground level or easily accessible roof level). Monitoring parameter readings (i.e., pressure drop readings, etc.) and inspection checks shall be maintained in logs (written or electronic), along with any corrective action taken when deviations occur. Each incidence of operation outside the operational ranges, including date and time, cause, and corrective action taken, shall be recorded and kept on site. Exceedance of operational range shall not be considered a violation of an emission limit of this permit, unless the exceedance is also accompanied by other information demonstrating that a

C. LIMITATIONS, MONITORING AND REPORTING CONDITIONS

Condition Number	Conditions
	violation of an emission limit has taken place. Reports of these incidences shall be submitted semiannually. If no incidences occurred during the reporting period then a letter shall indicate such. Any alternative method for monitoring control device performance must be preapproved by the Department and shall be incorporated into the permit as set forth in S.C. Regulation 61-62.70.7.
C.4	**Equipment/Control Device ID:** CD-RTO1 For any source test required under an applicable standard or permit condition, the owner, operator, or representative shall comply with S.C. Regulation 61-62.1, Section IV - Source Tests. Unless approved otherwise by the Department, the owner, operator, or representative shall ensure that source tests are conducted while the source is operating at the maximum expected production rate or other production rate or operating parameter which would result in the highest emissions for the pollutants being tested. Some sources may have to spike fuels or raw materials to avoid being subjected to a more restrictive feed or process rate. Any source test performed at a production rate less than the rated capacity may result in permit limits on emission rates, including limits on production if necessary. The owner or operator shall comply with any limits that result from conducting a source test at less than rated capacity. A copy of the most recent Department issued source test summary letter, whether it imposes a limit or not, shall be maintained with the operating permit, for each source that is required to conduct a source test. Site-specific test plans and amendments, notifications, and source test reports shall be submitted to the Manager of the Source Evaluation Section, Bureau of Air Quality.
C.5	**Equipment/Control Device ID:** B01, B02, ADH01, ADH02, OV01, OV02, OV03, OV22, OV23, OV04,, ASU37 (S.C. Regulation 61-62.5, Standard No. 1, Section I) The fuel burning source(s) shall not discharge into the ambient air smoke which exceeds opacity of 20%. The owner/operator shall, to the extent practicable, maintain and operate any source including associated air pollution control equipment in a manner consistent with good air pollution control practices for minimizing emissions.
C.6	**Equipment/Control Device ID:** CD-RTO1 (S.C. Regulation 61-62.5, Standard No. 3, Section III.I.1) Emissions from these sources shall not exhibit an opacity greater than 20%, each.
C.7	**Equipment/Control Device ID:** ED01, EO01, GC01, GC21, GO01, GO21, SAM01, SAM21, UBC01, UBC21, UBS01, UBS21, SS01, SS21, SKS01, SKS21, BC01, BC21, CC01, TO01, TO21, PSA, ASA, SR01, SR02, SR03, AR01, CW, PS01, BS02, AW, AUW, PC, BS01, PMR, RB1, RB2, RB3, AFF, AWT, WD

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C. LIMITATIONS, MONITORING AND REPORTING CONDITIONS

Condition Number	Conditions
	(S.C. Regulation 61-62.5, Standard No. 4, Section IX) Where construction or modification began after December 31, 1985, emissions from these sources (including fugitive emissions) shall not exhibit an opacity greater than 20%, each.
C.8	**Equipment/Control Device ID:** CD-RTO1, ED01, EO01, GC01, GC21, GO01, GO21, SAM01, SAM21, UBC01, UBC21, UBS01, UBS21, SS01, SS21, SKS01, SKS21, BC01, BC21, CC01, TO01, TO21, PSA, ASA, SR01, SR02, SR03, AR01, CW, PS01, BS02, AW, AUW, PC, BS01, PMR, RB1, RB2, RB3, AFF, AWT, WD The owner/operator shall perform a visual inspection of opacity on a semiannual basis. Visual inspection means a qualitative observation of opacity during daylight hours where the inspector records results in a log, noting color, duration, density (heavy or light), cause, and corrective action taken for any abnormal emissions. The observer does not need to be certified to conduct valid visual inspections. However, at a minimum, the observer should be trained and knowledgeable about the effects on visibility of emissions caused by background contrast, ambient lighting, and observer position relative to lighting, wind, and the presence of uncombined water. No periodic monitoring for opacity will be required during periods of burning natural gas or propane only. Logs shall be kept to record all visual inspections, including cause and corrective action taken for any abnormal emissions and visual inspections from date of recording. The owner/operator shall submit semiannual reports. The report shall include records of abnormal emissions, if any, and corrective actions taken. If only natural gas or propane was combusted or if the unit did not operate during the semiannual period, the report shall state so.
C.9	**Equipment/Control Device ID:** B01, B02, ADH01, ADH02, OV01, OV02, OV03, OV,22, OV23, OV04, ASU37 (S.C. Regulation 61-62.5, Standard No. 1, Section II) The maximum allowable discharge of particulate matter resulting from these sources is 0.6 pounds per million BTU input.
C.10	**Equipment/Control Device ID:** B01, B02, ADH01, ADH02, OV01, OV02, OV03, OV22, OV23, OV04, ASU37 (S.C. Regulation 61-62.5, Standard No. 1, Section III) The maximum allowable discharge of sulfur dioxide (SO_2) resulting from these sources is 2.3 pounds per million BTU input.
C.11	**Equipment/Control Device ID:** B01, B02, ADH01, ADH02, OV01, OV02, OV03, OV,22, OV23, OV04, ASU P/BC/CC, ASU 2.1, ASU 3, ASU 2.2, ASU 1, ASU 2.3, ASU 4, ASU 6, ASU 5, ASU 31, ASU32, ASU33, ASU34, ASU35, ASU CR2, ASU36, ASU37, AS-RTU01, AS-RTU04, AS-RTU06, AS-RTU08, AS-RTU10, AS-RTU11, AS-RTU13, BS-RTU01, BS-RTU02, BS-RTU04, BS-RTU05, BS-RTU06, BS-RTU07, BS-RTU10, BS-RTU17, BS-RTU18, BS-RTU23, BS-RTU25, BS-RTU26, BS-RTU30, BS-RTU32, BS-RTU33, BS-RTU35, CD-RTO1 These sources are permitted to burn only pipeline quality natural gas as fuel. The use of any other substances as fuel is prohibited without prior written approval from the Department.
C.12	**Equipment/Control Device ID:** CD-RTO1 (S.C. Regulation 61-62.5, Standard No.3, Section III.I.2) Particulate matter emissions from these

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C. LIMITATIONS, MONITORING AND REPORTING CONDITIONS

<table>
<tr><th>Condition Number</th><th>Conditions</th></tr>
<tr><td></td><td>sources shall not exceed 0.5 lb/10^6 Btu total heat input. The total heat input value from waste and virgin fuel used for production shall not exceed the Btus used to affect the combustion of the waste and shall not include any Btu input from auxiliary burners located outside of the primary combustion chamber such as those found in secondary combustion chambers, tertiary combustion chambers or afterburners unless those auxiliary burners are fired with waste. In the case where waste is fired in the auxiliary burners located outside of the primary combustion chamber, only the Btu value of the fuel for the auxiliary burner which is from waste shall be added to the total heat input value.</td></tr>
<tr><td>C.13</td><td>Equipment/Control Device ID: CD-RTO1

The owner/operator shall install, operate and maintain combustion zone and/or afterburner temperature indicators on each incinerator and maintained on site. Temperature readings shall be recorded at least every fifteen (15) minutes during source operation for each incinerator. Maintenance checks for proper temperature indicator operation shall be made on at least a weekly basis. Each incinerator shall be in place and operational whenever processes controlled by it are running, except during periods of flame incinerator malfunction or mechanical failure.</td></tr>
<tr><td>C.14</td><td>Equipment/Control Device ID: CD-RTO1

(S.C. Regulation 61-62.5, Standard No. 3, Section IX.D) An exemption from all of the Operator Training Requirements in S.C. Regulations 61-62.5, Standard No. 3, Section IX.C has been granted for the RTOs (CD-RTO1, CD-RTO2, CD-RTO3).</td></tr>
<tr><td>C.15</td><td>Equipment/Control Device ID: ED01, EO01, GC01, GC21, GO01, GO21, SAM01, SAM21, UBC01, UBC21, UBS01, UBS21, SS01, SS21, SKS01, SKS21, BC01, BC21, CC01, TO01, TO21, PSA, ASA, SR01, SR02, SR03, AR01, CW, PS01, BS02, AW, AUW, PC, BS01, PMR, RB1, RB2, RB3, AFF, AWT, WD

(S.C. Regulation 61-62.5, Standard No. 4, Section VIII) Particulate matter emissions shall be limited to the rate specified by use of the following equations:
For process weight rates less than or equal to 30 tons per hour
$E = (F)\ 4.10P^{0.67}$ and
For process weight rates greater than 30 tons per hour
$E = (F)\ 55.0P^{0.11} - 40$
Where E = the allowable emission rate in pounds per hour
P = process weight rate in tons per hour
F = effect factor from Table B in S.C. Regulation 61-62.5, Standard No. 4

For the purposes of compliance with this condition, the process boundaries are defined as follows:

<table><tr><th>Process/Equipment IDs</th><th>Max Process Weight Rate (ton/hr)</th></tr><tr><td>Automobile Body and Coating Operations (ED01, EO01, GC01, GC21, GO01, GO21, SAM01,</td><td>54.25</td></tr></table></td></tr>
</table>

C. LIMITATIONS, MONITORING AND REPORTING CONDITIONS

<table>
<tr><th>Condition Number</th><th>Conditions</th></tr>
<tr><td></td><td><table>
<tr><td>SAM21, UBC01, UBC21, UBS01, UBS21, SS01, SS21, SKS01, SKS21, BC01, BC21, CC01, TO01, TO21,PSA, ASA, SR01, SR02, SR03, CW, PS01, BS20, PC, BS01, PMR, WD)</td><td></td></tr>
<tr><td>Automobile Assembly Operations(AR01, RB1, RB2, RB3, AW, AUW, AFF, AWT)</td><td>60.63</td></tr>
</table></td></tr>
<tr><td>C.16</td><td>Equipment/Control Device ID: B01, B02

(S.C. Regulation 61-62.5, Standard No. 5.2, Section III) The allowable discharge of NO_X resulting from these sources is Low-NO_X Burners or equivalent technology capable of achieving 30 parts per million by volume (ppmv) at 3 percent O_2 Dry Basis (0.036 pounds per million metric British thermal units (lb/MMBtu).

The supporting documentation (certification from manufacturer, stack test results, 30 days of normal readings, opacity readings, etc.) for the low NOx burners shall be submitted to the Director of Air Permitting with the Certification of Construction.</td></tr>
<tr><td>C.17</td><td>RESERVED.</td></tr>
<tr><td>C.18</td><td>Equipment/Control Device ID: B01, B02
(S.C. Regulation 61-62.5, Standard No. 5.2, Section IV)

The owner or operator shall maintain records of the occurrence and duration of any malfunction in the operation of an affected source; any malfunction of the air pollution control equipment; or any periods during which a continuous monitoring system or monitoring device is inoperative.</td></tr>
<tr><td>C.19</td><td>Equipment/Control Device ID: B01, B02

These sources are subject to New Source Performance Standards (NSPS), 40 CFR 60 Subpart A, General Conditions and Subpart Dc, Small Industrial-Commercial-Institutional Steam Generating Units and S.C. Regulation 61-62.60, Subparts A and Dc, Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units, as applicable. Compliance with the regulation shall be demonstrated by burning only natural gas or propane for fuel. The use of other fuels will subject this source to additional emission limitations and is prohibited without prior written approval from the Department.</td></tr>
<tr><td>C.20</td><td>Equipment/Control Device ID: B01, B02

The owner/operator shall record and maintain records of the amounts and types of each fuel combusted by these sources. The amount and type of fuel combusted shall be recorded monthly. As</td></tr>
</table>

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C. LIMITATIONS, MONITORING AND REPORTING CONDITIONS

Condition Number	Conditions
	an alternative, the owner/operator may record and maintain records of the total amount of each source's fuel delivered to the facility during each calendar month.
C.21	**Equipment/Control Device ID:** ED01, EO01, GC01, GC21, GO01, GO21, BC01, BC21, CC01, TO01, TO21, PS01, WD (E-Coat Sand/Spot Repair), CD-RTO1, CD-ADW1, CD-ADW2, CD-ADW3, CD-ADW4 These sources are subject to New Source Performance Standards (NSPS), 40 CFR 60 Subpart A, General Provisions and Subpart MM, Automobile And Light-Duty Truck Surface Coating Operations, and S.C. Regulation 61-62.60 Subparts A and MM, Automobile And Light-Duty Truck Surface Coating Operations, as applicable. These sources shall comply with all applicable requirements of Subparts A and MM.
C.22	**Equipment/Control Device ID:** ED01, EO01, PS01, CD-RTO1 (40 CFR 60, Subpart MM) On and after the date on which the initial performance test required by 40 CFR 60.8 is completed, no owner or operator subject to the provisions of this subpart shall discharge or cause the discharge into the atmosphere from any affected facility VOC emissions in excess of: (a) For each EDP prime coat operation: (i) 0.17 kilogram of VOC per liter of applied coating solids when R_T is 0.16 or greater. (ii) 0.17 x 350 $(^{0.160}-R_T)$ kg of VOC per liter of applied coating solids when R_T is greater than or equal to 0.040 and less than 0.160. (iii) When R_T is less than 0.040, there is no emission limit. Where R_T is the ratio of total volume of coating solids that is added to the EDP system in a calendar month divided by the total volume design capacity of the EDP system. (b) For each non-electrodeposition prime coat operation: (i) 0.17 kilogram of VOC per liter of applied coating solids.
C.23	**Equipment/Control Device ID:** GC01, GC21, GO01, GO21, PS01, WD (E-Coat Sand/Spot Repair), CD-ADW1, CD-ADW2, CD-ADW3, CD-ADW4, CD-RTO1 (40 CFR 60, Subpart MM) On and after the date on which the initial performance test required by 40 CFR 60.8 is completed, no owner or operator subject to the provisions of this subpart shall discharge or cause the discharge into the atmosphere from any affected facility VOC emissions in excess of: For each guide coat operation: (i) 1.40 kilograms of VOC per liter of applied coating solids.
C.24	**Equipment/Control Device ID:** BC01, BC21, CC01, TO01, TO21, PS01, CD-ADW1, CD-ADW2, CD-ADW3, CD-ADW4, CD-RTO1

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Condition Number	Conditions
	(40 CFR 60, Subpart MM) On and after the date on which the initial performance test required by 40 CFR 60.8 is completed, no owner or operator subject to the provisions of this subpart shall discharge or cause the discharge into the atmosphere from any affected facility VOC emissions in excess of: For each topcoat operation: (i) 1.47 kilograms of VOC per liter of applied coating solids.
C.25	**Equipment/Control Device ID:** ADH01, ADH02, OV01, OV02, OV04, OV22, OV23, ED01, EO01, GC01, GC21, GO01, GO21, BC01, BC21, CC01, TO01, TO21, PS01, WD(E-Coat Sand/Spot Repair), CD-RTO1, CD-ADW1, CD-ADW2, CD-ADW3, CD-ADW4 (40 CFR 60, Subpart MM) The owner or operator of an affected facility shall conduct an initial performance test in accordance with by 40 CFR 60.8(a) and thereafter for each calendar month for each affected facility according to the procedures below: The owner or operator shall use the following procedures for determining the monthly volume weighted average mass of VOC emitted per volume of applied coating solids. (1) The owner or operator shall use the following procedures for each affected facility which does not use a capture system and a control device to comply with the applicable emission limit specified under 40 CFR 60.392. (i) Calculate the volume weighted average mass of VOC per volume of applied coating solids for each calendar month for each affected facility. The owner or operator shall determine the composition of the coatings by formulation data supplied by the manufacturer of the coating or from data determined by an analysis of each coating, as received, by Method 24. The Administrator may require the owner or operator who uses formulation data supplied by the manufacturer of the coating to determine data used in the calculation of the VOC content of coatings by Method 24 or an equivalent or alternative method. The owner or operator shall determine from company records on a monthly basis the volume of coating consumed, as received, and the mass of solvent used for thinning purposes. The volume weighted average of the total mass of VOC per volume of coating solids used each calendar month will be determined by the following procedures. (i)(A) Calculate the mass of VOC used in each calendar month for each affected facility by the following equation where "n" is the total number of coatings used and "m" is the total number of VOC solvents used: $M_o + M_d = \sum_{i=1}^{n} L_{c}iD_{c}iW_{o}i + \sum_{j=1}^{m} L_{d}jD_{d}j$ [$\sum L_{d}j\ D_{d}j$ will be zero if no VOC solvent is added to the coatings, as received].

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Condition Number	Conditions
	(i)(B) Calculate the total volume of coating solids used in each calendar month for each affected facility by the following equation where "n" is the total number of coatings used: $L_s = \sum_{i=1}^{n} L_c i V_s i$ (i)(C) Select the appropriate transfer efficiency (T) from the following tables for each surface coating operation: Application method | Transfer efficiency Air Atomized Spray (waterborne coating)........| 0.39 Air Atomized Spray (solvent-borne coating)....| 0.50 Manual Electrostatic Spray...............................| 0.75 Automatic Electrostatic Spray..........................| 0.95 Electrodeposition...| 1.00 The values in the table above represent an overall system efficiency which includes a total capture of purge. If a spray system uses line purging after each vehicle and does not collect any of the purge material, the following table shall be used: Application method | Transfer efficiency Air Atomized Spray (waterborne coating).......| 0.30 Air Atomized Spray (solvent-borne coating)...| 0.40 Manual Electrostatic Spray..............................| 0.62 Automatic Electrostatic Spray.........................| 0.75 If the owner or operator can justify to the Administrator's satisfaction that other values for transfer efficiencies are appropriate, the Administrator will approve their use on a case-by-case basis. (i)(C)(1) When more than one application method (*l*) is used on an individual surface coating operation, the owner or operator shall perform an analysis to determine an average transfer efficiency by the following equation where "n" is the total number of coatings used and "p" is the total number of application methods: $T = \dfrac{\sum_{i=1}^{n} T_l V_s i L_c i l}{\sum_{l=l}^{p} L_s}$

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Condition Number	Conditions
	(1)(i)(D) Calculate the volume weighted average mass of VOC per volume of applied coating solids (G) during each calendar month for each affected facility by the following equation: $G = \dfrac{M_o + M_d}{L_s T}$ (1)(i)(E) For each EDP prime coat operation, calculate the turnover ratio (R_T) by the following equation: $R_T = \dfrac{L_S}{L_E}$, truncated after 3 decimal places. Then calculate or select the appropriate limit according to 40 CFR 60.392(a). (1)(ii) If the volume weighted average mass of VOC per volume of applied coating solids (G), calculated on a calendar month basis, is less than or equal to the applicable emission limit specified in 40 CFR 60.392, the affected facility is in compliance. Each monthly calculation is a performance test for the purpose of this subpart.
C.26	**Equipment/Control Device ID:** ED01, EO01, GC01, GC21, GO01, GO21, BC01, BC21, CC01, TO01, TO21, PS01, WD (E-Coat Sand/Spot Repair), CD-RTO1, CD-ADW1, CD-ADW2, CD-ADW3, CD-ADW4 (40 CFR 60, Subpart MM) The owner or operator shall use the following procedures for determining the monthly volume weighted average mass of VOC emitted per volume of applied coating solids. (2) The owner or operator shall use the following procedures for each affected facility which uses a capture system and a control device that destroys VOC (e.g., incinerator) to comply with the applicable emission limit specified under 40 CFR 60.392. (2)(i) Calculate the volume weighted average mass of VOC per volume of applied coating solids (G) during each calendar month for each affected facility as described under 40 CFR 60.393(c)(1)(i). (2)(ii) Calculate the volume weighted average mass of VOC per volume of applied solids emitted after the control device, by the following equation: N = G[1 - FE] (2)(ii)(A) Determine the fraction of total VOC which is emitted by an affected facility that enters the control device by using the following equation where "n" is the total number of stacks entering the control device and "p" is the total number of stacks not connected to the control device: $F = \dfrac{\sum_{i=l}^{n} Q_{b}i\, C_{b}i}{\sum^{n} Qbi\, C_{b}i + \sum^{p} Q_{f}k\, C_{f}k}$

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	i = 1 k = l If the owner can justify to the Administrator's satisfaction that another method will give comparable results, the Administrator will approve its use on a case-by-case basis. (2)(ii)(A)(*1*) In subsequent months, the owner or operator shall use the most recently determined capture fraction for the performance test. (c)(2)(ii)(B) Determines the destruction efficiency of the control device using values of the volumetric flow rate of the gas streams and the VOC content (as carbon) of each of the gas streams in and out of the device by the following equation where "n" is the total number of stacks entering the control device and "m" is the total number of stacks leaving the control device: $E = \frac{\sum_{i=l}^{n} Q_{b}i\ C_{b}i - \sum_{j=l}^{m} Q_{a}j\ C_{a}j}{\sum_{i=l}^{n} Q_{b}i\ C_{b}i}$ (2)(ii)(B)(*1*) In subsequent months, the owner or operator shall use the most recently determined VOC destruction efficiency for the performance test. (2)(ii)(C) If an emission control device controls the emissions from more than one affected facility, the owner or operator shall measure the VOC concentration ($C_{b}i$) in the effluent gas entering the control device (in parts per million by volume) and the volumetric flow rate ($Q_{b}i$) of the effluent gas (in dry standard cubic meters per hour) entering the device through each stack. The destruction or removal efficiency determined using these data shall be applied to each affected facility served by the control device. (2)(iii) If the volume weighted average mass of VOC per volume of applied solids emitted after the control device (N) calculated on a calendar month basis is less than or equal to the applicable emission limit specified in 40 CFR 60.392, the affected facility is in compliance. Each monthly calculation is a performance test for the purposes of this subpart.
C.27	**Equipment/Control Device ID:** CD-RTO1, CD-ADW1, CD-ADW2, CD-ADW3, CD-ADW4 (40 CFR 60, Subpart MM) The owner or operator of an affected facility which uses an incinerator to comply with the emission limits specified under 40 CFR 60.392 shall install, calibrate, maintain, and operate temperature measurement devices as prescribed below: (a) Where thermal incineration is used, a temperature measurement device shall be installed in the firebox. Where catalytic incineration is used, a temperature measurement device shall be installed in the gas stream immediately before and after the catalyst bed.

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	(b) Each temperature measurement device shall be installed, calibrated, and maintained according to accepted practice and the manufacturer's specifications. The device shall have an accuracy of the greater of ±0.75 percent of the temperature being measured expressed in degrees Celsius or ±2.5° C. (c) Each temperature measurement device shall be equipped with a recording device so that a permanent record is produced.
C.28	**Equipment/Control Device ID:** ED01, EO01, GC01, GC21, GO01. GO21, BC01, BC21, CC01, TO01, TO21, PS01, WD (E-Coat Sand/Spot Repair), CD-RTO1, CD-ADW1, CD-ADW2, CD-ADW3, CD-ADW4 (40 CFR 60, Subpart MM) Each owner or operator of an affected facility shall include the data outlined in paragraphs (1) and (2) in the initial compliance report required by 40 CFR 60.8. (1) The owner or operator shall report the volume weighted average mass of VOC per volume of applied coating solids for each affected facility. (2) Where compliance is achieved through the use of incineration, the owner or operator shall include the following additional data in the control device initial performance test required by 40 CFR 60.8(a) or subsequent performance tests at which destruction efficiency is determined: the combustion temperature (or the gas temperature upstream and downstream of the catalyst bed), the total mass of VOC per volume of applied coating solids before and after the incinerator, capture efficiency, the destruction efficiency of the incinerator used to attain compliance with the applicable emission limit specified in 40 CFR 60.392 and a description of the method used to establish the fraction of VOC captured and sent to the control device.
C.29	**Equipment/Control Device ID:** ED01, EO01, GC01, GC21, GO01, GO21, BC01, BC21, CC01, TO01, TO21, PS01, WD (E-Coat Sand/Spot Repair), CD-RTO1, CD-ADW1, CD-ADW2, CD-ADW3, CD-ADW4 (40 CFR 60, Subpart MM) Following the initial performance test, the owner or operator of an affected facility shall identify, record, and submit a written report every calendar quarter of each instance in which the volume-weighted average of the total mass of VOC's emitted to the atmosphere per volume of applied coating solids (N) is greater than the limit specified under 40 CFR 60.392. If no such instances have occurred during a particular quarter, a report stating this shall be submitted to the Administrator semiannually. Where compliance is achieved through the use of a capture system and control device, the volume-weighted average after the control device should be reported.
C.30	**Equipment/Control Device ID:** CD-RTO1, CD-ADW1, CD-ADW2, CD-ADW3, CD-ADW4 (40 CFR 60, Subpart MM) Where compliance with 40 CFR 60.392 is achieved through the use of incineration, the owner or operator shall continuously record the incinerator combustion temperature during coating operations for thermal incineration or the gas temperature upstream and downstream of the incinerator catalyst bed during coating operations for catalytic incineration. The owner or operator shall submit a written report semiannually and as defined below.

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	(1) For thermal incinerators, every three-hour period shall be reported during which the average temperature measured is more than 28°C less than the average temperature during the most recent control device performance test at which the destruction efficiency was determined as specified under 40 CFR 60.393. (2) For catalytic incinerators, every three-hour period shall be reported during which the average temperature immediately before the catalyst bed, when the coating system is operational, is more than 28° C less than the average temperature immediately before the catalyst bed during the most recent control device performance test at which destruction efficiency was determined as specified under 40 CFR 60.393. In addition, every three-hour period shall be reported each quarter during which the average temperature difference across the catalyst bed when the coating system is operational is less than 80 percent of the average temperature difference of the device during the most recent control device performance test at which destruction efficiency was determined as specified under 40 CFR 60.393. (3) For thermal and catalytic incinerators, if no such incidents occurred during the reporting period, such information shall be stated in the report.
C.31	**Equipment/Control Device ID:** ED01, EO01, GC01, GC21, GO01, GO21, BC01, BC21, CC01, TO01, TO21, PS01, CD-RTO1, CD-ADW1, CD-ADW2, CD-ADW3, CD-ADW4 (40 CFR 60, Subpart MM) The owner or operator shall notify the Department 30 days in advance of any test by Method 25.
C.32	Equipment/Control Device ID: ED01, EO01, GC01, GC21, GO01, GO21, BC01, BC21, CC01, TO01, TO21, PS01, WD (E-Coat Sand/Spot Repair), CD-RTO1, CD-ADW1, CD-ADW2, CD-ADW3, CD-ADW4 (40 CFR 60, Subpart MM) The reference methods in Appendix A of 40 CFR 60, except as provided in 40 CFR 60.8 shall be used to conduct performance tests. (1) Method 24 or an equivalent or alternative method approved by the Administrator shall be used for the determination of the data used in the calculation of the VOC content of the coatings used for each affected facility. Manufacturers' formulation data is approved by the Administrator as an alternative method to Method 24. In the event of dispute, Method 24 shall be the referee method. (2) Method 25 or an equivalent or alternative method approved by the Administrator shall be used for the determination of the VOC concentration in the effluent gas entering and leaving the emission control device for each stack equipped with an emission control device and in the effluent gas leaving each stack not equipped with a control device. (3) The following methods shall be used to determine the volumetric flow rate in the effluent gas in a stack:

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Condition Number	Conditions
	(i) Method 1 for sample and velocity traverses, (ii) Method 2 for velocity and volumetric flow rate, (iii) Method 3 for gas analysis, and (iv) Method 4 for stack gas moisture. (4) For Method 24, the coating sample must be a 1-liter sample taken in a 1-liter container. (5) For Method 25, the sampling time for each of three runs must be at least one hour. The minimum sample volume must be 0.003 dscm except that shorter sampling times or smaller volumes, when necessitated by process variables or other factors, may be approved by the Administrator. The Administrator will approve the sampling of representative stacks on a case-by-case basis if the owner or operator can demonstrate to the satisfaction of the Administrator that the testing of representative stacks would yield results comparable to those that would be obtained by testing all stacks.
C.33	**Equipment/Control Device ID:** ED01, EO01, GC01, GC21, GO01, GO21, C21, CC01, TO01, TO21, PS01, WD (E-Coat Sand/Spot Repair), CD-RTO1,, CD-ADW1, CD-ADW2, CD-ADW3, CD-ADW4 (40 CFR 60, Subpart MM) The following physical or operational changes are not, by themselves, considered modifications of existing facilities: (a) Changes as a result of model year changeovers or switches to larger cars. (b) Changes in the application of the coatings to increase coating film thickness.
C.34	**Equipment/Control Device ID:** Project Wide (S.C. Regulation 61-62.1, Section II.E) This facility is a potential major source for NO_x emissions. The facility has agreed to federally enforceable operating limitations to limit its potential to emit to less than 40 tons per year for NO_x emissions to avoid PSD. The owner/operator shall maintain fuel combustion records and any other records necessary to determine facility wide NO_x emissions. NO_x emissions shall be calculated on a monthly basis, and a twelve month rolling sum shall be calculated for total NO_x emissions. Emissions from malfunctions are required to be quantified and included in the calculations. The twelve month rolling sum shall be less than 40 tons. Reports of the calculated values and the twelve-month rolling sum, calculated for each month in the reporting period, shall be submitted semiannually. An algorithm, including example calculations and emission factors, explaining the method used to determine emission rates shall only be included in the initial report. Subsequent submittals of the algorithm are required within 30 days of the change if the algorithm or basis for emissions is modified or the Department requests additional information.
C.35	**Equipment/Control Device ID:** Project Wide

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	(S.C. Regulation 61-62.1, Section II.E) This facility is a potential major source for Greenhouse Gas emissions. The facility has agreed to federally enforceable operating limitations to limit its potential to emit to less than 75,000 tons per year for Carbon Dioxide Equivalent (CO_2e) emissions to avoid PSD. The owner/operator shall maintain fuel combustion records, shield gas usage and any other records necessary to determine facility wide CO_2e emissions. CO_2e emissions shall be calculated on a monthly basis, and a twelve month rolling sum shall be calculated for total CO_2e emissions. Emissions from malfunctions are required to be quantified and included in the calculations. The twelve month rolling sum shall be less than 75,000 tons. Reports of the calculated values and the twelve-month rolling sum, calculated for each month in the reporting period, shall be submitted semiannually. An algorithm, including example calculations and emission factors, explaining the method used to determine emission rates shall be included in the initial report. Subsequent submittals of the algorithm and example calculations are unnecessary, unless the method of calculation is found to be unacceptable by the Bureau or if the facility changes the method of calculating emissions and/or changes emission factors.
C.36	**Equipment/Control Device ID:** Project wide The facility is limited to a nominal production rate of 164,250 vehicles (12 month rolling sum). The owner/operator must record the actual production rates monthly. Records of the production rate shall be maintained on site. Any facility proposed changes, changes in the method of calculating emissions, and/or changes in emission factors that alter the nominal production rate shall be submitted to ensure compliance with the project wide limits of 40 tons per year of NO_x and 75,000 tons per year of CO_2e. The permit may be administratively updated to reflect the new production rate.
C.37	**Equipment/Control Device ID:** CT01, CT02, CT03, CT04, CT05, CT06, CT07 Emissions are based a nominal total dissolved solids (TDS) concentration in the cooling towers process water of 650 ppm. The owner/operator shall maintain records of the TDS from the local water system used for the cooling tower circulating water when operating. Any facility proposed changes, changes in the method of calculating emissions, and/or changes in emission factors that alter the total dissolved solids concentration shall be submitted to ensure compliance with the $PM_{2.5}$ modeled emission rates. The permit may be administratively updated to reflect the new concentration.
C.38	**Equipment/Control Device ID:** EG01, EG02, EG03, EG04, FP01 (S.C. Regulation 61-62.5, Standard No. 7) In accordance with Standard No. 7 – Prevention of Significant Deterioration and based on BACT analysis for PM, PM_{10}, $PM_{2.5}$ and VOCs, these sources shall meet

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	emission standards of 40 CFR 60 Subpart IIII, shall be limited to operating no more than 100 hours per year on a non-emergency basis, and shall burn only ultra-low sulfur diesel as fuel. The owner or operator shall record the actual operating hours of each generator on a monthly basis. Reports of the recorded hours of operation shall be submitted semiannually. These sources are permitted to burn only ultra-low sulfur diesel as fuel. The use of any other substances as fuel is prohibited without prior written approval from the Department. Fuel oil sulfur content shall be less than or equal to 0.0015 percent by weight. Fuel oil supplier certification shall be obtained for each batch of oil received and stored on site. Reports of any exceedances of the sulfur content shall be submitted semiannually. If no exceedances occurred during the reporting period then a letter shall indicate such.
C.39	**Equipment/Control Device ID:** B01, B02, ADH01, ADH02, OV01, OV02, OV03, OV04, OV22, OV23, ASU P/BC/CC, ASU 2.1, ASU 3, ASU 2.2, ASU 1, ASU 2.3, ASU 4, ASU 6, ASU 5, ASU 31, ASU32, ASU33, ASU34, ASU35, ASU CR2, ASU36, ASU37 (S.C. Regulation 61-62.5, Standard No. 7) In accordance with Standard No. 7 – Prevention of Significant Deterioration and based on BACT analysis, these sources are subject to PM, PM_{10} and $PM_{2.5}$ limits of 7.6 lb/MMscf (3 hour block average). This limit shall apply at all times. These sources are permitted to burn only natural gas as fuel. The use of any other substances as fuel is prohibited without prior written approval from the Department. Natural gas fuel usage shall be monitored and recorded on a monthly basis. Records of natural gas usage shall be maintained onsite. The owner or operator shall develop a tune-up plan and perform tune-ups on Equipment IDs B01 and B02 in accordance with the requirements in 40 CFR 63.7540(a)(10). Records of tune-ups shall be submitted once every five (5) years. The tune-up plan shall only be included in the initial report. Subsequent submittals of the tune-up plan are required within 30 days of the change if the plan is modified or the Department requests additional information.
C.40	**Equipment/Control Device ID:** GC01, GC21, BC01, BC21, CC01, CD-FS1, CD-FS2, CD-FS3, CD-FS4, CD-FS5 (S.C. Regulation 61-62.5, Standard No. 7) In accordance with Standard No. 7 – Prevention of Significant Deterioration and based on BACT analysis, these sources are subject to PM, PM_{10} and $PM_{2.5}$ limits of 1.0 mg/m^3 (3 hour block average). This limit shall apply at all times. The owner/operator shall install, operate and maintain pressure drop gauge(s) on the dry filtration system. Pressure drop readings shall be recorded daily during source operation and shall be within the range specified by the manufacturer's recommendations. These ranges and supporting documentation (certification from manufacturer, stack test results, 30 days of normal readings, opacity readings, etc.) shall be submitted to the Director of Air Permitting within 180 days of startup.

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	As an alternative, the owner/operator may collect monitoring data on a more frequent basis and calculate the average as specified by the minimum frequency for purposes of determining whether an excursion has occurred. However, the owner/operator must collect additional data points on a regular basis and shall not be collected and used in particular instances to avoid reporting excursions. The owner/operator shall report the frequency chosen to the Director of Air Permitting with the Certification of Construction. Records of any excursions shall be submitted semiannually. The dry filtration systems shall be operational and in place at all times when equipment or processes controlled by filter(s) are operating, except during periods of malfunction or mechanical failure. A schedule shall be implemented for the weekly inspection and regular cleaning or replacement of the dry filter(s). Records of these events shall be maintained in logs (written or electronic) onsite.
C.41	**Equipment/Control Device ID:** CW, CD-DF (S.C. Regulation 61-62.5, Standard No. 7) In accordance with Standard No. 7 – Prevention of Significant Deterioration and based on BACT analysis, these sources are subject to PM, PM_{10} and $PM_{2.5}$ limits of 98.5% filter efficiency. This limit shall apply at all times. The dry filters shall be operational and in place at all times when equipment or processes controlled by filter(s) are operating, except during periods of malfunction or mechanical failure. A schedule shall be implemented for the weekly inspection and regular cleaning or replacement of the dry filter(s). Records of these events shall be maintained in logs (written or electronic) onsite.
C.42	**Equipment/Control Device ID:** UBS01, UBS21, UBC01, UBC21, SR01, SR02, SR03, AR01, CD-DF (S.C. Regulation 61-62.5, Standard No. 7) In accordance with Standard No. 7 – Prevention of Significant Deterioration and based on BACT analysis, these sources are subject to PM, PM_{10} and $PM_{2.5}$ limits of 98.5% filter efficiency. This limit shall apply at all times. The dry filters shall be operational and in place at all times when equipment or processes controlled by filter(s) are operating, except during periods of malfunction or mechanical failure. A schedule shall be implemented for the weekly inspection and regular cleaning or replacement of the dry filter(s) associated with UBS01, UBS21, UBC01 and UBC21. A schedule shall be implemented for the monthly inspection and regular cleaning or replacement of the dry filter(s) associated with SR01, SR02, SR03 and AR01. Records of these events shall be maintained in logs (written or electronic) onsite.
C.43	**Equipment/Control Device ID:** AUW, CD-DF (S.C. Regulation 61-62.5, Standard No. 7) In accordance with Standard No. 7 – Prevention of Significant Deterioration and based on BACT analysis, these sources are subject to PM, PM_{10} and $PM_{2.5}$ limits of 98.0% filter efficiency. This limit shall apply at all times.

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	The dry filters shall be operational and in place at all times when equipment or processes controlled by filter(s) are operating, except during periods of malfunction or mechanical failure. A schedule shall be implemented for the weekly inspection and regular cleaning or replacement of the dry filter(s). Records of these events shall be maintained in logs (written or electronic) onsite.
C.44	**Equipment/Control Device ID:** CT01, CT02, CT03, CT04, CT05, CT06, CT07 (S.C. Regulation 61-62.5, Standard No. 7) In accordance with Standard No. 7 – Prevention of Significant Deterioration and based on BACT analysis, these sources are subject to PM, PM_{10} and $PM_{2.5}$ limits of 0.001% drift rate. This limit shall apply at all times. The supporting documentation (certification from manufacturer, stack test results, 30 days of normal readings, opacity readings, etc.) for the drift rate shall be submitted to the Director of Air Permitting within 180 days of startup. Operation and maintenance checks shall be made on at least a semiannual basis for the cooling towers' drift eliminators for proper operation. Documentation of the semiannual inspections, maintenance activities, and other work performed shall be maintained onsite.
C.45	**Equipment/Control Device ID:** PC, CD-ME (S.C. Regulation 61-62.5, Standard No. 7) In accordance with Standard No. 7 – Prevention of Significant Deterioration and based on BACT analysis, these sources are subject to PM, PM_{10} and $PM_{2.5}$ work practice standards of the proper use of a mist eliminator in accordance with the manufacturers recommendations. The supporting documentation (certification from manufacturer, stack test results, 30 days of normal readings, opacity readings, etc.) for the mist eliminator shall be submitted to the Director of Air Permitting within 180 days of startup. Operation and maintenance checks shall be made on at least a semiannual basis for the phosphate cleaning mist eliminators for proper operation. Documentation of the semiannual inspections, maintenance activities, and other work performed shall be maintained onsite.
C.46	**Equipment/Control Device ID:** BS01, CD-CF (S.C. Regulation 61-62.5, Standard No. 7) In accordance with Standard No. 7 – Prevention of Significant Deterioration and based on BACT analysis, these sources are subject to PM, PM_{10} and $PM_{2.5}$ work practice standards of the proper use of an cartridge filter for MAG welding in accordance with the manufacturers recommendations, good operating practices and indoor venting. The owner/operator shall perform monthly maintenance inspections on the cartridge filter to ensure proper operation of the control device. Documentation of the maintenance activities and any other work performed (emergency, etc.) shall be maintained on site. Semiannual summary reports,

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	including any variances from established parameters and appropriate corrective action taken during the reporting period, shall be submitted. The cartridge filter shall be in place and operational whenever processes controlled by it are running, except during periods of cartridge filter malfunction or mechanical failure. The supporting documentation (certification from manufacturer, stack test results, 30 days of normal readings, opacity readings, etc.) for the cartridge filter and the good operating practices shall be submitted to the Director of Air Permitting within 180 days of startup.
C.47	**Equipment/Control Device ID:** RB1, RB2, RB3 (S.C. Regulation 61-62.5, Standard No. 7) In accordance with Standard No. 7 – Prevention of Significant Deterioration and based on BACT analysis, these sources are subject to PM, PM_{10} and $PM_{2.5}$ work practice standards of the proper use of diesel particulate filters and utilizing an engine design that will meet EPA fuel economy standards. The supporting documentation (certification from manufacturer, stack test results, 30 days of normal readings, opacity readings, etc.) for the diesel particulate filter and engine design shall be submitted to the Director of Air Permitting within 180 days of startup.
C.48	**Equipment/Control Device ID:** WD (S.C. Regulation 61-62.5, Standard No. 7) In accordance with Standard No. 7 – Prevention of Significant Deterioration and based on BACT analysis, these sources are subject to PM, PM_{10} and $PM_{2.5}$ work practice standards of the good operating practices on all work decks.. The supporting documentation (certification from manufacturer, stack test results, 30 days of normal readings, opacity readings, etc.) for the good operating practices shall be submitted to the Director of Air Permitting within 180 days of startup.
C.49	**Equipment/Control Device ID:** RD (S.C. Regulation 61-62.5, Standard No. 7) In accordance with Standard No. 7 – Prevention of Significant Deterioration and based on BACT analysis, these sources are subject to PM, PM_{10} and $PM_{2.5}$ work practice standards of the proper maintenance of all roads. The owner/operator shall maintain dust control of any roadway owned or controlled by the owner/operator by paving, or other suitable measures. Volatile organic compounds shall not be used for dust control purposes. Oil treatment is also prohibited The owner/operator shall prepare a plan to minimize fugitive particulate matter emissions. The plan shall, at a minimum: (a) Identify sources that reasonably have the potential to emit fugitive particulate matter. These sources shall include but are not limited to roadways, storage piles, etc.

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<table>
<tr><th>Condition Number</th><th>Conditions</th></tr>
<tr><td></td><td>(b) Include steps that the owner/operator takes to minimize fugitive emissions from the identified sources
(c) Record episodes of excess fugitive particulate matter emissions
(d) Record the corrective actions taken to mitigate emissions during the episode

The plan shall be maintained at the facility, kept up-to-date, and made available to the Department upon request. Plan requirements may be modified if future fugitive emission issues arise.</td></tr>
<tr><td>C.50</td><td>Equipment/Control Device ID: B01, B02, ADH01, ADH02, OV01,OV02,, OV03,, OV04, OV22, OV23, ASU P/BC/CC, ASU 2.1, ASU 3, ASU 2.2, ASU 1, ASU 2.3, ASU 4, ASU 6, ASU 5, ASU 31, ASU32, ASU33, ASU34, ASU35, ASU CR2, ASU36, ASU37

(S.C. Regulation 61-62.5, Standard No. 7) In accordance with Standard No. 7 – Prevention of Significant Deterioration and based on BACT analysis, these sources are subject to VOC limits of 5.5 lb/MMscf (3 hour block average). This limit shall apply at all times.

These sources are permitted to burn only natural gas as fuel. The use of any other substances as fuel is prohibited without prior written approval from the Department. Natural gas fuel usage shall be monitored and recorded on a monthly basis. Records of natural gas usage shall be submitted semiannually.

The owner or operator shall develop a tune-up plan and perform tune-ups on Equipment IDs B01and B02 in accordance with the requirements in 40 CFR 63.7540(a)(10). Records of tune-ups shall be submitted once every five (5). The tune-up plan shall only be included in the initial report. Subsequent submittals of the tune-up plan are required within 30 days of the change if the plan is modified or the Department requests additional information.</td></tr>
<tr><td>C.51</td><td>Equipment/Control Device ID: ED01, EO01, CD-RTO1

(S.C. Regulation 61-62.5, Standard No. 7) In accordance with Standard No. 7 – Prevention of Significant Deterioration and based on BACT analysis, these sources are subject to the following VOC limits. These limits shall apply at all times.

<table>
<tr><th>Supplier</th><th>Limit</th><th>Unit</th><th>Averaging Period</th></tr>
<tr><td>PPG</td><td>0.26</td><td>lb VOC/GACS</td><td>Monthly</td></tr>
<tr><td>Axalta</td><td>0.15</td><td>lb VOC/GACS</td><td>Monthly</td></tr>
<tr><td>BASF</td><td>0.16</td><td>lb VOC/GACS</td><td>Monthly</td></tr>
</table>

An initial source test for VOC emissions shall be conducted in accordance with the procedures in 40 CFR 60, Subpart MM, within 180 days after startup of each supplier, and every four years thereafter. If a specific supplier material is not in use when the periodic source test for the supplier is required, then the source test shall be performed within 180 days after the next use of the material from that</td></tr>
</table>

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C. LIMITATIONS, MONITORING AND REPORTING CONDITIONS

Condition Number	Conditions
	supplier. The required periodic source test frequency of every four years will continue following the last source test. The source test shall be used to show compliance with the Standard No. 7 BACT limits, verify emissions, verification of capture efficiencies of the coating lines and verification of control efficiencies of the control devices. The owner/operator shall maintain records of all volatile organic compounds (VOC) and material usage. These records shall include the name of the supplier of the material, the total amount of each material used, the VOC content in percent by weight of each material, capture and control efficiencies and any other records necessary to determine VOC emissions and material usage. VOC emissions and material usage shall be calculated on a monthly basis. Emissions from malfunctions are required to be quantified and included in the calculations. Reports of the calculated values for each month in the reporting period, shall be submitted semiannually. An algorithm, including example calculations and emission factors, explaining the method used to determine emission rates shall only be included in the initial report. Subsequent submittals of the algorithm are required within 30 days of the change if the algorithm or basis for emissions is modified or the Department requests additional information.
C.52	**Equipment/Control Device ID:** GC01, GC21, GO01, GO21, CD-RTO1, CD-ADW1, CD-ADW2, CD-ADW3, CD-ADW4 (S.C. Regulation 61-62.5, Standard No. 7) In accordance with Standard No. 7 – Prevention of Significant Deterioration and based on BACT analysis, these sources are subject to VOC limits of 4.1 lb VOC/gal of applied coating solids (monthly average). This limit shall apply at all times. An initial source test for VOC emissions shall be conducted in accordance with the procedures in 40 CFR 60, Subpart MM, within 180 days after startup, and every four years thereafter. The source test shall be used to show compliance with the Standard No. 7 BACT limits verify emissions, verification of capture efficiencies of the coating lines and verification of control efficiencies of the control devices. The owner/operator shall install, operate and maintain the desorption gas inlet temperature on each carbon adsorption wheel. Temperature readings for each carbon adsorption wheel shall be recorded daily during source operation. Each carbon adsorption wheel shall be in place and operational whenever processes controlled by it are running, except during periods of carbon adsorption wheel malfunction or mechanical failure. As an alternative, the owner/operator may collect monitoring data on a more frequent basis and calculate the average as specified by the minimum frequency for purposes of determining whether an excursion has occurred. However, the owner/operator must collect additional data points on a regular basis and shall not be collected and used in particular instances to avoid reporting excursions. The owner/operator shall report the frequency chosen to the Director of Air Permitting with the

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C. LIMITATIONS, MONITORING AND REPORTING CONDITIONS

Condition Number	Conditions
	Certification of Construction. Records of any excursions shall be submitted semiannually. Operational ranges for the desorption gas inlet temperature shall be established to ensure proper operation of the pollution control equipment. These operational ranges for the monitored parameters shall be derived from stack test data, vendor certification, and/or operational history and visual inspections, which demonstrate the proper operation of the equipment. These ranges and supporting documentation (certification from manufacturer, stack test results, 30 days of normal readings, opacity readings, etc.) shall be submitted to the Director of Air Permitting within 180 days of startup. Operating ranges may be updated following submittal to the Department. The owner/operator shall maintain records of all volatile organic compounds (VOC) and material usage. These records shall include the total amount of each material used, the VOC content in percent by weight of each material, capture and control efficiencies and any other records necessary to determine VOC emissions and material usage. VOC emissions and material usage shall be calculated on a monthly basis. Emissions from malfunctions are required to be quantified and included in the calculations. Reports of the calculated values for each month in the reporting period, shall be submitted semiannually. An algorithm, including example calculations and emission factors, explaining the method used to determine emission rates shall only be included in the initial report. Subsequent submittals of the algorithm are required within 30 days of the change if the algorithm or basis for emissions is modified or the Department requests additional information.
C.53	**Equipment/Control Device ID:** UBS01, UBS21, SAM01, SAM21, PSA, ASA, SS01, SS21, SKS01, SKS21, BS02, AUW (S.C. Regulation 61-62.5, Standard No. 7) In accordance with Standard No. 7 – Prevention of Significant Deterioration and based on BACT analysis, these sources are subject to VOC limits of 0.3 lb VOC/gal of material as applied (monthly average). This limit shall apply at all times. The owner/operator shall maintain records of all volatile organic compounds (VOC) and material usage. These records shall include the total amount of each material used, the VOC content in percent by weight of each material, and any other records necessary to determine monthly average VOC content. Monthly average VOC content shall be calculated on a monthly basis. Emissions from malfunctions are required to be quantified and included in the calculations. Reports of the calculated values for each month in the reporting period, shall be submitted semiannually. An algorithm, including example calculations and emission factors, explaining the method used to determine emission rates shall only be included in the initial report. Subsequent submittals of the algorithm are required within 30 days of the change if the algorithm or basis for emissions is modified or the Department requests additional information.
C.54	**Equipment/Control Device ID:** BC01, BC21, TO01, TO21, CC01, CD-RTO1, CD-ADW1, CD-ADW2, CD-

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C. LIMITATIONS, MONITORING AND REPORTING CONDITIONS

Condition Number	Conditions
	ADW3, CD-ADW4 (S.C. Regulation 61-62.5, Standard No. 7) In accordance with Standard No. 7 – Prevention of Significant Deterioration and based on BACT analysis, these sources are subject to VOC limits of 4.4 lb VOC/gal of applied coating solids (monthly average) during monocoat operations. This limit shall apply at all times. An initial source test for VOC emissions shall be conducted in accordance with the procedures in 40 CFR 60, Subpart MM, within 180 days after startup, and every four years thereafter. The source test shall be used to show compliance with the Standard No. 7 BACT limits verify emissions, verification of capture efficiencies of the coating lines and verification of control efficiencies of the control devices. The owner/operator shall install, operate and maintain the desorption gas inlet temperature on each carbon adsorption wheel. Temperature readings for each carbon adsorption wheel shall be recorded daily during source operation. Each carbon adsorption wheel shall be in place and operational whenever processes controlled by it are running, except during periods of carbon adsorption wheel malfunction or mechanical failure. As an alternative, the owner/operator may collect monitoring data on a more frequent basis and calculate the average as specified by the minimum frequency for purposes of determining whether an excursion has occurred. However, the owner/operator must collect additional data points on a regular basis and shall not be collected and used in particular instances to avoid reporting excursions. The owner/operator shall report the frequency chosen to the Director of Air Permitting with the Certification of Construction. Records of any excursions shall be submitted semiannually. Operational ranges for the desorption gas inlet temperature shall be established to ensure proper operation of the pollution control equipment. These operational ranges for the monitored parameters shall be derived from stack test data, vendor certification, and/or operational history and visual inspections, which demonstrate the proper operation of the equipment. These ranges and supporting documentation (certification from manufacturer, stack test results, 30 days of normal readings, opacity readings, etc.) shall be submitted to the Director of Air Permitting within 180 days of startup. Operating ranges may be updated following submittal to the Department. The owner/operator shall maintain records of all volatile organic compounds (VOC) and material usage. These records shall include the total amount of each material used, the VOC content in percent by weight of each material, capture and control efficiencies and any other records necessary to determine VOC emissions and material usage. VOC emissions and material usage shall be calculated on a monthly basis. Emissions from malfunctions are required to be quantified and included in the calculations. Reports of the calculated values for each month in the reporting period, shall be submitted semiannually.

C. LIMITATIONS, MONITORING AND REPORTING CONDITIONS

Condition Number	Conditions
	An algorithm, including example calculations and emission factors, explaining the method used to determine emission rates shall only be included in the initial report. Subsequent submittals of the algorithm are required within 30 days of the change if the algorithm or basis for emissions is modified or the Department requests additional information.
C.55	**Equipment/Control Device ID:** BC01, BC21, CC01, TO01, TO21, CD-RTO1, CD-ADW1, CD-ADW2, CD-ADW3, CD-ADW4 (S.C. Regulation 61-62.5, Standard No. 7) In accordance with Standard No. 7 – Prevention of Significant Deterioration and based on BACT analysis, these sources are subject to VOC limits of 6.9 lb VOC/gal of applied coating solids (monthly average) during basecoat/clearcoat operations. This limit shall apply at all times. An initial source test for VOC emissions shall be conducted in accordance with the procedures in 40 CFR 60, Subpart MM, within 180 days after startup, and every four years thereafter. The source test shall be used to show compliance with the Standard No. 7 BACT limits verify emissions, verification of capture efficiencies of the coating lines and verification of control efficiencies of the control devices. The owner/operator shall install, operate and maintain the desorption gas inlet temperature on each carbon adsorption wheel. Temperature readings for each carbon adsorption wheel shall be recorded daily during source operation. Each carbon adsorption wheel shall be in place and operational whenever processes controlled by it are running, except during periods of carbon adsorption wheel malfunction or mechanical failure. As an alternative, the owner/operator may collect monitoring data on a more frequent basis and calculate the average as specified by the minimum frequency for purposes of determining whether an excursion has occurred. However, the owner/operator must collect additional data points on a regular basis and shall not be collected and used in particular instances to avoid reporting excursions. The owner/operator shall report the frequency chosen to the Director of Air Permitting with the Certification of Construction. Records of any excursions shall be submitted semiannually. Operational ranges for the desorption gas inlet temperature shall be established to ensure proper operation of the pollution control equipment. These operational ranges for the monitored parameters shall be derived from stack test data, vendor certification, and/or operational history and visual inspections, which demonstrate the proper operation of the equipment. These ranges and supporting documentation (certification from manufacturer, stack test results, 30 days of normal readings, opacity readings, etc.) shall be submitted to the Director of Air Permitting within 180 days of startup. Operating ranges may be updated following submittal to the Department. The owner/operator shall maintain records of all volatile organic compounds (VOC) and material

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C. LIMITATIONS, MONITORING AND REPORTING CONDITIONS

Condition Number	Conditions
	usage. These records shall include the total amount of each material used, the VOC content in percent by weight of each material, capture and control efficiencies and any other records necessary to determine VOC emissions and material usage. VOC emissions and material usage shall be calculated on a monthly basis. Emissions from malfunctions are required to be quantified and included in the calculations. Reports of the calculated values for each month in the reporting period, shall be submitted semiannually. An algorithm, including example calculations and emission factors, explaining the method used to determine emission rates shall only be included in the initial report. Subsequent submittals of the algorithm are required within 30 days of the change if the algorithm or basis for emissions is modified or the Department requests additional information.
C.56	**Equipment/Control Device ID:** AW (S.C. Regulation 61-62.5, Standard No. 7) In accordance with Standard No. 7 – Prevention of Significant Deterioration and based on BACT analysis, these sources are subject to VOC limits of 0.4 lb VOC/gal of material as applied (monthly average). This limit shall apply at all times. The owner/operator shall maintain records of all volatile organic compounds (VOC) and material usage. These records shall include the total amount of each material used, the VOC content in percent by weight of each material, and any other records necessary to determine monthly average VOC content. Monthly average VOC content shall be calculated on a monthly basis. Emissions from malfunctions are required to be quantified and included in the calculations. Reports of the calculated values for each month in the reporting period, shall be submitted semiannually. An algorithm, including example calculations and emission factors, explaining the method used to determine emission rates shall only be included in the initial report. Subsequent submittals of the algorithm are required within 30 days of the change if the algorithm or basis for emissions is modified or the Department requests additional information.
C.57	**Equipment/Control Device ID:** CW, CD-RTO1 (S.C. Regulation 61-62.5, Standard No. 7) In accordance with Standard No. 7 – Prevention of Significant Deterioration and based on BACT analysis, these sources are subject to VOC limits of 95% RTO efficiency. This limit shall apply at all times. An initial source test for VOC emissions shall be conducted in accordance with the procedures of 40 CFR 60, Subpart MM, within 180 days after startup, and every four years thereafter. The source test shall be used to show compliance with the Standard No. 7 BACT limits and verify destruction efficiency.
C.58	**Equipment/Control Device ID:** SR01, SR02, SR03, AR01, WD (E-Coat Sand/Spot Repair) (S.C. Regulation 61-62.5, Standard No. 7) In accordance with Standard No. 7 – Prevention of Significant Deterioration and based on BACT analysis, these sources are subject to VOC limits of 6.0 lb VOC/gal

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C. LIMITATIONS, MONITORING AND REPORTING CONDITIONS

Condition Number	Conditions
	of material as applied (monthly average). This limit shall apply at all times. The owner/operator shall maintain records of all volatile organic compounds (VOC) and material usage. These records shall include the total amount of each material used, the VOC content in percent by weight of each material, and any other records necessary to determine monthly average VOC content. Monthly average VOC content shall be calculated on a monthly basis. Emissions from malfunctions are required to be quantified and included in the calculations. Reports of the calculated values for each month in the reporting period, shall be submitted semiannually. An algorithm, including example calculations and emission factors, explaining the method used to determine emission rates shall only be included in the initial report. Subsequent submittals of the algorithm are required within 30 days of the change if the algorithm or basis for emissions is modified or the Department requests additional information.
C.59	**Equipment/Control Device ID:** UBC01, UBC21 (S.C. Regulation 61-62.5, Standard No. 7) In accordance with Standard No. 7 – Prevention of Significant Deterioration and based on BACT analysis, these sources are subject to VOC limits of 4.25 lb VOC/gal of material as applied (monthly average). This limit shall apply at all times. The owner/operator shall maintain records of all volatile organic compounds (VOC) and material usage. These records shall include the total amount of each material used, the VOC content in percent by weight of each material, and any other records necessary to determine monthly average VOC content. Monthly average VOC content shall be calculated on a monthly basis. Emissions from malfunctions are required to be quantified and included in the calculations. Reports of the calculated values for each month in the reporting period, shall be submitted semiannually. An algorithm, including example calculations and emission factors, explaining the method used to determine emission rates shall only be included in the initial report. Subsequent submittals of the algorithm are required within 30 days of the change if the algorithm or basis for emissions is modified or the Department requests additional information.
C.60	**Equipment/Control Device ID:** PS01, CD-RTO1 (S.C. Regulation 61-62.5, Standard No. 7) In accordance with Standard No. 7 – Prevention of Significant Deterioration and based on BACT analysis, these sources are subject to VOC limits of 82 tons VOC per year (12 month rolling sum). This limit shall apply at all times. Emissions data collected from the source tests shall be used to show compliance with the Standard No. 7 BACT limits verify emissions, and verification of control efficiencies of the control devices. The owner/operator shall maintain records of all volatile organic compounds (VOC) and material usage. These records shall include the total amount of each material used, the VOC content in percent

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C. LIMITATIONS, MONITORING AND REPORTING CONDITIONS

Condition Number	Conditions
	by weight of each material, capture and control efficiencies and any other records necessary to determine VOC emissions and material usage. VOC emissions and material usage shall be calculated on a monthly basis. Emissions from malfunctions are required to be quantified and included in the calculations. . The twelve-month rolling sum shall be less than 82 tons. Reports of the calculated values and the twelve-month rolling sum, calculated for each month in the reporting period, shall be submitted semiannually. An algorithm, including example calculations and emission factors, explaining the method used to determine emission rates shall only be included in the initial report. Subsequent submittals of the algorithm are required within 30 days of the change if the algorithm or basis for emissions is modified or the Department requests additional information.
C.61	**Equipment/Control Device ID:** PMR (S.C. Regulation 61-62.5, Standard No. 7) In accordance with Standard No. 7 – Prevention of Significant Deterioration and based on BACT analysis, these sources are subject to VOC work practice standards of the good VOC work practices for all paint shop mixing operations.. The supporting documentation (certification from manufacturer, stack test results, 30 days of normal readings, opacity readings, etc.) for the good VOC work practices shall be submitted to the Director of Air Permitting within 180 days of startup.
C.62	**Equipment/Control Device ID:** RB1, RB2, RB3 (S.C. Regulation 61-62.5, Standard No. 7) In accordance with Standard No. 7 – Prevention of Significant Deterioration and based on BACT analysis, these sources are subject to VOC work practice standards of utilizing an engine design that will meet EPA fuel economy standards. The supporting documentation (certification from manufacturer, stack test results, 30 days of normal readings, opacity readings, etc.) for the engine design shall be submitted to the Director of Air Permitting within 180 days of startup.
C.63	**Equipment/Control Device ID:** AFF(gasoline only), CD-ORVR (gasoline only) (S.C. Regulation 61-62.5, Standard No. 7) In accordance with Standard No. 7 – Prevention of Significant Deterioration and based on BACT analysis, these sources are subject to VOC work practice standards of proper utilization of onboard refueling vapor recovery (ORVR). The supporting documentation (certification from manufacturer, stack test results, 30 days of normal readings, opacity readings, etc.) for the ORVR shall be submitted to the Director of Air Permitting within 180 days of startup.
C.64	**Equipment/Control Device ID:** AWT (S.C. Regulation 61-62.5, Standard No. 7) In accordance with Standard No. 7 – Prevention of Significant

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Condition Number	Conditions
	Deterioration and based on BACT analysis, these sources are subject to VOC work practice standards of the use of water based materials. The supporting documentation (certification from manufacturer, stack test results, 30 days of normal readings, opacity readings, etc.) for the use of water based materials shall be submitted to the Director of Air Permitting within 180 days of startup.
C.65	**Equipment/Control Device ID:** TK01 (S.C. Regulation 61-62.5, Standard No. 7) In accordance with Standard No. 7 – Prevention of Significant Deterioration and based on BACT analysis, these sources are subject to VOC work practice standards of the use of Stage 1 vapor control. The supporting documentation (certification from manufacturer, stack test results, 30 days of normal readings, opacity readings, etc.) for the use of Stage 1 vapor control shall be submitted to the Director of Air Permitting within 180 days of startup.
C.66	**Equipment/Control Device ID:** BC01, CC01, BC21, GC-01, GC-21, CD-FS1, CD-FS2, CD-FS3,CD-FS4, CD-FS5 This source is subject to 40 CFR 64, Compliance Assurance Monitoring and shall comply with all applicable provisions. To meet the requirements of 40 CFR 64 for BC01, CC01, BC21, GC-01, and GC-21, and TO21, the indicator for particulate matter will be filtration system pressure drop. The owner/operator shall install, continue to operate, and maintain a pressure drop monitoring system across the filtration system as the measurement approach. Filtration system pressure drop monitoring shall be used to provide assurance of compliance with PM, PM_{10}, $PM_{2.5}$ BACT emission limits. The filtration system shall be in place and operational whenever processes controlled by it are running, except during periods of filtration system malfunction or mechanical failure. The operational ranges for the pressure drop, with supporting documentation and quality assurance procedures, shall be submitted to the Department for approval within 180 days of the startup date of these sources. At that time, an excursion for monitoring parameters shall also be defined. These operational ranges for the monitored parameters shall be derived from data, which demonstrate a reasonable assurance of compliance. Process and capture system operational parameters shall be monitored during the stack tests, and operational ranges or inspection and maintenance activities shall be developed for these parameters to reflect proper operation and maintenance of the control device and capture system. Testing must be conducted in accordance with S.C. Regulation 61-62.1, Section IV, Source Tests. The owner/operator shall coordinate with the Source Evaluation Section of the Bureau of Air Quality, and the test must be performed according to a protocol approved by this Department. The Source Evaluation Section shall be notified not less than two (2) weeks before the

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Condition Number	Conditions
	initiation of the test, and the final test report must be submitted no later than 30 days after completion of on-site testing. The operational range, exceedance, and excursion information shall be incorporated into the facility's Part 70 (Title V) Operating Permit once all appropriate testing has been completed and the test results have been approved by the Department. Such incorporation will represent a minor modification to the permit. The facility shall provide all relevant information for this modification, including a listing of the exact changes needed to the existing Title V permit as required by Part 70 regulations. The facility shall update their CAM plan with this information as appropriate.
C.67	**Equipment/Control Device ID:** GC01, GC21, BC01, CC01, BC21, PS01, CD-ADW1, CD-ADW2, CD-ADW3, CD-ADW4 This source is subject to 40 CFR 64, Compliance Assurance Monitoring and shall comply with all applicable provisions. To meet the requirements of 40 CFR 64 for GC01, GC21, BC01, CC01, BC21 and PS01, the indicator for VOC will be desorption gas inlet temperature. The owner/operator shall install, operate, and maintain temperature monitors at the desorption stream inlet as the measurement approach. Desorption stream gas inlet temperature monitoring shall be used to provide assurance of compliance with VOC BACT emission limits. The adsorption wheels shall be in place and operational whenever processes controlled by it are running, except during periods of adsorption wheel malfunction or mechanical failure. The operational ranges for the desorption gas inlet temperature, with supporting documentation and quality assurance procedures, shall be submitted to the Department for approval within 180 days of the startup date of these sources. At that time, an excursion for monitoring parameters shall also be defined. These operational ranges for the monitored parameters shall be derived from data, which demonstrate a reasonable assurance of compliance. Process and capture system operational parameters shall be monitored during the stack tests, and operational ranges or inspection and maintenance activities shall be developed for these parameters to reflect proper operation and maintenance of the control device and capture system. Testing must be conducted in accordance with S.C. Regulation 61-62.1, Section IV, Source Tests. The owner/operator shall coordinate with the Source Evaluation Section of the Bureau of Air Quality, and the test must be performed according to a protocol approved by this Department. The Source Evaluation Section shall be notified not less than two (2) weeks before the initiation of the test, and the final test report must be submitted no later than 30 days after completion of on-site testing. The operational range, exceedance, and excursion information shall be incorporated into the facility's Part 70 (Title V) Operating Permit once all appropriate testing has been completed and the test results have been approved by the Department. Such incorporation will represent a minor modification to the permit. The facility shall provide all relevant information for this modification, including a listing of

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C. LIMITATIONS, MONITORING AND REPORTING CONDITIONS

Condition Number	Conditions
	the exact changes needed to the existing Title V permit as required by Part 70 regulations. The facility shall update their CAM plan with this information as appropriate.
C.68	**Equipment/Control Device ID:** EO01, GC01, GC21, GO01, GO21, BC01, CC01, BC21, TO01, TO21, PS01, CD-RTO1 This source is subject to 40 CFR 64, Compliance Assurance Monitoring and shall comply with all applicable provisions. To meet the requirements of 40 CFR 64 for EO01, GC01, GO01, GC21, GO21, BC01, CC01, TO01, BC21, TO21 and PS01, the indicator for VOC will be firebox temperature. The owner/operator shall install, continue to operate, and maintain thermocouple(s) at the firebox as the measurement approach. RTO temperature monitoring shall be used to provide assurance of compliance with VOC BACT emission limits. The RTO shall be in place and operational whenever processes controlled by it are running, except during periods of RTO malfunction or mechanical failure. The minimum operating temperature shall be derived from the initial stack test. The operational ranges for the firebox temperature, with supporting documentation and quality assurance procedures, shall be submitted to the Department for approval within 180 days of the startup date of these sources. At that time, an excursion for monitoring parameters shall also be defined. These operational ranges for the monitored parameters shall be derived from data, which demonstrate a reasonable assurance of compliance. Process and capture system operational parameters shall be monitored during the stack tests, and operational ranges or inspection and maintenance activities shall be developed for these parameters to reflect proper operation and maintenance of the control device and capture system. Testing must be conducted in accordance with S.C. Regulation 61-62.1, Section IV, Source Tests. The owner/operator shall coordinate with the Source Evaluation Section of the Bureau of Air Quality, and the test must be performed according to a protocol approved by this Department. The Source Evaluation Section shall be notified not less than two (2) weeks before the initiation of the test, and the final test report must be submitted no later than 30 days after completion of on-site testing. The operational range, exceedance, and excursion information shall be incorporated into the facility's Part 70 (Title V) Operating Permit once all appropriate testing has been completed and the test results have been approved by the Department. Such incorporation will represent a minor modification to the permit. The facility shall provide all relevant information for this modification, including a listing of the exact changes needed to the existing Title V permit as required by Part 70 regulations. The facility shall update their CAM plan with this information as appropriate.
C.69	**Equipment/Control Device ID:** ED01, EO01, GC01, GC21, GO01, GO21, BC01, BC21, CC01, TO01, TO21, PS01, CD-RTO1, CD-ADW1, CD-ADW2, CD-ADW3, CD-ADW4 (40 CFR 60, Subpart MM) Within 60 calendar days after achieving the maximum production rate at

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C. LIMITATIONS, MONITORING AND REPORTING CONDITIONS

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	which this facility will be operated, but no later than 180 calendar days after its initial startup and at such other times as may be required by the Department under section 114 of the Clean Air Act, the owner/operator of this facility shall conduct performance tests. Performance tests shall be conducted on all applicable units to show compliance with the VOC standards. Compliance with the VOC standards shall be determined by conducting performance tests in accordance with the procedures and methods specified in 40 CFR 60, Subpart MM.
C.70	**Equipment/Control Device ID:** Project Wide (S.C. Regulation 61-62.5, Standard No. 7) For phased construction projects, the determination of BACT shall be reviewed and modified as appropriate at the latest reasonable time which occurs no later than eighteen (18) months prior to commencement of construction of each independent phase of the project. At such time, the owner or operator of the applicable stationary source may be required to demonstrate the adequacy of any previous determination of BACT for the source. If construction of an independent phase occurs within 18 months following the completion of construction of the previous phase, no updated BACT determination is required.
C.71	**Equipment/Control Device ID:** Project Wide (S.C. Regulation 61-62.5, Standard No. 7) Approval to construct shall become invalid if construction is not commenced within eighteen (18) months after receipt of such approval, if construction is discontinued for a period of eighteen (18) months or more, or if construction is not completed within a reasonable time. The Department may extend the 18-month period upon a satisfactory showing that an extension is justified. This provision does not apply to the time period between construction of the approved phases of a phased construction project; each phase must commence construction within eighteen (18) months of the projected and approved commencement dates which are as follows: **Phase** / **Start of Construction** 1 / May 2016 2 / January 2024 3 / January 2028
C.72	**Equipment/Control Device ID:** All Operational ranges for the monitored parameters shall be established to ensure proper operation of the pollution control equipment. These operational ranges for the monitored parameters shall be derived from stack test data, vendor certification, and/or operational history and visual inspections, which demonstrate the proper operation of the equipment. Prior to the first source test, the facility shall use manufacturer's recommendations for operational ranges. The manufacturer's recommendations must be maintained on site. These ranges and supporting documentation (certification from manufacturer, stack test results, 30 days of normal readings, opacity readings, etc.) shall be submitted to the Director of Air Permitting within 180 days of startup or 60 days of completion

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C. LIMITATIONS, MONITORING AND REPORTING CONDITIONS

Condition Number	Conditions
	of source testing, whichever is later. Operating ranges may be updated following submittal to the Department.
C.73	**Equipment/Control Device ID:** Project Wide All applicable requirements from construction permit 0560-0385-CA-R2 have been included in this revised construction permit.

D. NESHAP PERIODIC REPORTING SCHEDULE SUMMARY

NESHAP Part	NESHAP Subpart	Compliance Monitoring Report Submittal Frequency	Reporting Period	Report Due Date
63	EEEE	Semi-Annual	January 1 through June 30 July 1 through December 31	Postmarked no later than July 31 or January 31, whichever date follows the end of the first calendar half after the compliance date.
63	IIII	Semi-Annual	January 1 through June 30 July 1 through December 31	January 31st July 31st
63	ZZZZ (Emergency Generators see note 3 and 4)	N/A	N/A	N/A
63	DDDDD (5D)	Annual	January 1 – December 31	Postmarked no later than January 31 following the end of the reporting period

1. This table summarizes only the periodic compliance reporting schedule. Additional reports may be required. See specific NESHAP Subpart for additional reporting requirements and associated schedule.
2. This reporting schedule does not supersede any other reporting requirements including but not limited to 40 CFR Part 60, 40 CFR Part 61, 40 CFR Part 63, and/or Title V. The MACT reporting schedule may be adjusted to coincide with the Title V reporting schedule with prior approval from the Department in accordance with §63.10.a.5. This request may be made 1 year after the compliance date for the associated MACT standard.
3. Emergency generators are not required to submit reports unless they meet the criteria under 63.6650(h) and must submit reports annually. Only non-emergency engines are required to submit semiannual reports.
4. Emergency engines shall comply with the operations limits specified in 40 CFR 63.6640(f).

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E. NESHAP - CONDITIONS

Condition Number	Condition
E.1	All NESHAP notifications and reports shall be sent to the Manager of the Air Toxics Section, South Carolina Department of Health and Environmental Control - Bureau of Air Quality.
E.2	All NESHAP notifications and the cover letter to periodic reports shall be sent to the United States Environmental Protection Agency (US EPA) at the following address: **US EPA, Region 4** **Air, Pesticides and Toxics Management Division** **61 Forsyth Street SW** **Atlanta, GA 30303**
E.3	Affected sources: All Stationary IC Engines: This facility is subject to the provisions of S.C. Regulation 61-62.63 and 40 CFR Part 63, National Emission Standards for Hazardous Air Pollutants, Subparts A and NESHAP for Stationary Reciprocating Internal Combustion Engines. Existing affected sources shall comply with the applicable provisions by the compliance date specified in Subpart ZZZZ. Any new affected sources shall comply with the requirements of this Subpart upon initial start-up unless otherwise noted.
E.4	Emergency power generators less than or equal to 150 kilowatt (kW) rated capacity or greater than 150 kW rated capacity designated for emergency use only and operated a total of 500 hours per year or less for testing and maintenance with a method to record the actual hours of use such as an hour meter have been determined to be exempt from construction permitting requirements in accordance with South Carolina Regulation 61-62.1. These sources shall still comply with the requirements of all applicable regulations including but not limited to the following: New Source Performance Standards (NSPS) 40 CFR 60 Subpart A (General Provisions); NSPS 40 CFR 60 Subpart IIII (Stationary Compression Ignition Internal Combustion Engines); NSPS 40 CFR 60 Subpart JJJJ (Stationary Spark Ignition Internal Combustion Engines); National Emission Standards for Hazardous Air Pollutants (NESHAP) 40 CFR 63 Subpart A (General Provisions); and NESHAP 40 CFR 63 Subpart ZZZZ (Stationary Reciprocating Internal Combustion Engines).
E.5	This facility has processes subject to the provisions of S.C. Regulation 61-62.63 and 40 CFR Part 63, National Emission Standards for Hazardous Air Pollutants, Subparts A, General Provisions, and IIII, Surface Coating Of Automobiles And Light-Duty Trucks. Existing affected sources shall be in compliance with the requirements of these Subparts on the compliance date, unless otherwise noted. Any new affected sources shall comply with the requirements of these Subparts upon initial start-up unless otherwise noted.
E.6	This facility has processes subject to the provisions of S.C. Regulation 61-62.63 and 40 CFR Part 63, National Emission Standards for Hazardous Air Pollutants, Subparts A, General Provisions, and EEEE, Organic Liquid Distribution (Non-Gasoline). Existing affected sources shall be in compliance with the requirements of these Subparts on the compliance date, unless otherwise noted. Any new affected sources shall comply with the requirements of these Subparts upon initial start-up unless otherwise noted.

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E. NESHAP - CONDITIONS

Condition Number	Condition
E.7	This facility has processes subject to the provisions of S.C. Regulation 61-62.63 and 40 CFR Part 63, National Emission Standards for Hazardous Air Pollutants, Subparts A, General Provisions, and DDDDD, Industrial, Commercial, and Institutional Boilers and Process Heaters. Existing affected sources shall be in compliance with the requirements of these Subparts on the compliance date, unless otherwise noted. Any new affected sources shall comply with the requirements of these Subparts upon initial start-up unless otherwise noted.

F. AMBIENT AIR STANDARDS REQUIREMENTS

Condition Number	Condition
F.1	Air dispersion modeling (or other method) has demonstrated that this facility's operation will not interfere with the attainment and maintenance of any state or federal ambient air standard. Any changes in the parameters used in this demonstration may require a review by the facility to determine continuing compliance with these standards. These potential changes include any decrease in stack height, decrease in stack velocity, increase in stack diameter, decrease in stack exit temperature, increase in building height or building additions, increase in emission rates, decrease in distance between stack and property line, changes in vertical stack orientation, and installation of a rain cap that impedes vertical flow. Parameters that are not required in the determination will not invalidate the demonstration if they are modified. The emission rates used in the determination are listed in Attachment - Emission Rates for Ambient Air Standards of this permit. Higher emission rates may be administratively incorporated into Attachment - Emission Rates for Ambient Air Standards of this permit provided a demonstration using these higher emission rates shows the attainment and maintenance of any state or federal ambient air quality standard or with any other applicable requirement. Variations from the input parameters in the demonstration shall not constitute a violation unless the maximum allowable ambient concentrations identified in the standard are exceeded. The owner/operator shall maintain this facility at or below the emission rates as listed in Attachment - Emission Rates for Ambient Air Standards, not to exceed the pollutant limitations of this permit. Should the facility wish to increase the emission rates listed in Attachment - Emission Rates for Ambient Air Standards, not to exceed the pollutant limitations in the body of this permit, it may do so by the administrative process specified above. This is a State Only enforceable requirement.

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G. PERIODIC REPORTING SCHEDULE

Compliance Monitoring Report Submittal Frequency	Reporting Period (Begins on the startup date of the source.)	Report Due Date
Quarterly	January-March April-June July-September October-December	April 30 July 30 October 30 January 30
Semiannual	January-June April-September July-December October-March	July 30 October 30 January 30 April 30
Annual	January-December April-March July-June October-September	January 30 April 30 July 30 October 30
Note: This reporting schedule does not supersede any federal reporting requirements including but not limited to 40 CFR Part 60, 40 CFR Part 61, and 40 CFR Part 63. All federal reports must meet the reporting time frames specified in the federal standard unless the Department or EPA approves a change.		

H. REPORTING CONDITIONS

Condition Number	Condition
H.1	Reporting required in this permit, shall be submitted in a timely manner as directed in the Periodic Reporting Schedule of this permit.
H.2	All reports and notifications required under this permit shall be submitted to the person indicated in the specific condition at the following address: **2600 Bull Street** **Columbia, SC 29201** The contact information for the local Environmental Affairs Regional office can be found at: **http://www.scdhec.gov**
H.3	The owner/operator shall submit written notification to the Director of Air Permitting of the date construction is commenced, postmarked no later than 30 days after such date.
H.4	Unless elsewhere specified within this permit, all reports required under this permit shall be submitted to the Manager of the Technical Management Section, Bureau of Air Quality.

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H. REPORTING CONDITIONS

Condition Number	Condition
H.5	(S.C. Regulation 61-62.1, Section II.J) For sources not required to have continuous emissions monitors, any malfunction of air pollution control equipment or system, process upset or other equipment failure which results in discharges of air contaminants lasting for one hour or more and which are greater than those discharges described for normal operation in the permit application shall be reported to the Department's local Environmental Quality Control Regional office within 24 hours after the beginning of the occurrence. The owner/operator shall also submit a written report within 30 days of the occurrence. This report shall be submitted to the Manager of the Technical Management Section, Bureau of Air Quality and shall include, at a minimum, the following: 1. The identity of the stack and/or emission point where the excess emissions occurred; 2. The magnitude of excess emissions expressed in the units of the applicable emission limitation and the operating data and calculations used in determining the excess emissions; 3. The time and duration of excess emissions; 4. The identity of the equipment causing the excess emissions; 5. The nature and cause of such excess emissions; 6. The steps taken to remedy the malfunction and the steps taken or planned to prevent the recurrence of such malfunction; 7. The steps taken to limit the excess emissions; and, 8. Documentation that the air pollution control equipment, process equipment, or processes were at all times maintained and operated, to the maximum extent practicable, in a manner consistent with good practice for minimizing emissions.

I. PERMIT EXPIRATION AND EXTENSION

Condition Number	Condition
I.1	(S.C. Regulation 61-62.1, Section II.A.4) Approval to construct shall become invalid if construction: a. is not commenced within 18 months after receipt of such approval; b. is discontinued for a period of 18 months or more; or c. is not completed within a reasonable time as deemed by the Department. The Department may extend the construction permit for an additional 18-month period upon a satisfactory showing that an extension is justified. This request must be made prior to the permit expiration.
I.2	This provision does not apply to the time period between construction of the approved phases of a phased construction project; each phase must commence construction within 18 months of the projected and approved commencement date.

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J. PERMIT TO OPERATE

Condition Number	Condition
J.1	(S.C. Regulation 61-62.1 Section II.F.2) The owner/operator or professional engineer in charge of the project shall certify that, to the best of his/her knowledge and belief and as a result of periodic observation during construction, the construction under application has been completed in accordance with the specifications agreed upon in the construction permit issued by the Department.
J.2	If construction is certified as provided in S.C. Regulation 61-62.1 Section II.F.2, the owner or operator, may operate the source in compliance with the terms and conditions of the construction permit until the operating permit is issued by the Department.
J.3	If construction is not built as specified in the permit application and associated construction permit(s), the owner/operator must submit to the Department a complete description of modifications that are at variance with the documentation of the construction permitting determination prior to commencing operation. Construction variances that would trigger additional requirements that have not been addressed prior to start of operation shall be considered construction without a permit.
J.4	(S.C. Regulation 61-62.1, Section II.F.3) For sources not yet covered by an effective Title V operating permit, the owner or operator shall submit a written request to the Director of the Air Permitting for a new or revised operating permit to cover any new, or altered source, postmarked no later than 15 days after the actual date of initial startup of each new or altered source. (S.C. Regulation 61-62.70.5.a) The owner or operator shall submit a timely and complete Part 70 permit application within 12 months of startup.

K. GENERAL CONDITIONS

Condition Number	Condition
K.1	The permittee shall pay permit fees to the Department in accordance with the requirements of S.C. Regulation 61-30, Environmental Protection Fees.
K.2	In the event of an emergency, as defined in S.C. Regulation 61-62.1, Section II.L, the owner or operator may document an emergency situation through properly signed, contemporaneous operating logs, and other relevant evidence that verify: 1. An emergency occurred, and the owner or operator can identify the cause(s) of the emergency; 2. The permitted source was at the time the emergency occurred being properly operated; 3. During the period of the emergency, the owner or operator took all reasonable steps to minimize levels of emissions that exceeded the emission standards, or other requirements in the permit; and 4. The owner or operator gave a verbal notification of the emergency to the Department within 24 hours of the time when emission limitations were exceeded, followed by a written report within 30 days. The written report shall include, at a minimum, the information required by

K. GENERAL CONDITIONS

Condition Number	Condition
	S.C. Regulation 61-62.1, Section II.J.1.c.i through viii. The written report shall contain a description of the emergency, any steps taken to mitigate emissions, and corrective actions taken. This provision is in addition to any emergency or upset provision contained in any applicable requirement.
K.3	(S.C. Regulation 61-62.1, Section II.O) Upon presentation of credentials and other documents as may be required by law, the owner or operator shall allow the Department or an authorized representative to perform the following: 1. Enter the facility where emissions-related activity is conducted, or where records must be kept under the conditions of the permit. 2. Have access to and copy, at reasonable times, any records that must be kept under the conditions of the permit. 3. Inspect any facilities, equipment (including monitoring and air pollution control equipment), practices, or operations regulated or required under this permit. 4. As authorized by the Federal Clean Air Act and/or the S.C. Pollution Control Act, sample or monitor at reasonable times substances or parameters for the purpose of assuring compliance with the permit or applicable requirements.

L. EMISSIONS INVENTORY REPORTS

Condition Number	Condition
L.1	All newly permitted and constructed Title V sources and/or Non-attainment Area Sources shall complete and submit an emissions inventory consistent with the schedule approved pursuant to S.C. Regulation 61-62.1, Section III. These Emissions Inventory Reports shall be submitted to the Manager of the Emissions Inventory Section, Bureau of Air Quality. This requirement notwithstanding, an emissions inventory may be required at any time in order to determine the compliance status of any facility.

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ATTACHMENT - Emission Rates for Ambient Air Standards

Mercedes-Benz Vans, LLC
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The emission rates listed herein are not considered enforceable limitations but are used to evaluate ambient air quality impact. Until the Department makes a determination that a facility is causing or contributing to an exceedance of a state or federal ambient air quality standard, increases to these emission rates are not in themselves considered violations of these ambient air quality standards (see Ambient Air Standards Requirements).

AMBIENT AIR QUALITY STANDARDS - STANDARDS NO. 2 and 7						
Emission Point ID	Emission Rates (lbs/hr)					
	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO	Lead
ASRTU01	0.0059	0.0059	0.000468	0.039	0.065	--
ASRTU01	0.0059	0.0059	0.000468	0.0088	0.065	--
ASRTU04	0.0059	0.0059	0.000468	0.0088	0.065	--
ASRTU06	0.0059	0.0059	0.000468	0.0088	0.065	--
ASRTU08	0.0059	0.0059	0.000468	0.0088	0.065	--
ASRTU10	0.0059	0.0059	0.000468	0.0088	0.065	--
ASRTU11	0.0059	0.0059	0.000468	0.0088	0.065	--
ASRTU13	0.0059	0.0059	0.000468	0.0088	0.065	--
ASU02	0.0741	0.0741	0.006	0.97	0.82	--
ASU03	0.0551	0.0551	0.004	0.72	0.61	--
ASU04	0.0741	0.0741	0.006	0.97	0.82	--
ASU05	0.0357	0.0357	0.003	0.47	0.39	--
ASU06	0.0741	0.0741	0.006	0.97	0.82	--
ASU07	0.0358	0.0358	0.003	0.47	0.40	--
ASU08	0.0633	0.0633	0.005	0.83	0.70	--
ASU11	0.0432	0.0432	0.003	0.57	0.48	--
ASU33	0.0367	0.0367	0.003	0.48	0.41	--
ASU34	0.0190	0.0190	0.001	0.25	0.21	--
ASU35	0.0596	0.0596	0.005	0.78	0.66	--
ASU36	0.0093	0.0093	0.001	0.12	0.10	--
ASU37	0.0227	0.0227	0.002	0.30	0.25	--
ASU38	0.0113	0.0113	0.001	0.15	0.13	
AUW	0.0728	0.0728	--	--	--	--
B01	0.1057	0.1057	0.01	0.51	1.17	0.0005
B02	0.1057	0.1057	0.01	0.51	1.17	0.0005
BSRTU01	0.0059	0.0059	0.000468	0.0088	0.065	--
BSRTU02	0.0059	0.0059	0.000468	0.0088	0.065	--
BSRTU04	0.0059	0.0059	0.000468	0.0088	0.065	--
BSRTU05	0.0059	0.0059	0.000468	0.0088	0.065	--
BSRTU06	0.0059	0.0059	0.000468	0.0088	0.065	--

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ATTACHMENT - Emission Rates for Ambient Air Standards

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AMBIENT AIR QUALITY STANDARDS - STANDARDS NO. 2 and 7						
Emission Point ID	Emission Rates (lbs/hr)					
	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO	Lead
BSRTU07	0.0059	0.0059	0.000468	0.0088	0.065	--
BSRTU10	0.00593	0.00593	0.000468	0.0088	0.065	--
BSRTU17	0.0059	0.0059	0.000468	0.0088	0.065	--
BSRTU18	0.0059	0.0059	0.000468	0.0088	0.065	--
BSRTU23	0.0059	0.0059	0.000468	0.0088	0.065	--
BSRTU25	0.0059	0.0059	0.000468	0.0088	0.065	--
BSRTU26	0.0059	0.0059	0.000468	0.0088	0.065	--
BSRTU30	0.0059	0.0059	0.000468	0.0088	0.065	--
BSRTU32	0.0059	0.0059	0.000468	0.0088	0.065	--
BSRTU33	0.0059	0.0059	0.000468	0.0088	0.065	--
BSRTU35	0.0059	0.0059	0.000468	0.0088	0.065	--
CT1	0.0033	0.0020	--	--	--	--
CT2	0.0033	0.0020	--	--	--	--
CT3	0.0033	0.0020	--	--	--	--
CT4A	0.0003	0.0002	--	--	--	--
CT4B	0.0003	0.0002	--	--	--	--
CT5	0.0039	0.0024	--	--	--	--
CT6	0.0039	0.0024	--	--	--	--
CT7	0.0039	0.0024	--	--	--	--
O1	0.6311	0.6311	0.025	--	2.00	--
OV01A	0.0359	0.0359	0.003	0.24	0.40	--
OV02A	0.0318	0.0318	0.003	0.21	0.35	--
OV03A	0.0316	0.0316	0.002	0.21	0.35	--
OV04	0.0312	0.0312	0.003	0.42	0.35	--
OV22	0.0379	0.0379	0.003	0.25	0.42	--
OV23	0.0424	0.0424	0.003	0.28	0.47	--
PC01A	0.3114	0.3114	--	--	--	--
PC01B	0.3114	0.3114	--	--	--	--
RB1	0.0033	0.0033	--	0.0123	0.174	--
RB2	0.0033	0.0033	--	0.0123	0.174	--
RB3	0.0033	0.0033	--	0.0123	0.174	--
SR01	0.0085	0.0085	--	--	--	--
UBC01	0.2344	0.2344	--	--	--	--
UBS01	0.3121	0.3121	--	--	--	--
UBS21	0.2471	0.2471	--	--	--	--

ATTACHMENT - Emission Rates for Ambient Air Standards

Mercedes-Benz Vans, LLC
0560-0385-CA

AMBIENT AIR QUALITY STANDARDS - STANDARDS NO. 2 and 7						
Emission Point ID	Emission Rates (lbs/hr)					
	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO	Lead
WD03TU	0.0473	0.0473	--	--	--	--
WD4TU	0.1085	0.1085	--	--	--	--

TOXIC AIR POLLUTANTS - STANDARD NO. 8					
Emission Point ID	Emission Rates (lbs/hr)				
	Manganese Compounds	--	--	--	--
Body Shop Welding	0.000565	--	--	--	--

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Appendix D – Statement of Basis

Company Name	Mercedes Benz Vans, LLC	Permit Writer:	Fatina Ann Washburn Clark
Permit Number:	0560-0385-CA-R3	Date:	DRAFT

EXPEDITED REVIEW: Accepted February 26, 2018

DATE APPLICATION RECEIVED: February 20, 2018

FACILITY DESCRIPTION

Mercedes-Benz Vans, LLC (Mercedes-Benz Vans) owns and operates a van assembly plant in Ladson, Charleston County, South Carolina (the Charleston plant). Mercedes-Benz Vans submitted a Prevention of Significant Deterioration (PSD) construction and operating permit application in October 2015 and later submitted a revised application in February 2016 for the expansion of existing assembly processes and addition of new processes, including a body shop, paint shop, and energy center. Construction Permit No. 0560-0385-CA was issued for the project on April 15, 2016, and the facility is under construction as permitted. On April 3, 2017, the facility requested a revision to the permit to incorporate additional operations that had been identified. Revision 0560-0385-CA-R1 was issued on July 21, 2017. On October 3, 2017, the facility requested a revision to the permit to incorporate additional operations that had been identified. Revision 0560-0385-CA-R2 was issued on January 26, 2018.

PROJECT DESCRIPTION

Since permit revision issuance on January 26, 2018, Mercedes-Benz Vans has identified changes to the coatings in the E-coat area that were not foreseen in the previous permit application or revisions. Additionally, some design changes have occurred that require updates to Permit No. 0560-0385-CA. Therefore, Mercedes-Benz Vans is submitting this application to revise the issued PSD permit to incorporate these changes. The requested permit revisions are listed as follows:

- Modify dry filter monitoring requirements to include visual inspection and maintenance checks.
- Modify adsorption wheel monitoring requirements for Std 7 and CAM.
- Modify boiler tune up requirements for Std 7 to be consistent with the 40 CFR 63, Subpart DDDDD.
- Modify permit condition C.5 for natural gas only sources.
- Remove natural gas sources from permit condition C.8 as it does not apply to sources that burn only natural gas.
- Update the control device for MAG welding.
- Add emergency generators and update sizes for previously permitted units.
- Add a second diesel storage tank.
- Modify the number and size of the RTOs.
- Modify oven heat input capacity.
- Modify the list of air supply and rooftop units.
- Modify the window glazing vent.
- Modify the cooling tower design capacity.
- Update sources that are subject to SC Regulation 61-62.5, Standard 5.2.
- Clarify Body Shop Adhesive locations.
- Update CAM applicability for the E-coat process.
- Update emission point IDs for the oven burners.
- Clarified control device configuration for the booth filtration systems.
- Revise BACT for E-Coat Spot Repair.
- Standard 5.2 case by case monitoring request for the boilers.

Company Name	Mercedes Benz Vans, LLC	**Permit Writer:**	Fatina Ann Washburn Clark
Permit Number:	0560-0385-CA-R3	**Date:**	DRAFT

SOURCE TEST REQUIREMENTS

There are no additional source testing requirements as a result of this revision.

SPECIAL CONDITIONS, MONITORING, LIMITS

The facility requested that permit condition C.5 indicate that the applicable units are natural gas fired only. This request was not incorporated as it is already contained in condition C.11.

The facility requested that the Boilers B01 and B02 be exempt from SC Regulation 61-62.5, Standard 5.2 as they are exempt under SC Regulation 61-62.1. After review, it was determined that the limiting emission factors were used to determine emissions and regulatory applicability. Since SC Regulation 61-62.1 requires uncontrolled emissions to evaluate construction permit exemption criteria, the boilers would not be exempt from construction permitting as NOx and CO are above 5 TPY. Therefore, these boilers are not exempt from SC Regulation 61-62.5, Standard 5.2. The facility subsequently requested a case by case determination from SC Regulation 61-62.5, Standard 5.2. The Department concluded that the facility could meet the limit in the table, however the tune-ups and recordkeeping requirements required alternatives. The tune-ups will be required every five years as required by the Boiler MACT. The fuel recordkeeping will be required elsewhere in the permit and can be removed. The facility demonstrated the infeasibility of recording start up and shutdowns with this design so the recordkeeping was revised to include only malfunctions.

During the July 21, 2017 revision of the construction permit, the facility requested the flexibility to apply the body shop adhesives in both the body shop and the paint shop. While the emissions were calculated using the full application rates in both areas, the process would only be in one area or the other, therefore the emissions were counted twice for conservatism. The nomenclature used for the emission points PSA and BS02 were confusing as the assembly area was also included in the equipment description. With this revision, it has been clarified that the body shop adhesives may be applied in all three areas – Body Shop, Paint Shop and Assembly Shop. An additional equipment ID ASA was included with this revision to reflect the possibility of application in the assembly area. The emissions for ASA were not added to the facility wide totals with this revision. No additional modeling for this emission point will be required as it is a VOC only emission point.

FACILITY WIDE EMISSIONS			
Pollutant	Uncontrolled Emissions	Controlled Emissions	Limited Emissions
	TPY	TPY	TPY
PM	1,354.08	24.74	21.32
PM_{10}	1,346.79	17.45	14.11
$PM_{2.5}$	1,345.49	16.15	12.81
SO_2	0.94	0.94	0.73
NO_x	61.91	61.91	39.90
CO	78.03	78.03	49.63
VOC	3,446.82	1,114.35	955.36
CO_2e	104,003	104,003	63,637
Lead	4.31E-04	4.31E-04	3.10E-04
Total HAP	415.61	415.61	358.00

Company Name	Mercedes Benz Vans, LLC	**Permit Writer:**	Fatina Ann Washburn Clark
Permit Number:	0560-0385-CA-R3	**Date:**	DRAFT

OPERATING PERMIT STATUS

This facility does not currently have an operating permit but will be issued a Title V Operating Permit.

REGULATORY APPLICABILITY REVIEW	
Regulations	**Comments/Periodic Monitoring Requirements**
Section II.E – Synthetic Minor	This revision does not establish any new synthetic minor limits.
Standard No. 1	The boilers, ovens, desorption heaters and social room air supply unit ASU37 (formerly ASU22) continue to be subject to this standard. Each unit will have an opacity limit of 20%, a PM emission limit of 0.6 lb/MMBtu, and an SO_2 limit of 2.3 lb/MMBtu. Monitoring will be required for this standard. The facility is only allowed to burn pipeline quality natural gas in the units.
Standard No. 3 (state only)	This revision does not establish any additional requirements from this standard.
Standard No. 4	The automobile manufacturing process continues to be subject to this standard. A single process includes all the process emission units and/or group of process emission units used to make a "finished identifiable output." All activities within the body shop and paint shop will be considered one process, while the assembly shop will be a separate process since it will process from assemblies from the paint shop as well as processing existing assembly operations. There are opacity limits of 20% for each process, and PM limits based on each process weight rate. Visual emissions will be required for opacity and the facility will demonstrate compliance with the PM limit by operating, monitoring and maintaining the PM control equipment. These limits do not apply to VOC only sources within the body shop/paint shop process or the assembly process nor do they apply to specific sources in these processes with no external vent.
Standard No. 5	This project is not an existing source; therefore, this standard is not applicable.
Standard No. 5.2	The boilers will continue to be subject to this standard. The boilers are subject to a 30 ppmv limit at $3\%O_2$ using low NO_x burners or equivalent technology. For the purposes of control, low NO_x burners are inherent and not considered control devices and, therefore, will not be listed as such in the permit. Tune-ups will be required every five years for the boilers per the Boiler MACT. This standard is no longer applicable to the oven (OV01) and air supply unit ASU 1 (formerly ASU06) as they have been derated and PTE for this equipment is now less than 5 TPY each.
Standard No. 7	The PTE for this project revision exceeds 250 TPY for VOCs, PM, PM_{10}, and $PM_{2.5}$. The PTE for this project revision exceeds 40 TPY of NOx and 75,000 TPY of CO_2e. The facility has requested a federally enforceable limits for NO_x and CO_2e to avoid PSD for those pollutants in the original application. The facility has undergone BACT for VOCs for the boilers and gas fired combustion units and has undergone BACT for PM, PM_{10}, and $PM_{2.5}$. for the boilers, gas fired combustion units, and MAG welding in this revision. The control device changed for the MAG welding from and ESP to a cartridge filter with equivalent or better efficiency. The boiler tune ups were revised to every five year consistent with the Boiler MACT requirements. The proposed limits shall apply at all times.

Company Name	Mercedes Benz Vans, LLC	**Permit Writer:**	Fatina Ann Washburn Clark
Permit Number:	0560-0385-CA-R3	**Date:**	DRAFT

REGULATORY APPLICABILITY REVIEW	
Regulations	**Comments/Periodic Monitoring Requirements**
61-62.6	This project revision does not emit fugitive particulate matter; therefore, this regulation does not apply.
40 CFR 60 and 61-62.60	The boilers continue to be subject to Subparts A and Dc, Standards of Performance for Small Industrial Commercial – Institutional Steam Generating Units. They must burn only natural gas and monitor fuel usage monthly. The automobile manufacturing process continues to be subject to Subparts A and MM, Standards of Performance for Automobile and Light Duty Truck Surface Coating Operations. Specific limits, monitoring, testing, recordkeeping and reporting are required per the regulation. No additional applicable operations were included with this revision. The emergency generators and fire pumps are subject to Subparts A and IIII, Standards of Performance for Stationary Compression Ignition Internal Combustion Engines. The engines are required to be certified to the appropriate tier based on manufactured date.
40 CFR 61 and 61-62.61	There are no Subparts applicable to this project.
40 CFR 63 and 61-62.63	The boilers continue to be subject to Subparts A and DDDDD, Industrial, Commercial, and Institutional Boilers & Process Heaters. Although the definitions allow for the use of liquid fuel for periodic testing of liquid fuel, maintenance, or operator training, not to exceed a combined total of 48 hours during any calendar year, and the use of liquid fuel during periods of gas curtailment or gas supply interruptions of any duration, the application and permit are based on the use of natural gas only. The frequency of tune ups was revised since the units contain an oxygen trim system. Tune ups are required every five years on these units as opposed to annually. The option to comply with the requirements of Subpart IIII, Surface Coating of Automobiles and Light-Duty Trucks rather than Subparts MMMM, Surface Coating Of Miscellaneous Metal Parts And Products, and PPPP, Surface Coating of Plastic Parts and Products, does not change with this permit revision. The emergency generators and fire pumps will be subject to Subparts A and ZZZZ, Stationary Reciprocating Internal Combustion Engines. Compliance with this standard is by complying with 40 CFR 60, Subpart IIII.
61-62.68	This facility does not store or use chemicals subject to 112(r) above the threshold quantities; therefore, this regulation does not apply.
40 CFR 64 (CAM)	The facility is a major source and plans to install adsorption wheels, RTOs and dry filtration systems that will be subject to CAM. This revision modified the indicator for the adsorption wheel from VOC outlet concentration to desorption gas inlet temperature consistent with the monitoring parameters of 40 CFR 63, Supbart IIII. Documentation for ranges shall be established during the initial source tests or

DRAFT

Company Name	Mercedes Benz Vans, LLC	Permit Writer:	Fatina Ann Washburn Clark
Permit Number:	0560-0385-CA-R3	Date:	DRAFT

REGULATORY APPLICABILITY REVIEW	
Regulations	**Comments/Periodic Monitoring Requirements**
	within 180 days of startup. Reevaluation of these ranges may occur during subsequent source tests. Additionally, the e-coat process will be included in the CAM condition. The overall uncontrolled PTE is greater than 100 TPY with a control device on the e-coat oven only. A split was assumed in the emission calculations which would indicate that the PTE to the oven would be less than 100TPY. This split was conservatively assumed to indicate the possibility of more uncontrolled emissions overall. Since the actual split is unknown, it is assumed all of the emissions will go through the e-coat oven for CAM applicability purposes.

AMBIENT AIR STANDARDS REVIEW	
Regulations	**Comments/Periodic Monitoring Requirements**
Standard No. 2	This facility has demonstrated compliance through air dispersion modeling; see modeling summary dated April 13, 2018.
Standard No. 7.c	This facility has demonstrated compliance through air dispersion modeling; see modeling summary dated April 13, 2018.
Standard No. 8 (state only)	This facility has demonstrated compliance through air dispersion modeling; see modeling summary dated April 13, 2018.

PUBLIC NOTICE

This construction permit will undergo a 30-day public notice period to establish new VOC and PM/PM_{10}/$PM_{2.5}$ BACT limits for the E-Coat spot repair, to modify dry filter monitoring requirements to include visual inspection and maintenance checks, to modify adsorption wheel monitoring requirements for Std 7 and CAM, to modify boiler tune up requirements for 61-62.5, Standard 7 and Standard 5.2 to be consistent with the 40 CFR 63, Subpart DDDDD, to update the control device for MAG welding, to update sources that are subject to SC Regulation 61-62.5, Standard 5.2, to update CAM applicability for the E-coat process, and to include a 61-62.5, Standard 5.2 case by case monitoring for the boilers in accordance with SC Regulation 61-62.1, Section II.N and SC Regulation 61-62.5, Standard 7(q). The comment period was open from May 3, 2018 to June 1, 2018 and was placed on the BAQ website during that time period.

SUMMARY AND CONCLUSIONS

It has been determined that this source, if operated in accordance with the submitted application, will meet all applicable requirements and emission standards.

Appendix E – Public Notice of Draft PSD Construction Permit

PUBLIC NOTICE

State of South Carolina (SC)
Department of Health and Environmental Control (DHEC)
Bureau of Air Quality (BAQ)
2600 Bull Street
Columbia, SC 29201
(803) 898-4123

Notice of a Draft Air Prevention of Significant Deterioration (PSD) Construction Permit
PUBLIC NOTICE #18-016-PSD

COMMENT PERIOD: Public Notice will begin on **May 3, 2018** and will end at close of business, which is 5:00 p.m. on **June 1, 2018**.

Mercedes-Benz Vans, LLC
8501 Palmetto Commerce Parkway
Ladson, South Carolina 29456
(Charleston County)
AIR PERMIT # 0560-0385-CA

Mercedes-Benz Vans, LLC has applied to the SC DHEC, BAQ, for a Prevention of Significant Deterioration (PSD) revised air construction permit to modify and add equipment at their existing facility. A revised Preliminary Determination, draft revised construction permit, and revised Statement of Basis have been written by the BAQ outlining this proposed project and applicable regulations. In addition to other state and federal air quality regulations, the draft permit is subject to review under SC DHEC Regulation 61-62.5, Standard No. 7 “Prevention of Significant Deterioration (PSD).” This regulation is equivalent to Title 40 of the Code of Federal Regulations, Part 52.21 “Prevention of Significant Deterioration of Air Quality.” Under these regulations, a facility must demonstrate that it will not significantly deteriorate the air quality in its region prior to constructing or modifying sources of air pollutants. The draft permit has not yet been approved and is open to comment from the public, the United States Environmental Protection Agency (EPA), the Federal Land Managers, the chief executives of Charleston, North Charleston, Summerville, Goose Creek, and the Berkeley-Charleston-Dorchester Council of Government.

Mercedes-Benz Vans, LLC operates a van assembly plant. This PSD permit revision will include changes to the Preliminary Determination and PSD construction permit (0560-0385-CA-R2) in order to incorporate changes in the size, number, equipment identifier, location or capacity of various plant equipment; to modify filter, adsorption wheel monitoring requirements; to modify boiler tune up and monitoring requirements; and to modify BACT for E-Coat spot repair. Emissions generated by this facility as a result of the proposed project will include: Particulate Matter (PM); Particulate Matter less than 10 micrometers in diameter (PM10); Particulate Matter less than 2.5 micrometers in diameter (PM2.5); Sulfur Dioxide (SO2); Nitrogen Oxides (NOx); Carbon Monoxide (CO); Lead (Pb); Carbon Dioxide Equivalent (CO2e); Volatile Organic Compounds (VOCs), and Hazardous Air Pollutants (HAPs).

The maximum degrees of Class I PSD increment consumption resulting from the proposed project are predicted to be: PM2.5 29% of the 24-hour standard and 5% of the annual standard. The maximum degree of Class II PSD PM10 increment consumption is 33% of 24-hour standard and 18% of the annual standard. The maximum degree of the Class II PSD PM2.5 increment consumption is 100% of the 24-hour standard and 50% of the annual standard. Air dispersion modeling has indicated that the release of emissions from this facility will not cause or contribute to an exceedance of the National Ambient Air Quality Standards (NAAQS).

If this permit is approved, Mercedes-Benz Vans, LLC will be considered a major source for Title V applicability purposes. Therefore, the facility will be required to submit a Part 70 (Title V Operating) permit application within twelve (12) months after it becomes subject to the SC Title V Operating Permit Program.

Interested persons may review the materials drafted and maintained by DHEC for this facility and submit written comments on the draft permit by the end of the public notice period listed above, to Ruthie Hall at the above DHEC address or by e-mail at hallmr@dhec.sc.gov. All comments received by the end of the notice period, will be considered when making a decision to approve, disapprove, or modify the draft permit. Where there is a significant amount of public interest, DHEC may hold a public hearing to receive additional comments. Public hearing requests should be made in writing to Ruthie Hall at the above DHEC address or by e-mail. If a public hearing is requested and scheduled, notice will be given thirty (30) days in advance. If you have questions concerning the draft permit, please contact Fatina Washburn Clark at the phone number listed above. A final review request may be filed after a permit decision has been made. Information regarding final review procedures is available from DHEC's legal office at the above address or by calling (803) 898-3350. Information relative to the draft permit will be made available for review through the end of the notice period listed above, at the DHEC Columbia Office listed above and at the following location:

SC DHEC, Charleston BEHS Office, 1362 McMillan Avenue, Suite 300, Charleston, SC 29405

Information on permit decisions and hearing procedures is available by contacting DHEC at either address listed above. Copies of a draft permit or other related documents may be requested in writing to the Freedom of Information Office; fees may apply. Please bring this notice to the attention of persons you know will be interested in this matter.

This public notice, along with the Preliminary Determination which includes the draft permit and draft statement of basis, may be viewed through the end of the notice period on DHEC's website at: http://www.scdhec.gov/PublicNotices/.

Appendix F – Correspondence

RoboVent®

ROBOVENT BRAND
ENDUREX™
High Performance Filters

Improving Lives through Clean Air™

WWW.ROBOVENT.COM • 888.ROBOVENT

featuring
RMO Technology

Endurex A15 Premium Filter

The Endurex A15 filter is made from a fire retardant, hybrid poly/cellulose media that uses a specially formulated blend of fibers to form a multi-layered fiber base. This technology sets the Endurex apart from other blended medias by giving it a higher filtration efficiency and prolonged filter life. Cell layering, combined with RMO pleat spacing, helps the particulate release easily during pulse cleaning cycles and reduces the potential for media abrasion. Endurex filters are designed specifically to handle heavy production weld smoke. Each filter is treated with a proprietary nanofiber process that protects the filter from oil deposits while greatly improving filter efficiency.

Superior performance: Endurex A15 Nanofiber Cartridge Filters uses RoboVent's Reinforced Media Optimization (RMO) technology. RoboVent's RMO is truly the future in efficient filtration. By widening the pleat spacing in our proprietary filter media and ensuring that the pleats remain apart, we maximize the surface area of media available to dust and fume particles, while maintaining the highest level of filtration efficiency. The result is reduction in static pressure, and superior particulate release. In short, longer filter life, using less media.

Gasket:	0.625 x 0.625 Neoprene
Pleat Depth:	2"
Filter Media:	80/20 Media with Nanofiber Membrane
Inner Cage:	Galvanized Expanded Metal
Outer Support:	Multiple Outer Support Bands
Potting Material:	Urethane
End Cap Depth:	0.5"
Efficiency:	99.9 @ .5 micron
MERV Rating:	MERV 15
Max. Operating Temp:	149° F
Filter Size:	10" Diameter; 12" Height 12" Diameter; 26" Height 14" Diameter; 26" Height 14" Diameter; 36" Height 18" Diameter; 12" Height 18" Diameter; 14" Height 22" Diameter; 14" Height

Endurex A15 Filter Media Technical Specifications:

	UNITS	NOMINAL VALUE		UNITS	NOMINAL VALUE
Basis Weight:	G/m^2	115	**Air Permeability (DSPH):**	CFM	35
Caliper:	mm	.5	**Pressure Drop:**	PA	40

©2017 RoboVent Product Group, Inc. 05/2017

3.7.6. Source Types and Stack Parameters

The AERMOD dispersion model allows for emissions units to be represented as point, area, or volume sources. For point sources with unobstructed vertical releases, it is appropriate to use actual stack parameters (i.e., height, diameter, exhaust gas temperature, and gas exit velocity) in the modeling analyses. Table 3-5 presents the modeled source locations, stack parameters and emission rates for the Charleston Plant. All stacks are unobstructed vertical releases, however some of the sources are "ambient discharges". Per DHEC Guidance ambient releases were assigned an exit temperature of 0 K and an exit velocity of 0.001 m/s.

In general, the stack ID in the modeling files and the permit ID, as proposed in the permit application submitted, align. However, there are several air supply units (ASU) that were renamed at the facility since the AERMOD models were finalized. Table 3-4, below, provides a cross-reference between the stack ID in the model and the proposed permit ID.

Table 3-4. Modeled Source ID and Permit ID Cross-Reference

Model ID	Model Description	Permit ID	Permit Description
ASU02	ASU 2.1 Shop + Open WD	ASU 2.1	ASU 2.1 Shop + Open WD
ASU03	ASU 3 - UBS + Repair	ASU 3	ASU 3 - UBP + Repair
ASU04	ASU 2.2 Shop + Open WD	ASU 2.2	ASU 2.2 Shop + Open WD
ASU05	ASU 1 - Spot Repair	ASU 1	ASU 1 - Spot Repair
ASU06	ASU 2.3 Shop	ASU 2.3	ASU 2.3 Shop
ASU07	ASU 4 - Wax	ASU 4	ASU 4 - Wax
ASU08	Primer Oven Cooling Zone Exhaust	ASU 6	Workdecks ASU 6 (Phase 2)
ASU11	Primer Oven Cooling ASU	ASU 5	Workdecks ASU 5 (Phase 2)
ASU36	Clean Room 21 Air Supply Unit (Phase 3)	ASU CR2	ASU Cleanroom (Phase 2)
ASU33	Workdecks Air Supply Unit 21 (Phase 3)	ASU33	Workdecks Air Supply Unit 1 Phase 3
ASU34	Workdecks Air Supply Unit 22 (Phase 3)	ASU34	Workdecks Air Supply Unit 2 Phase 3
ASU35	Workdecks Air Supply Unit 23 (Phase 3)	ASU35	Workdecks Air Supply Unit 3 Phase 3
ASU37	Shop Ventilation 21 Air Supply Unit (Phase 3)	ASU36	Shop Ventilation Air Supply Unit Phase 3
ASU38	Social Rooms Air Supply Unit 2 (Phase 3)	ASU37	Social Rooms Air Supply Unit Phase 3

All outdoor process and storage areas will be paved and all material transfer routes will occur in between the processes on the paved areas. Mercedes-Benz Vans will implement best management practices to ensure emissions of unconfined PM are insignificant. Emissions from those areas were quantified in the permit application for completion, however, due to inherently low fugitive releases from all transfer and process areas, Mercedes-Benz Vans focused the dispersion modeling on those sources with clear emission points and well-documented emissions estimates, and did not delineate fugitive sources in the model per DHEC's approval.[20]

[20] Phone call between John Glass (DHEC) and Nicole Saniti (Trinity Consultants) on November 3, 2015.

325 Arlington Avenue | Suite 500 | Charlotte, NC 28203 | P (704) 553-7747 | F (704) 553-8838
trinityconsultants.com

Trinity Consultants

February 16, 2018

Steve McCaslin, P.E.
South Carolina DHEC
Bureau of Air Quality
2600 Bull Street
Columbia, SC 29201

RECEIVED
FEB 20 2018
BUREAU OF AIR QUALITY

RE: Mercedes-Benz Vans, LLC – Ladson, SC
PSD Permit Revision Application

Dear Mr. McCaslin:

Mercedes-Benz Vans, LLC (Mercedes) owns and operates a van assembly plant in Ladson, Charleston County, South Carolina (the Charleston plant). Mercedes-Benz Vans submitted a Prevention of Significant Deterioration (PSD) construction and operating permit application in October 2015 and later submitted a revised application in February 2016 for the expansion of existing assembly processes and addition of new processes, including a body shop, paint shop, and energy center. Construction Permit No. 0560-0385-CA was issued on April 15, 2016 for the initial permit application. Construction Permit No. 0560-0385-CA-R1 was issued on July 21, 2017 to include design changes and additional operations that will be needed at the Charleston plant that were not included in the previous permit application. Construction Permit No. 0560-0385-CA-R2 was issued on January 26, 2018 to include changes to the E-coat operations. Since the issuance of Permit No. 0560-0385-CA-R2, Mercedes-Benz Vans has identified changes to facility operations that were not foreseen in the previous permit applications. Therefore, Mercedes-Benz Vans is submitting this application to revise the issued PSD construction and operating permit to incorporate the proposed changes to the facility.

Trinity Consultants, Inc. is submitting this construction permit application to DHEC on behalf of Mercedes for the following permit revisions:

- Proposed updates to monitoring requirements for several units onsite;
- Installation of a high efficiency particulate air (HEPA) filtration system on the body shop welding process rather than an electrostatic precipitator (ESP);
- Installation of new equipment including emergency generators, and diesel storage tank; and
- Modify the list of Air Supply Units and Rooftop Units at the Charleston Plant.

The application includes all required elements to revise the PSD permit, including updated project emission calculations, Best Available Control Technology (BACT) analyses, and permit application forms. Mercedes is requesting acceptance into the expedited review program and will provide payment for the permit application fee upon notification of acceptance.

Note that as previously approved by DHEC, Class I, Class II, and additional impacts analyses will be submitted under separate cover.

If you have any questions or comments about the information presented in this letter or the permit application, please do not hesitate to call me at (704) 553-7747.

Sincerely,

TRINITY CONSULTANTS, INC.

Antoine Jabon

Tony Jabon, P.E.
Principal Consultant

cc: Jae Park – Mercedes Benz Vans, LLC
Russell Revell – Mercedes-Benz Vans, LLC
Nicole Saniti, P.E. – Trinity Consultants, Inc.

Enclosures

CONSTRUCTION AND OPERATING PERMIT APPLICATION

Mercedes-Benz Vans, LLC > Ladson, SC

RECEIVED

FEB 20 2018

BUREAU OF AIR QUALITY

Charleston Plant Expansion Revisions

Prepared By:

Jae Park – Mercedes-Benz Vans, LLC
Russell Revell – Mercedes-Benz Vans, LLC

Nicole Saniti, P.E. – Trinity Consultants, Inc.
Tony Jabon, P.E. – Trinity Consultants, Inc.
Kim Teofilak – Trinity Consultants, Inc.

TRINITY CONSULTANTS
325 Arlington Ave.
Suite 500
Charlotte, NC 28203
(704) 553-7747

February 2018

Project 173402.0150

Trinity Consultants

Environmental solutions delivered uncommonly well

TABLE OF CONTENTS

1. EXECUTIVE SUMMARY

Mercedes-Benz Vans, LLC (Mercedes-Benz Vans) owns and operates a van assembly plant in Ladson, Charleston County, South Carolina (the Charleston plant). Mercedes-Benz Vans submitted a Prevention of Significant Deterioration (PSD) construction and operating permit application in October 2015 and later submitted a revised application in February 2016 for the expansion of existing assembly processes and addition of new processes, including a body shop, paint shop, and energy center. Construction Permit No. 0560-0385-CA was issued on April 15, 2016 for the initial permit application. Construction Permit No. 0560-0385-CA-R1 was issued on July 21, 2017 to include design changes and additional operations that will be needed at the Charleston plant that were not included in the previous permit application. Construction Permit No. 0560-0385-CA-R2 was issued on January 26, 2018 to include changes to the E-coat operations. Since the issuance of Permit No. 0560-0385-CA-R2, Mercedes-Benz Vans has identified changes to facility operations that were not foreseen in the previous permit applications. Therefore, Mercedes-Benz Vans is submitting this application to revise the issued PSD construction and operating permit to incorporate the proposed changes to the facility.

1.1. PROJECT DESCRIPTION

Mercedes-Benz Vans is submitting this application to incorporate proposed changes at the Charleston plant. The requested permit revisions are summarized as follows:

- Proposed updates to monitoring requirements for several units onsite;
- Installation of a high efficiency particulate air (HEPA) filtration system on the body shop welding process rather than an electrostatic precipitator (ESP);
- Installation of new equipment including emergency generators, and diesel storage tank; and
- Modify the list of Air Supply Units and Rooftop Units at the Charleston Plant.

Detailed descriptions of the proposed changes described above and other minor permit revisions are provided in Section 2 of this application.

1.2. PERMITTING AND REGULATORY REQUIREMENTS

Facility-wide potential emissions exceed the VOC PSD major source threshold of 250 tons per year (tpy). Further, as the facility is a PSD major source, PSD permitting for the project is required for pollutants with potential emissions exceeding the Significant Emission Rates (SER), which includes particulate matter with aerodynamic diameter less than 2.5 microns ($PM_{2.5}$). In the original construction permit application, potential facility wide emissions of total PM and PM with an aerodynamic diameter less than 10 microns (PM_{10}) were greater than the SER. Facility-wide PM and PM_{10} emissions are now less than the SER due to changes described in this revision application, however, Mercedes-Benz Vans is requesting continued PSD review for PM_{10} and PM.

With this construction permit revision application, Mercedes-Benz Vans has addressed Best Available Control Technology (BACT) requirements for VOC, PM, PM_{10}, and $PM_{2.5}$ emissions. As described in Section 6 of this application, updated analyses to demonstrate compliance with requirements associated with the National Ambient Air Quality Standards (NAAQS), Class I and Class II increments, Class I visibility, and non-air quality impacts are will be provided under separate cover.

A detailed analysis of the regulatory requirements that apply to the proposed operations is provided in Section 4 of this application.

1.3. BACT DETERMINATION

Mercedes-Benz Vans has revised the BACT analysis for equipment identified in this application for the PSD-regulated pollutants exceeding the major source threshold (VOC, PM, PM_{10}, $PM_{2.5}$), generally following the "top-down" approach suggested by U.S. EPA. The top-down process begins by ranking all potentially relevant control technologies in descending order of control effectiveness. The most stringent or "top" control option is BACT unless the applicant demonstrates, and the permitting authority in its informed opinion agrees, that energy, environmental, and/or economic impacts justify the conclusion that the most stringent control option does not meet the definition of BACT. Where the top option is not determined to be BACT, the next most stringent alternative is evaluated in the same manner. This process continues until BACT is determined.

Based on the BACT review, Mercedes-Benz Vans has determined that the emission limits presented in Table 1-1 and operating requirements in Table 1-2 are BACT for the various emission units during periods of normal operation.

Table 1-1. Proposed BACT Emission Limits Summary

Equipment ID	Unit Description	$PM/PM_{10}/PM_{2.5}$ BACT Limit	Units	Avg. Period	VOC BACT Limit	Units	Avg. Period
B01, B02	Boilers	7.6	lb/MMscf	3-hour	5.5	lb/MMscf	Monthly
ASU, AS-RTU, BS-RTU, OV01, OV02, OV03	Gas-Fired Combustion Units	7.6	lb/MMscf	3-hour	5.5	lb/MMscf	Monthly

Table 1-2. Proposed BACT Operating Requirements Summary

Equipment ID	Unit Description	$PM/PM_{10}/PM_{2.5}$ BACT Operating Requirement	VOC BACT Operating Requirement
B01, B02	Boilers	Tune-ups every five (5) years as required in 40 CFR 63 Subpart DDDDD	Tune-ups every five (5) years as required in 40 CFR 63 Subpart DDDDD
ASU, AS-RTU, BS-RTU, OV01, OV02, OV03	Gas-Fired Combustion Units	Good combustion practices	Good combustion practices
EG03, EG04	Emergency Generators	NSPS Subpart IIII compliance	NSPS Subpart IIII compliance
TK03	Diesel Storage Tank	N/A	N/A
BS	Body Shop Welding Area	HEPA Filter (MAG Welding), good operating practices, indoor venting	N/A

1.4. ORGANIZATION OF APPLICATION

The permit application is organized as follows:

- Section 1 includes the application summary;
- Section 2 contains the project description;
- Section 3 contains the emission calculation methodologies and presents the facility-wide potential emissions following the proposed changes;
- Section 4 contains the regulatory applicability analysis for the proposed operations;
- Section 5 contains the BACT analyses for the proposed operations;
- Section 6 addresses the Class I and Class II area analysis, as well as the additional impacts analyses;
- Section 7 provides the DHEC-required permit application forms;
- Appendix A includes an area map, site layout, and process flow diagrams;
- Appendix B contains the detailed emissions calculations for each project phase;
- Appendix C contains BACT supporting documentation;
- Appendix D contains a detailed listing of equipment in each project phase; and
- Appendix E contains an electronic copy of the application and supporting documentation.

This section describes the proposed revisions to Construction Permit No. 0560-0385-CA-R2, including the addition of new equipment and proposed changes to monitoring and control devices. The proposed changes are described in the following subsections.

2.1. SITE DESCRIPTION

The Mercedes-Benz Vans Charleston plant is located in Charleston County, which has been designated by the United States Environmental Protection Agency (U.S. EPA) as "attainment" or "unclassifiable" for all criteria pollutants.

An area map showing the location of the facility is included in Appendix A.

2.2. PROPOSED UPDATES TO MONITORING REQUIREMENTS

2.2.1. Modify Dry Filter Monitoring Requirements

Construction Permit No. 0560-0385-CA-R2 requires that Mercedes-Benz Vans conduct daily pressure drop readings for several dry filters at the Charleston Plant. Mercedes-Benz Vans has determined that visual inspections are more appropriate for many dry filters in the assembly plant and requests that the pressure drop monitoring requirement be eliminated. Visual inspections will allow Mercedes-Benz Vans to determine filter replacement needs faster than pressure drop and will allow for the replacement of clogged media in appropriate cells of filter controls. The use of visual inspections is a common practice and consistent with monitoring conducted for similar sources in the industry. The proposed changes for the dry filter monitoring are identified in the following table.

Table 2-1. Proposed Dry Filter Monitoring Changes

Permit Condition No.	Emission Unit ID(s)	Emission Unit Description	Pre-Control Unrestricted $PM/PM_{10}/PM_{2.5}$ Emissions (tpy)	Control Device ID	Control Device Description	Proposed Monitoring Requirements
C.41	CW	Cavity Wax Booth	19.26	CD-DF	Dry Filters	Weekly Visual Inspections
C.42	UBS01	Underbody PVC Booth #1	72.14	CD-DF	Dry Filters	Weekly Visual Inspections
	UBS21	Underbody PVC Booth #2	72.14			
	UBC01, UBC21	Underbody Coating Booth #1 & #2	48.94			
	SR01, SR02, SR03	Spot Repair Booth #1, #2, & #3	1.27	CD-DF	Dry Filters	Monthly Visual Inspections
	AR01	Assembly Repair Booth	3.14			
C.43	AUW	Assembly UB Wax	15.93	CD-DF	Dry Filters	Weekly Visual Inspections

Sources identified in Table 2-1 are not subject to the more stringent monitoring requirements contained in 40 CFR Part 64 as the potential pre-control unrestricted emissions from each source are less than 100 tons per year (tpy). Therefore, Mercedes-Benz Vans believes that weekly visual inspections for the sources identified in Table 2-1 (except the repair booths) will be sufficient to demonstrate compliance. Mercedes-Benz Vans proposes a less frequent (monthly) visual inspection schedule for the repair booths due to intermittent use and very low emissions. Further details of non-applicability of 40 CFR Part 64 are provided in Section 4.1.4 of this application. The BACT determination for equipment listed in Table 2-1 has not changed, therefore, the BACT analysis is not included in Section 5 of this revision application.

2.2.2. Modify ADW Monitoring Requirements

Process exhaust from several sources at the Charleston plant will be routed through dry filtration systems (Dry X) to adsorption wheel (ADW) systems, where the solvent content of the air is first adsorbed, then the concentrated desorb stream is sent to a regenerative thermal oxidizer (RTO) for control.

Mercedes-Benz Vans requests revision of Condition C.67 for the ADWs which requires monitoring of the desorption outlet VOC concentration. Condition C.67 was included due to the 40 CFR Part 64 Compliance Assurance Monitoring (CAM) monitoring requirements. Consistent with the monitoring in Conditions C.54 and C.55, Mercedes-Benz Vans requests that DHEC update Condition C.67 to utilize the desorption gas inlet temperature as the compliance indicator in lieu of VOC concentration. Also, Mercedes-Benz Vans requests that Conditions C.54 and C.55 be modified to indicate that the facility will monitor desorption gas inlet temperature instead of outlet temperature on each ADW.

Monitoring of the desorption side of the ADW would vary greatly due to the booth operations and coatings which may have higher or lower VOC contents and would be difficult to provide an adequate range for proper operation. In addition, monitoring VOC content would be an engineering challenge given that a stream of the adsorption outlet is used for desorption inlet in the final design. Therefore, Mercedes-Benz Vans believes that continuously monitoring the desorption gas inlet temperature pursuant to Table 1 to Subpart IIII of Part 63 (Item 5), is sufficient to determine compliance with applicable regulations.

In the background documentation for Subpart IIII of Part 63, desorption gas inlet temperature is an acceptable monitoring parameter for the following reasons:[1]

> *The monitoring approach applies to the primary control equipment that concentrates the VOC emissions, and uses inlet temperature to the desorption/reactivation zone of the concentrator as the indicator that VOCs are being removed from the appropriate area of the concentrator system. The release of VOCs from the concentrator media is a direct function of the temperature in the desorption/reactivation zone. Maintaining the inlet temperature within the appropriate range provides assurance that the VOCs are being released to the secondary device (capture or destruction) as designed for the system.*

Mercedes-Benz Vans requests that Condition C.67 be updated to include desorption gas inlet temperature as the monitoring requirements contained in Table 1 to Subpart IIII of Part 63 (Item 5) will be sufficient to demonstrate compliance. Also, Mercedes-Benz Vans requests that Conditions C.54 and C.55 be modified to indicate that the facility will monitor desorption gas inlet temperature instead of outlet temperature on each ADW.

---

[1] EPA-HQ-OAR-2002-0093-0034, Attachment 3 to the Summary of Meeting with the Alliance of Automobile Manufacturers (AAM), Section "BB" II, David Green, Research Triangle Institute (RTI).

PM emission estimates from the paint shop have been updated due to a design change. A portion of the air stream from the dry filtration systems (Dry X) will be recycled back to the paint shop booths. Mercedes-Benz Vans estimates that approximately 73 percent of the air stream will be recycled. Updated emission calculations are provided in Appendix B, Section B.3.4.

2.2.3. Modify Boiler Tune-up Requirements

Permit Condition C.39 in Construction Permit No. 0560-0385-CA-R2 contains the following requirement for Boilers #1 and #2 (B01, B02):

> *The owner or operator shall develop a tune-up plan and perform tune-ups on Equipment IDs B01 and B02 in accordance with the requirements in 40 CFR 63.7540(a)(10). Records of tune-ups shall be submitted* ***annually****. The tune-up plan shall only be included in the initial report. Subsequent submittals of the tune-up plan are required within 30 days of the change if the plan is modified or the Department requests additional information.*

Mercedes-Benz Vans operates two boilers (B01, B02) that are subject to 40 CFR 63 Subpart DDDDD, National Emission Standards for Hazardous Air Pollutants for Major Sources: Industrial, Commercial, and Industrial Boilers and Process Heaters. B01 and B02 are natural gas-fired units with a heat input capacity of 14.27 MMBtu/hr, and each boiler is equipped with a continuous oxygen trim system that maintains an optimum fuel ratio. Pursuant to the definitions provided in 40 CFR §63.7575, B01 and B02 are considered "gas 1 units" because they only burn natural gas. In accordance with Table 3 to Subpart DDDDD, Item 1, new or existing boilers with a continuous oxygen trim system are only required to conduct a tune-up once every five (5) years.

Mercedes-Benz Vans requests that Permit Condition C.39 be modified to reduce the tune-up requirement to once every five (5) years to line up with the requirements contained in Subpart DDDDD. Under Subpart DDDDD, tune-ups are not required on a more frequent basis because B01 and B02 are each equipped with a continuous oxygen trim system that maintains an optimum fuel ratio.

2.2.4. Modify Permit Condition No. C.5 and Permit Condition No. C.8

Permit Condition C.5 in Construction Permit No. 0560-0385-CA-R2 contains the following requirement for sources subject to SC Standard No. 1:

> *(S.C. Regulation 61-62.5, Standard No. 1, Section I) The fuel burning source(s) shall not discharge into the ambient air smoke which exceeds opacity of 20%. The opacity standards set forth above do not apply during startup or shutdown. The owner/operator shall, to the extent practicable, maintain and operate any source including associated air pollution control equipment in a manner consistent with good air pollution control practices for minimizing emissions.*
>
> *In addition, the owner or operator shall maintain a log of the time, magnitude, duration, and any other pertinent information to determine periods of startup and shutdown and make available to the Department upon request.*

Mercedes-Benz Vans requests that Permit Condition C.5 be modified to remove references to the startup and shutdown recordkeeping requirements. In accordance with SC Standard No. 1 Section I(C), startup/shutdown logs are not required for natural gas-fired units. All sources referenced in Permit Condition C.5 are permitted to burn natural gas only, therefore, this recordkeeping provision is not applicable. Mercedes-Benz Vans also requests that Condition C.5 indicate that these units are natural gas-fired only.

Similarly, Condition C.8 provides a requirement to conduct a visual inspection of opacity, but indicates that these inspections are not required during periods of burning natural gas or propane only. However, the condition lists multiple emission units that are only permitted to burn natural gas. Therefore, Mercedes-Benz Vans requests that B01, B02, ADH01, ADH02, OV01, OV02, OV03, OV22, OV23, OV04, and all ASUs be removed from Condition C.8.

2.3. UPDATE CONTROL DEVICE FOR METAL ACTIVE GAS (MAG) WELDING

In the body shop, parts are welded to form the "body-in-white." The body shop includes welding of small stamped parts, the front-end subassembly, the rear-end subassembly, the side frame subassembly, the underbody subassembly, the mid- and upper-body assembly, and panels. The body shop includes re-spot welding, soldering, attachment of hinged parts (doors and hoods), and inspection.

With this application, Mercedes-Benz Vans proposes that PM emissions from the MAG welding operations be controlled by a HEPA filter system instead of an ESP as noted in Construction Permit No. 0560-0385-CA-R2. The proposed HEPA filter system will vent inside the building. The proposed HEPA filter system will achieve an equivalent level of PM control as the ESP; therefore, the proposed change does not result in any increase in potential emissions from the MAG welding operations.

PM emissions for spot welding, laser welding, and soldering operations will vent inside the building with no additional controls. There will also be fugitive CO_2 emissions from shield gases used in MAG welding. CO_2 emissions are quantified in the detailed emission calculations provided in Appendix B.

2.4. EQUIPMENT UPDATES

2.4.1. Add and Modify Emergency Generators

Mercedes-Benz Vans is proposing to install two (2) additional diesel-fired emergency generators at the Charleston Plant:

- EG03 – 30 kilowatt (kW) diesel-fired emergency generator with 74-gallon base tank
- EG04 – 1,500 horsepower (hp) diesel-fired emergency generator

Both generators will be restricted to emergency use only and will be tested periodically.

In addition, Mercedes-Benz Vans has made as-built changes to the currently permitted emergency generators and fire pump. These changes were identified in the operating permit requests for the generators. The installed generator and fire pump capacities are listed as follows:

- EG01 – 398 hp paint shop emergency generator with 956-gallon base tank
- EG02 – 65 hp hazardous materials building emergency generator with 132-gallon base tank
- FP01 – 305 hp with 500-gallon base tank

Emissions from the base tanks are assumed to be negligible.

2.4.2. Add Diesel Storage Tank

Mercedes-Benz Vans is proposing to install a 1,240 gallon diesel storage tank and associated pump with this application revision. The diesel fuel will be stored in an atmospheric tank designed with submerged fill lines, spill and overfill protection, and conservation vents to minimize atmospheric emissions.

2.4.3. Modify Number and Size of RTOs

Construction Permit No. 0560-0385-CA-R2 includes three regenerative thermal oxidizers (RTOs) that will be used to control emissions from several sources at the Charleston plant. Mercedes-Benz Vans is proposing to install one RTO during Phases 1 and 2 of the project that will be natural-gas fired and have a heat input capacity of 8 MMBtu/hr. During Phase 3, the existing RTO will be replaced with a new RTO which will have a heat input capacity up to 16 MMBtu/hr. The units will vent from the same emission point, and there will be no changes to the vent stack due to this replacement scheduled for Phase 3.

The required DHEC permit application forms have been updated to reflect the proposed change and are included in Section 7 of this application.

2.4.4. Modify Oven Heat Input Capacity

Several indirect ovens are used in the paint shops at the Charleston plant. Mercedes-Benz Vans has made several as-built changes to the heat input capacity of the oven burners. Potential emissions from the proposed equipment will decrease due to the proposed decrease in heat input capacity. A summary of the proposed updates are described in Table 2-2.

Table 2-2. Proposed Oven Heat Input Capacity Updates

Equipment ID	Emission Unit Description	Current Heat Input Capacity (MMBtu/hr)	Proposed Heat Input Capacity (MMBtu/hr)
OV01	E-Coat Oven Burners (natural gas fired)	10.44	4.85
OV02	Primer (Guidecoat) Oven #1 Burners (natural gas fired)	8.39	4.30
OV03	Topcoat Oven #1 Burners (natural gas fired)	9.01	4.27

2.4.5. Modify List of Air Supply Units

There are a number of operations at the Charleston plant that require air supply units for HVAC. These operations include paint shop coating activities, workdecks for sanding, touch-up, and spot repair operations, clean rooms, and office meeting rooms throughout the facility. The air supply units vary in capacity from 420 kW to 4,720 kW, with heat input capacities provided in Appendix B. The exhaust from the primer booth and basecoat/clearcoat booth air supply units vents to the dry filtration systems (Dry X), then to the ADW and RTO for control. The exhaust from the remaining air supply units vents to the atmosphere. The social room air supply units have been replaced with hot water coils, which are heated by the boilers. Therefore, there is no natural gas combustion associated with these units.

Mercedes-Benz Vans has made several as-built changes to the air supply units at the Charleston plant, including changes to heat input capacity and updates to equipment IDs. A summary of the proposed updates are described in Table 2-3.

Table 2-3. Proposed Updates to Air Supply Units (ASU)

Current Equipment ID	Proposed Equipment ID	Proposed Permit Change Note(s)	Proposed Emission Unit Description
ASU01, ASU02, ASU20	ASU P/BC/CC	1	Air Supply Unit for Primer Booth, BC Booth, and CC Booth (natural gas fired)
ASU03	ASU 2.1	1	Air Supply Unit 2.1 – Shop + Open Workdecks (natural gas fired)
ASU04	ASU 3	1	Air Supply Unit 3 – UBS + Repair (natural gas fired)
ASU05	ASU 2.2	1	Air Supply Unit 2.2 – Shop + Open Workdecks (natural gas fired)
ASU06	ASU 1	1	Air Supply Unit 1 – Spot Repair (natural gas fired)
ASU07	ASU 2.3	1	Air Supply Unit 2.3 – Shop (natural gas fired)
ASU08	ASU 4	1	Air Supply Unit 4 – Wax (natural gas fired)
N/A	ASU 6	1	Workdecks Air Supply Unit 6 (natural gas fired)
ASU19	ASU CR2	1	Air Supply Unit Clean Room Phase 2
ASU09	N/A	2	N/A
ASU10	N/A	2	N/A
ASU11	ASU 5	1	Workdecks Air Supply Unit 5 (natural gas fired)
ASU12	N/A	2	N/A
ASU13	N/A	2	N/A
ASU14	ASU31	1	Primer Booth Air Supply Unit Phase 3 (natural gas fired)
ASU15	ASU32	1	BC Booth Air Supply Unit Phase 3 (natural gas fired)
ASU16	ASU33	1	Workdecks Air Supply Unit 1 Phase 3 (natural gas fired)
ASU17	ASU34	1	Workdecks Air Supply Unit 2 Phase 3 (natural gas fired)
ASU18	ASU35	1	Workdecks Air Supply Unit 3 Phase 3 (natural gas fired)
ASU21	ASU36	1	Shop Ventilation Air Supply Unit Phase 3 (natural gas fired)
ASU22	ASU37	1	Social Rooms Air Supply Unit Phase 3 (natural gas fired)

Permit Change Notes:

1. Update the equipment ID and description for the ASU at the Charleston Plant.
2. Units have been eliminated from the facility design or will not be fuel-fired and will not emit regulated pollutants, therefore Mercedes-Benz Vans requests that the equipment be removed from the construction permit.

2.4.6. Modify List of Rooftop Units

The Charleston Plant operates a number of combustion sources, including natural gas-fired rooftop units (RTUs). Mercedes-Benz Vans is proposing to update the RTU equipment descriptions and heat input capacities based on as-built changes at the facility as described in Table 2-4.

Table 2-4. Proposed Updates to Rooftop Units (RTU)

Current Equipment ID	Proposed Equipment ID	Proposed Permit Change Note(s)	Proposed Emission Unit Description
RTU01	AS-RTU01	1	0.8 MMBtu/hr natural gas-fired rooftop unit (Assembly)
RTU02	N/A	2	N/A
RTU03	N/A	2	N/A
RTU04	AS-RTU04	1	0.8 MMBtu/hr natural gas-fired rooftop unit (Assembly)
RTU05	N/A	2	N/A
RTU06	AS-RTU06	1	0.8 MMBtu/hr natural gas-fired rooftop unit (Assembly)
RTU07	N/A	2	N/A
RTU08	AS-RTU08	1	0.8 MMBtu/hr natural gas-fired rooftop unit (Assembly)
RTU09	N/A	2	N/A
RTU10	AS-RTU10	1	0.8 MMBtu/hr natural gas-fired rooftop unit (Assembly)
RTU11	AS-RTU11	1	0.8 MMBtu/hr natural gas-fired rooftop unit (Assembly)
RTU12	N/A	2	N/A
RTU13	AS-RTU13	1	0.8 MMBtu/hr natural gas-fired rooftop unit (Assembly)
RTU14	BS-RTU01	3	0.8 MMBtu/hr natural gas-fired rooftop unit (Body Shop)
RTU15	BS-RTU02	3	0.8 MMBtu/hr natural gas-fired rooftop unit (Body Shop)
RTU16	N/A	2	N/A
RTU17	BS-RTU04	3	0.8 MMBtu/hr natural gas-fired rooftop unit (Body Shop)
RTU18	BS-RTU05	3	0.8 MMBtu/hr natural gas-fired rooftop unit (Body Shop)
RTU19	BS-RTU06	3	0.8 MMBtu/hr natural gas-fired rooftop unit (Body Shop)
RTU20	BS-RTU07	3	0.8 MMBtu/hr natural gas-fired rooftop unit (Body Shop)
RTU21	BS-RTU10	3	0.8 MMBtu/hr natural gas-fired rooftop unit (Body Shop)
RTU22	BS-RTU17	3	0.8 MMBtu/hr natural gas-fired rooftop unit (Body Shop)
RTU23	BS-RTU18	3	0.8 MMBtu/hr natural gas-fired rooftop unit (Body Shop)
RTU24	BS-RTU23	3	0.8 MMBtu/hr natural gas-fired rooftop unit (Body Shop)
RTU25	BS-RTU25	3	0.8 MMBtu/hr natural gas-fired rooftop unit (Body Shop)
RTU26	BS-RTU26	3	0.8 MMBtu/hr natural gas-fired rooftop unit (Body Shop)
RTU27	BS-RTU30	3	0.8 MMBtu/hr natural gas-fired rooftop unit (Body Shop)
RTU28	BS-RTU32	3	0.8 MMBtu/hr natural gas-fired rooftop unit (Body Shop)
RTU29	BS-RTU33	3	0.8 MMBtu/hr natural gas-fired rooftop unit (Body Shop)
RTU30	BS-RTU35	3	0.8 MMBtu/hr natural gas-fired rooftop unit (Body Shop)
RTU31	N/A	2	N/A
RTU32	N/A	2	N/A
RTU33	N/A	2	N/A
RTU34	N/A	2	N/A
RTU35	N/A	2	N/A

Permit Change Notes:

1. Update the equipment ID and description for the RTU located in the assembly area at the Charleston Plant.

2. Units will not be fuel-fired and will not emit regulated pollutants, therefore Mercedes-Benz Vans requests that the equipment be removed from the construction permit.
3. Update the equipment ID and description for the RTU located in the body shop at the Charleston Plant.

2.4.7. Modify Window Glazing Vent

Window and windshield installation requires the use of a number different chemicals for preparation and installation. Window and windshield glazing activities include the application of primers and adhesives. Multiple primers are used in the direct glazing process and an adhesive binds the windows and windshield to the car body.

In the original application, Mercedes-Benz Vans proposed to exhaust VOC emissions associated with the window and windshield installation with normal building ventilation. With this application revision, Mercedes-Benz Vans proposes to exhaust the emissions through a vent stack. Potential emissions will not change due to this proposed modification. No changes to the modeling demonstration will be required due to this change in vent stack parameters as the emissions associated with this source are VOC only.

2.4.8. Modify Cooling Tower Design Capacity

Seven cooling towers at the Charleston plant will provide process cooling to the facility. The cooling towers will be used for body shop and energy center cooling and will be an integral part of the energy center operations. Mercedes-Benz Vans has made several as-built changes to the cooling tower at the Charleston plant, including changes to the maximum circulating water flow rate (gallons per hour) of each unit. Potential emissions from cooling towers will decrease due to the proposed change. A summary of the proposed updates are described in Table 2-5.

Table 2-5. Proposed Cooling Tower Updates

Equipment ID	Emission Unit Description	Current Circulating Water Flowrate (gal/hr)	Proposed Circulating Water Flowrate (gal/hr)
CT01	Cooling Tower #1	150,000	412,500
CT02	Cooling Tower #2	500,000	412,500
CT03	Cooling Tower #3	500,000	412,500
CT04	Cooling Tower #4	500,000	73,800
CT05	Cooling Tower #5	500,000	484,900
CT06	Cooling Tower #6	500,000	484,900
CT07	Cooling Tower #7	500,000	484,900

The BACT determination for equipment listed in Table 2-5 has not changed, therefore, the BACT analysis for cooling towers is not included in Section 5 of this revision application.

2.5. UPDATE SC REGULATION 61-62.5 STANDARD NO. 5.2 APPLICABILITY

The provisions of this regulation apply to any stationary source constructed that emits or has the potential to emit NO_X generated from fuel combustion, has not undergone a BACT analysis for NO_X in accordance with SC Regulation 61-62.5, Standard No. 7, and meets one or more of the following criteria:

- Constructed after June 25, 2004;
- Constructed before June 25, 2004 and has replaced a burner assembly after May 25, 2007; and
- Removed from one permitted facility and moved to another permitted facility after May 25, 2007 except for process equipment and commercial or industrial boilers transferred between facilities within the state under common ownership.

Pursuant to Section I(B)(1) of Standard No. 5.2, any source emitting NO_X listed in SC Regulation 61-62.1, Section II(B), is exempt from Standard No. 5.2. Regulation 61-62.1, Section II(B) includes sources with a total uncontrolled potential to emit (PTE) of less than five (5) tons per year (tpy) each of PM, SO_2, NO_X, and CO; and a total uncontrolled PTE of less than 1,000 pounds per month (lbs/month) of VOCs. As shown in Appendix B, the potential emissions from Boiler #1 (B01), Boiler #2 (B02), E-coat oven burners (OV01), Air Supply Unit 2.1 – Shop + Open Workdecks (ASU 2.1), Air Supply Unit 2.2 – Shop + Open Workdecks (ASU 2.2), and Air Supply Unit 2.3 – Shop (ASU 2.3) are each well below 5 tpy of PM, SO_2, NO_X, and CO, and 1,000 lbs/month of VOC. Therefore, B01, B02, OV01, ASU 2.1, ASU 2.2, and ASU 2.3 are exempt from Standard No. 5.2. Mercedes-Benz Vans requests that Conditions C.16, C.17, and C.18 in Construction Permit No. 0560-0385-CA-R2 be eliminated because Standard 5.2 is not applicable to these sources.

Potential emissions from B01, B02, OV01, ASU 2.1, ASU 2.2, and ASU 2 have been provided in Appendix B of this application.

3. EMISSION CALCULATION METHODOLOGY

This section presents the calculation methodologies used to quantify potential emissions from the operations associated with this permit revision. Detailed calculations are provided in Appendix B.

3.1. COMBUSTION UNIT EMISSIONS

The Charleston plant operates a variety combustion sources. Combustion source emissions are based on emission limits, manufacturer data, and AP-42. Except for the emergency generators and paint shop combustion sources, potential firing rates for all equipment are based on the maximum heat input capacity assuming hours of operation based on the percent utilization required to remain below the proposed limits on CO_2e and NO_X emissions.[2] Mercedes-Benz Vans assumes 500 hours/yr of operation for emergency equipment. Paint shop combustion source hours of operation are equivalent to the paint shop hours of operation. A heating value of 1,026 Btu/ft^3 is assumed for natural gas, pursuant to 40 CFR 98, Subpart C, Table C-1. Mercedes-Benz Vans is not requesting limitations on hours of operation for combustion sources at the facility. Sample calculations for PM emissions from boiler B01 are provided as follows.

Potential Hourly PM Emissions from Boiler B01:

$$\text{PM Emissions}\left(\frac{\text{lb}}{\text{hr}}\right) = \text{B01 Heat Input Rating}\left(\frac{\text{MMBtu}}{\text{hr}}\right) \cdot \text{PM Emission Factor}\left(\frac{\text{lb}}{\text{MMscf}}\right) \div \text{NG Heat Value}\left(\frac{\text{MMBtu}}{\text{MMscf}}\right)$$

$$\text{PM Emissions}\left(\frac{\text{lb}}{\text{hr}}\right) = 14.27\frac{\text{MMBtu}}{\text{hr}} \cdot 7.6\frac{\text{lb}}{\text{MMscf}} \div 1{,}026\frac{\text{MMBtu}}{\text{MMscf}} = 0.11\frac{\text{lb}}{\text{hr}}$$

Potential Annual PM Emissions from Boiler B01:

$$\text{PM Emissions}\left(\frac{\text{tons}}{\text{yr}}\right) = \text{Hourly PM Emissions}\left(\frac{\text{lb}}{\text{hr}}\right) \cdot \text{Hours of Operation}\left(\frac{\text{hr}}{\text{yr}}\right) \cdot \left(\frac{\text{ton}}{2{,}000\text{ lb}}\right)$$

$$\text{PM Emissions}\left(\frac{\text{tons}}{\text{yr}}\right) = 0.11\frac{\text{lb}}{\text{hr}} \cdot 6{,}055\frac{\text{hr}}{\text{yr}} \cdot \frac{\text{ton}}{2{,}000\text{ lb}} = 0.32\frac{\text{tons}}{\text{yr}}$$

3.2. MAG WELDING EMISSIONS

PM emissions result from several operations in the proposed body shop, including MAG welding and spot welding operations. The body shop operations have a production capacity of approximately 17 vehicles per hour and 124,800 vehicles per year. MAG welding, spot welding emissions are determined by multiplying the consumable welding material per vehicle by the PM emission factor. Since all welding is performed within the building, a 90% building capture/control efficiency is included in the calculations.[3] The body shop utilizes mechanical ventilation, resulting in minimal airflow to the outside of the building and particulate residence time

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[2] Note that Mercedes-Benz Vans is not requesting any limitation on hours of operation for individual emission units. Mercedes-Benz Vans will demonstrate compliance with CO_2e and NO_X emission limits by calculating 12-month rolling CO_2e and NO_X emissions on a monthly basis.

[3] A building capture efficiency of 90% is assumed for the body shop for both uncontrolled and controlled emissions based on building enclosure capture efficiency provided in *Texas Commission on Environmental Quality, Rock Crushing Plants*, Table 7, February, 2002.

that exceeds the settling time.[4] Therefore, it is expected that all PM emissions will settle on building floors. Sample calculations for PM emissions from spot welding in the body shop are provided as follows.

Potential Hourly PM Emissions from MAG Welding:

$$\text{PM Emissions}\left(\frac{\text{lb}}{\text{hr}}\right) = \text{Production Rate}\left(\frac{\text{units}}{\text{hr}}\right) \cdot \text{Welding Material Usage}\left(\frac{\text{lb}}{\text{unit}}\right) \cdot \text{PM Emission Factor}\left(\frac{\text{lb PM}}{1{,}000\text{ lb}}\right)$$
$$\cdot\,(1 - \text{Control Eff.}) \cdot (1 - \text{Building Capture Eff.})$$

$$\text{PM Emissions}\left(\frac{\text{lb}}{\text{hr}}\right) = 17\,\frac{\text{units}}{\text{hr}} \cdot 0.3\,\frac{\text{lb material}}{\text{veh}} \cdot 20.0\,\frac{\text{lb PM}}{1{,}000\text{ lb material}} \cdot (1-0.95)\cdot(1-0.90) = 0.0005\,\frac{\text{lb}}{\text{hr}}$$

Potential Annual PM Emissions from MAG Welding:

$$\text{PM Emissions}\left(\frac{\text{tons}}{\text{yr}}\right) = \text{Production Rate}\left(\frac{\text{units}}{\text{yr}}\right) \cdot \text{Welding Material Usage}\left(\frac{\text{lb}}{\text{unit}}\right) \cdot \text{PM Emission Factor}\left(\frac{\text{lb PM}}{1{,}000\text{ lb}}\right)$$
$$\cdot\,(1 - \text{Control Eff.}) \cdot (1 - \text{Building Capture Eff.}) \cdot \left(\frac{\text{ton}}{2{,}000\text{ lb}}\right)$$

$$\text{PM Emissions}\left(\frac{\text{tons}}{\text{yr}}\right) = 124{,}800\,\frac{\text{units}}{\text{yr}} \cdot 0.3\,\frac{\text{lb material}}{\text{veh}} \cdot 20.0\,\frac{\text{lb PM}}{1{,}000\text{ lb material}} \cdot (1-0.95)\cdot(1-0.90)\cdot\left(\frac{\text{ton}}{2{,}000\text{ lb}}\right)$$

$$\text{PM Emissions}\left(\frac{\text{tons}}{\text{yr}}\right) = 0.0019\text{ tpy}$$

3.3. TANK EMISSIONS

Emissions from the proposed diesel storage tank were estimated using the EPA TANKS 4.0.9d program. Throughput and TANKS output for the proposed tank is provided in Appendix B. Mercedes-Benz Vans assumes that the diesel generator base storage tank emissions are negligible.

[4] Particulate settling time is established using Stokes' Law.

4. REGULATORY APPLICABILITY ANALYSIS

The Charleston plant is subject to federal and state air quality regulations. This section summarizes the air permitting requirements and key air quality regulations that apply to the proposed changes to operations at the Charleston Plant.

4.1. FEDERAL REGULATIONS

Applicability or non-applicability of the following federal regulatory programs is addressed:

- New Source Review (NSR) / Prevention of Significant Deterioration (PSD)
- New Source Performance Standards (NSPS)
- National Emission Standards for Hazardous Air Pollutants (NESHAP)
- Compliance Assurance Monitoring (CAM)
- Title V Operating Permit Program

4.1.1. NSR/PSD Applicability

The proposed project detailed in the permit application submitted in October 2015, revised in February 2016, April 2017 and October 2017 exceeded the VOC PSD major source threshold of 250 tpy. Furthermore, as the facility is a PSD major source, PSD permitting is also required for pollutants with potential emissions exceeding the SER, which, for the permitted project at the Charleston plant, includes $PM_{2.5}$. In the original construction permit application, potential facility wide emissions of total PM and PM_{10} were greater than the SER. Due to changes described in this revision application, facility-wide PM and PM_{10} emissions are now less than the SER, however, Mercedes-Benz Vans is requesting continued PSD review for PM_{10} and PM.

With the previous submitted applications, Mercedes-Benz Vans requested emission limits of 40 tpy of NO_X, and 75,000 tpy of CO_2e to avoid PSD permitting requirements for these pollutants. All other PSD-regulated pollutants emitted from the facility will be below the PSD permitting thresholds without federally enforceable limits. These include CO, SO_2, and Pb. The proposed updates identified in this application revision will not alter the PSD applicability determined in the original application. Updated project emission increase calculations are provided in Table 4-1.

Table 4-1. Facility-wide Emissions and PSD Applicability

Pollutants	Project Emissions[5] (tpy)	PSD Significant Emission Rates (tpy)	PSD Permitting Required? (Yes/No)
PM	21.94	25	**Yes***
PM_{10}	14.73	15	**Yes***
$PM_{2.5}$	13.43	10	**Yes**
SO_2	0.79	40	No
CO	57.76	100	No
NO_X	35.42	40	No
VOC	955.85	40	**Yes**
H_2SO_4	0.00E+00	7	No
Fluorides	0.00E+00	3	No
Lead	3.10E-04	0.6	No
CO_2e	74,999	75,000	No

* Voluntary PM, PM_{10} PSD review

Mercedes-Benz Vans is submitting this construction and operating permit application revision in accordance with all federal and state requirements. Therefore, a complete BACT analysis for the units discussed in Section 2 of this application is provided in Section 5 of this application.

4.1.2. New Source Performance Standards (NSPS)

NSPS require new, modified, or reconstructed sources to control emissions to the level achievable by the best-demonstrated technology as specified in the applicable provisions. Moreover, any source subject to an NSPS is also subject to the general provisions of Subpart A, except as otherwise specified. The following subsections discuss applicable and non-applicable subparts to the proposed project.

4.1.2.1. 40 CFR 60 Subpart A—General Provisions

NSPS Subpart A provides general provisions referenced by other NSPS Subparts. The equipment described in Section 2 of this application is potentially subject to NSPS Subparts Kb, MM, IIII and JJJJ, which reference Subpart A. Subpart A provides requirements for notifications, performance testing, recordkeeping, monitoring, and control requirements for referencing subparts as applicable.

4.1.2.2. 40 CFR 60 Subpart Kb—Volatile Organic Liquid Storage Vessels (including Petroleum Liquid Storage Vessels)

Pursuant to §60.110b, NSPS Subpart Kb applies to the following volatile organic liquid storage vessels for which construction, reconstruction, or modification commenced after July 23, 1984:

[5] Mercedes-Benz Vans has chosen to request a 75,000 tpy synthetic minor limit on greenhouse gas emissions (CO_2e) to remain below the PSD SER.

(a) *Except as provided in paragraph (b) of this section, the affected facility to which this subpart applies is each storage vessel with a capacity greater than or equal to 75 cubic meters (m^3) that is used to store volatile organic liquids (VOL) for which construction, reconstruction, or modification is commenced after July 23, 1984.*

(b) *This subpart does not apply to storage vessels with a capacity greater than or equal to 151 m^3 storing a liquid with a maximum true vapor pressure less than 3.5 kilopascals (kPa) or with a capacity greater than or equal to 75 m^3 but less than 151 m^3 storing a liquid with a maximum true vapor pressure less than 15.0 kPa.*

Mercedes-Benz Vans is proposing to install a 1,240 gallon (4.7 m^3) diesel storage tank and a 74 gallon (0.3 m^3) diesel base tank for the 30-kW emergency generator. The proposed storage tanks each have a capacity less than 75 m^3, therefore NSPS Subpart Kb is not applicable.

4.1.2.3. 40 CFR Part 60 Subpart MM—Automobile and Light Duty Truck Surface Coating Operations

NSPS Subpart MM regulates primecoat, guidecoat, and topcoat operations at automobile assembly plants NSPS Subpart MM regulates primecoat (E-coat), guidecoat, and topcoat operations at automobile assembly plants constructed and modified after October 4, 1979. This subpart does not apply to the coating of plastic body components per §60.390(b). The proposed paint shop includes metal body coating operations. These operations include each of the three stages: E-coat (Unit ID 3), guidecoat (Unit ID 4), and topcoat (Unit ID 6). Therefore, the facility is required to meet the applicable VOC emission standards under this subpart. VOC emission standards vary based on the stages conducted in each of the coating operations. The following VOC emission limits apply to the proposed paint shop: Primecoat 0.17 kg/L ACS, Guidecoat 1.40 kg/L ACS, and Topcoat 1.47 kg/L ACS.

An initial performance test shall be conducted within 60 days of achieving the maximum production rate but no later than 180 days after startup in accordance with 40 CFR 60.8(a). All the elements listed in 40 CFR 60.395(a)(2) will be included in the initial compliance demonstration.

Mercedes-Benz Vans will comply with all applicable Subpart MM requirements, as listed in Construction Permit No. 0560-0385-CA-R2.

4.1.2.4. 40 CFR Part 60 Subpart IIII—Stationary Compression Ignition Internal Combustion Engines

NSPS Subpart IIII applies to stationary compression ignition (CI) internal combustion engines (ICE) that commence construction after July 11, 2005 or are modified or reconstructed after July 11, 2005. The Charleston plant is proposing the installation of two diesel-fired emergency generators with this application revision. Therefore, Mercedes-Benz Vans will comply with the applicable requirements of this subpart based on the model year and specifications of each engine. The applicable requirements for the emergency generators (EG03-EG04) under this subpart are shown in Table 4-2.

Table 4-2. Summary of NSPS Subpart IIII Requirements for Emergency Generators

Requirement	Action	Citation
Emission Limits	The following emission limits apply for the emergency generators with a rated power ≥ 19 kW and < 37 kW (EG03): ➢ $NMHC+NO_X$ = 7.5 g/kW-hr ➢ CO = 5.5 g/kW-hr ➢ PM = 0.6 g/kW-hr The following emission limits apply for the emergency generators with a rated power > 560 kW (EG04): ➢ $NMHC+NO_X$ = 6.4 g/kW-hr ➢ CO = 3.5 g/kW-hr ➢ PM = 0.2 g/kW-hr	§60.4205(b) §60.4202(a)(2) §89.112(a)
	Opacity limit = 20% during acceleration mode Opacity limit = 15% during lugging mode Opacity limit = 50% during the peaks in acceleration or lugging modes	§89.113(a)(1)-(3)
Monitoring/ Testing	Install a non-resettable hour meter prior to startup of the engine.	§60.4209(a)
Recordkeeping/ Reporting	If the stationary CI internal combustion engine is an emergency stationary internal combustion engine, the owner or operator is not required to submit an initial notification. Keep records of the operation of the engine in emergency and non-emergency service that are recorded through the non-resettable hour meter. Record the time of operation of the engine and the reason the engine was in operation during that time.	§60.4214(b)

4.1.2.5. 40 CFR Part 60 Subpart JJJJ—Stationary Spark Ignition Internal Combustion Engines

NSPS Subpart JJJJ applies to manufacturers, owners, and operators of new stationary spark ignition (SI) internal combustion engines (ICE) that are manufactured after the dates specified in 40 CFR 60.4230(a)(1) – (5). This subpart is applicable to emergency SI ICE with a horsepower rating greater than 25 horsepower (hp) and constructed after January 1, 2009. The Charleston plant is proposing the installation of diesel-fired emergency generators with this application. The proposed diesel-fired engines do not meet the definition of spark ignition internal combustion engines. Therefore, the facility is not subject to NSPS Subpart JJJJ.

4.1.3. National Emission Standards for Hazardous Air Pollutants (NESHAP)

4.1.3.1. 40 CFR 63 Subpart A—General Provisions

NESHAP Subpart A provides general provisions referenced by other NESHAP Subparts. The equipment described in Section 2 of this application is potentially subject to NESHAP Subparts IIII, MMMM, PPPP, ZZZZ and DDDDD, which reference Subpart A. Subpart A provides requirements for notifications, performance testing, recordkeeping, monitoring, and control requirements for referencing subparts as applicable.

4.1.3.2. 40 CFR 63 Subpart IIII—Surface Coating of Automobiles and Light-Duty Trucks

Subpart IIII applies to all new, modified, and existing automobile and light-duty truck surface coating operations located at a major source of HAP.

Per §63.3082(e), an affected source is a new affected source if construction commenced after December 24, 2002, and the construction is for a completely new automobile and light-duty truck paint shop. As discussed in the original construction permit application for the facility, the proposed paint shop will be a new affected source and will comply with the combined organic HAP emission limits in 40 CFR 63.3090 for new or reconstructed affected sources. Compliance will be demonstrated according to 40 CFR 63.3161 or 63.3171.

The vehicles to be coated at the Charleston plant will vary in size as the project phases progress. Mercedes-Benz Vans is proposing to manufacture and coat only vehicles greater than 8,500 lbs in Phase 1. The vehicles in Phase 1 would not meet the definition of automobiles and light-duty trucks as defined in §63.3176. However, in Phase 2 and Phase 3, Mercedes-Benz Vans is proposing to manufacture and coat some vehicles less than 8,500 lbs, in addition to the vehicles that are greater than 8,500 lbs. The vehicles in Phases 2 and 3 that are less than 8,500 lbs would meet the definition of automobiles and light-duty trucks as defined in Subpart IIII. Since there are future plans to manufacture and coat automobiles and light-duty trucks as the Charleston plant, Mercedes-Benz Vans is requesting that the Charleston plant be subject to the requirements of Subpart IIII. Table 4-3 shows the applicable operating limits, notification, recordkeeping, and reporting requirements of Subpart IIII as they pertain to the ADW. Due to the number of compliance options available, compliance demonstration requirements are not included in Table 4-3.

Table 4-3. Summary of NESHAP Subpart IIII Requirements for ADW

Requirement	Action	Citation
Operating Limits	For coating operations with add-on controls: you must meet the operating limits specified in Table 1 to this subpart. 5. Concentrators, including zeolite wheels and rotary carbon adsorbers a. The average desorption gas inlet temperature in any 3 hour period must not fall below the limit established according to §63.3167(e). i. Collecting the temperature data according to §63.3168(f); ii. Reducing the data to 3-hour block averages; and iii. Maintaining the 3-hour average temperature at or above the temperature limit.	§63.3093(b) §63.3093(c) Table 1
	If your add-on control device includes a concentrator, establish operating limits for the concentrator as follows: ➢ During the performance test, monitor and record the desorption gas inlet temperature at least once every 15 minutes during each of the 3 runs of the performance test. ➢ Use performance test data to calculate and record the average desorption gas inlet temperature. The minimum operating limit for the concentrator is 8 °C (15 °F) below the average desorption gas inlet temperature maintained during the performance test for that concentrator.	§63.3167(e)

Table 4-3. Summary of NESHAP Subpart IIII Requirements (cont.)

Requirement	Action	Citation
Operating Limits	➢ Keep the set point for the desorption gas inlet temperature no lower than 6 °C (10 °F) below the lower of that set point during the performance test for that concentrator and the average desorption gas inlet temperature maintained during the performance test for that concentrator.	§63.3167(e)
Notifications	Submit the Initial Notification required by §63.9(b) for a new or reconstructed affected source no later than 120 days after startup.	§63.3110(b)
	Submit the Notification of Compliance Status required by §63.9(h) no later than 60 days after the first day of the first full month following completion of all applicable performance tests.	§63.3110(c)
Recordkeeping	A copy of each notification and report that you submitted to comply with this subpart, and the documentation supporting each notification and report.	§63.3130(a)
	A current copy of information provided by materials suppliers or manufacturers	§63.3130(b)
	For each month, the records specified in paragraphs (c)(1)-(6).	§63.3130(c)
	Your records must be in a form suitable and readily available for expeditious review. Where appropriate, the records may be maintained as electronic spreadsheets or as a database. You must keep each record for 5 years following each occurrence, measurement, maintenance, corrective action, report, or record.	§63.3131(a)-(o)
Reporting	You must submit semiannual compliance reports for each affected source according to the requirements of §63.3120(a)(1) - (9).	§63.3120(a)
	You must submit reports of performance test results for emission capture systems and add-on control devices no later than 60 days after completing the tests as specified in §63.10(d)(2). You must submit reports of transfer efficiency tests no later than 60 days after completing the tests as specified in §63.10(d)(2).	§63.3120(b)
	If you used add-on control devices and you had a startup, shutdown, or malfunction during the semiannual reporting period, you must submit the reports specified in paragraphs §63.3120(c)(1) and (2).	§63.3120(c)

4.1.3.3. 40 CFR Part 63 Subpart MMMM—Surface Coating of Miscellaneous Metal Parts and Products

Subpart MMMM establishes HAP limits for miscellaneous metal parts and products surface coating facilities. Miscellaneous metal parts and products include metal motor vehicle parts and accessories.

As discussed in the original construction permit application for the facility, the vehicles to be coated in Phase 1 would not meet the definition of automobiles and light-duty trucks as defined in §63.3176, and would therefore be considered miscellaneous metal parts and products. However, in Phase 2 and Phase 3, Mercedes-Benz Vans is proposing to manufacture and coat some vehicles less than 8,500 lbs, in addition to the vehicles that are greater than 8,500 lbs. The vehicles in Phases 2 and 3 that are less than 8,500 lbs would meet the definition of automobiles and light-duty trucks as defined in Subpart IIII.

Pursuant to §63.3881(d), since the Charleston plant meets the applicability criteria in §63.3082(b) for the surface coating of automobiles and light-duty trucks, Mercedes-Benz Vans has chosen to comply with the requirements of Subpart IIII in lieu of complying with Subpart MMMM. Therefore, the coating processes at the Charleston plant will comply with the requirements of 40 CFR Part 63 Subpart IIII.

4.1.3.4. 40 CFR Part 63 Subpart PPPP—Surface Coating of Plastic Parts and Products

Subpart PPPP establishes HAP emission limits for plastic parts and products surface coating facilities. Plastic components include motor vehicle parts and accessories for automobiles, trucks, and recreation vehicles. However, the proposed operations in this revision do not include coating of plastic parts at the Charleston plant. Therefore, the facility is not subject to this requirement.

4.1.3.5. 40 CFR 63 Subpart ZZZZ—Reciprocating Internal Combustion Engines

Subpart ZZZZ regulates HAP emitted from stationary reciprocating internal combustion engines (RICE) located at major and area sources of HAP emissions. The proposed emergency compression ignition (CI) internal combustion engines will be new sources with respect to this subpart and will comply with 40 CFR 63 Subpart ZZZZ by complying with 40 CFR 60 Subpart IIII, pursuant to §63.6590(c). Since the proposed engines are not spark ignition (SI) ICE, the Charleston plant will comply with no further requirements under this Subpart.

4.1.3.6. 40 CFR 63 Subpart DDDDD—Industrial, Commercial, and Institutional Boilers & Process Heaters

This subpart establishes emission limitations and work practice standards for HAP emitted from industrial, commercial, and institutional boilers and process heaters located at major sources of HAP. This subpart also establishes requirements to demonstrate initial and continuous compliance with the emission limitations and work practice standards as well as recordkeeping and reporting requirements. As described in Section 2.2.3 of this application, Boilers B01 and B02 are considered "gas 1 units" under Subpart DDDDD and each boiler will be equipped with a continuous oxygen trim system that maintains an optimum fuel ratio. A summary of the applicable Subpart DDDDD requirements for the boiler is provided in Table 4-4.

Table 4-4. Summary of NESHAP Subpart DDDDD Requirements

Requirement	Action	Citation
Emission Limits	None	Subpart DDDDD, Table 1, Table 2
Compliance	Conduct initial tune up followed by tune-ups once every five (5) years for boilers with continuous oxygen trim systems. Tune-ups should be completed no more than 13 months after the previous tune-up. Initial tune-up shall be completed by: ➤ New Sources: 13 months after initial startup	Table 3, Item 1 §63.7515(d) §63.7540(a)(10)
Notifications	Submit a notification of alternative fuel use within 48 hours of the declaration of each period of natural gas curtailment or supply interruption.	§63.7545(f)
Recordkeeping	Maintain records of each notification and report.	§63.7555(a)
	Maintain records of fuel specification analysis.	§63.7555(g)
	Maintain tune-up records, as specified in §63.7540(a)(10)(i) through (vi).	§63.7540(a)(10)
	Maintain startup and shutdown records: ➤ The calendar date, time, occurrence and duration of each startup and shutdown. ➤ The type(s) and amount(s) of fuels used during each startup and shutdown.	§63.7555(i) §63.7555(j)
	Maintain all records and reports for five years.	§63.7560
Reporting	Submit Initial Notification within 120 calendar days after January 31, 2013.	§63.9(b)(2) §63.7545(b)
	Submit Initial Notification within 15 days after actual startup of the boiler.	§63.9(b)(4)(v) §63.7545(c)
	Submit Notification of Compliance Status report within 60 days following completion of the relevant compliance demonstration.	§63.9(h) §63.7545(e)
	Submit an annual compliance report no later than January 31 for the previous calendar year containing the information in 63.7550(c) (annual tune-up information and landfill gas fuel analysis results). Submit report electronically using CEDRI, if available.	§63.7550(b)

The ADW desorption heaters are part of the proposed carbon adsorption system to control and concentrate VOCs. As part of the control process, the carbon must be regenerated by heating it using an indirect-fired heater. The indirect-fired heaters are only used to regenerate the carbon adsorption system (control device) and do not heat any process units at the plant. Since the proposed ADW desorption heaters do not heat a transfer material "for use in a process unit", they do not meet the definition of a process heater provided in §63.7575. Therefore, the ADW desorption heaters are not subject to Subpart DDDDD.

Also pursuant to §63.7575, process heaters do not include units used for comfort heat or space heat. Since the social room air supply units provide comfort heat to the facility buildings, they are not subject to Subpart DDDDD.

4.1.4. Compliance Assurance Monitoring

Under 40 CFR 64, Compliance Assurance Monitoring (CAM), facilities are required to prepare and submit monitoring plans for certain emission units with the Title V application. The CAM Plans provide an on-going and reasonable assurance of compliance with emission limits. Under the general applicability criteria, this regulation only applies to emission units that use a control device to achieve compliance with an emission limit and whose pre-controlled emission levels exceed the major source thresholds under the Title V permitting program. Emission units with a continuous compliance determination method for a regulated pollutant are exempt from the requirements of CAM per 40 CFR 64.2(b)(1)(vi). For an emission unit with post-controlled emissions less than the major source emission thresholds, a CAM Plan is required to be submitted with the first Title V permit renewal application. For emission units that are routed to a control device and have pre-control emissions that exceed the major source threshold, Mercedes-Benz Vans comply with the CAM requirements listed in Construction Permit No. 0560-0385-CA-R2, except as described below.

As described in Section 2.2.1 of this application, several sources at the Charleston Plant are equipped with dry filters to control PM emissions. As described in Section 2.2.1 and the detailed emission calculations in Appendix B, pre-control emissions from each source do not exceed the 100 tpy major source thresholds for PM. Therefore, these operations are not subject to the CAM requirements.

As described in Section 2.2.2 of this application, Mercedes-Benz Vans requests revision of Condition C.67 for the ADWs which requires monitoring of the desorption outlet VOC concentration. Condition C.67 was included due to the 40 CFR Part 64 CAM monitoring requirements. Consistent with the monitoring in Conditions C.54 and C.55, Mercedes-Benz Vans requests that DHEC update Condition C.67 to utilize the desorption gas inlet temperature as the compliance indicator in lieu of VOC concentration.

4.1.5. Title V Operating Permit Program

40 CFR 70 establishes the federal Title V operating program. South Carolina has incorporated the provisions of this federal program in its state regulation, SC Regulation 61-62.70, *Title V Operating Permit Program*. Upon completion of the proposed project, the Charleston plant will be considered a Title V major source. As such, Mercedes-Benz Vans will submit a Title V operating permit application within 12 months after becoming a major source.

4.2. SOUTH CAROLINA REGULATION 61-62

SC Regulation 61-62 has been promulgated under authority from "The South Carolina Pollution Control Act" and these rules are applicable to each air pollution source operating in the State of South Carolina. Therefore, operations at the Charleston plant are subject to various regulations contained in these rules. The major provisions of the rules containing applicable emission/work practice standards applicable to the operations discussed in this application are discussed below.

4.2.1. Standard No. 1— Fuel Burning Operations

Regulation 61-62.5 Standard No. 1 regulates emissions of PM, SO_2, and opacity from fuel burning operations. Fuel burning operations are defined in Regulation 61-62.1 as:

> *Use of furnace, boiler, device or mechanism used principally but not exclusively, to burn any fuel for the purpose of indirect heating in which the material being heated is not contacted by and adds no substance to the products of combustion.*

The boilers, indirect paint shop combustion sources (ovens and ADW desorption heaters in Unit ID 2), and air supply units meet this definition and are subject to this standard. The requirements include:

- 20% Opacity limit (Regulation 62.5, Standard 1, Section I)
- 0.6 lb/MMBtu PM limit (Regulation 62.5, Standard 1, Section II)
- 2.3 lb/MMBtu SO_2 limit (Regulation 62.5, Standard 1, Section III)

Emission limits will be met through the use of natural gas as a fuel. Pursuant to Section I(C) of Standard 1, natural gas-fired units are not required to maintain records (in a log) of the periods of startup and shutdown.

4.2.2. Standard No. 2– Ambient Air Quality

Regulation 61-62.5 Standard No. 2 regulates ambient air quality and largely restates the allowable emission levels in the National Ambient Air Quality Standards (NAAQS). Compliance with Standard 2 is addressed in Section 6 of this application and a modeling submittal under separate cover.

4.2.3. Standard No. 3– Waste Combustion and Reduction

Regulation 61-62.5 Standard No. 3 generally regulates all sources that burn any waste other than virgin fuel for any purpose. The Charleston plant is proposing the installation of a RTO fueled by natural gas (RTO1) which will control HAP and VOC emissions from the paint shop.

RTO1 shall comply with the opacity and PM emissions limits for Industrial Incinerators. Pursuant to Standard No. 3, Section III.I.1-2, opacity shall not exceed 20%, and PM emissions shall not exceed 0.5 lbs/10^6 Btu total heat input.

Section IV sets forth the notification requirements and compliance schedules for new and existing units. The proposed RTO will begin operation after the compliance date and are therefore considered new units under this rule. Mercedes-Benz Vans will submit a notification of startup including all applicable information to the agency prior to commencing operation of RTO1, pursuant to Section IV.B.

Sections V, VI, and VIII describe the waste analysis requirements, monitoring requirements, and periodic testing requirements for sources subject to this regulation. Mercedes-Benz Vans is requesting exemption from these requirements on the basis that the exhaust streams routed to RTO1 contain minimal concentrations of PM, which is the only pollutant regulated under Standard No. 3 for industrial incinerators.

4.2.4. Standard No. 4– Emissions from Process Industries

Regulation 61-62.5 Standard No. 4 regulates various pollutants from specific process industries and particulate matter and opacity from any unspecified process sources. Process industry is defined in Regulation 61-62.1 Section I.69 as follows:

> *Any source engaged in the manufacture, processing, handling, treatment, forming, storing or any other action upon materials except fuel-burning operations.*

Section VIII sets particulate matter emission limits where not elsewhere specified. The emission limit in Section VIII – "Other Manufacturing" is calculated from the following equations:

$$E = (F)(4.10)(P)^{0.67} \quad \text{for } P < 30 \text{ tons per hour}$$
$$E = (F)(55.0\,(P)^{0.11} - 40), \quad \text{for } P \geq 30 \text{ tons per hour}$$

Where:

E	=	PM emissions limit in lb/hr;
P	=	Process weight rate in tons/hr; and
F	=	Effect factor (defined as 1)

All units other than the indirect-fired combustion units at the facility are subject to the emission limit in Section VIII. This includes all of the equipment in Table 4-5.

Table 4-5. Summary of Emission Limits for Units Subject to Standard No. 4

Unit ID	Equipment ID	Description	[P] (ton/hr)	[E] (lb/hr)
4	GC01, GC21	Paint Shop Guidecoat Booth	54.25	45.34
5	UBS01, UBS21	Underbody PVC Sealer Decks	54.25	45.34
6	CW01	Cavity Wax Operations	54.25	45.34
6	BC01, CC01, BC21	Paint Shop Topcoat Booths	54.25	45.34
6	SR01, SR02, SR03, AR01	Paint Shop Spot and Assembly Repair Booths	54.25	45.34
10	AUW	Assembly Underbody Wax Application	60.63	46.39
BS	BS01	Body Shop Welding and Soldering	54.25	45.34

Note that the emission limits provided in Table 4-5 are based on the curb weight of the largest vehicle manufactured at the facility.

Section IX sets visible emissions standards for those units where it is not elsewhere specified. Per this section, all proposed combustion equipment at the facility may not exhibit opacity greater than 20%.

Section X of Standard 4 applies to non-enclosed operations. Daimler Vans does not operate any non-enclosed stationary sources other than roads at the Charleston plant.

4.2.5. Standard No. 5— Volatile Organic Compounds

Regulation 61-62.5 Standard No. 5 regulates VOC from certain specific processes at facilities with the potential to emit VOC more than 100 tpy. The only potentially applicable sections of this standard are requirements for petroleum liquid storage in Section II.O and Section II.P, which apply to storage tanks greater than 40,000 and 39,600 gallons, respectively. The proposed revisions to the construction permit include the installation of a 1,240 gallon diesel storage tank (TK-03). The capacity of the proposed tank is less than 39,600 gallons, therefore, this standard does not apply.

4.2.6. Standard No. 5.2— Control of Oxides of Nitrogen (NO_X)

The provisions of this regulation apply to any stationary source constructed that emits or has the potential to emit NO_X generated from fuel combustion, has not undergone a BACT analysis for NO_X in accordance with SC Regulation 61-62.5, Standard No. 7, and meets one or more of the following criteria:

- Constructed after June 25, 2004;
- Constructed before June 25, 2004 and has replaced a burner assembly after May 25, 2007; and

- Removed from one permitted facility and moved to another permitted facility after May 25, 2007 except for process equipment and commercial or industrial boilers transferred between facilities within the state under common ownership.

Pursuant to Section I(B)(1) of Standard No. 5.2, any source emitting NO_X listed in Regulation 61-62.1, Section II(B) is exempt from Standard No. 5.2. Regulation 61-62.1, Section II(B) includes sources with a total uncontrolled potential to emit (PTE) of less than five (5) tons per year (tpy) each of PM, SO_2, NO_X, and CO; and a total uncontrolled PTE of less than 1,000 pounds per month (lbs/month) of VOCs. As shown in Appendix B, the potential emissions from Boiler #1 (B01), Boiler #2 (B02), E-coat oven burners (OV01), Air Supply Unit 2.1 – Shop + Open Workdecks (ASU 2.1), Air Supply Unit 2.2 – Shop + Open Workdecks (ASU 2.2), and Air Supply Unit 2.3 – Shop (ASU 2.3) are each well below 5 tpy of PM, SO_2, NO_X, and CO, and 1,000 lbs/month of VOC. Therefore, B01, B02, OV01, ASU 2.1, ASU 2.2, and ASU 2.3 are exempt from Standard No. 5.2. Mercedes-Benz Vans requests that Conditions C.16, C.17, and C.18 in Construction Permit No. 0560-0385-CA-R2 be eliminated because Standard 5.2 is not applicable to these sources.

Potential emissions from B01, B02, OV01, ASU 2.1, ASU 2.2, and ASU 2 have been provided in Appendix B of this application.

4.2.7. Standard No. 7— Prevention of Significant Deterioration

Regulation 61-62.5 Standard No. 7 is South Carolina's version of the PSD program. Table 4-1 of this section illustrates that potential emissions of at least one pollutant (VOC) will be greater than 250 tpy from the proposed project. Therefore, since at least one PSD-regulated pollutant has emissions exceeding 250 tpy, the Charleston plant is a PSD major stationary source, and PSD review is required for the project. As the entire site will then be a major PSD source, emissions increases from the project must then be assessed against the PSD SERs as shown in Table 4-1. As shown in Table 4-1, PM, PM_{10} and $PM_{2.5}$ are above the SERs for the project. The proposed updates to operations identified in this construction permit revision application will not change the PSD applicability determined in the original application as detailed in Table 4-1.

All of the requirements of Standard No. 7 are either provided with this application, or will be provided under separate cover. NAAQS modeling, increment modeling, Class I area modeling analyses, as well as an additional impacts analysis will be provided under separate cover. A complete analysis of BACT (control technology review) is provided in Section 5 of this application.

4.2.8. Standard No. 8— Toxic Air Pollutants

Regulation 61-62.5 Standard No. 8 regulates ambient air quality of certain toxic air pollutants (TAP), including federal HAP. The paint shop will be subject to the Auto MACT (40 CFR 63 Subpart IIII), the proposed boilers will be subject to Boiler MACT (40 CFR 63 Subpart DDDDD), and the proposed emergency generators will be subject to RICE MACT (40 CFR 63 Subpart ZZZZ). These operations are exempt from the requirements of Standard No. 8 for toxic air pollutants that are HAPs in accordance with Standard No. 8, Section I.D.1. Additionally, the rooftop units, and air supply units are exempt from Standard No. 8 through the combustion of virgin fuels.

Due to the variability in materials used at the Charleston plant, the proposed operations could potentially emit TAPs that are not HAPs. In accordance with Standard No. 8, Section I.D.3, Mercedes-Benz Vans requests exemption from Standard No. 8 in these instances since non-HAP/TAP emissions are controlled by MACT controls.

Emissions from body shop welding operations contain a small quantity of manganese, however, the manganese emission rate is below the modeling de minimis level. No other permitted emission units emit TAP.

4.2.9. Regulation 61-62.6– Control of Fugitive Particulate Matter

Regulation 61-62.6 requires the control of fugitive particulate matter in non-attainment areas, problem areas, and statewide. The Charleston plant is located in Charleston County, which is designated as attainment or unclassifiable for particulate matter.[6] Charleston County is also not considered a problem area. Therefore, the facility is subject to the statewide requirement to implement good dust control practices.

[6] 40 CFR §81.341

5. CRITERIA POLLUTANT BACT ANALYSIS

As required in Regulation 61-62.5, Standard No. 7, Section (aa)(11)(c), Mercedes-Benz Vans is including a revised BACT analysis for the equipment described in Section 2 of this application. This section discusses the regulatory basis for BACT, the approach used in completing the BACT analyses, and the BACT analyses for the processes. Supporting documentation is included in Appendix C.

5.1. BACT DEFINITION

BACT is defined in the PSD regulations [40 CFR 52.21(b)(12)] as:

...an emissions limitation (including a visible emission standard) based on the maximum degree of reduction for each pollutant subject to regulation under Act which would be emitted from any proposed major stationary source or major modification which the Administrator, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such source or modification through application of production processes or available methods, systems, and techniques, including fuel cleaning or treatment or innovative fuel combustion techniques for control of such pollutant. In no event shall application of best available control technology result in emissions of any pollutant which would exceed the emissions allowed by any applicable standard under 40 CFR parts 60 and 61.

South Carolina Regulation 61-62.5, Standard No. 7 Section (b)(8) provides the following BACT definition:

*(8) "**Best available control technology (BACT)**" means an emissions limitation (including a visible emission standard) based on the maximum degree of reduction for each regulated NSR pollutant which would be emitted from any proposed major stationary source or major modification which the Department, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such source or modification through application of production processes or available methods, systems, and techniques, including fuel cleaning or treatment or innovative fuel combustion techniques for control of such pollutant. In no event shall application of BACT result in emissions of any pollutant which would exceed the emissions allowed by any applicable standard under 40 CFR 60 and 61. If the Department determines that technological or economic limitations on the application of measurement methodology to a particular emissions unit would make the imposition of an emissions standard infeasible, a design, equipment, work practice, operational standard, or combination thereof, may be prescribed instead to satisfy the requirement for the application of BACT. Such standard shall, to the degree possible, set forth the emissions reduction achievable by implementation of such design, equipment, work practice or operation, and shall provide for compliance by means which achieve equivalent results.*

5.2. BACT DETERMINATION ANALYSIS

In a memorandum dated December 1, 1987, the U.S. EPA stated their preference for a "top-down" analysis.[7] The first step in this approach is to determine the most stringent control available for a similar or identical source or source category for each emission unit. If it can be shown that this level of control is technically, environmentally, or economically infeasible for the unit in question, then the next most stringent level of control is determined and similarly evaluated. This process continues until the BACT level under consideration cannot be eliminated by any substantial or unique technical, environmental, or economic objections. Presented below

[7] U.S. EPA, Office of Air and Radiation. Memorandum from J.C. Potter to the Regional Administrators. Washington, D.C. December 1, 1987.

are the five basic steps of a "top-down" BACT analysis procedure as identified by the U.S. EPA in the October 1990 Draft *New Source Review Workshop Manual.*[8]

5.2.1. BACT Step 1– Identify All Control Technologies

Available control technologies are identified for each emission unit in question. The following methods are used to identify potential technologies: 1) researching the Reasonably Available Control Technology (RACT)/Best Available Control Technology (BACT)/Lowest Achievable Emission Reduction (LAER) Clearinghouse (RBLC) database, 2) surveying regulatory agencies, 3) drawing from previous engineering experience, 4) surveying air pollution control equipment vendors, and 5) surveying available literature.

5.2.2. BACT Step 2– Eliminate Technically Infeasible Options

After the identification of control options, an analysis is conducted to eliminate technically infeasible options. A control option is eliminated from consideration if there are process-specific conditions that prohibit the implementation of the control or if the highest control efficiency of the option would result in an emission level that is higher than any applicable regulatory limits, such as a NSPS.

5.2.3. BACT Step 3– Eliminate Technically Infeasible Options

Once technically infeasible options are removed from consideration, the remaining options are ranked based on their control effectiveness. If there is only one remaining option, or if all of the remaining technologies could achieve equivalent control efficiencies, ranking based on control efficiency is not required.

5.2.4. BACT Step 4– Evaluate the Most Effective Controls and Document Results

Beginning with the most efficient control option in the ranking, detailed economic, energy, and environmental impact evaluations are performed. If a control option is determined to be economically feasible without adverse energy or environmental impacts, it is not necessary to evaluate the remaining options with lower control efficiencies.

The economic evaluation centers on the cost effectiveness of the control option. Costs of installing and operating control technologies are estimated and annualized following the methodologies outlined in the EPA's *Control Cost Manual* (CCM)[9] and other industry resources. Cost effectiveness is expressed in dollars per ton of pollutant controlled. Objective analyses of energy and environmental impacts associated with each option are also conducted. Both beneficial and adverse impacts are discussed and quantified.

5.2.5. BACT Step 5– Select BACT

In the final step, one pollutant specific control option is proposed as BACT for each emission unit under review based on evaluations from the previous step.

The technical aspect of a BACT evaluation is a fairly non-subjective process. The same cannot be said for the economic feasibility. The definition of the limit of economic feasibility, the level at which the annual cost of

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[8] U.S. EPA, Office of Air Quality Planning and Standards. *New Source Review Workshop Manual: Prevention of Significant Deterioration and Nonattainment Area Permitting*, Draft. Research Triangle Park, NC. October 1990.

[9] U.S. EPA, Office of Air Quality Planning and Standards. EPA Control Cost Manual, 6th edition. EPA 452/B-02-001. Research Triangle Park, NC. January 2002.

owning and operating a control device or technology per ton of pollutant removed is considered an economic burden (infeasible), varies on a case-by-case basis as determined by DHEC.

Economic analyses are performed to compare total costs (capital and annual) for potential control technologies as appropriate. Capital costs include the initial cost of the components intrinsic to the complete control system. Operating costs include the financial requirements to operate the control system on an annual basis and include overhead, maintenance, outages, raw materials, and utilities.

The capital cost estimating technique is based on a factored method of determining direct and indirect installation costs. This technique is a modified version of the Lang Method whereby installation costs are expressed as a function of known equipment costs. This method is consistent with the latest U.S. EPA guidance manual on estimating control technology costs.[10]

Total purchased equipment cost represents the delivered cost of the control equipment, auxiliary equipment, and instrumentation. Auxiliary equipment consists of all the structural, mechanical and electrical components required for efficient operation of the device. Auxiliary equipment costs are estimated as a straight percentage of the basic equipment cost obtained directly from representative vendors. Direct installation costs consist of the direct expenditures for materials and labor for site preparation, foundations, structural steel, erection, piping, electrical, painting, and facilities.[11] Indirect installation costs include engineering and supervision of contractors, construction and field expenses, construction fees, and contingencies.[12] Other indirect costs include equipment startup, performance testing, working capital, and interest during construction.

Annualized costs are comprised of direct and indirect operating costs. Direct annual costs include labor, maintenance, replacement parts, raw materials, utilities, and waste disposal. Indirect operating costs include plant overhead, taxes, insurance, general administration, and capital charges. Labor supervision was estimated at 15% of operating labor. Replacement part costs are included where applicable, while raw material costs are estimated based upon the unit cost and annual consumption. With the exception of overhead, indirect operating costs are calculated as a percentage of the total capital costs. The indirect capital costs are based on the capital recovery factor (CRF) defined as:

$$CRF = \frac{i(1+i)^n}{(1+i)^n - 1}$$

where i is the annual interest rate and n is the equipment life in years. The economic life of a control system is typically 10 to 20 years. For example, a 10-year equipment economic life with an average interest rate of 9.75 percent results in a CRF of 0.1610.

5.3. BACT APPLICABILITY

The BACT requirement applies to each new or modified emission unit from which there are emissions increases of pollutants above the PSD SERs.

The proposed Charleston plant expansion results in a significant increase of PM, PM_{10}, $PM_{2.5}$ and VOC emissions. Table 5-1 identifies the pollutants considered in the BACT analysis for each emission unit described in Section 2

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[10] U.S. EPA, Office of Air Quality Planning and Standards Control Cost Manual, 6th edition, EPA/452/B-02-001, January 2002.

[11] Ibid.

[12] Ibid.

of this application. For a number of units with low uncontrolled emissions or fugitive emissions, an abbreviated BACT analysis was completed. In lieu of a "top-down" analysis, a RBLC comparison is performed. For all other units, a "top-down" analysis is provided.

Table 5-1 provides a summary of the revised BACT analyses included in this application. Please note that only the $PM/PM_{10}/PM_{2.5}$ BACT analyses for equipment described in Section 2.2.1 is provided in this section as the proposed monitoring changes are related to the dry filters only.

Table 5-1. BACT Analysis Summary By Unit

Equipment ID	Unit Description	$PM/PM_{10}/PM_{2.5}$	VOC
B01, B02	Energy Center Boilers	Top-Down	Top-Down
BS (MAG)	Body Shop MAG Welding Areas	Top-Down	N/A
ASU, AS-RTU, BS-RTU	Gas-Fired Combustion Units	Top-Down	Top-Down
EG03, EG04	Diesel-Fired Emergency Generators	Abbreviated	Abbreviated
TK03	Diesel Storage Tank	N/A	Abbreviated

5.4. ABBREVIATED BACT FOR LOW EMITTING AND FUGITIVE SOURCES

Abbreviated analyses for units with uncontrolled emissions 5 tons per year (tpy) or less and fugitive emissions sources are provided in the following subsections. Note the same control techniques that reduce PM also reduce PM_{10} and filterable $PM_{2.5}$. The BACT analyses for PM, PM_{10} and $PM_{2.5}$ are combined to eliminate redundancy.

5.4.1. Storage Tank

The proposed diesel storage tank is considered insignificant activities for permitting purposes and has potential uncontrolled VOC emissions of less than 5 pounds per year. The proposed atmospheric tank will be designed with submerged fill lines, spill and overfill protection, and conservation vents to minimize atmospheric emissions.

5.4.2. Emergency Engines

The proposed emergency generators (EG03, EG04) are diesel-fired. The total $PM/PM_{10}/PM_{2.5}$ and VOC emissions from these units are each less than 5 tpy. In addition, the operation of this equipment will be limited to emergency events, and required routine testing. Therefore, the total hours of operation is limited to 500 hours per year. Due to the small quantity of $PM/PM_{10}/PM_{2.5}$ and VOC emissions associated with the emergency units, and the emergency nature of operation of the units, a "top-down" BACT analysis has not been conducted. These units will meet BACT requirements by complying with the applicable requirements of NSPS Subpart IIII and NESHAP Subpart ZZZZ.

5.5. VOC TOP-DOWN BACT

The following sections provide the revised VOC "top-down" BACT analyses for the boilers and air supply units. The control technologies listed in the following subsections were obtained from the sources listed in Section 5.3.

5.5.1. Boiler BACT

5.5.1.1. Identification of Potential Control Techniques (Step 1)

Analyzing the RBLC search results and permit review results for similar natural gas-fired units, as well as review of technical literature, potentially applicable VOC control technologies were identified based on the principles of the control technology and engineering experience for general combustion units. These technologies are listed as follows:

- Oxidation Catalyst
- Good Combustion Practices

These VOC reduction options are discussed in the following subsections.

Oxidation Catalyst
Oxidation catalyst controls VOC emissions by facilitating the complete combustion of organic compounds to water vapor and carbon dioxide. Oxidation catalysts are effective and suitable for use with natural gas and distillate combustion.

Good Combustion Practices
Ensuring that the temperature and oxygen availability are adequate for complete combustion minimizes VOC formation. This technique includes continued operation of the boiler at the appropriate oxygen range and temperature.

5.5.1.2. Elimination of Technically Infeasible Control Options (Step 2)

All of the controls listed in Step 1 are technically feasible.

5.5.1.3. Rank of Remaining Control Technologies (Step 3)

Table 5-2. Remaining VOC Control Technologies (Boiler BACT)

Rank	Control Technology	Potential Control Efficiency of Captured VOC (%)
1	Oxidation Catalyst	20-40
2	Good Combustion Practices	Varies

5.5.1.4. Evaluation of Most Stringent Controls (Step 4)

Mercedes-Benz Vans evaluated the economic impacts of oxidation catalyst in order to determine whether this control technology is a feasible option. Potential VOC emissions from each boiler are 0.23 tpy. With potential uncontrolled VOC emission rates of this magnitude, add-on control technologies for VOC are cost prohibitive for the boilers. As shown in Appendix C, the annual control cost of oxidation catalyst exceeds $300,000 per ton of emissions reduced.

No natural gas-fired boilers at automobile manufacturing facilities listed in the RBLC have oxidation catalyst listed as a control method. All of the VOC BACT limits for comparable RBLC entries are based off the AP-42 emission factor for natural gas combustion. The comparable RBLC entries are provided in Table C.1.2.1, as part of the RLBC database search results in Appendix C. Therefore, based on the economic analysis and a review of similar boilers in the RBLC database, oxidation catalyst is not selected as BACT for control of VOC emissions from the boilers. The RBLC indicates that the use of gaseous fuel (i.e., natural gas) represents BACT for VOC for units in this size range. Thus, Mercedes-Benz Vans proceeded with evaluating the next most efficient control option.

The only remaining technology is good combustion practices, including the burning of natural gas in the combustion units. A properly designed and operated natural gas-fired combustion unit minimizes VOC formation by ensuring that the unit temperature and oxygen availability are adequate for complete combustion. Good combustion practices are considered BACT for VOC emissions from the boiler.

5.5.1.5. Selection of BACT (Step 5)

Based on the control technology evaluation, good combustion practices to achieve minimum emissions of VOC is determined as the BACT for the boilers. This involves ensuring good air/fuel mixing and sufficient residence time in the combustion zone, operating with excess oxygen levels high enough to complete combustion while maximizing thermal efficiency, and ensuring proper fuel gas supply system design and operation. In addition, Mercedes-Benz Vans will demonstrate continuous compliance with the proposed emission limits by complying with the work practice standards in SC Standard 5.2 and 40 CFR 63 Subpart DDDDD. With this application Mercedes-Benz Vans is proposing to conduct a tune-up of each boiler every five (5) years as described in Section 2.2.3.

The RBLC database search results in Table C.1.2.1 in Appendix C indicate that similar natural gas-fired units used the AP-42 emission factors to set VOC BACT limits for boilers. Mercedes-Benz Vans will use the same basis to set the VOC BACT limits. The proposed emission limit for natural gas combustion sources (5.5 lb/MMscf) is provided in Table 5-5. A column is provided in the RLBC search results in Appendix C that shows the calculated emission limit for each entry in units of lb/MMscf in order to easily compare to the AP-42 factors. The proposed limit is less than or equal to the calculated lb/MMscf values calculated for all other paint shop boilers.

5.5.2. Gas-Fired Combustion Units BACT

5.5.2.1. Identification of Potential Control Techniques (Step 1)

Using the RBLC search and permit review results, as well as review of technical literature, potentially applicable VOC control technologies were identified based on the principles of the control technology and engineering experience for natural gas-fired combustion units (i.e. ovens, ASU, RTU). These technologies are listed as follows:

- Oxidation Catalyst
- Good Combustion Practices

5.5.2.2. Elimination of Technically Infeasible Control Options (Step 2)

All of the controls listed in Step 1 are technically feasible.

5.5.2.3. Rank of Remaining Control Technologies (Step 3)

Table 5-3. Remaining VOC Control Technologies (Gas-Fired Combustion Units BACT)

Rank	Control Technology	Potential Control Efficiency of Captured VOC (%)
1	Oxidation Catalyst	20-40
2	Good Combustion Practices	Varies

5.5.2.4. Evaluation of Most Stringent Controls (Step 4)

Mercedes-Benz Vans evaluated the economic impacts of oxidation catalyst in order to determine whether this control technology is a feasible option. Potential VOC emissions from each individual natural gas-fired combustion unit are less than 0.30 tpy. With potential uncontrolled VOC emission rates of this magnitude, add-on control technologies for VOC are cost prohibitive for all natural gas-fired combustion units. As shown in Appendix C, the annual control cost of oxidation catalyst exceeds $300,000 per ton of emissions reduced.

The only remaining technology is good combustion practices, including the burning of natural gas in the combustion units. A properly designed and operated natural gas-fired combustion unit minimizes VOC formation by ensuring that the unit temperature and oxygen availability are adequate for complete combustion. Good combustion practices is considered BACT for VOC emissions for the gas-fired combustion units.

5.5.2.5. Selection of BACT (Step 5)

Comparable RBLC entries are provided in Table C.1.2.2, as part of the RLBC database search results in Appendix C. Based on the control technology evaluation, good combustion practices to minimize emissions of VOC is determined as the BACT for the gas-fired combustion units. This involves inspection of burners and flame patterns, and ensuring proper fuel gas supply system design and operation.

The RBLC database search results provided in Table C.1.2.2 indicate that similar operations used the AP-42 emission factors for natural gas combustion to set VOC BACT limits natural gas-fired combustion units. The proposed emission limit (5.5 lb/MMscf) is provided in Table 5-5. A column is provided in the RLBC database in Appendix C that shows the calculated emission limit for each entry in units of lb/MMscf in order to easily compare to the AP-42 factors. The proposed limit is less than or equal to the calculated lb/MMscf values calculated for all other gas-fired combustion units.

5.6. PM/ PM_{10} / $PM_{2.5}$ TOP-DOWN BACT

The following sections provide the revised PM/PM_{10}/$PM_{2.5}$ "top-down" BACT analyses for the body shop welding operations.

5.6.1. Boiler BACT

5.6.1.1. Identification of Potential Control Techniques (Step 1)

Using an RBLC search for similar natural gas-fired boilers and permit review results, as well as review of technical literature, potentially applicable PM/PM_{10}/$PM_{2.5}$ control technologies were identified based on the principles of the control technology and engineering experience for general combustion units. The only available control option is good combustion practices.

5.6.1.2. Elimination of Technically Infeasible Control Options (Step 2)

Good combustion practices are a technically feasible control options for reducing $PM/PM_{10}/PM_{2.5}$ emissions from the boilers.

5.6.1.3. Rank of Remaining Control Technologies (Step 3)

Implementing good combustion practices provides the most effective means for reducing emissions of $PM/PM_{10}/PM_{2.5}$ from the boilers.

5.6.1.4. Evaluation of Most Stringent Controls (Step 4)

The top and only available and technically feasible $PM/PM_{10}/PM_{2.5}$ control option will be applied to achieve compliance with the proposed BACT limit.

5.6.1.5. Selection of BACT (Step 5)

Table C.1.1.1 in the RBLC database search results in Appendix C indicates that similar natural gas-fired units used the AP-42 emission factors to set $PM/PM_{10}/PM_{2.5}$ BACT limits for boilers. Mercedes-Benz Vans will utilize good combustion practices to limit $PM/PM_{10}/PM_{2.5}$ emissions from the boilers. Good combustion practices include ensuring good air/fuel mixing and sufficient residence time in the combustion zone, good burner maintenance and operation, and proper fuel gas supply system design and operation. In addition, Mercedes-Benz Vans will demonstrate continuous compliance with the proposed BACT requirements by complying with the work practice standards in SC Standard 5.2 and 40 CFR 63 Subpart DDDDD. With this application Mercedes-Benz Vans is proposing to conduct a tune-up of each boiler every five (5) years as described in Section 2.2.3.

The proposed $PM/PM_{10}/PM_{2.5}$ BACT limit of 7.6 lb/MMscf is provided in Table 5-5. This limit is based on the AP-42 emission factor and is consistent with all other similar RBLC entries. A column is provided in the RLBC database in Appendix C that shows the calculated emission limit for each entry in units of lb/MMscf in order to easily compare to the AP-42 factors.[13] Since Mercedes-Benz is proposing a BACT limit based on the AP-42 emission factor for total PM, entries based on filterable PM were not compared to the proposed BACT limit. There is one entry in the RBLC database for boilers whose emission limit is slightly lower than the limit proposed by Mercedes-Benz Vans in Table 5-5. The RBLC database shows that Daimler Chrysler Corporation proposed a 0.15 lb/hr limit for two 13.31 MMBtu/hr natural gas-fired boilers at its Toledo facility. This limit is equal to 7.50 lb/MMscf. Mercedes-Benz Vans believes that rounding or the use of a different natural gas heating value caused this limit to be slightly lower than the AP-42 emission factor for total PM (7.60 lb/MMscf). Since the limit is rounded to two decimal places, it is possible that the limit proposed by Daimler Chrysler is between 0.15 – 0.154 lb/hr. A limit of 0.154 lb/hr is equal to 7.70 lb/MMscf, slightly higher than the AP-42 emission factor and the limit proposed by Mercedes-Benz Vans in Table 5-5. Therefore, Mercedes-Benz Vans has determined that the AP-42 emission factor for $PM/PM_{10}/PM_{2.5}$ is an appropriate BACT limit.

5.6.2. Gas-Fired Combustion Units BACT

5.6.2.1. Identification of Potential Control Techniques (Step 1)

Using the RBLC search and permit review results, as well as review of technical literature, potentially applicable $PM/PM_{10}/PM_{2.5}$ control technologies were identified based on the principles of the control technology and

[13] Mercedes-Benz Vans assumed a natural gas heating value of 1,020 Btu/scf, per AP-42 Section 1.4, Natural Gas Combustion to convert the limits in the RBLC database to units of lb/MMscf for comparison purposes.

engineering experience for gas-fired combustion units. The only available control option is good combustion practices.

5.6.2.2. Elimination of Technically Infeasible Control Options (Step 2)

Good combustion practices are a technically feasible control options for reducing $PM/PM_{10}/PM_{2.5}$ emissions from natural gas-fired combustion units.

5.6.2.3. Rank of Remaining Control Technologies (Step 3)

Implementing good combustion practices provides the most effective means for reducing emissions of $PM/PM_{10}/PM_{2.5}$ from the natural gas-fired combustion units.

5.6.2.4. Evaluation of Most Stringent Controls (Step 4)

The top and only available and technically feasible $PM/PM_{10}/PM_{2.5}$ control option will be applied to achieve compliance with the proposed BACT limit.

5.6.2.5. Selection of BACT (Step 5)

Table C.1.1.2 in the RBLC database search results in Appendix C indicates that similar operations used the AP-42 emission factors for natural gas combustion to set $PM/PM_{10}/PM_{2.5}$ BACT limits for natural gas-fired combustion units. Mercedes-Benz Vans will utilize good combustion practices to limit $PM/PM_{10}/PM_{2.5}$ emissions from the natural gas-fired combustion units. Good combustion practices include ensuring good air/fuel mixing and sufficient residence time in the combustion zone, good burner maintenance and operation, and proper fuel gas supply system design and operation. The proposed $PM/PM_{10}/PM_{2.5}$ BACT limit of 7.6 lb/MMscf is provided in Table 5-5. This limit is based on the AP-42 emission factor and is less than or equal to all other similar RBLC entries. A column is provided in the RLBC database in Appendix C that shows the calculated emission limit for each entry in units of lb/MMscf in order to easily compare to the AP-42 factors. Since Mercedes-Benz Vans is proposing a BACT limit based on the AP-42 emissions factor for total PM, entries based on filterable PM were not compared to the proposed BACT limit.

5.6.3. Body Shop MAG Welding BACT

5.6.3.1. Identification of Potential Control Techniques (Step 1)

Candidate control options identified from the RBLC search, permit review, and the literature review include those classified as pollution reduction techniques. $PM/PM_{10}/PM_{2.5}$ reduction options include:

- HEPA Filter
- Good operating practices
- Electrostatic Precipitator

5.6.3.2. Elimination of Technically Infeasible Control Options (Step 2)

There are no control options described in Section 5.6.3.1 that are technically infeasible.

5.6.3.3. Rank of Remaining Control Technologies (Step 3)

The third of the five steps in the "top-down" BACT assessment procedure is to rank technically feasible control technologies by control effectiveness. The remaining control technologies are presented in Table 5-4.

Table 5-4. Remaining $PM/PM_{10}/PM_{2.5}$ Control Technologies (MAG Welding Operations)

Rank	Control Technology	Potential Control Efficiency of Captured $PM/PM_{10}/PM_{2.5}$ (%)
1	HEPA Filter	90-99
2	Electrostatic Precipitator	90-99
3	Good Operating Practices	Varies

5.6.3.4. Evaluation of Most Stringent Controls (Step 4)

For the purposes of employee health and safety, Mercedes-Benz Vans has elected to utilize a HEPA filter to control emissions from MAG welding operations to reduce $PM/PM_{10}/PM_{2.5}$ emissions. The HEPA filter will vent inside the building. The use of a HEPA filter provides an equivalent level of control to the currently permitted electrostatic precipitator and therefore satisfies BACT requirements.

5.6.3.5. Selection of BACT (Step 5)

Mercedes-Benz Vans will control $PM/PM_{10}/PM_{2.5}$ emissions from MAG welding operations with the use of a HEPA filter. The proposed $PM/PM_{10}/PM_{2.5}$ BACT operating requirements are summarized in Table 5-6.

Table C.1.1.3 in Appendix C provides RBLC search results from body shop operations. The emission limits provided are in a variety of forms, including control efficiencies, mass-based emission limits, and opacity limits. Mercedes-Benz Vans is not proposing an opacity limit, as the correlation between opacity and $PM/PM_{10}/PM_{2.5}$ from these operations has not been established. The reduction in $PM/PM/PM_{10}$ emissions reductions that are achieved for MAG welding operations with the use of HEPA filters that vent indoors are greater than the 99% control efficiency listed for the control devices used at the Nissan North America facility of 99%. Mercedes-Benz Vans is not proposing mass-based emission limits since all welding operations are conducted indoors and are not easily evaluated to demonstrate compliance. Mercedes-Benz Vans estimates that actual emissions will be negligible.

5.7. PROPOSED BACT LIMITS

Based on the analyses provided in this section, the proposed numerical BACT limits for the proposed operations are summarized in Table 5-5. Proposed BACT operating summary requirements are provided in Table 5-6.

Table 5-5. Proposed BACT Emission Limits Summary

Equipment ID	Unit Description	$PM/PM_{10}/PM_{2.5}$ BACT Limit	Units	Avg. Period	VOC BACT Limit	Units	Avg. Period
B01, B02	Boilers	7.6	lb/MMscf	3-hour	5.5	lb/MMscf	Monthly
ASU, AS-RTU, BS-RTU, OV01, OV02, OV03	Gas-Fired Combustion Units	7.6	lb/MMscf	3-hour	5.5	lb/MMscf	Monthly

Table 5-6. Proposed BACT Operating Requirements Summary

Equipment ID	Unit Description	$PM/PM_{10}/PM_{2.5}$ BACT Operating Requirement	VOC BACT Operating Requirement
B01, B02	Boilers	Tune-ups every five (5) years as required in 40 CFR 63 Subpart DDDDD	Tune-ups every five (5) years as required in 40 CFR 63 Subpart DDDDD
ASU, AS-RTU, BS-RTU, OV01, OV02, OV03	Gas-Fired Combustion Units	Good combustion practices	Good combustion practices
EG03, EG04	Emergency Generators	NSPS Subpart IIII compliance	NSPS Subpart IIII compliance
TK03	Diesel Storage Tank	N/A	N/A
BS	Body Shop Welding Area	HEPA Filter (MAG Welding), good operating practices, indoor venting	N/A

6. CLASS I, CLASS II, AND ADDITIONAL IMPACTS ANALYSIS

The air dispersion modeling demonstrations submitted in the original application have been revised due to changes described in this application. A detailed modeling report for the proposed project including Class I, Class II, and additional impacts analysis will be provided under separate cover.

7. DHEC PERMIT APPLICATION FORMS

The required DHEC permit application forms are included in this section.

(P) dhec

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BUREAU OF AIR QUALITY

Bureau of Air Quality
Construction Permit Application
Facility Information
Page 1 of 2

FACILITY IDENTIFICATION	
SC Air Permit Number (8-digits only) *(Leave blank if one has never been assigned)* 0560 - 0385	Application Date February 2018
Facility Name *(This should be the name used to identify the facility at the physical address listed below)* Mercedes-Benz Vans, LLC	Facility Federal Tax Identification Number *(Established by the U.S. Internal Revenue Service to identify a business entity)*

FACILITY PHYSICAL ADDRESS		
Physical Address: 8501 Palmetto Commerce Parkway		County: Charleston
City: Ladson	State: SC	Zip Code: 29456
Facility Coordinates *(Facility coordinates should be based at the front door or main entrance of the facility.)*		
Latitude: 32° 57' 50.25"	Longitude: 80° 06' 27.27"	☐ NAD27 *(North American Datum of 1927)* Or ☒ NAD83 *(North American Datum of 1983)*

CO-LOCATION DETERMINATION
Are there other facilities in close proximity that could be considered co-located? ☒ No ☐ Yes*
List potential co-located facilities, including air permit numbers if applicable: Not Applicable

**If yes, please submit co-location applicability determination details in an attachment to this application.*

COMMUNITY OUTREACH
What are the potential air issues and community concerns? Please provide a brief description of potential air issues and community concerns about the entire facility and/or specific project. Include how these issues and concerns are being addressed, if the community has been informed of the proposed construction project, and if so, how they have been informed.

FACILITY'S PRODUCTS / SERVICES	
Primary Products / Services *(List the primary product and/or service)* Automobile Manufacturing, Light Truck and Utility Vehicle Manufacturing	
Primary SIC Code *(Standard Industrial Classification Codes)* 3711	Primary NAICS Code *(North American Industry Classification System)* 336111
Other Products / Services *(List any other products and/or services)*	
Other SIC Code(s): 3713	Other NAICS Code(s): 336112

AIR PERMIT FACILITY CONTACT *(Person at the facility who can answer technical questions about the facility and permit application.)*			
Title/Position: Paint Engineer	Salutation: Mr.	First Name: Jae	Last Name: Park
Mailing Address: 8501 Palmetto Commerce Parkway			
City: Ladson		State: SC	Zip Code: 29456
E-mail Address: jae.park@daimler.com		Phone No.: (843) 695-5095	Cell No.:

The signed permit will be e-mailed to the designated Air Permit Contact. If additional individuals need copies of the permit, please provide their names and e-mail addresses.	
Name	**E-mail Address**
Russell Revell	russell.revell@daimler.com

CONFIDENTIAL INFORMATION / DATA
Does this application contain confidential information or data? ☒ No ☐ Yes*

If yes, include a sanitized version of the application for public review and **ONLY ONE COPY OF CONFIDENTIAL INFORMATION SHOULD BE SUBMITTED*

dhec

Bureau of Air Quality
Construction Permit Application
Facility Information

LIST OF FORMS INCLUDED *(Identify all forms included in the application package)*	
Form Name	**Included (Y/N)**
Expedited Review Request (DHEC Form 2212)	☒ Yes ☐ No
Equipment/Processes (DHEC Form 2567)	☒ Yes
Emissions (DHEC Form 2569)	☒ Yes
Regulatory Review (DHEC Form 2570)	☒ Yes
Emissions Point Information (DHEC Form 2573)	☒ Yes ☐ No (If No, Explain:)

OWNER OR OPERATOR			
Title/Position: President/CEO	Salutation: Mr.	First Name: Michael	Last Name: Balke
Mailing Address: 8501 Palmetto Commerce Parkway			
City: Ladson		State: SC	Zip Code: 29546
E-mail Address: Michael.balke@daimler.com		Phone No.: (843) 695-5142	Cell No.:

OWNER OR OPERATOR SIGNATURE

I certify, to the best of my knowledge and belief, that no applicable standards and/or regulations will be contravened or violated. I certify that any application form, report, or compliance certification submitted in this permit application is true, accurate, and complete based on information and belief formed after reasonable inquiry. I understand that any statements and/or descriptions, which are found to be incorrect, may result in the immediate revocation of any permit issued for this application.

[signature] 02-15-18

Signature of Owner or Operator Date

PERSON AND/OR FIRM THAT PREPARED THIS APPLICATION *(If not the same person as the Professional Engineer who has reviewed and signed this application.)*			
Consulting Firm Name: Same as P.E - see below			
Title/Position:	Salutation:	First Name:	Last Name:
Mailing Address:			
City:		State:	Zip Code:
E-mail Address:		Phone No.:	Cell No.:
SC Professional Engineer License/Registration No. (if applicable):			

PROFESSIONAL ENGINEER INFORMATION			
Consulting Firm Name: Trinity Consultants, Inc.			
Title/Position: Principal Consultant	Salutation: Mr.	First Name: Antoine	Last Name: Jabon
Mailing Address: 325 Arlington Ave. Suite 500			
City: Charlotte		State: NC	Zip Code: 28203
E-mail Address: tjabon@trinityconsultants.com		Phone No.: (704) 553-7747	Cell No.:
SC License/Registration No.: 33177			

PROFESSIONAL ENGINEER SIGNATURE

I have placed my signature and seal on the engineering documents submitted, signifying that I have reviewed this construction permit application as it pertains to the requirements of *South Carolina Regulation 61-62, Air Pollution Control Regulations and Standards.*

[signature] 2/19/18

Signature of Professional Engineer Date

SOUTH CAROLINA LICENSED PROFESSIONAL ENGINEER No. 33177 ANTOINE H. JABON

dhec

Bureau of Air Quality
Expedited Review Request Instructions
Construction Permits

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FEB 20 2018
BUREAU OF AIR QUALITY

APPLICATION IDENTIFICATION		
Facility Name *(This should be the name used to identify the facility)*	SC Air Permit Number (8-digits only) *(Leave blank if one has never been assigned)*	Request Date
Mercedes-Benz Vans, LLC	0560 - 0385	February 2018

PRIMARY AIR PERMIT CONTACT			
Title/Position: Paint Engineer	Mr.	First Name: Jae	Last Name: Park
E-mail Address: jae.park@daimler.com		Phone No.: (843) 695-5095	Cell No.: ( ) -

SECONDARY AIR PERMIT CONTACT *(If the Department is unable to contact the primary air permit contact please provided a secondary contact.)*			
Title/Position: Principal Consultant	Mr.	First Name: Antoine	Last Name: Jabon
E-mail Address: tjabon@trinityconsultants.com		Phone No.: (704) 553-7747	Cell No.: ( ) -

Check One	Permit Type	Expedited Review Days*	Fee**
☐	Minor Source Construction Permit	30	$3,000
☐	Synthetic Minor Construction Permit	65	$4,000
☐	Prevention of Significant Deterioration (PSD) not impacting a Class I Area (no Class I modeling required)	120	$20,000
☐	Prevention of Significant Deterioration (PSD) Modification not impacting a Class I Area (no Class I modeling required) No BACT limit change but requires Public Notice	120	$5,000
☐	Prevention of Significant Deterioration (PSD) Modification not impacting a Class I Area (no Class I modeling required) Number of BACT Pollutants ___ X $5,000 per BACT modification	120	Total Fee $ _____ Maximum of $20,000
☐	Prevention of Significant Deterioration (PSD) impacting a Class I Area (Class I modeling required)	150	$25,000
☐	Prevention of Significant Deterioration (PSD) Modification impacting a Class I Area (Class I modeling required) No BACT limit change but requires Public Notice	150	$5,000
☒	Prevention of Significant Deterioration (PSD) Modification impacting a Class I Area (Class I modeling required) Number of BACT Pollutants 2 X $5,000 per BACT modification	150	Total Fee **$10,000** Maximum of $25,000
☐	**Concrete** Minor Source Construction Permit Relocation Request	10	$1,500
☐	**Asphalt** Synthetic Minor Construction Permit Relocation Request	15	$3,500

*All days above are calendar days, but exclude State holidays, and building closure dates due to severe weather or other emergencies. Expedited days for asphalt and concrete also exclude weekends.

****DO NOT SEND PAYMENT UNTIL THE APPLICATION HAS BEEN ACCEPTED INTO THE EXPEDITED PROGRAM**. If chosen for expedited review, you will be notified by phone for verbal acceptance into the program. Fees must be paid within five business days of acceptance.

PRIMARY AIR PERMIT CONTACT SIGNATURE
I have read the most recent version of the Expedited Review Program Standard Operating Procedures and accept all of the terms and conditions within. I understand that it is my responsibility to ensure an application of the highest quality is submitted in a timely manner, and to address any requests for additional information by the deadline specified. I understand that submittal of this request form is not a guarantee that expedited review will be granted.

[signature] 2/14/18

Signature of Primary Air Permit Contact Date

RECEIVED
FEB 20 2018
BUREAU OF AIR QUALITY

APPLICATION IDENTIFICATION *(Please ensure that the information list in this table is the same on all of the forms and required information submitted in this construction permit application package.)*		
Facility Name *(This should be the name used to identify the facility)* Mercedes-Benz Vans, LLC	SC Air Permit Number (8-digits only) *(Leave blank if one has never been assigned)* 0560 - 0385	Application Date February 2018

PROJECT DESCRIPTION
Brief Project Description (What, why, how, etc.): Daimler Vans is proposing to expand current assembly operations at the Ladson plant to include a paint shop, body shop, and additional assembly areas, including all associated combustion equipment. This application revises information submitted to the Department for Construction Permit No. 0560-0385, 0560-0385-R1, and 0560-0385-R2.

ATTACHMENTS	
☒ Process Flow Diagram	Location in Application: Appendix A
☒ Detailed Project Description	Location in Application: Application Section 2

EQUIPMENT / PROCESS INFORMATION

Equipment ID Process ID	Action	Equipment / Process Description	Maximum Design Capacity (Units)	Control Device ID(s)	Pollutants Controlled (Include CAS#)	Capture System Efficiency and Description	Emission Point ID(s)
B01	☐ Add ☐ Remove ☐ Modify ☒ Other	Boiler #1 (14.27 MMBtu/hr natural gas fired)	14.27 MMBtu/hr	N/A	N/A	N/A	EP-B01
B02	☐ Add ☐ Remove ☐ Modify ☒ Other	Boiler #2 (14.27 MMBtu/hr natural gas fired)	14.27 MMBtu/hr	N/A	N/A	N/A	EP-B02
OV01	☐ Add ☐ Remove ☒ Modify ☐ Other	E-Coat Oven Burners (natural gas fired)	4.85 MMBtu/hr	N/A	N/A	N/A	EP-RO12 EP-RO13 EP-RO14 EP-RO14a EP-RO15
OV02	☐ Add ☐ Remove ☒ Modify ☐ Other	Primer (Guidecoat) Oven #1 Burners (natural gas fired)	4.30 MMBtu/hr	N/A	N/A	N/A	EP-RO22 EP-RO23 EP-RO24 EP-RO24a EP-RO25

EQUIPMENT / PROCESS INFORMATION							
Equipment ID Process ID	Action	Equipment / Process Description	Maximum Design Capacity (Units)	Control Device ID(s)	Pollutants Controlled (Include CAS#)	Capture System Efficiency and Description	Emission Point ID(s)
OV03	☐ Add ☐ Remove ☒ Modify ☐ Other	Topcoat Oven #1 Burners (natural gas fired)	4.27 MMBtu/hr	N/A	N/A	N/A	EP-RO32 EP-RO33 EP-RO34 EP-RO35 EP-RO36
ED01	☐ Add ☐ Remove ☒ Modify ☐ Other	E-Coat Oven	124,800, units/yr	CD-RTO1	VOC, HAP	100%	EP-O1
GC01	☐ Add ☐ Remove ☒ Modify ☐ Other	Guidecoat (Primer Booth) #1	124,800, units/yr	CD-FS1, CD-FS2, CD-FS3, CD-ADW1, CD-ADW2, CD-ADW3, CD-RTO1	PM / PM_{10} / $PM_{2.5}$, VOC, and HAP	100%	EP-O1
GC21	☐ Add ☐ Remove ☒ Modify ☐ Other	Guidecoat (Primer Booth) #2	124,800, units/yr	CD-FS4, CD-ADW4, CD-RTO1	PM / PM_{10} / $PM_{2.5}$, VOC, and HAP	100%	EP-O1
GO01	☐ Add ☐ Remove ☒ Modify ☐ Other	Guidecoat (Primer) Oven #1	124,800, units/yr	CD-RTO1	VOC, HAP	100%	EP-O1
GO21	☐ Add ☐ Remove ☒ Modify ☐ Other	Guidecoat (Primer) Oven #2	124,800, units/yr	CD-RTO1	VOC, HAP	100%	EP-O1
UBC01	☐ Add ☐ Remove ☐ Modify ☒ Other	Underbody Coating Booth #1	124,800, units/yr	CD-DF	PM / PM_{10} / $PM_{2.5}$	100%	EP-UBC01 EP-RO41
UBC21	☐ Add ☐ Remove ☐ Modify ☒ Other	Underbody Coating Booth #2	124,800, units/yr	CD-DF	PM / PM_{10} / $PM_{2.5}$	100%	EP-UBC21 EP-RO341
UBS01	☐ Add ☐ Remove ☐ Modify ☒ Other	Underbody PVC Booth #1	124,800, units/yr	CD-DF	PM / PM_{10} / $PM_{2.5}$	100%	EP-RO41

EQUIPMENT / PROCESS INFORMATION							
Equipment ID Process ID	Action	Equipment / Process Description	Maximum Design Capacity (Units)	Control Device ID(s)	Pollutants Controlled (Include CAS#)	Capture System Efficiency and Description	Emission Point ID(s)
UBS21	☐ Add ☐ Remove ☐ Modify ☒ Other	Underbody PVC Booth #2	124,800, units/yr	CD-DF	PM / PM_{10} / $PM_{2.5}$	100%	EP-RO341
BC21	☐ Add ☐ Remove ☒ Modify ☐ Other	Basecoat/Clearcoat Booth #2	124,800, units/yr	CD-FS4, CD-ADW4, CD-RTO1	PM / PM_{10} / $PM_{2.5}$, VOC, and HAP	100%	EP-O1
TO21	☐ Add ☐ Remove ☒ Modify ☐ Other	Topcoat Oven #2	124,800, units/yr	CD-RTO1	VOC, HAP	100%	EP-O1
SR01	☐ Add ☐ Remove ☐ Modify ☒ Other	Spot Repair Booth #1	124,800, units/yr	CD-DF	PM / PM_{10} / $PM_{2.5}$	100%	EP-RO60
SR02	☐ Add ☐ Remove ☐ Modify ☒ Other	Spot Repair Booth #2	124,800, units/yr	CD-DF	PM / PM_{10} / $PM_{2.5}$	100%	EP-RO60
SR03	☐ Add ☐ Remove ☐ Modify ☒ Other	Spot Repair Booth #3	124,800, units/yr	CD-DF	PM / PM_{10} / $PM_{2.5}$	100%	EP-RO60
AR01	☐ Add ☐ Remove ☐ Modify ☒ Other	Assembly Repair Booth	124,800, units/yr	CD-DF	PM / PM_{10} / $PM_{2.5}$	100%	EP-AR01
CW	☐ Add ☐ Remove ☐ Modify ☒ Other	Cavity Wax Booth	124,800 units/yr	CD-DF, CD-ADW1, CD-ADW2, CD-ADW3, CD-RTO1	PM / PM_{10} / $PM_{2.5}$, VOC, and HAP	100%	EP-O1
PS01	☐ Add ☐ Remove ☒ Modify ☐ Other	Purge/Cleaning Solvent	124,800 units/yr	CD-ADW1, CD-ADW2, CD-ADW3, CD-ADW4, CD-RTO1	PM / PM_{10} / $PM_{2.5}$, VOC, and HAP	100%	EP-O1

EQUIPMENT / PROCESS INFORMATION							
Equipment ID Process ID	**Action**	**Equipment / Process Description**	**Maximum Design Capacity (Units)**	**Control Device ID(s)**	**Pollutants Controlled (Include CAS#)**	**Capture System Efficiency and Description**	**Emission Point ID(s)**
AW	☐ Add ☐ Remove ☒ Modify ☐ Other	Assembly Glazing	124,800 units/yr	N/A	N/A	N/A	EP-AW
AUW	☐ Add ☐ Remove ☐ Modify ☒ Other	Assembly UB Wax	124,800, units/yr	CD-DF	PM / PM_{10} / $PM_{2.5}$	100%	EP-AUW
BS-01	☐ Add ☐ Remove ☒ Modify ☐ Other	Body Shop Welding	124,800, units/yr	CD-HEPA (MAG only)	PM / PM_{10} / $PM_{2.5}$	100%	EP-BS
ASU P/BC/CC	☐ Add ☐ Remove ☒ Modify ☐ Other	Air Supply Unit for Primer Booth, BC Booth, and CC Booth (natural gas fired)	6.49 MMBtu/hr	N/A	N/A	N/A	EP-O1
ASU 2.1	☐ Add ☐ Remove ☒ Modify ☐ Other	Air Supply Unit 2.1 – Shop + Open Workdecks (natural gas fired)	10 MMBtu/hr	N/A	N/A	N/A	EP-O1
ASU 3	☐ Add ☐ Remove ☒ Modify ☐ Other	Air Supply Unit 3 – UBP + Repair (natural gas fired)	7.44 MMBtu/hr	N/A	N/A	N/A	EP-ASU 3
ASU 2.2	☐ Add ☐ Remove ☒ Modify ☐ Other	Air Supply Unit 2.2 – Shop + Open Workdecks (natural gas fired)	10 MMBtu/hr	N/A	N/A	N/A	EP-ASU 2.2
ASU 1	☐ Add ☐ Remove ☒ Modify ☐ Other	Air Supply Unit 1 – Spot Repair (natural gas fired)	4.82 MMBtu/hr	N/A	N/A	N/A	EP-ASU 1
ASU 2.3	☐ Add ☐ Remove ☒ Modify ☐ Other	Air Supply Unit 2.3 – Shop	10 MMBtu/hr	N/A	N/A	N/A	EP-ASU 2.3
ASU 4	☐ Add ☐ Remove ☒ Modify ☐ Other	Air Supply Unit 4 – Wax (natural gas fired)	4.84 MMBtu/hr	N/A	N/A	N/A	EP-ASU 4

EQUIPMENT / PROCESS INFORMATION							
Equipment ID Process ID	Action	Equipment / Process Description	Maximum Design Capacity (Units)	Control Device ID(s)	Pollutants Controlled (Include CAS#)	Capture System Efficiency and Description	Emission Point ID(s)
ASU 6	☐ Add ☐ Remove ☒ Modify ☐ Other	Workdecks Air Supply Unit 6 (natural gas fired)	8.54 MMBtu/hr	N/A	N/A	N/A	EP-ASU 6
ASU CR2	☐ Add ☐ Remove ☒ Modify ☐ Other	Air Supply Unit Clean Room Phase 2 (natural gas fired)	5.83 MMBtu/hr	N/A	N/A	N/A	EP-ASU CR2
ASU 5	☐ Add ☐ Remove ☒ Modify ☐ Other	Workdecks Air Supply Unit 5 (natural gas fired)	5.83 MMBtu/hr	N/A	N/A	N/A	EP-ASU 5
ASU31	☐ Add ☐ Remove ☒ Modify * ☐ Other	Primer Booth Air Supply Unit Phase 3 (natural gas fired)	7.57 MMBtu/hr	N/A	N/A	N/A	EP-ASU31
ASU32	☐ Add ☐ Remove ☒ Modify * ☐ Other	BC Booth Air Supply Unit Phase 3 (natural gas fired)	7.68 MMBtu/hr	N/A	N/A	N/A	EP-ASU32
ASU33	☐ Add ☐ Remove ☒ Modify * ☐ Other	Workdecks Air Supply Unit 1 Phase 3 (natural gas fired)	4.96 MMBtu/hr	N/A	N/A	N/A	EP-ASU33
ASU34	☐ Add ☐ Remove ☒ Modify * ☐ Other	Workdecks Air Supply Unit 2 Phase 3 (natural gas fired)	2.56 MMBtu/hr	N/A	N/A	N/A	EP-ASU34
ASU35	☐ Add ☐ Remove ☒ Modify * ☐ Other	Workdecks Air Supply Unit 3 Phase 3 (natural gas fired)	8.05 MMBtu/hr	N/A	N/A	N/A	EP-ASU35
ASU36	☐ Add ☐ Remove ☒ Modify * ☐ Other	Shop Ventilation Air Supply Unit Phase 3 (natural gas fired)	1.26 MMBtu/hr	N/A	N/A	N/A	EP-ASU36
ASU37	☐ Add ☐ Remove ☒ Modify * ☐ Other	Social Rooms Air Supply Unit Phase 3 (natural gas fired)	1.53 MMBtu/hr	N/A	N/A	N/A	EP-ASU37

EQUIPMENT / PROCESS INFORMATION							
Equipment ID Process ID	Action	Equipment / Process Description	Maximum Design Capacity (Units)	Control Device ID(s)	Pollutants Controlled (Include CAS#)	Capture System Efficiency and Description	Emission Point ID(s)
ASU01	☐ Add ☒ Remove ☐ Modify ☐ Other	Primer Booth Air Supply Unit (natural gas fired)	7.57 MMBtu/hr	N/A	N/A	N/A	EP-O1 EP-O2 EP-O301
ASU02	☐ Add ☒ Remove ☐ Modify ☐ Other	BC Booth Air Supply Unit (natural gas fired)	7.68 MMBtu/hr	N/A	N/A	N/A	EP-O1 EP-O2 EP-O301
ASU20	☐ Add ☒ Remove ☐ Modify ☐ Other	CC Booth Air Supply Unit (natural gas fired)	9.21 MMBtu/hr	N/A	N/A	N/A	EP-O1 EP-O2 EP-O301
ASU09	☐ Add ☒ Remove ☐ Modify ☐ Other	Clean Room 1 Air Supply Unit (natural gas fired)	1.26 MMBtu/hr	N/A	N/A	N/A	EP-ASU09
ASU10	☐ Add ☒ Remove ☐ Modify ☐ Other	Clean Room 2 Air Supply Unit (natural gas fired)	1.62 MMBtu/hr	N/A	N/A	N/A	EP-ASU10
ASU12	☐ Add ☒ Remove ☐ Modify ☐ Other	Shop Ventilation 2 Air Supply Unit (natural gas fired)	4.09 MMBtu/hr	N/A	N/A	N/A	EP-ASU12
ASU13	☐ Add ☒ Remove ☐ Modify ☐ Other	Social Rooms Air Supply Unit (natural gas fired)	1.53 MMBtu/hr	N/A	N/A	N/A	EP-ASU13
AS-RTU01	☐ Add ☐ Remove ☒ Modify * ☐ Other	0.8 MMBtu/hr natural gas-fired rooftop unit (Assembly)	0.80 MMBtu/hr	N/A	N/A	N/A	EP-AS-RTU01
RTU02	☐ Add ☒ Remove ☐ Modify ☐ Other	Rooftop Unit 02 (natural gas fired)	0.60 MMBtu/hr	N/A	N/A	N/A	EP-RTU02
RTU03	☐ Add ☒ Remove ☐ Modify ☐ Other	Rooftop Unit 03 (natural gas fired)	0.60 MMBtu/hr	N/A	N/A	N/A	EP-RTU03

EQUIPMENT / PROCESS INFORMATION							
Equipment ID Process ID	Action	Equipment / Process Description	Maximum Design Capacity (Units)	Control Device ID(s)	Pollutants Controlled (Include CAS#)	Capture System Efficiency and Description	Emission Point ID(s)
AS-RTU04	☐ Add ☐ Remove ☒ Modify * ☐ Other	0.8 MMBtu/hr natural gas-fired rooftop unit (Assembly)	0.80 MMBtu/hr	N/A	N/A	N/A	EP-AS-RTU04
RTU05	☐ Add ☒ Remove ☐ Modify ☐ Other	Rooftop Unit 05 (natural gas fired)	0.60 MMBtu/hr	N/A	N/A	N/A	EP-RTU05
AS-RTU06	☐ Add ☐ Remove ☒ Modify * ☐ Other	0.8 MMBtu/hr natural gas-fired rooftop unit (Assembly)	0.80 MMBtu/hr	N/A	N/A	N/A	EP-AS - RTU06
RTU07	☐ Add ☒ Remove ☐ Modify ☐ Other	Rooftop Unit 07 (natural gas fired)	0.60 MMBtu/hr	N/A	N/A	N/A	EP-RTU07
AS-RTU08	☐ Add ☐ Remove ☒ Modify * ☐ Other	0.8 MMBtu/hr natural gas-fired rooftop unit (Assembly)	0.80 MMBtu/hr	N/A	N/A	N/A	EP-AS-RTU08
RTU09	☐ Add ☒ Remove ☐ Modify ☐ Other	Rooftop Unit 09 (natural gas fired)	0.60 MMBtu/hr	N/A	N/A	N/A	EP-RTU09
AS-RTU10	☐ Add ☐ Remove ☒ Modify * ☐ Other	0.8 MMBtu/hr natural gas-fired rooftop unit (Assembly)	0.80 MMBtu/hr	N/A	N/A	N/A	EP-AS-RTU10
AS-RTU10	☐ Add ☐ Remove ☒ Modify * ☐ Other	0.8 MMBtu/hr natural gas-fired rooftop unit (Assembly)	0.80 MMBtu/hr	N/A	N/A	N/A	EP-AS-RTU11
RTU12	☐ Add ☒ Remove ☐ Modify ☐ Other	Rooftop Unit 12 (natural gas fired)	0.27 MMBtu/hr	N/A	N/A	N/A	EP-RTU12
AS-RTU13	☐ Add ☐ Remove ☒ Modify * ☐ Other	0.8 MMBtu/hr natural gas-fired rooftop unit (Assembly)	0.80 MMBtu/hr	N/A	N/A	N/A	EP-AS-RTU13

EQUIPMENT / PROCESS INFORMATION							
Equipment ID Process ID	Action	Equipment / Process Description	Maximum Design Capacity (Units)	Control Device ID(s)	Pollutants Controlled (Include CAS#)	Capture System Efficiency and Description	Emission Point ID(s)
BS-RTU01	☐ Add ☐ Remove ☒ Modify * ☐ Other	0.8 MMBtu/hr natural gas-fired rooftop unit (Body Shop)	0.80 MMBtu/hr	N/A	N/A	N/A	EP-BS-RTU01
BS-RTU02	☐ Add ☐ Remove ☒ Modify * ☐ Other	0.8 MMBtu/hr natural gas-fired rooftop unit (Body Shop)	0.80 MMBtu/hr	N/A	N/A	N/A	EP-BS-RTU02
RTU16	☐ Add ☒ Remove ☐ Modify ☐ Other	Rooftop Unit 16 (natural gas fired)	0.02 MMBtu/hr	N/A	N/A	N/A	EP-RTU16
BS-RTU04	☐ Add ☐ Remove ☒ Modify * ☐ Other	0.8 MMBtu/hr natural gas-fired rooftop unit (Body Shop)	0.80 MMBtu/hr	N/A	N/A	N/A	EP-BS-RTU04
BS-RTU05	☐ Add ☐ Remove ☒ Modify * ☐ Other	0.8 MMBtu/hr natural gas-fired rooftop unit (Body Shop)	0.80 MMBtu/hr	N/A	N/A	N/A	EP-BS-RTU05
BS-RTU06	☐ Add ☐ Remove ☒ Modify * ☐ Other	0.8 MMBtu/hr natural gas-fired rooftop unit (Body Shop)	0.80 MMBtu/hr	N/A	N/A	N/A	EP-BS-RTU06
BS-RTU07	☐ Add ☐ Remove ☒ Modify * ☐ Other	0.8 MMBtu/hr natural gas-fired rooftop unit (Body Shop)	0.80 MMBtu/hr	N/A	N/A	N/A	EP-BS-RTU07
BS-RTU10	☐ Add ☐ Remove ☒ Modify * ☐ Other	0.8 MMBtu/hr natural gas-fired rooftop unit (Body Shop)	0.80 MMBtu/hr	N/A	N/A	N/A	EP-BS-RTU10
BS-RTU17	☐ Add ☐ Remove ☒ Modify * ☐ Other	0.8 MMBtu/hr natural gas-fired rooftop unit (Body Shop)	0.80 MMBtu/hr	N/A	N/A	N/A	EP-BS-RTU17
BS-RTU18	☐ Add ☐ Remove ☒ Modify * ☐ Other	0.8 MMBtu/hr natural gas-fired rooftop unit (Body Shop)	0.80 MMBtu/hr	N/A	N/A	N/A	EP-BS-RTU18

EQUIPMENT / PROCESS INFORMATION							
Equipment ID Process ID	**Action**	**Equipment / Process Description**	**Maximum Design Capacity (Units)**	**Control Device ID(s)**	**Pollutants Controlled (Include CAS#)**	**Capture System Efficiency and Description**	**Emission Point ID(s)**
BS-RTU23	☐ Add ☐ Remove ☒ Modify * ☐ Other	0.8 MMBtu/hr natural gas-fired rooftop unit (Body Shop)	0.80 MMBtu/hr	N/A	N/A	N/A	EP-BS-RTU23
BS-RTU25	☐ Add ☐ Remove ☒ Modify * ☐ Other	0.8 MMBtu/hr natural gas-fired rooftop unit (Body Shop)	0.80 MMBtu/hr	N/A	N/A	N/A	EP-BS-RTU25
BS-RTU26	☐ Add ☐ Remove ☒ Modify * ☐ Other	0.8 MMBtu/hr natural gas-fired rooftop unit (Body Shop)	0.80 MMBtu/hr	N/A	N/A	N/A	EP-BS-RTU26
BS-RTU30	☐ Add ☐ Remove ☒ Modify * ☐ Other	0.8 MMBtu/hr natural gas-fired rooftop unit (Body Shop)	0.80 MMBtu/hr	N/A	N/A	N/A	EP-BS-RTU30
BS-RTU32	☐ Add ☐ Remove ☒ Modify * ☐ Other	0.8 MMBtu/hr natural gas-fired rooftop unit (Body Shop)	0.80 MMBtu/hr	N/A	N/A	N/A	EP-BS-RTU32
BS-RTU33	☐ Add ☐ Remove ☒ Modify * ☐ Other	0.8 MMBtu/hr natural gas-fired rooftop unit (Body Shop)	0.80 MMBtu/hr	N/A	N/A	N/A	EP-BS-RTU33
BS-RTU35	☐ Add ☐ Remove ☒ Modify * ☐ Other	0.8 MMBtu/hr natural gas-fired rooftop unit (Body Shop)	0.80 MMBtu/hr	N/A	N/A	N/A	EP-BS-RTU35
RTU31	☐ Add ☒ Remove ☐ Modify ☐ Other	Rooftop Unit 31 (natural gas fired)	0.60 MMBtu/hr	N/A	N/A	N/A	EP-RTU31
RTU32	☐ Add ☒ Remove ☐ Modify ☐ Other	Rooftop Unit 32 (natural gas fired)	0.60 MMBtu/hr	N/A	N/A	N/A	EP-RTU32
RTU33	☐ Add ☒ Remove ☐ Modify ☐ Other	Rooftop Unit 33 (natural gas fired)	1.59 MMBtu/hr	N/A	N/A	N/A	EP-RTU33

EQUIPMENT / PROCESS INFORMATION							
Equipment ID Process ID	Action	Equipment / Process Description	Maximum Design Capacity (Units)	Control Device ID(s)	Pollutants Controlled (Include CAS#)	Capture System Efficiency and Description	Emission Point ID(s)
RTU34	☐ Add ☒ Remove ☐ Modify ☐ Other	Rooftop Unit 34 (natural gas fired)	1.59 MMBtu/hr	N/A	N/A	N/A	EP-RTU34
RTU35	☐ Add ☒ Remove ☐ Modify ☐ Other	Rooftop Unit 35 (natural gas fired)	1.59 MMBtu/hr	N/A	N/A	N/A	EP-RTU35
CT01	☐ Add ☐ Remove ☒ Modify ☐ Other	Cooling tower #1	412,500 gal/hr	N/A	N/A	N/A	CT01
CT02	☐ Add ☐ Remove ☒ Modify ☐ Other	Cooling tower #2	412,500 gal/hr	N/A	N/A	N/A	CT02
CT03	☐ Add ☐ Remove ☒ Modify ☐ Other	Cooling tower #3	412,500 gal/hr	N/A	N/A	N/A	CT03
CT04	☐ Add ☐ Remove ☒ Modify ☐ Other	Cooling tower #4	73,800 gal/hr	N/A	N/A	N/A	CT04
CT05	☐ Add ☐ Remove ☒ Modify ☐ Other	Cooling tower #5	484,900 gal/hr	N/A	N/A	N/A	CT05
CT06	☐ Add ☐ Remove ☒ Modify ☐ Other	Cooling tower #6	484,900 gal/hr	N/A	N/A	N/A	CT06
CT07	☐ Add ☐ Remove ☒ Modify ☐ Other	Cooling tower #7	484,900 gal/hr	N/A	N/A	N/A	CT07
TK03	☒ Add ☐ Remove ☐ Modify ☐ Other	Diesel storage tank	8,760 hr/yr	N/A	N/A	N/A	EP-TK03

EQUIPMENT / PROCESS INFORMATION

Equipment ID Process ID	Action	Equipment / Process Description	Maximum Design Capacity (Units)	Control Device ID(s)	Pollutants Controlled (Include CAS#)	Capture System Efficiency and Description	Emission Point ID(s)
EG03	☒ Add ☐ Remove ☐ Modify ☐ Other	Emergency Generator 03	500 hr/yr	N/A	N/A	N/A	EP-EG03
EG04	☒ Add ☐ Remove ☐ Modify ☐ Other	Emergency Generator 04	500 hr/yr	N/A	N/A	N/A	EP-EG04

* Equipment ID and Equipment description have been updated as described in Section 2 of the construction permit application.

CONTROL DEVICE INFORMATION

Control Device ID	Action	Control Device Description	Maximum Design Capacity (Units)	Inherent/Required/Voluntary (Explain)	Destruction/Removal Efficiency Determination
CD-ESP	☐ Add ☒ Remove ☐ Modify ☐ Other	Electrostatic Precipitator	124,800, units/yr	Required	95%
CD-HEPA	☒ Add ☐ Remove ☐ Modify ☐ Other	HEPA Filter (MAG Only)	124,800, units/yr	Required	95%
CD-DF	☐ Add ☐ Remove ☐ Modify ☒ Other	Dry Filters	124,800, units/yr	Required	98.5% (CW, UBS01, UBS21, UBC01, UBC21, SR01, SR02, SR03, AR01) 98% (AUW)
CD-RTO1	☐ Add ☐ Remove ☒ Modify ☐ Other	Regenerative Thermal Oxidizer (RTO) #1	8 MMBtu/hr (Phase 1) 16 MMBtu/hr (Phase 2 or 3)	Required	95%
CD-RTO2	☐ Add ☒ Remove ☐ Modify ☐ Other	Regenerative Thermal Oxidizer (RTO) #2	3.41 MMBtu/hr	Required	95%
CD-RTO3	☐ Add ☒ Remove ☐ Modify ☐ Other	Regenerative Thermal Oxidizer (RTO) #3	3.41 MMBtu/hr	Required	95%

RAW MATERIAL AND PRODUCT INFORMATION			
Equipment ID Process ID Control Device ID	Raw Material(s)	Product(s)	Fuels Combusted
B01, B02	N/A	Hot Water	Natural Gas
OV01, OV02, OV03	N/A	Process Heat	Natural Gas
AW	Primer and Adhesive	Vehicle Bodies	N/A
BS01	Welding Material	Vehicle Bodies	N/A
ASUs	N/A	Process Air	Natural Gas
AS-RTUs, BS-RTUs	N/A	Process Air	Natural Gas
CT01 - CT07	N/A	Process Cooling	N/A
TK03	Diesel	Diesel Storage	N/A
EG03, EG04	N/A	Electricity	Diesel

MONITORING AND REORTING INFORMATION					
Equipment ID Process ID Control Device ID	Pollutant(s)/Parameter(s) Monitored	Monitoring Frequency	Reporting Frequency	Monitoring/Reporting Basis	Averaging Period(s)
B01, B02	Fuel Usage	Monthly	Semiannual	NSPS Subpart Dc	Monthly
B01, B02	Tune-up	Biannual	Biannual	SC Regulation 61-62.5 Std. No. 5.2, NESHAP Subpart DDDDD	24 months
OV01, OV02, OV03	N/A	N/A	N/A	N/A	N/A
CW, UBS01, UBS21, UBC01, UBC21, and AUW to CD-DF	Visual Inspection	Weekly	Semi-Annual	SC Regulation 61-62.5 Standard No. 7	Weekly
SR01, SR02, SR03, and AR01 to CD-DF	Visual Inspection	Monthly	Semi-Annual	SC Regulation 61-62.5 Standard No. 7	Monthly
AW	N/A	N/A	N/A	N/A	N/A
CD-HEPA	N/A	N/A	N/A	N/A	N/A
ASUs	N/A	N/A	N/A	N/A	N/A
AS-RTUs, BS-RTUs	N/A	N/A	N/A	N/A	N/A
CT01 - CT07	N/A	N/A	N/A	N/A	N/A
TK03	N/A	N/A	N/A	N/A	N/A
EG03, EG04	Hours of Operation	As necessary	As necessary	NSPS Subpart IIII	Annual

Bureau of Air Quality
Construction Permit Application
Emissions

APPLICATION IDENTIFICATION *(Please ensure that the information list in this table is the same on all of the forms and required information submitted in this construction permit application package.)*		
Facility Name *(This should be the name used to identify the facility)*	SC Air Permit Number (8-digits only) *(Leave blank if one has never been assigned)*	Application Date
Mercedes-Benz Vans, LLC	0560 - 0385	February 2018

ATTACHMENTS *(Check all the appropriate checkboxes if included as an attachment)*	
☒ Sample Calculations, Emission Factors Used, etc.	☒ Detailed Explanation of Assumptions, Bottlenecks, etc.
☒ Supporting Information: Manufacturer's Data, etc.	☐ Source Test Information
☒ Details on Limits Being Taken for Limited Emissions	☒ NSR Analysis

SUMMARY OF PROJECTED CHANGE IN FACILITY WIDE POTENTIAL EMISSIONS
(Calculated at maximum design capacity.)

Pollutants	Emission Rates Prior to Construction / Modification (tons/year)			Emission Rates After Construction / Modification (tons/year)		
	Uncontrolled	Controlled	Limited	Uncontrolled	Controlled	Limited
Particulate Matter (PM)	1,353.39	29.51	26.97	1,353.99	24.65	21.94
Particulate Matter <10 Microns (PM_{10})	1,346.10	22.23	19.77	1,346.70	17.36	14.73
Particulate Matter <2.5 Microns ($PM_{2.5}$)	1,344.79	20.92	18.46	1,345.39	16.05	13.43
Sulfur Dioxide (SO_2)	0.72	0.72	0.59	0.93	0.93	0.79
Nitrogen Oxides (NO_x)	48.94	48.94	38.55	46.37	46.37	35.42
Carbon Monoxide (CO)	77.43	77.43	59.16	76.98	76.98	57.76
Volatile Organic Compounds (VOC)	3,442.84	1,110.37	952.04	3,446.70	1,114.23	955.85
Lead (Pb)	4.18E-04	4.18E-04	3.09E-04	4.24E-04	4.24E-04	3.10E-04
Highest HAP Prior to Construction (CAS #:)	Multiple >10	Multiple >10		Multiple >10	Multiple >10	
Highest HAP After Construction (CAS #:)						
Total HAP Emissions*	415.56	415.56	358.18	415.58	415.58	358.18

Include emissions from exempt equipment and emission increases from process changes that were exempt from construction permits.
(*All HAP emitted from the various equipment or processes must be listed in the appropriate "Potential Emission Rates at Maximum Design Capacity" Table)

POTENTIAL EMISSION RATES AT MAXIMUM DESIGN CAPACITY									
Equipment ID / Process ID	**Emission Point ID**	**Pollutants** (Include CAS #)	**Calculation Methods / Limits Taken / Other Comments**	**Uncontrolled**		**Controlled**		**Limited**	
				lbs/hr	**tons/yr**	**lbs/hr**	**tons/yr**	**lbs/hr**	**tons/yr**
See Appendix B of the Application									

Bureau of Air Quality
Construction Permit Application
Regulatory Review

APPLICATION IDENTIFICATION (Please ensure that the information list in this table is the same on all of the forms and required information submitted in this construction permit application package.)		
Facility Name *(This should be the name used to identify the facility)*	SC Air Permit Number (8-digits only) *(Leave blank if one has never been assigned)*	Application Date
Mercedes-Benz Vans, LLC	0560 - 0385	February 2018

STATE AND FEDERAL AIR POLLUTION CONTROL REGULATIONS AND STANDARDS
(If not listed below add any additional regulations that are triggered.)

Regulation	Applicable		Include all limits, work practices, monitoring, record keeping, etc.		
	Yes	No	Explain Applicability Determination	List the specific limitations and/or requirements that apply.	How will compliance be demonstrated?
Regulation 61-62.1, Section II(E) Synthetic Minor Construction Permits	☐	☒	See Section 4	N/A	N/A
Regulation 61-62.1, Section II(G) Conditional Major Operating Permits	☐	☒	See Section 4	N/A	N/A
Regulation 61-62.5, Standard No. 1 Emissions from Fuel Burning Operations	☒	☐	See Section 4	See Section 4	See Section 4
Regulation 61-62.5, Standard No. 2 Ambient Air Quality Standards	☒	☐	See Section 4	See Section 4	See Section 4
Regulation 61-62.5, Standard No. 3 Waste Combustion and Reduction	☐	☒	See Section 4	N/A	N/A
Regulation 61-62.5, Standard No. 4 Emissions from Process Industries	☒	☐	See Section 4	See Section 4	See Section 4
Regulation 61-62.5, Standard No. 5 Volatile Organic Compounds	☐	☒	See Section 4	N/A	N/A
Regulation 61-62.5, Standard No. 5.2 Control of Oxides of Nitrogen	☐	☒	See Sections 2 and 4	N/A	N/A
Regulation 61-62.5, Standard No. 7 Prevention of Significant Deterioration*	☒	☐	See Section 4	See Section 4	See Section 4
Regulation 61-62.5, Standard No. 7.1 Nonattainment New Source Review*	☐	☒	See Section 4	N/A	N/A
Regulation 61-62.5, Standard No. 8 Toxic Air Pollutants	☐	☒	See Section 4	N/A	N/A
Regulation 61-62.6 Control of Fugitive Particulate Matter	☒	☐	See Section 4	See Section 4	See Section 4

STATE AND FEDERAL AIR POLLUTION CONTROL REGULATIONS AND STANDARDS (If not listed below add any additional regulations that are triggered.)					
Regulation	**Applicable**		**Include all limits, work practices, monitoring, record keeping, etc.**		
	Yes	**No**	**Explain Applicability Determination**	**List the specific limitations and/or requirements that apply.**	**How will compliance be demonstrated?**
Regulation 61-62.68 Chemical Accident Prevention Provisions	☐	☒	N/A	N/A	N/A
Regulation 61-62.70 Title V Operating Permit Program	☒	☐	See Section 4	See Section 4	See Section 4
40 CFR Part 64 - Compliance Assurance Monitoring (CAM)	☐	☒	See Section 4	N/A	N/A
40 CFR 60 Subpart A - General Provisions	☒	☐	See Section 4	See Section 4	See Section 4
Subpart Kb	☐	☒	See Section 4	N/A	N/A
Subpart MM	☒	☐	See Section 4	See Section 4	See Section 4
Subpart IIII	☒	☐	See Section 4	See Section 4	See Section 4
Subpart JJJJ	☐	☒	See Section 4	N/A	N/A
40 CFR 61 Subpart A - General Provisions	☐	☒	N/A	N/A	N/A
	☐	☐			
40 CFR 63 Subpart A - General Provisions	☒	☐	See Section 4	See Section 4	See Section 4
Subpart IIII	☒	☐	See Section 4	See Section 4	See Section 4
Subpart MMMM	☐	☒	See Section 4	N/A	N/A
Subpart PPPP	☐	☒	See Section 4	N/A	N/A
Subpart ZZZZ	☒	☐	See Section 4	See Section 4	See Section 4
Subpart DDDDD	☒	☐	See Section 4	See Section 4	See Section 4
	☐	☐			

* Green House Gas emissions must be quantified if these regulations are triggered.

Bureau of Air Quality
Construction Permit Application
Application Revision Request

CONSTRUCTION PERMIT IDENTIFICATION			
SC Air Permit Number *(8-digits only)* *(Leave blank if unknown or has never been assigned)*	Construction Permit ID	Date Construction Permit Issued	Revision Request Date
0560 - 0385	0560-0385-CA-R2	January 26, 2018	February 2018
Facility Name *(This should be the name used to identify the facility)*			
Mercedes-Benz Vans, LLC			

CONSTRUCTION PERMIT APPLICATION FORMS BEING REVISED
(Amended construction permit forms must be filled out completely and attached to this modification request.)

Form #	Date of Original Submittal	Brief Description of Revision
D-2566	February 2016	No change
D-2567	February 2016	Revised equipment form as described in Section 2 of the application.
D-2569	February 2016	Revised facility-wide emission estimate as described in the application. Calculations are provided in Appendix B.
D-2570	February 2016	Revised regulatory applicability as described in Section 2 of the application
D-2573	February 2016	Updated modeling demonstration (see modeling report)

OWNER OR OPERATOR

Title/Position: President/CEO	Salutation: Mr	First Name: Michael	Last Name: Balke
Mailing Address: 8501 Palmetto Commerce Parkway			
City: Ladson		State: SC	Zip Code: 29546
E-mail Address: Michael.balke@daimler.com		Phone No.: (843) 695-5142	Cell No.:

OWNER OR OPERATOR SIGNATURE

I certify, to the best of my knowledge and belief, that no applicable standards and/or regulations will be contravened or violated. I certify that any application form, report, or compliance certification submitted in this permit application is true, accurate, and complete based on information and belief formed after reasonable inquiry. I understand that any statements and/or descriptions, which are found to be incorrect, may result in the immediate revocation of any permit issued for this application.

M. Balke — 02-15-18

Signature of Owner or Operator — Date

AIR PERMIT CONSULTANT *(If not the same person as the Professional Engineer.)*			
Consulting Firm Name: Same as P.E. (see below)			
Title/Position:	Salutation:	First Name:	Last Name:
Mailing Address:			
City:		State:	Zip Code:
E-mail Address:		Phone No.:	Cell No.:
PROFESSIONAL ENGINEER INFORMATION			
Consulting Firm Name: Trinity Consultants, Inc.			
Title/Position: Principal Consultant	Salutation: Mr.	First Name: Antoine	Last Name: Jabon
Mailing Address: 325 Arlington Ave. Suite 500			
City: Charlotte		State: NC	Zip Code: 28203
E-mail Address: tjabon@trinityconsultants.com		Phone No.: (704) 553-7747	Cell No.:
SC License/Registration No.: 33177			
PROFESSIONAL ENGINEER SIGNATURE			
I have placed my signature and seal on the engineering documents submitted, signifying that I have reviewed this construction permit application as it pertains to *South Carolina Regulation 61-62, Air Pollution Control Regulations and Standards.*			

[signature] 2/19/18
Signature of Professional Engineer — Date

SOUTH CAROLINA LICENSED PROFESSIONAL ENGINEER No. 33177 ANTOINE H. JABON

A. APPLICATION IDENTIFICATION	
1. Facility Name: Mercedes-Benz Vans, LLC	
2. SC Air Permit Number (if known; 8-digits only): 0560 - 0385	3. Application Date: February 2018
4. Project Description: Modifications to Construction Permit No. 0560-0385-R2 as described in Section 2 of the application.	

B. FACILITY INFORMATION	
1. Is your company a Small Business? ☐ Yes ☒ No	2. If a Small Business or small government facility, is Bureau assistance being requested? ☐ Yes ☒ No
3. Are other facilities collocated for air compliance? ☐ Yes ☒ No	4. If Yes, provide permit numbers of collocated facilities:

C. AIR CONTACT			
Consulting Firm Name (if applicable): Trinity Consultants, Inc.			
Title/Position: Principal Consultant	Salutation: Mr.	First Name: Antoine	Last Name: Jabon
Mailing Address: 325 Arlington Avenue, Suite 500			
City: Charlotte		State: NC	Zip Code: 28203
E-mail Address: tjabon@trinityconsultants.com		Phone No.: (704) 553-7747	Cell No.:

D. EMISSION POINT DISPERSION PARAMETERS
Source data requirements are based on the appropriate source classification. Each emission point is classified as a point, area, volume, or flare source. Contact the Bureau of Air Quality for clarification of data requirements. Include sources on a scaled site map. Also, a picture of area or volume sources would be helpful but is not required. A user generated document or spreadsheet may be substituted in lieu of this form provided all of the required emission point parameters are submitted in the same order, units, etc. as presented in these tables.
Abbreviations / Units of Measure: UTM = Universal Transverse Mercator; °N = Degrees North; °W = Degrees West; m = meters; AGL = Above Ground Level; ft = feet; ft/s = feet per second; ° = Degrees; °F = Degrees Fahrenheit

Bureau of Air Quality
Emission Point Information

E. POINT SOURCE DATA (Point sources such as stacks, chimneys, exhaust fans, and vents.)															
Emission Point ID	Description/Name	Point Source Coordinates Projection:				Release Height AGL (ft)	Temp. (°F)	Exit Velocity (ft/s)	Inside Diameter (ft)	Discharge Orientation	Rain Cap? (Y/N)	Distance To Nearest Property Boundary (ft)	Building		
		UTM E (m)	UTM N (m)	Lat (°N)	Long (°W)								Height (ft)	Length (ft)	Width (ft)
	See Modeling Report														

F. AREA SOURCE DATA (Area sources such as storage piles, and other sources that have low level or ground level releases with no plumes.)										
Emission Point ID	Description/Name	Area Source Coordinates Projection:				Release Height AGL (ft)	Easterly Length (ft)	Northerly Length (ft)	Angle From North (°)	Distance To Nearest Property Boundary (ft)
		UTM E (m)	UTM N (m)	Lat (°N)	Long (° W)					
	N/A									

G. VOLUME SOURCE DATA (Volume sources such as building fugitives that have initial dispersion vertical depth prior to release.)									
Emission Point ID	Description/Name	Volume Source Coordinates Projection:				Release Height AGL (ft)	Initial Horizontal Dimension (ft)	Initial Vertical Dimension (ft)	Distance To Nearest Property Boundary (ft)
		UTM E (m)	UTM N (m)	Lat (°N)	Long (° W)				
	See Modeling Report								

dhec

H. FLARE SOURCE DATA
(Point sources where the combustion takes place at the tip of the stack.)

Emission Point ID	Description/Name	Flare Source Coordinates Projection:				Release Height AGL (ft)	Heat Release Rate (BTU/hr)	Distance To Nearest Property Boundary (ft)	Building		
		UTM E (m)	UTM N (m)	Lat (°N)	Long (° W)				Height (ft)	Length (ft)	Width (ft)
	N/A										

I. AREA CIRCULAR SOURCE DATA

Emission Point ID	Description/Name	Area Circular Source Coordinates Projection:				Release Height AGL (ft)	Radius of Area (ft)	Distance To Nearest Property Boundary (ft)
		UTM E (m)	UTM N (m)	Lat (°N)	Long (° W)			
	N/A							

J. AREA POLY SOURCE DATA

Emission Point ID	Description/Name	Area Poly Source Coordinates Projection:		Release Height AGL (ft)	Number of Vertices
		UTM E (m)	UTM N (m)		
	N/A				

K. OPEN PIT SOURCE DATA

Emission Point ID	Description/Name	Open Pit Source Coordinates Projection:		Release Height AGL (ft)	Easterly Length (ft)	Northerly Length (ft)	Volume (ft^3)	Angle From North (°)
		UTM E (m)	UTM N (m)					
	N/A							

L. EMISSION RATES						
Emission Point ID	Pollutant Name	CAS #	Emission Rate (lb/hr)	Same as Permitted (1)	Controlled or Uncontrolled	Averaging Period
	See Modeling Report			☐ Yes ☐ No		
				☐ Yes ☐ No		
				☐ Yes ☐ No		
				☐ Yes ☐ No		
				☐ Yes ☐ No		
				☐ Yes ☐ No		
				☐ Yes ☐ No		
				☐ Yes ☐ No		
				☐ Yes ☐ No		
				☐ Yes ☐ No		
				☐ Yes ☐ No		
				☐ Yes ☐ No		
				☐ Yes ☐ No		
				☐ Yes ☐ No		
				☐ Yes ☐ No		
				☐ Yes ☐ No		
				☐ Yes ☐ No		
				☐ Yes ☐ No		
				☐ Yes ☐ No		
				☐ Yes ☐ No		
				☐ Yes ☐ No		
				☐ Yes ☐ No		
				☐ Yes ☐ No		
				☐ Yes ☐ No		
				☐ Yes ☐ No		
				☐ Yes ☐ No		
				☐ Yes ☐ No		

(1) Any difference between the rates used for permitting and the air compliance demonstration must be explained in the application report.

APPENDIX A: AREA MAP, SITE LAYOUT, AND PROCESS FLOW DIAGRAMS

Mercedes-Benz Vans, LLC

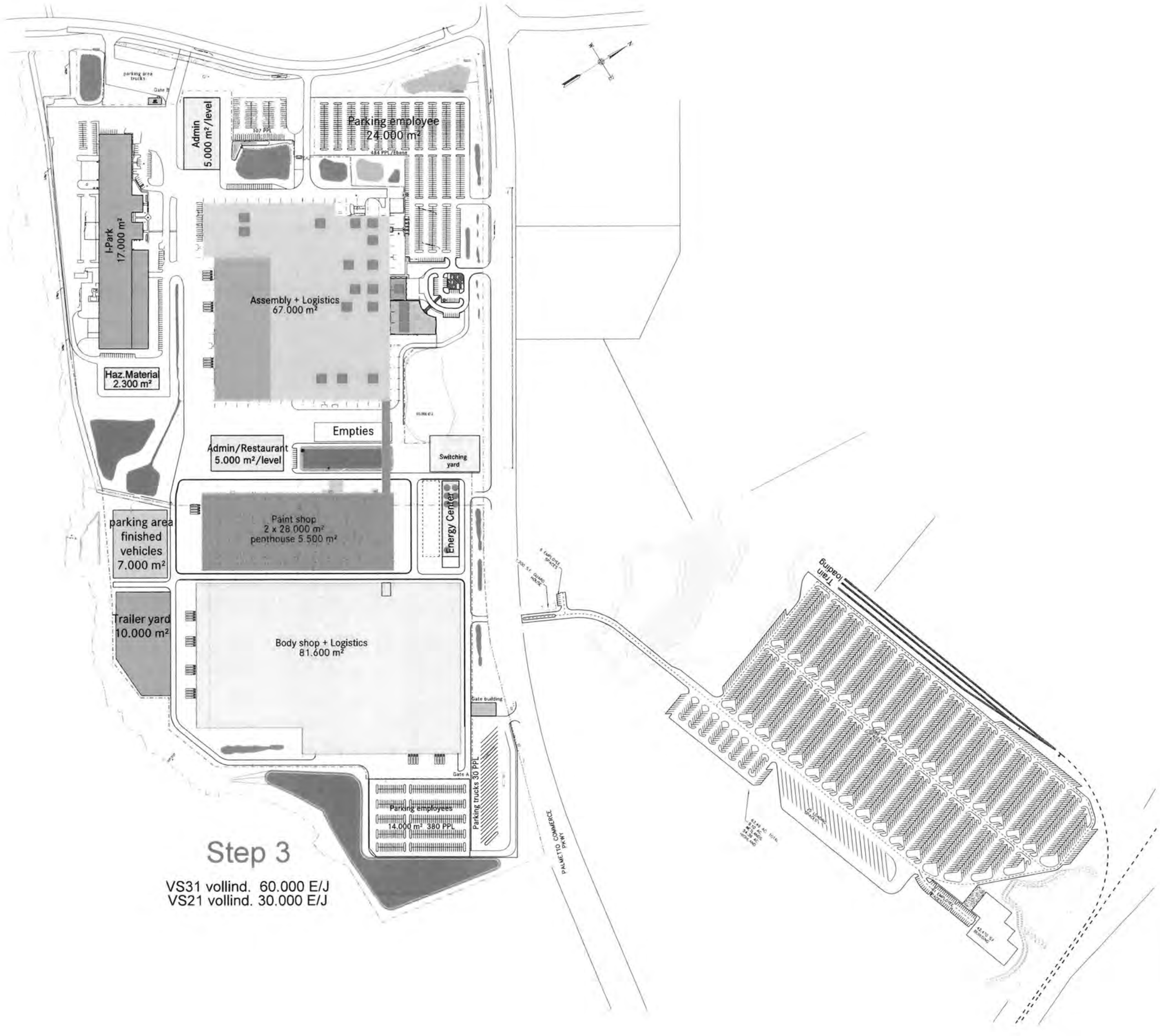
Charleston Plant Expansion Area Map

Edge Markings in UTM Coordinates (meters)

0 275 550

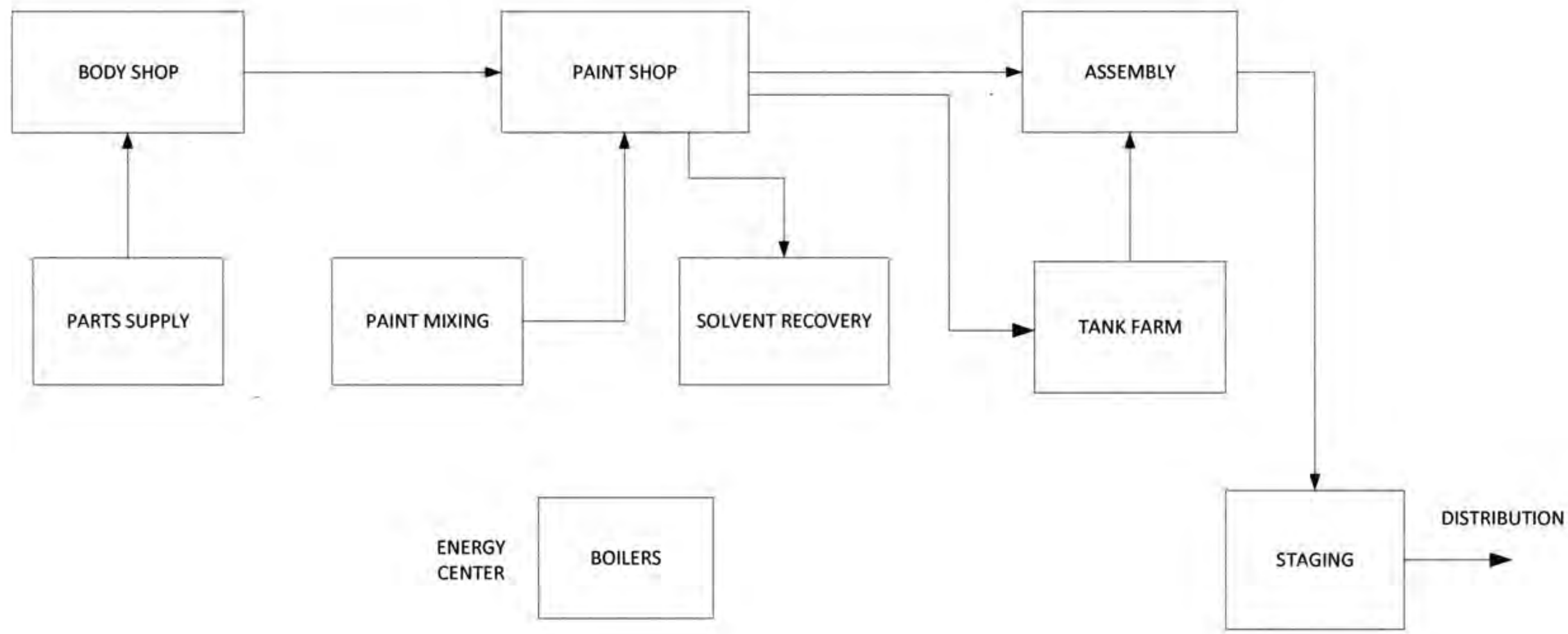
USGS Aerial Photograph
UTM Zone 17

Trinity Consultants



Step 3

VS31 vollind. 60.000 E/J
VS21 vollind. 30.000 E/J

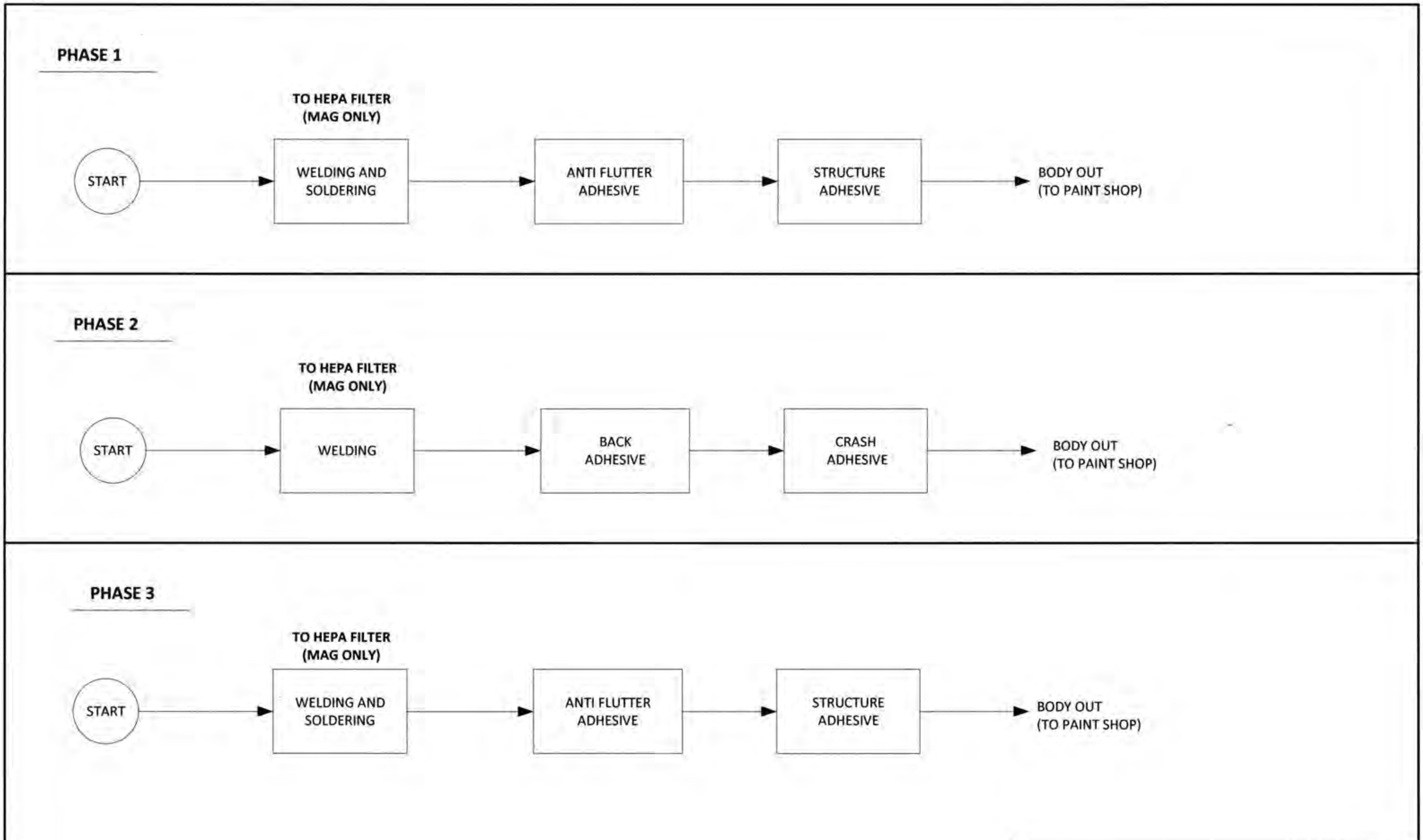


MERCEDES-BENZ VANS
Charleston Facility

Trinity Consultants

Facility
Block Flow Diagram
(All Phases)

February 2018

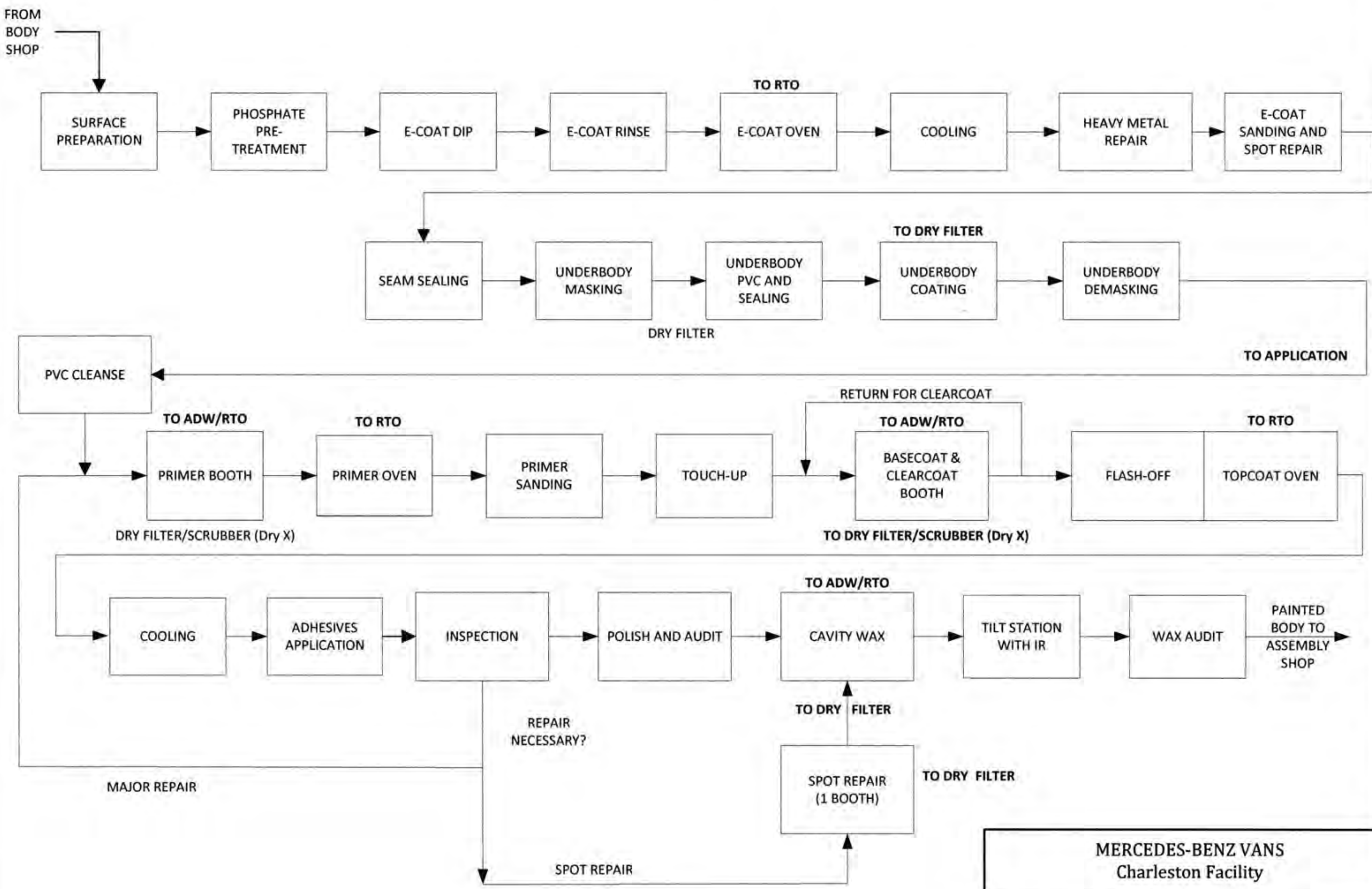


MERCEDES-BENZ VANS
Charleston Facility

Trinity Consultants

Body Shop
Block Flow Diagram
(All Phases)

February 201

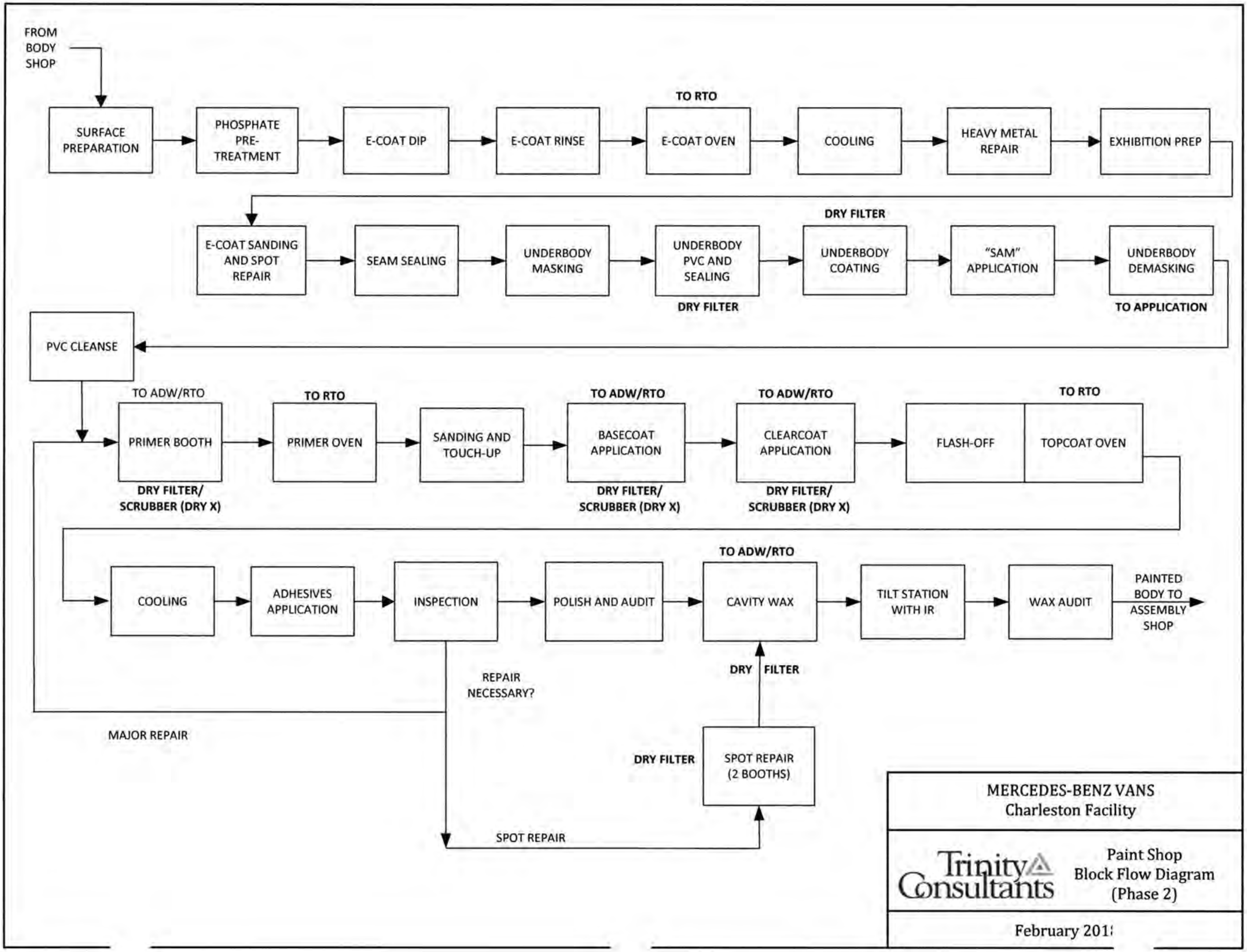


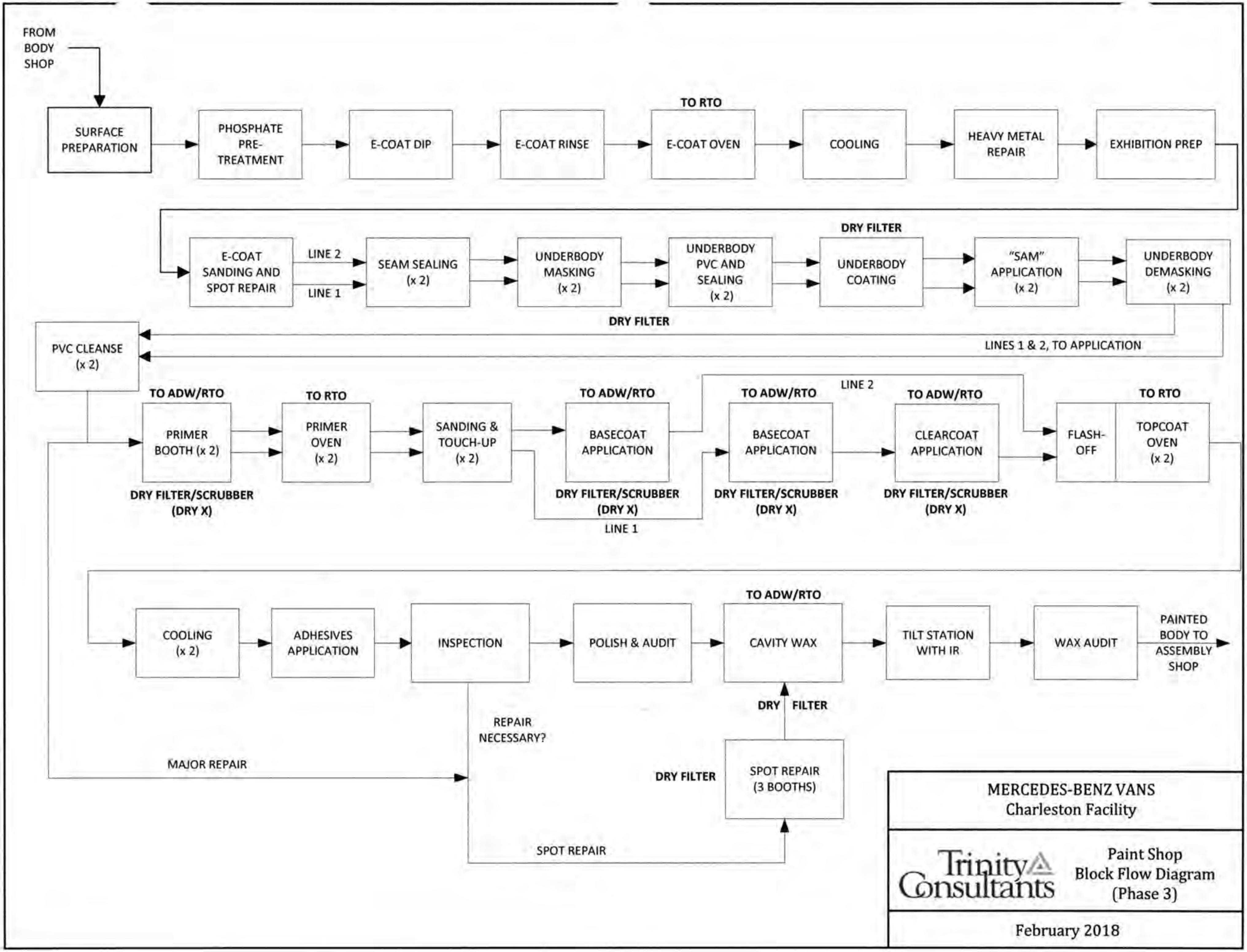
MERCEDES-BENZ VANS
Charleston Facility

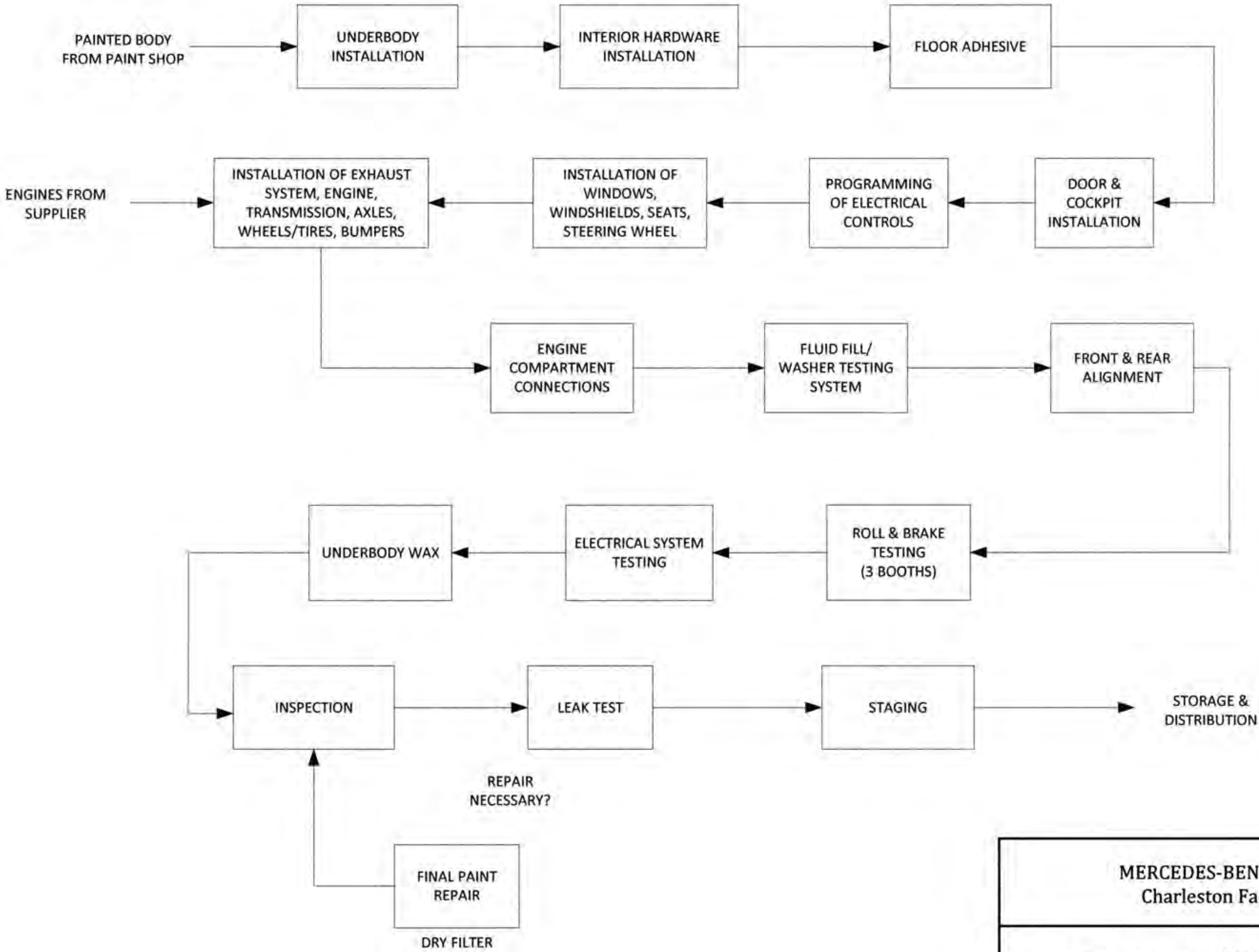
Trinity Consultants

Paint Shop
Block Flow Diagram
(Phase 1)

February 2018


FROM BODY SHOP
SURFACE PREPARATION
PHOSPHATE PRE-TREATMENT
E-COAT DIP
E-COAT RINSE
TO RTO
E-COAT OVEN
COOLING
HEAVY METAL REPAIR
EXHIBITION PREP
E-COAT SANDING AND SPOT REPAIR
SEAM SEALING
UNDERBODY MASKING
UNDERBODY PVC AND SEALING
DRY FILTER
DRY FILTER
UNDERBODY COATING
"SAM" APPLICATION
UNDERBODY DEMASKING
TO APPLICATION
PVC CLEANSE
TO ADW/RTO
PRIMER BOOTH
DRY FILTER/ SCRUBBER (DRY X)
TO RTO
PRIMER OVEN
SANDING AND TOUCH-UP
TO ADW/RTO
BASECOAT APPLICATION
DRY FILTER/ SCRUBBER (DRY X)
TO ADW/RTO
CLEARCOAT APPLICATION
DRY FILTER/ SCRUBBER (DRY X)
FLASH-OFF
TO RTO
TOPCOAT OVEN
COOLING
ADHESIVES APPLICATION
INSPECTION
POLISH AND AUDIT
TO ADW/RTO
CAVITY WAX
TILT STATION WITH IR
WAX AUDIT
PAINTED BODY TO ASSEMBLY SHOP
REPAIR NECESSARY?
DRY FILTER
MAJOR REPAIR
DRY FILTER
SPOT REPAIR (2 BOOTHS)
SPOT REPAIR
MERCEDES-BENZ VANS
Charleston Facility
Trinity Consultants
Paint Shop
Block Flow Diagram
(Phase 2)
February 201


FROM BODY SHOP
SURFACE PREPARATION
PHOSPHATE PRE-TREATMENT
E-COAT DIP
E-COAT RINSE
TO RTO
E-COAT OVEN
COOLING
HEAVY METAL REPAIR
EXHIBITION PREP
E-COAT SANDING AND SPOT REPAIR
LINE 2
LINE 1
SEAM SEALING (x 2)
UNDERBODY MASKING (x 2)
UNDERBODY PVC AND SEALING (x 2)
DRY FILTER
DRY FILTER
UNDERBODY COATING
"SAM" APPLICATION (x 2)
UNDERBODY DEMASKING (x 2)
LINES 1 & 2, TO APPLICATION
PVC CLEANSE (x 2)
TO ADW/RTO
PRIMER BOOTH (x 2)
DRY FILTER/SCRUBBER (DRY X)
TO RTO
PRIMER OVEN (x 2)
SANDING & TOUCH-UP (x 2)
TO ADW/RTO
BASECOAT APPLICATION
DRY FILTER/SCRUBBER (DRY X)
LINE 2
LINE 1
TO ADW/RTO
BASECOAT APPLICATION
DRY FILTER/SCRUBBER (DRY X)
TO ADW/RTO
CLEARCOAT APPLICATION
DRY FILTER/SCRUBBER (DRY X)
FLASH-OFF
TO RTO
TOPCOAT OVEN (x 2)
COOLING (x 2)
ADHESIVES APPLICATION
INSPECTION
POLISH & AUDIT
TO ADW/RTO
CAVITY WAX
TILT STATION WITH IR
WAX AUDIT
PAINTED BODY TO ASSEMBLY SHOP
REPAIR NECESSARY?
MAJOR REPAIR
DRY FILTER
DRY FILTER
SPOT REPAIR (3 BOOTHS)
SPOT REPAIR
MERCEDES-BENZ VANS
Charleston Facility
Trinity Consultants
Paint Shop
Block Flow Diagram
(Phase 3)
February 2018

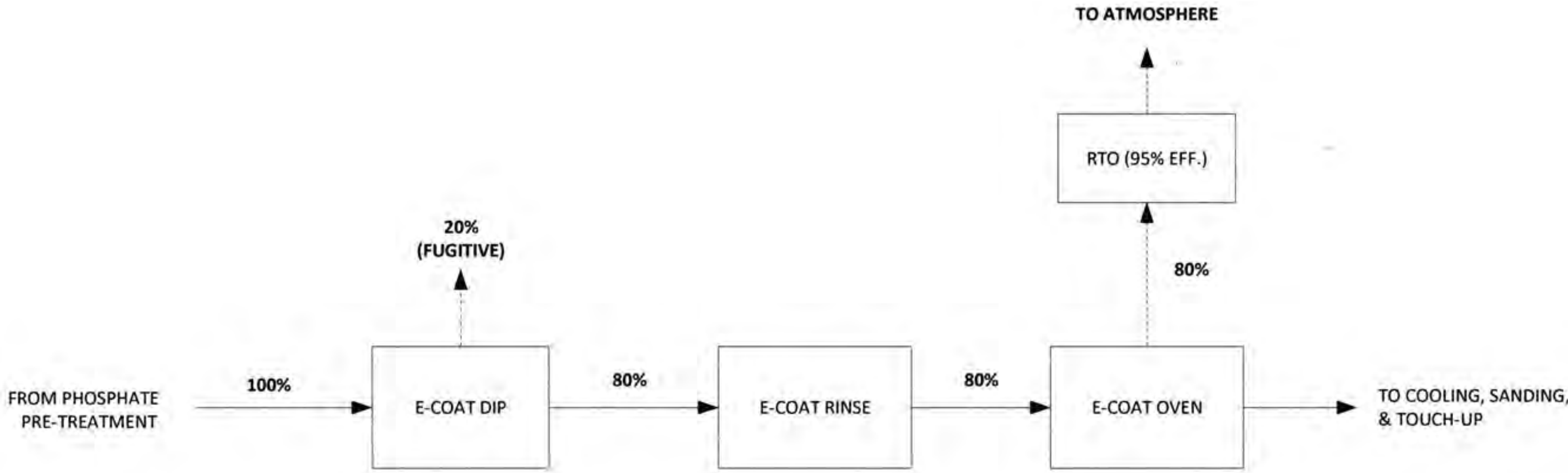


MERCEDES-BENZ VANS
Charleston Facility

Trinity Consultants

Assembly Shop Block Flow Diagram (All Phases)

February 201

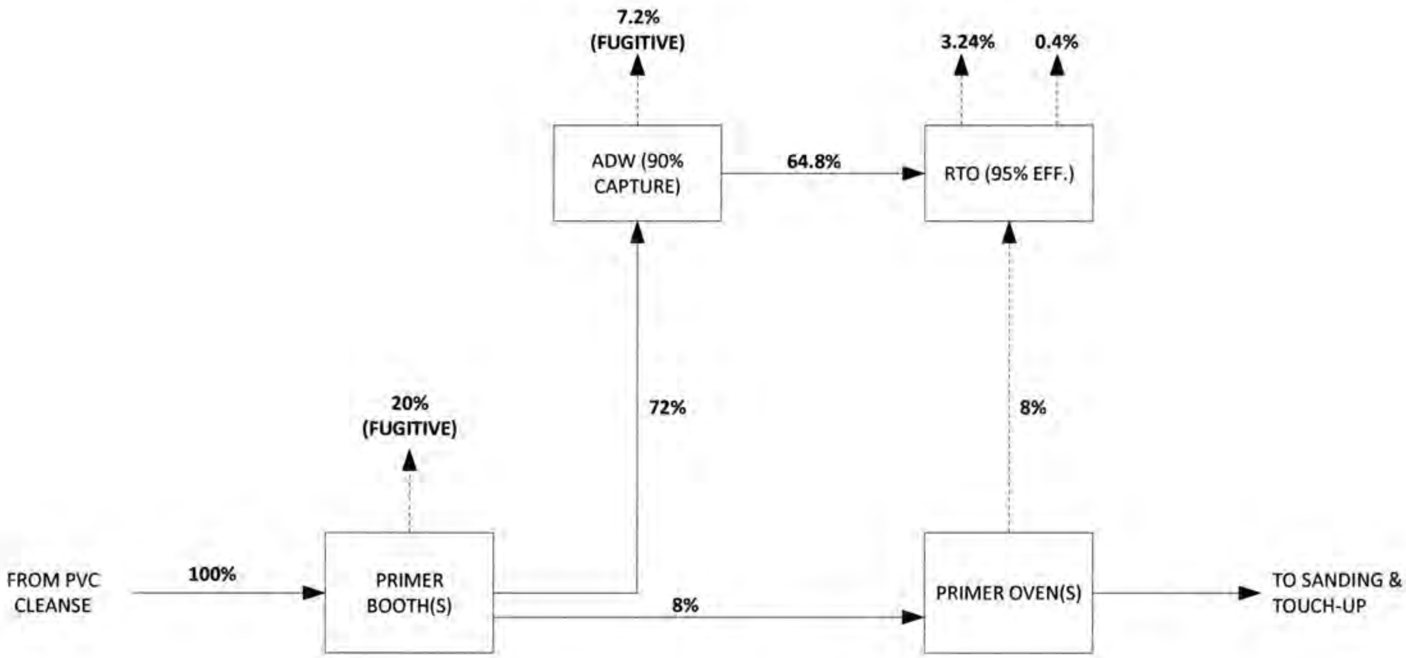


MERCEDES-BENZ VANS
Charleston Facility

Trinity Consultants

E-Coat VOC Capture and Control Block Flow Diagram (All Phases)

February 2018

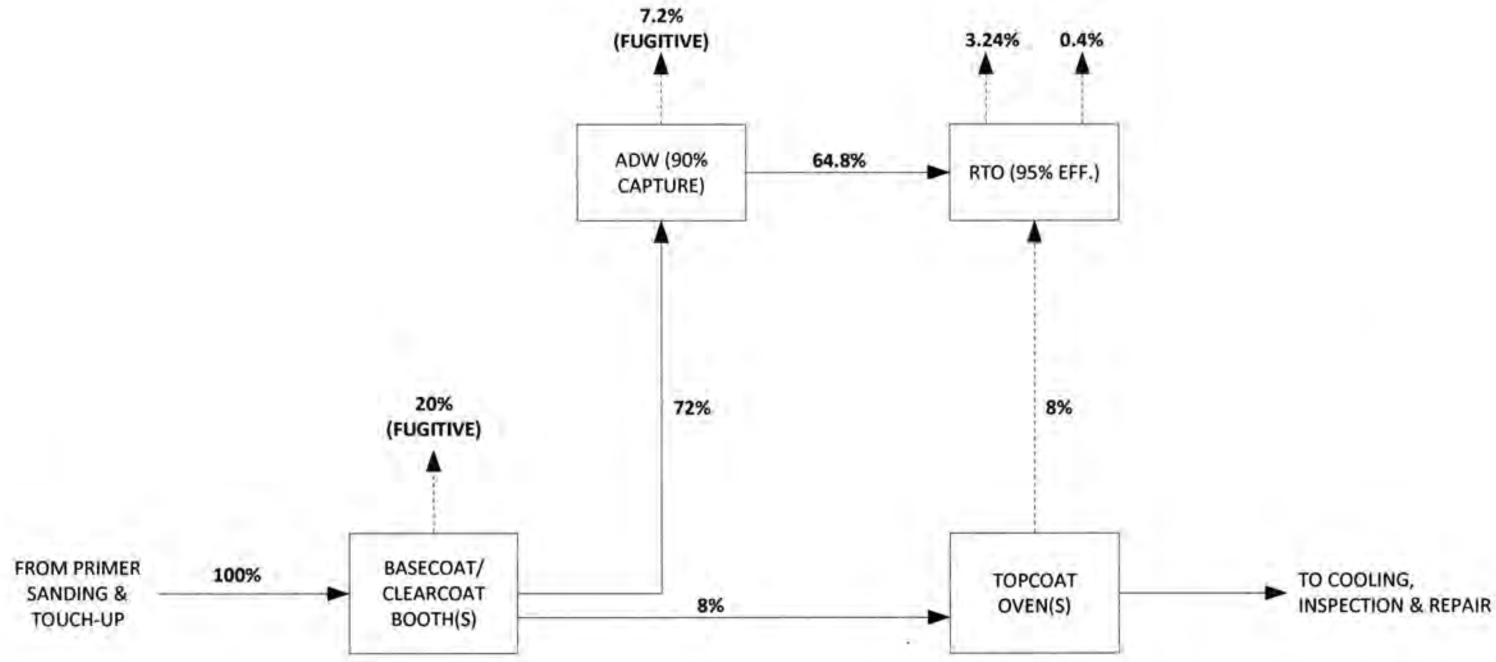


MERCEDES-BENZ VANS
Charleston Facility

Trinity Consultants

Primer VOC Capture and Control Block Flow Diagram (All Phases)

February 201

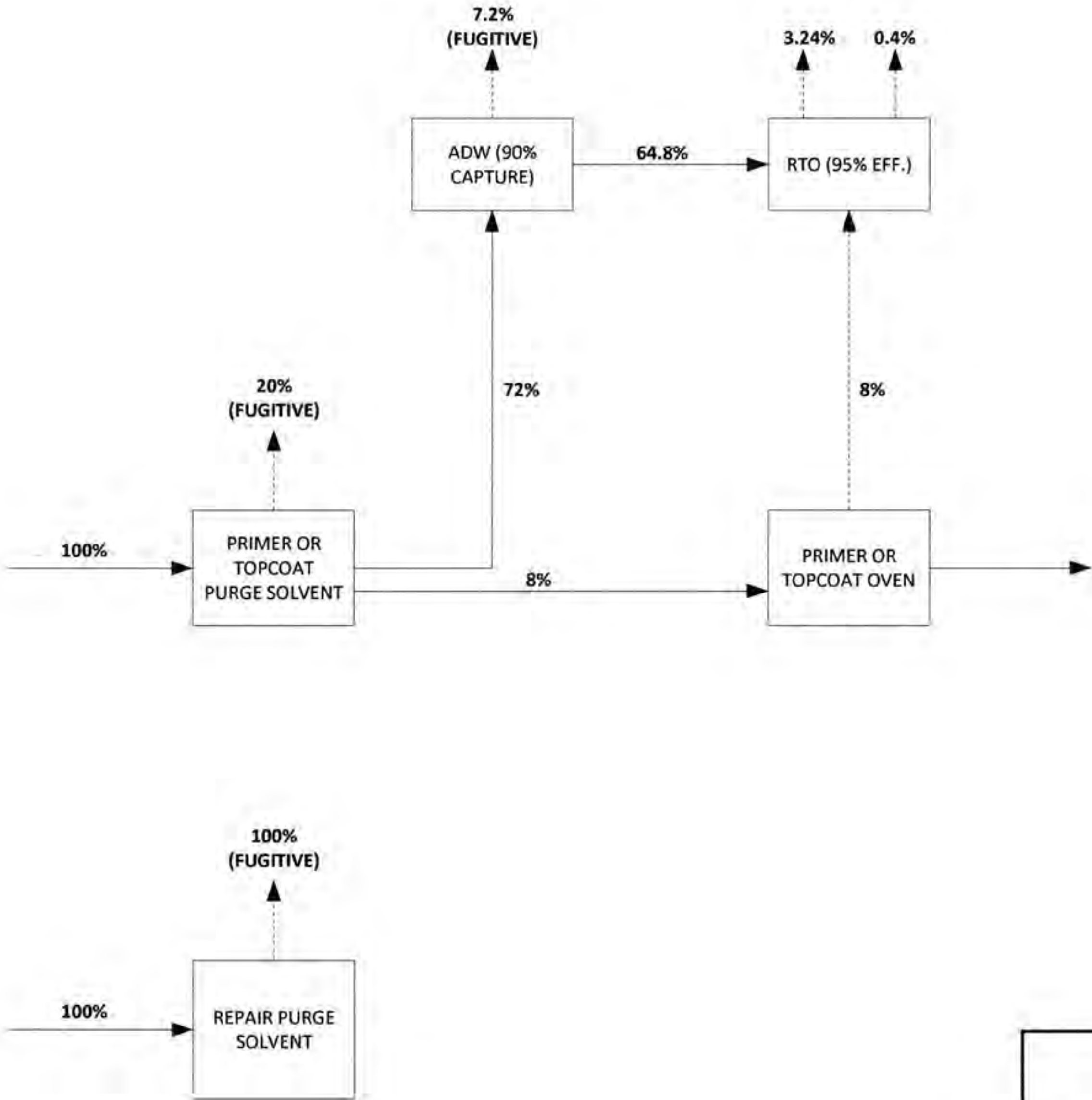


MERCEDES-BENZ VANS
Charleston Facility

Trinity Consultants

Basecoat/Clearcoat VOC Capture and Control Block Flow Diagram (All Phases)

February 2018

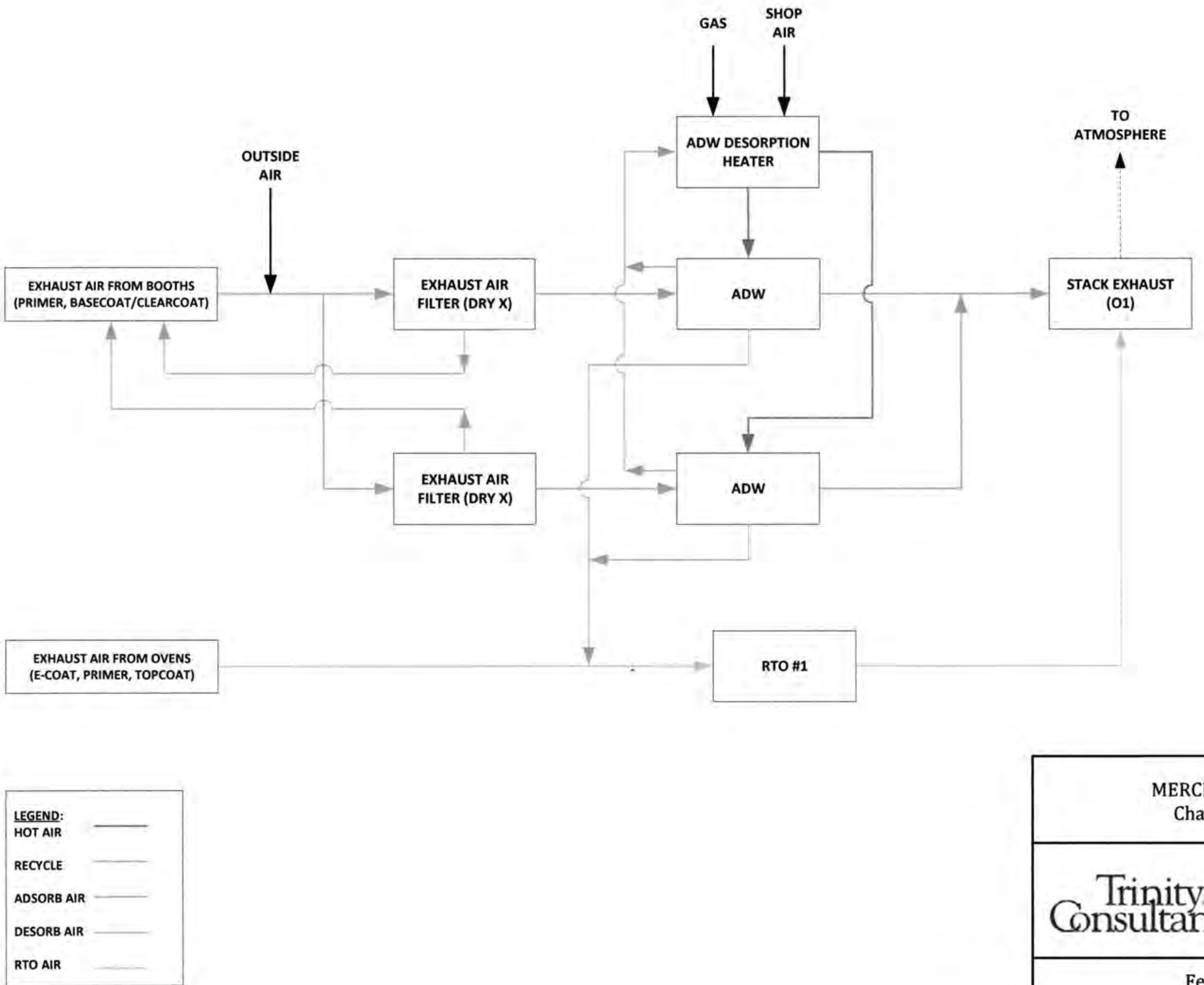


MERCEDES-BENZ VANS
Charleston Facility

Trinity Consultants

Purge/Cleaning Solvent VOC Capture and Control Block Flow Diagram (All Phases)

February 201

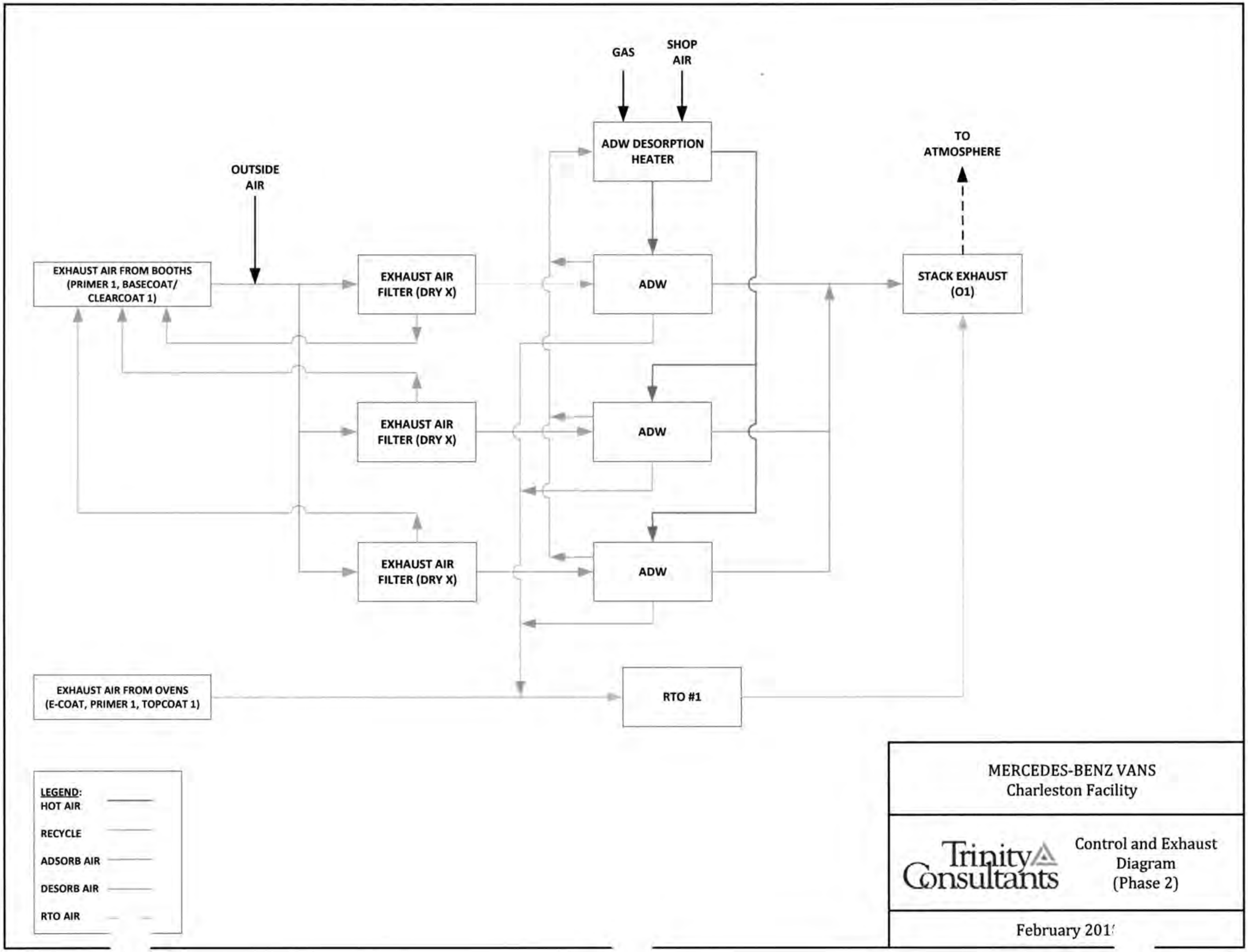


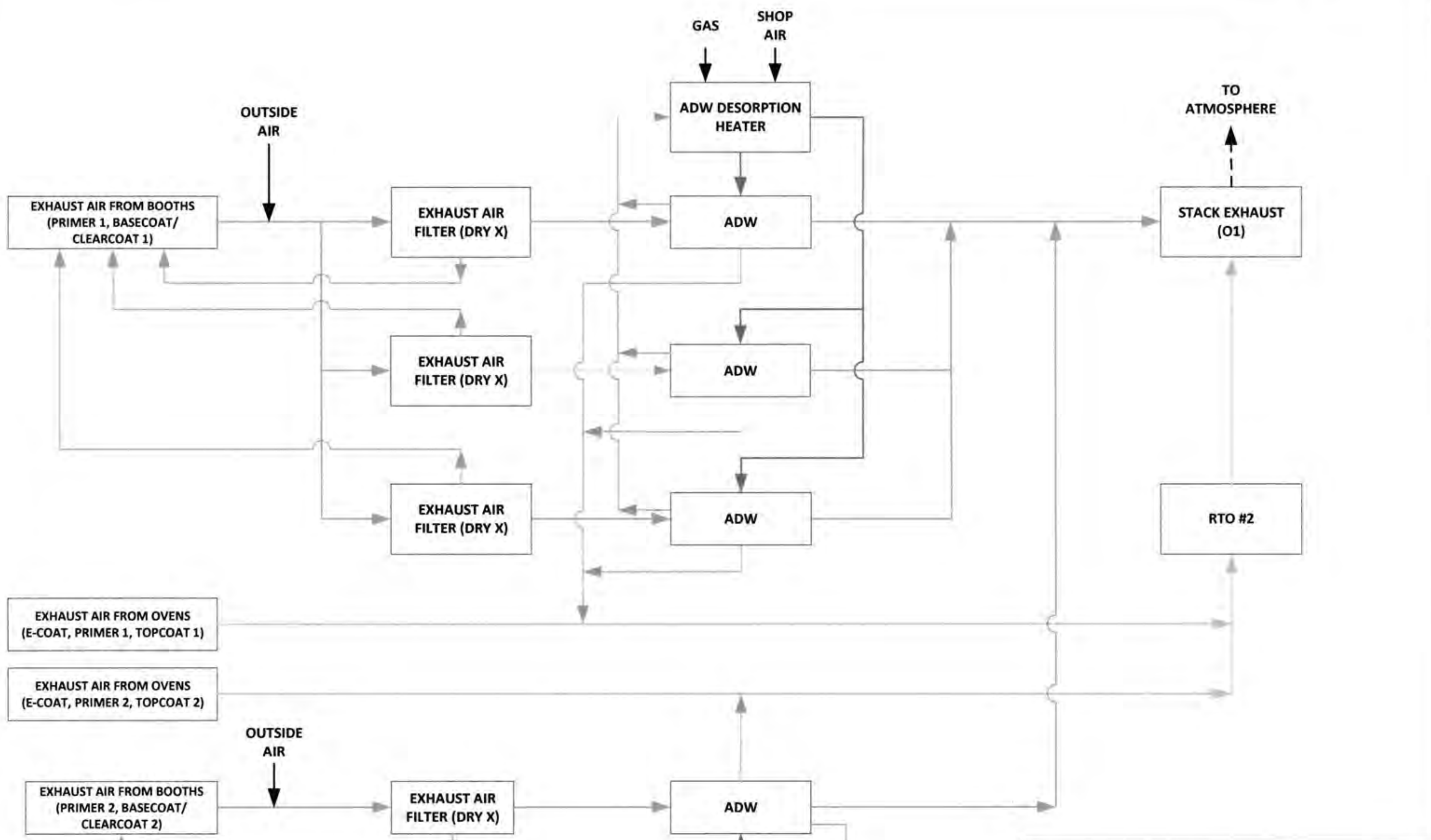
MERCEDES-BENZ VANS
Charleston Facility

Trinity Consultants

Control and Exhaust Diagram (Phase 1)

February 2018


GAS
SHOP AIR
ADW DESORPTION HEATER
TO ATMOSPHERE
OUTSIDE AIR
EXHAUST AIR FROM BOOTHS (PRIMER 1, BASECOAT/ CLEARCOAT 1)
EXHAUST AIR FILTER (DRY X)
ADW
STACK EXHAUST (O1)
EXHAUST AIR FILTER (DRY X)
ADW
EXHAUST AIR FILTER (DRY X)
ADW
EXHAUST AIR FROM OVENS (E-COAT, PRIMER 1, TOPCOAT 1)
RTO #1
LEGEND:
HOT AIR
RECYCLE
ADSORB AIR
DESORB AIR
RTO AIR
MERCEDES-BENZ VANS
Charleston Facility
Trinity Consultants
Control and Exhaust Diagram (Phase 2)
February 201



MERCEDES-BENZ VANS
Charleston Facility

Trinity Consultants

Control and Exhaust Diagram (Phase 3)

February 2018

APPENDIX B: DETAILED EMISSION CALCULATIONS

PSD Permit Application - Phase 3 Emission Calculations

Mercedes-Benz Vans, LLC
Charleston, South Carolina Facility

Facility-wide Potential Emissions

	Uncontrolled Emissions		Controlled Emissions	
Pollutants	lb/hr	tpy	lb/hr	tpy
PM	309.96	1,160.26	6.39	21.94
PM_{10}	308.29	1,153.06	4.73	14.73
$PM_{2.5}$	307.99	1,151.75	4.43	13.43
SO_2	1.79	0.79	1.79	0.79
CO	30.37	57.76	30.37	57.76
NO_X	30.78	35.42	30.78	35.42
VOC	809.12	2,950.29	274.72	955.85
Lead	9.69E-05	3.10E-04	9.69E-05	3.10E-04
CO_2e	24,187	74,999	24,187	74,999
CO_2	24,157	74,909	24,157	74,909
CH_4	0.56	1.81	0.56	1.81
N_2O	0.05	0.15	0.05	0.15

Facility-wide Potential HAP/TAP Emissions

	Total Emissions	
Pollutants	lb/hr	tpy
2-Methylnaphthalene	4.65E-06	1.49E-05
3-Methylchloranthrene	3.49E-07	1.12E-06
7,12-Dimethylbenz(a)anthracene	3.10E-06	9.92E-06
Acenaphthene	3.49E-07	1.12E-06
Acenaphthylene	3.49E-07	1.12E-06
Anthracene	4.65E-07	1.49E-06
Benz(a)anthracene	3.49E-07	1.12E-06
Benzene	5.29E-03	2.52E-03
Benzo(a)pyrene	2.33E-07	7.44E-07
Benzo(b)fluoranthene	3.49E-07	1.12E-06
Benzo(g,h,i)perylene	2.33E-07	7.44E-07
Benzo(k)fluoranthene	3.49E-07	1.12E-06
Butylglycol Acetate	4.65E-01	1.74E+00
Chrysene	3.49E-07	1.12E-06
Isopropylbenzene (Cumene)	1.55E-01	5.80E-01
Dibenzo(a,h)anthracene	2.33E-07	7.44E-07
Dichlorobenzene	2.33E-04	7.44E-04
Ethyl Benzene	3.10E-01	1.16E+00
Fluoranthene	5.81E-07	1.86E-06
Fluorene	5.43E-07	1.74E-06
Formaldehyde	1.95E-02	6.67E-02
Hexane	3.49E-01	1.12E+00
Indeno(1,2,3-cd)pyrene	3.49E-07	1.12E-06
Naphthalene	7.89E-04	5.46E-04
Phenanathrene	3.29E-06	1.05E-05
Pyrene	9.69E-07	3.10E-06
Toluene	2.57E-03	2.59E-03
Arsenic	3.88E-05	1.24E-04
Beryllium	2.33E-06	7.44E-06
Cadmium	2.13E-04	6.82E-04
Chromium	2.71E-04	8.68E-04
Cobalt	1.63E-05	5.21E-05
Lead	9.69E-05	3.10E-04
Manganese	6.39E-04	2.35E-03
Mercury	5.04E-05	1.61E-04
Nickel	4.07E-04	1.30E-03
Selenium	4.65E-06	1.49E-05
Xylene	1.09E+00	4.06E+00
Acetaldehyde	2.54E-04	6.35E-05
Acrolein	2.20E-04	5.51E-05
Total PAH	1.15E-03	2.89E-04
Methyl Ethyl Ketone	3.09E+00	1.35E+01
Acrylic acid	3.48E-02	1.53E-01
Methanol	7.59E-01	3.32E+00
Ethylene Glycol	1.06E+00	4.62E+00
Total HAP [a]	94.89	358.18

[a] Includes total HAP from paint shop and purge solvent.

Facility-wide Potential Emissions and PSD Applicability

Pollutants	Project Emissions (tpy)	PSD Significant Emission Rates (tpy)	PSD Permitting Required? (Yes/No)
PM	21.94	25	No
PM_{10}	14.73	15	No
$PM_{2.5}$	13.43	10	**Yes**
SO_2	0.79	40	No
CO	57.76	100	No
NO_X	35.42	40	No
VOC	955.85	40	**Yes**
H_2SO_4	0.00E+00	7	No
Fluorides	0.00E+00	3	No
Lead	3.10E-04	0.6	No
CO_2e	74,999	75,000	No

[a] Mercedes-Benz Vans has chosen to request a 75,000 tpy synthetic minor limit on greenhouse gas emissions (CO_2e) to remain below the PSD significant emission rate.

Inputs

Phase	Paint Shop Operation (days/yr)	Assembly Operation (days/yr)	Paint Shop/Body Shop Throughput			Assembly Throughput [a]		
			(units/hr)	(units/day)	(units/yr)	(units/hr)	(units/day)	(units/yr)
Phase 3	312	365	17	400	124,800	19	450	164,250

[a] Assembly throughput includes existing re-assembly throughput as well as proposed expansion throughput.

Daily Operation
24 hours/day

Combustion Average Utilization [b]	
Percent	Hours of Operation
69.3%	6,072

[b] Average combustion unit utilization for boiler, air supply units, and assembly oven is based on calculated utilization needed to remain below the proposed 75,000 tpy synthetic minor limit on greenhouse gas emissions (CO_2e). Paint shop RTO, ovens, and ADW desorb heater utilization is based on paint shop hours of operation. Mercedes-Benz Vans is not requesting utilization limits for individual emission units.

Hours of Operation [e] 6,072 hrs

Boiler Information

Equipment	Heat Input Capacity MMBtu/hr
Boiler 1 (B01)	14.27
Boiler 2 (B02)	14.27

Boiler Natural Gas Emission Factors

Pollutant	Emission Factor [a,b,c] lb/MMBtu
PM [d]	0.0074
SO_2	0.0006
CO	0.0819
NO_X	0.0360
VOC	0.0054
CO_2e	
CO_2	117.00
CH_4	2.21E-03
N_2O	2.21E-04

[a] Emission factors are from AP-42, Table 1.4-1 and 1.4-2 for small boilers with low NO_X burners. NO_X emission factor is from SC Standard No. 5.2, Section III, Table 1.
[b] Emission factors calculated using the default natural gas heating value of 1,026 Btu/scf from 40 CFR 98.
[c] Emission factors from 40 CFR 98, Subpart C, Tables C-1 and C-2. Factors were converted to lb/MMBtu.
[d] PM_{10} and $PM_{2.5}$ are assumed to be equal to PM for natural gas combustion.

Boilers Non-HAP Potential Emissions

Pollutant	Emission Rates [e]					
	B01		B02		Total	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
$PM/PM_{10}/PM_{2.5}$	0.11	0.32	0.11	0.32	0.21	0.64
SO_2	0.01	0.03	0.01	0.03	0.02	0.05
CO	1.17	3.55	1.17	3.55	2.34	7.09
NO_X	0.51	1.56	0.51	1.56	1.03	3.12
VOC	0.08	0.23	0.08	0.23	0.15	0.46
CO_2e	1,671	5,074	1,671	5,074	3,343	10,148
CO_2	1,670	5,069	1670	5,069	3,339	10,138
CH_4	0.03	0.10	0.03	0.10	0.06	0.19
N_2O	0.003	0.01	0.00	0.01	0.01	0.02

[e] Annual emissions are based on calculated hours of operation needed to remain below the proposed 75,000 tpy synthetic minor limit on greenhouse gas emissions (CO_2e). Mercedes-Benz Vans is not requesting limits on hours of operation for individual emission units.

Appendix B.3.2 - Boilers

Mercedes-Benz Vans, LLC

Boilers HAP/TAP Potential Emissions

Pollutant	Emission Factor [a] lb/MMscf	Boilers Total lb/hr	Boilers Total tpy
2-Methylnaphthalene	2.4E-05	6.7E-07	2.0E-06
3-Methylchloranthrene	1.8E-06	5.0E-08	1.5E-07
7,12-Dimethylbenz(a)anthracene	1.6E-05	4.5E-07	1.4E-06
Acenaphthene	1.8E-06	5.0E-08	1.5E-07
Acenaphthylene	1.8E-06	5.0E-08	1.5E-07
Anthracene	2.4E-06	6.7E-08	2.0E-07
Benz(a)anthracene	1.8E-06	5.0E-08	1.5E-07
Benzene	2.1E-03	5.8E-05	1.8E-04
Benzo(a)pyrene	1.2E-06	3.3E-08	1.0E-07
Benzo(b)fluoranthene	1.8E-06	5.0E-08	1.5E-07
Benzo(g,h,i)perylene	1.2E-06	3.3E-08	1.0E-07
Benzo(k)fluoranthene	1.8E-06	5.0E-08	1.5E-07
Chrysene	1.8E-06	5.0E-08	1.5E-07
Dibenzo(a,h)anthracene	1.2E-06	3.3E-08	1.0E-07
Dichlorobenzene	1.2E-03	3.3E-05	1.0E-04
Fluoranthene	3.0E-06	8.3E-08	2.5E-07
Fluorene	2.8E-06	7.8E-08	2.4E-07
Formaldehyde	7.5E-02	2.1E-03	6.3E-03
Hexane	1.8E+00	5.0E-02	1.5E-01
Indeno(1,2,3-cd)pyrene	1.8E-06	5.0E-08	1.5E-07
Naphthalene	6.1E-04	1.7E-05	5.2E-05
Phenanathrene	1.7E-05	4.7E-07	1.4E-06
Pyrene	5.0E-06	1.4E-07	4.2E-07
Toluene	3.4E-03	9.5E-05	2.9E-04
Arsenic	2.0E-04	5.6E-06	1.7E-05
Beryllium	1.2E-05	3.3E-07	1.0E-06
Cadmium	1.1E-03	3.1E-05	9.3E-05
Chromium	1.4E-03	3.9E-05	1.2E-04
Cobalt	8.4E-05	2.3E-06	7.1E-06
Lead	5.0E-04	1.4E-05	4.2E-05
Manganese	3.8E-04	1.1E-05	3.2E-05
Mercury	2.6E-04	7.2E-06	2.2E-05
Nickel	2.1E-03	5.8E-05	1.8E-04
Selenium	2.4E-05	6.7E-07	2.0E-06

[a] Emission factors are from AP-42, Table 1.4-2, 1.4-3, and 1.4-4.

Air Supply and Rooftop Units - Natural Gas Emission Factors

Hours of Operation [e] 6,072 hrs

Pollutant		NG Emission Factors [a,b,c] (lb/MMBtu)
$PM/PM_{10}/PM_{2.5}$		0.0074
SO_2		0.0006
NO_X		0.0487
CO		0.0819
VOC		0.0054
CO_2e [d]		
	CO_2	117.00
	CH_4	2.21E-03
	N_2O	2.21E-04

[a] PM, SO_2, and VOC natural gas emission factors are from AP-42, Table 1.4-2, 07/98.

[b] NO_X and CO natural gas emission factors are from AP-42, Table 1.4-1, 07/98, Small Boilers w/ Low NO_X Control.

[c] The heating value of natural gas is assumed to be 1,026 Btu/scf.

[d] Emission factors from 40 CFR 98, Subpart C, Tables C-1 and C-2. Factors were converted to lb/MMBtu.

[e] Annual emissions are based on calculated hours of operation needed to remain below the proposed 75,000 tpy synthetic minor limit on greenhouse gas emissions (CO_2e). Mercedes-Benz Vans is not requesting limits on hours of operation for individual emission units.

Air Supply Units Non-HAP Emissions

			Emission Rates [e]																	
		Rated Capacity	$PM/PM_{10}/PM_{2.5}$		SO_2		NO_X		CO		VOC		CO_2		CH_4		N_2O		CO_2e	
Description	Equipment	(MMBtu/hr)	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
ASU Primer/BC/CC	ASU P/BC/CC	6.49	Routed to Dry X. See Dry X PM Emissions Table.		0.004	0.012	0.32	0.96	0.53	1.61	0.03	0.11	759.31	2,305	0.014	0.043	0.001	0.004	760.10	2,308
ASU 2.1 Shop + Open WD	ASU 2.1	10.00	0.07	0.22	0.006	0.018	0.49	1.48	0.82	2.49	0.05	0.16	1,169.97	3,552	0.022	0.067	0.002	0.007	1,171.18	3,556
ASU 3 - UBP + Repair	ASU 3	7.44	0.06	0.17	0.004	0.013	0.36	1.10	0.61	1.85	0.04	0.12	870.46	2,643	0.016	0.050	0.002	0.005	871.36	2,646
ASU 2.2 Shop + Open WD	ASU 2.2	10.00	0.07	0.22	0.006	0.018	0.49	1.48	0.82	2.49	0.05	0.16	1,169.97	3,552	0.022	0.067	0.002	0.007	1,171.18	3,556
ASU 1 - Spot Repair	ASU 1	4.82	0.04	0.11	0.003	0.009	0.23	0.71	0.39	1.20	0.03	0.08	563.93	1,712	0.011	0.032	0.001	0.003	564.51	1,714
ASU 2.3 Shop	ASU 2.3	10.00	0.07	0.22	0.006	0.018	0.49	1.48	0.82	2.49	0.05	0.16	1,169.97	3,552	0.022	0.067	0.0022	0.007	1,171.18	3,556
ASU 4 - Wax	ASU 4	4.84	0.04	0.11	0.003	0.009	0.24	0.72	0.40	1.20	0.03	0.08	566.27	1,719	0.011	0.032	0.001	0.003	566.85	1,721
Workdecks ASU 6 (Phase 2)	ASU 6	8.54	0.06	0.19	0.005	0.015	0.42	1.26	0.70	2.12	0.05	0.14	999.16	3,034	0.019	0.057	0.002	0.006	1,000.19	3,037
Workdecks ASU 5 (Phase 2)	ASU 5	5.83	0.04	0.13	0.003	0.010	0.28	0.86	0.48	1.45	0.03	0.09	682.09	2,071	0.013	0.039	0.0013	0.004	682.80	2,073
ASU Cleanroom (Phase 2)	ASU CR2	1.26	0.01	0.03	0.001	0.002	0.06	0.19	0.10	0.31	0.01	0.02	147.42	448	0.003	0.008	0.000	0.001	147.57	448
Primer Booth Air Supply Unit Phase 3	ASU31	7.57	Routed to Dry X. See Dry X PM Emissions Table.		0.004	0.013	0.37	1.12	0.62	1.88	0.04	0.12	885.67	2,689	0.017	0.051	0.002	0.005	886.58	2,692
BC Booth Air Supply Unit Phase 3	ASU32	7.68			0.004	0.014	0.37	1.14	0.63	1.91	0.04	0.12	898.54	2,728	0.017	0.051	0.002	0.005	899.47	2,731
Workdecks Air Supply Unit 1 Phase 3	ASU33	4.96	0.04	0.11	0.003	0.009	0.24	0.73	0.41	1.23	0.03	0.08	580.31	1,762	0.011	0.033	0.001	0.003	580.91	1,764
Workdecks Air Supply Unit 2 Phase 3	ASU34	2.56	0.02	0.06	0.001	0.005	0.12	0.38	0.21	0.64	0.01	0.04	299.51	909	0.006	0.017	0.001	0.002	299.82	910
Workdecks Air Supply Unit 3 Phase 3	ASU35	8.05	0.06	0.18	0.005	0.014	0.39	1.19	0.66	2.00	0.04	0.13	941.83	2,859	0.018	0.054	0.002	0.005	942.80	2,862
Shop Ventilation Air Supply Unit Phase 3	ASU36	3.07	0.02	0.07	0.002	0.005	0.15	0.45	0.25	0.76	0.02	0.05	359.18	1,091	0.007	0.021	0.001	0.002	359.55	1,092
Social Rooms Air Supply Unit Phase 3	ASU37	1.53	0.01	0.03	0.001	0.003	0.07	0.23	0.13	0.38	0.01	0.02	179.01	543	0.003	0.010	0.000	0.001	179.19	544
ASU Total		**104.64**	**0.61**	**1.86**	**0.06**	**0.19**	**5.10**	**15.48**	**8.57**	**26.01**	**0.56**	**1.70**	**12,243**	**37,170**	**0.23**	**0.70**	**0.02**	**0.07**	**12,255**	**37,208**

Rooftop Units Non-HAP Emissions

Description	Equipment	Rated Capacity (MMBtu/hr)	Emission Rates [e] PM/PM$_{10}$/PM$_{2.5}$		SO_2		NO_X		CO		VOC		CO_2		CH_4		N_2O		CO_2e	
			lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
Assembly - Rooftop Unit 1	AS-RTU01	0.80	5.93E-03	1.80E-02	4.68E-04	1.42E-03	3.90E-02	1.18E-01	6.55E-02	1.99E-01	4.29E-03	1.30E-02	93.60	284	1.76E-03	5.36E-03	1.76E-04	5.36E-04	93.69	284
Assembly - Rooftop Unit 4	AS-RTU04	0.80	5.93E-03	1.80E-02	4.68E-04	1.42E-03	3.90E-02	1.18E-01	6.55E-02	1.99E-01	4.29E-03	1.30E-02	93.60	284	1.76E-03	5.36E-03	1.76E-04	5.36E-04	93.69	284
Assembly - Rooftop Unit 6	AS-RTU06	0.80	5.93E-03	1.80E-02	4.68E-04	1.42E-03	3.90E-02	1.18E-01	6.55E-02	1.99E-01	4.29E-03	1.30E-02	93.60	284	1.76E-03	5.36E-03	1.76E-04	5.36E-04	93.69	284
Assembly - Rooftop Unit 8	AS-RTU08	0.80	5.93E-03	1.80E-02	4.68E-04	1.42E-03	3.90E-02	1.18E-01	6.55E-02	1.99E-01	4.29E-03	1.30E-02	93.60	284	1.76E-03	5.36E-03	1.76E-04	5.36E-04	93.69	284
Assembly - Rooftop Unit 10	AS-RTU10	0.80	5.93E-03	1.80E-02	4.68E-04	1.42E-03	3.90E-02	1.18E-01	6.55E-02	1.99E-01	4.29E-03	1.30E-02	93.60	284	1.76E-03	5.36E-03	1.76E-04	5.36E-04	93.69	284
Assembly - Rooftop Unit 11	AS-RTU11	0.80	5.93E-03	1.80E-02	4.68E-04	1.42E-03	3.90E-02	1.18E-01	6.55E-02	1.99E-01	4.29E-03	1.30E-02	93.60	284	1.76E-03	5.36E-03	1.76E-04	5.36E-04	93.69	284
Assembly - Rooftop Unit 13	AS-RTU13	0.80	5.93E-03	1.80E-02	4.68E-04	1.42E-03	3.90E-02	1.18E-01	6.55E-02	1.99E-01	4.29E-03	1.30E-02	93.60	284	1.76E-03	5.36E-03	1.76E-04	5.36E-04	93.69	284
Body Shop - Rooftop Unit 1	BS-RTU01	0.80	5.93E-03	1.80E-02	4.68E-04	1.42E-03	3.90E-02	1.18E-01	6.55E-02	1.99E-01	4.29E-03	1.30E-02	93.60	284	1.76E-03	5.36E-03	1.76E-04	5.36E-04	93.69	284
Body Shop - Rooftop Unit 2	BS-RTU02	0.80	5.93E-03	1.80E-02	4.68E-04	1.42E-03	3.90E-02	1.18E-01	6.55E-02	1.99E-01	4.29E-03	1.30E-02	93.60	284	1.76E-03	5.36E-03	1.76E-04	5.36E-04	93.69	284
Body Shop - Rooftop Unit 4	BS-RTU04	0.80	5.93E-03	1.80E-02	4.68E-04	1.42E-03	3.90E-02	1.18E-01	6.55E-02	1.99E-01	4.29E-03	1.30E-02	93.60	284	1.76E-03	5.36E-03	1.76E-04	5.36E-04	93.69	284
Body Shop - Rooftop Unit 5	BS-RTU05	0.80	5.93E-03	1.80E-02	4.68E-04	1.42E-03	3.90E-02	1.18E-01	6.55E-02	1.99E-01	4.29E-03	1.30E-02	93.60	284	1.76E-03	5.36E-03	1.76E-04	5.36E-04	93.69	284
Body Shop - Rooftop Unit 6	BS-RTU06	0.80	5.93E-03	1.80E-02	4.68E-04	1.42E-03	3.90E-02	1.18E-01	6.55E-02	1.99E-01	4.29E-03	1.30E-02	93.60	284	1.76E-03	5.36E-03	1.76E-04	5.36E-04	93.69	284
Body Shop - Rooftop Unit 7	BS-RTU07	0.80	5.93E-03	1.80E-02	4.68E-04	1.42E-03	3.90E-02	1.18E-01	6.55E-02	1.99E-01	4.29E-03	1.30E-02	93.60	284	1.76E-03	5.36E-03	1.76E-04	5.36E-04	93.69	284
Body Shop - Rooftop Unit 10	BS-RTU10	0.80	5.93E-03	1.80E-02	4.68E-04	1.42E-03	3.90E-02	1.18E-01	6.55E-02	1.99E-01	4.29E-03	1.30E-02	93.60	284	1.76E-03	5.36E-03	1.76E-04	5.36E-04	93.69	284
Body Shop - Rooftop Unit 17	BS-RTU17	0.80	5.93E-03	1.80E-02	4.68E-04	1.42E-03	3.90E-02	1.18E-01	6.55E-02	1.99E-01	4.29E-03	1.30E-02	93.60	284	1.76E-03	5.36E-03	1.76E-04	5.36E-04	93.69	284
Body Shop - Rooftop Unit 18	BS-RTU18	0.80	5.93E-03	1.80E-02	4.68E-04	1.42E-03	3.90E-02	1.18E-01	6.55E-02	1.99E-01	4.29E-03	1.30E-02	93.60	284	1.76E-03	5.36E-03	1.76E-04	5.36E-04	93.69	284
Body Shop - Rooftop Unit 23	BS-RTU23	0.80	5.93E-03	1.80E-02	4.68E-04	1.42E-03	3.90E-02	1.18E-01	6.55E-02	1.99E-01	4.29E-03	1.30E-02	93.60	284	1.76E-03	5.36E-03	1.76E-04	5.36E-04	93.69	284
Body Shop - Rooftop Unit 25	BS-RTU25	0.80	5.93E-03	1.80E-02	4.68E-04	1.42E-03	3.90E-02	1.18E-01	6.55E-02	1.99E-01	4.29E-03	1.30E-02	93.60	284	1.76E-03	5.36E-03	1.76E-04	5.36E-04	93.69	284
Body Shop - Rooftop Unit 26	BS-RTU26	0.80	5.93E-03	1.80E-02	4.68E-04	1.42E-03	3.90E-02	1.18E-01	6.55E-02	1.99E-01	4.29E-03	1.30E-02	93.60	284	1.76E-03	5.36E-03	1.76E-04	5.36E-04	93.69	284
Body Shop - Rooftop Unit 30	BS-RTU30	0.80	5.93E-03	1.80E-02	4.68E-04	1.42E-03	3.90E-02	1.18E-01	6.55E-02	1.99E-01	4.29E-03	1.30E-02	93.60	284	1.76E-03	5.36E-03	1.76E-04	5.36E-04	93.69	284
Body Shop - Rooftop Unit 32	BS-RTU32	0.80	5.93E-03	1.80E-02	4.68E-04	1.42E-03	3.90E-02	1.18E-01	6.55E-02	1.99E-01	4.29E-03	1.30E-02	93.60	284	1.76E-03	5.36E-03	1.76E-04	5.36E-04	93.69	284
Body Shop - Rooftop Unit 33	BS-RTU33	0.80	5.93E-03	1.80E-02	4.68E-04	1.42E-03	3.90E-02	1.18E-01	6.55E-02	1.99E-01	4.29E-03	1.30E-02	93.60	284	1.76E-03	5.36E-03	1.76E-04	5.36E-04	93.69	284
Body Shop - Rooftop Unit 35	BS-RTU35	0.80	5.93E-03	1.80E-02	4.68E-04	1.42E-03	3.90E-02	1.18E-01	6.55E-02	1.99E-01	4.29E-03	1.30E-02	93.60	284	1.76E-03	5.36E-03	1.76E-04	5.36E-04	93.69	284
RTU Total		18.40	1.36E-01	4.14E-01	1.08E-02	3.27E-02	8.97E-01	2.72E+00	1.51E+00	4.57E+00	9.86E-02	2.99E-01	2,152.75	6,536	4.06E-02	1.23E-01	4.06E-03	1.23E-02	2,154.97	6,543
ASU + RTU Total		**123.04**	**7.50E-01**	**2.28**	**7.20E-02**	**2.18E-01**	**6.00E+00**	**1.82E+01**	**1.01E+01**	**3.06E+01**	**6.60E-01**	**2.00**	**14,395**	**43,706**	**2.71E-01**	**8.24E-01**	**2.71E-02**	**8.24E-02**	**14,410**	**43,751**

[e] Annual emissions are based on calculated hours of operation needed to remain below the proposed 75,000 tpy synthetic minor limit on greenhouse gas emissions (CO_2e). Mercedes-Benz Vans is not requesting limits on hours of operation for individual emission units.

Hours of Operation [a]	6,072	hrs
Total Rated Capacity	123.04	MMBtu/hr

Air Supply and Rooftop Units HAP/TAP Emissions

Pollutants	NG Emission Factor [b]	HAP/TAP	
	$lb/10^6$ scf	lb/hr	tpy
2-Methylnaphthalene	2.40E-05	2.88E-06	8.74E-06
3-Methylchloranthrene	1.80E-06	2.16E-07	6.55E-07
7,12-Dimethylbenz(a)anthracene	1.60E-05	1.92E-06	5.83E-06
Acenaphthene	1.80E-06	2.16E-07	6.55E-07
Acenaphthylene	1.80E-06	2.16E-07	6.55E-07
Anthracene	2.40E-06	2.88E-07	8.74E-07
Benz(a)anthracene	1.80E-06	2.16E-07	6.55E-07
Benzene	2.10E-03	2.52E-04	7.65E-04
Benzo(a)pyrene	1.20E-06	1.44E-07	4.37E-07
Benzo(b)fluoranthene	1.80E-06	2.16E-07	6.55E-07
Benzo(g,h,i)perylene	1.20E-06	1.44E-07	4.37E-07
Benzo(k)fluoranthene	1.80E-06	2.16E-07	6.55E-07
Chrysene	1.80E-06	2.16E-07	6.55E-07
Dibenzo(a,h)anthracene	1.20E-06	1.44E-07	4.37E-07
Dichlorobenzene	1.20E-03	1.44E-04	4.37E-04
Fluoranthene	3.00E-06	3.60E-07	1.09E-06
Fluorene	2.80E-06	3.36E-07	1.02E-06
Formaldehyde	7.50E-02	8.99E-03	2.73E-02
Hexane	1.80E+00	2.16E-01	6.55E-01
Indeno(1,2,3-cd)pyrene	1.80E-06	2.16E-07	6.55E-07
Naphthalene	6.10E-04	7.32E-05	2.22E-04
Phenanathrene	1.70E-05	2.04E-06	6.19E-06
Pyrene	5.00E-06	6.00E-07	1.82E-06
Toluene	3.40E-03	4.08E-04	1.24E-03
Arsenic	2.00E-04	2.40E-05	7.28E-05
Beryllium	1.20E-05	1.44E-06	4.37E-06
Cadmium	1.10E-03	1.32E-04	4.01E-04
Chromium	1.40E-03	1.68E-04	5.10E-04
Cobalt	8.40E-05	1.01E-05	3.06E-05
Lead	5.00E-04	6.00E-05	1.82E-04
Manganese	3.80E-04	4.56E-05	1.38E-04
Mercury	2.60E-04	3.12E-05	9.47E-05
Nickel	2.10E-03	2.52E-04	7.65E-04
Selenium	2.40E-05	2.88E-06	8.74E-06

[a] Annual emissions are based on calculated hours of operation needed to remain below the proposed 75,000 tpy synthetic minor limit on greenhouse gas emissions (CO_2e). Mercedes-Benz Vans is not requesting limits on hours of operation for individual emission units.

[b] Natural Gas Emission Factors are from AP-42 Section 1.4, Tables 1.4-2, 1.4-3, and 1.4-4.

Paint Shop Combustion - Natural Gas Emission Factors

Hours of Operation [e] 7,488 hrs

Pollutant	NG Emission Factors [a,b,c] (lb/MMBtu)
$PM/PM_{10}/PM_{2.5}$	0.0074
SO_2	0.0006
NO_X	0.0487
CO	0.0819
VOC	0.0054
CO_2e [d]	
CO_2	117.00
CH_4	2.21E-03
N_2O	2.21E-04

[a] PM, SO_2, and VOC natural gas emission factors are from AP-42, Table 1.4-2, 07/98.
[b] NO_X and CO natural gas emission factors are from AP-42, Table 1.4-1, 07/98, Small Boilers w/ Low NO_X Control.
[c] The heating value of natural gas is assumed to be 1,026 Btu/scf.
[d] Emission factors from 40 CFR 98, Subpart C, Tables C-1 and C-2. Factors were converted to lb/MMBtu.

Paint Shop Combustion Non-HAP Emissions

			Emission Rates [e]																	
		Rated Capacity	$PM/PM_{10}/PM_{2.5}$		SO_2		NO_X		CO		VOC		CO_2		CH_4		N_2O		CO_2e	
Description	Equipment	(MMBtu/hr)	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
RTO #1	RTO1	8.00	0.06	0.22	0.005	0.018	0.39	1.46	0.65	2.45	0.04	0.16	935.98	3,504	0.018	0.066	0.002	0.007	936.95	3,508
RTO #1 (add) [f]	RTO1	8.00	0.06	0.22	0.005	0.018	0.39	1.46	0.65	2.45	0.04	0.16	935.98	3,504	0.018	0.066	0.002	0.007	936.95	3,508
ADW Desorption Heater #1	ADH1	3.50	0.03	0.10	0.002	0.008	0.17	0.64	0.29	1.07	0.02	0.07	409.49	1,533	0.008	0.029	0.001	0.003	409.91	1,535
ADW Desorption Heater #2	ADH2	2.13	0.02	0.06	0.001	0.005	0.10	0.39	0.17	0.65	0.01	0.04	249.20	933	0.005	0.018	0.000	0.002	249.46	934
E-Coat Oven	OV01	4.85	0.04	0.13	0.003	0.011	0.24	0.88	0.40	1.49	0.03	0.10	567.44	2,124	0.011	0.040	0.001	0.004	568.02	2,127
Primer (Guidecoat) Oven #1	OV02	4.30	0.03	0.12	0.003	0.009	0.21	0.78	0.35	1.32	0.02	0.09	503.09	1,884	0.009	0.035	0.001	0.004	503.61	1,886
Topcoat Oven #1	OV03	4.27	0.03	0.12	0.002	0.009	0.21	0.78	0.35	1.31	0.02	0.09	499.58	1,870	0.009	0.035	0.001	0.004	500.09	1,872
Primer (Guidecoat) Oven #2	OV22	5.12	0.04	0.14	0.003	0.011	0.25	0.93	0.42	1.57	0.03	0.10	599.03	2,243	0.011	0.042	0.001	0.004	599.64	2,245
Topcoat Oven #2	OV23	5.73	0.04	0.16	0.003	0.013	0.28	1.05	0.47	1.76	0.03	0.12	670.39	2,510	0.013	0.047	0.001	0.005	671.09	2,513
Total		**45.90**	**0.34**	**1.27**	**0.03**	**0.10**	**2.24**	**8.37**	**3.76**	**14.07**	**0.25**	**0.92**	**5,370.18**	**20,106**	**0.10**	**0.38**	**0.01**	**0.04**	**5,375.72**	**20,127**

[e] Annual emissions are based on paint shop hours of operation.
[f] Phase II or III RTO will replace Phase I RTO (RTO #1 @ 8 MMBtu/hr), with a new unit that has 8 MMBtu/hr additional heat input, for a total of 16 MMBtu/hr. Emissions include combustion emissions from both RTO #1 and RTO #1 (add).

Hours of Operation [a]	7,488	hrs
Total Rated Capacity	45.90	MMBtu/hr

Paint Shop Combustion HAP/TAP Emissions

Pollutants	NG Emission Factor [b] lb/10^6 scf	HAP/TAP	
		lb/hr	tpy
2-Methylnaphthalene	2.40E-05	1.07E-06	4.02E-06
3-Methylchloranthrene	1.80E-06	8.05E-08	3.01E-07
7,12-Dimethylbenz(a)anthracene	1.60E-05	7.16E-07	2.68E-06
Acenaphthene	1.80E-06	8.05E-08	3.01E-07
Acenaphthylene	1.80E-06	8.05E-08	3.01E-07
Anthracene	2.40E-06	1.07E-07	4.02E-07
Benz(a)anthracene	1.80E-06	8.05E-08	3.01E-07
Benzene	2.10E-03	9.39E-05	3.52E-04
Benzo(a)pyrene	1.20E-06	5.37E-08	2.01E-07
Benzo(b)fluoranthene	1.80E-06	8.05E-08	3.01E-07
Benzo(g,h,i)perylene	1.20E-06	5.37E-08	2.01E-07
Benzo(k)fluoranthene	1.80E-06	8.05E-08	3.01E-07
Chrysene	1.80E-06	8.05E-08	3.01E-07
Dibenzo(a,h)anthracene	1.20E-06	5.37E-08	2.01E-07
Dichlorobenzene	1.20E-03	5.37E-05	2.01E-04
Fluoranthene	3.00E-06	1.34E-07	5.02E-07
Fluorene	2.80E-06	1.25E-07	4.69E-07
Formaldehyde	7.50E-02	3.36E-03	1.26E-02
Hexane	1.80E+00	8.05E-02	3.01E-01
Indeno(1,2,3-cd)pyrene	1.80E-06	8.05E-08	3.01E-07
Naphthalene	6.10E-04	2.73E-05	1.02E-04
Phenanathrene	1.70E-05	7.61E-07	2.85E-06
Pyrene	5.00E-06	2.24E-07	8.37E-07
Toluene	3.40E-03	1.52E-04	5.69E-04
Arsenic	2.00E-04	8.95E-06	3.35E-05
Beryllium	1.20E-05	5.37E-07	2.01E-06
Cadmium	1.10E-03	4.92E-05	1.84E-04
Chromium	1.40E-03	6.26E-05	2.34E-04
Cobalt	8.40E-05	3.76E-06	1.41E-05
Lead	5.00E-04	2.24E-05	8.37E-05
Manganese	3.80E-04	1.70E-05	6.36E-05
Mercury	2.60E-04	1.16E-05	4.35E-05
Nickel	2.10E-03	9.39E-05	3.52E-04
Selenium	2.40E-05	1.07E-06	4.02E-06

[a] Annual emissions are based on paint shop hours of operation.

[b] Natural Gas Emission Factors are from AP-42 Section 1.4, Tables 1.4-2, 1.4-3, and 1.4-4.

Coating Throughput Information

	# of Units	Notes
Paint Shop Bodies per Year	**124,800**	Based on maximum daily throughput and days of operation per year
Major Repair Equivalent Bodies per Year	**12,480**	Major repair area assumed to be equivalent to 10% of the total vehicle throughput.
Total Paint Shop Equivalent Bodies per Year	**137,280**	Based on total of maximum daily throughput and major repair area throughput.
Total Parts per Year	**3,744**	Parts painted area assumed to be equivalent to 3% of the total vehicle throughput.
Assembly Bodies per Year	**164,250**	Based on maximum daily throughput and days of operation per year
Operating Hours per year	**7,488**	Based on facility operating 24 hours/day and days of operation per year.

Coating Emission Calculations

Process	Parts: Application Rate	Split	Bodies: Application Rate	Material Data: Coating Density	Material Data: Coating Usage	VOC In	VOC In	VOC Capture & Control: Dip Tank Split	VOC Capture & Control: Oven Split	VOC Capture & Control: RTO Eff.	VOC Emissions: Emissions from Dip Tank	VOC Emissions: Emissions from Oven	VOC Emissions: Controlled VOC Emissions	Controlled VOC Emissions	Controlled VOC Emissions	PM/PM₁₀/PM₂.₅: Volume Solids	PM: Transfer Eff.	PM: Uncontrolled PM Emissions	Uncontrolled PM Emissions	PM: Control Eff.	PM: Controlled PM Emissions	Controlled PM Emissions	lb/GACS: GACS per year	lb/GACS: lbs VOC/ GACS
	A_1		A_2	B	C [a]	D	E=C x D	F	G	H	I [b]	J [c]	K [d]	L = I + J	M	N	O	P [d]	Q	R	S [d]	T [e]	U [f]	V [g]
	gal/unit		gal/unit	lb/gal	gal/yr	lb/gal	tpy	%	%	%	lb/yr	lb/yr	lb/hr	lb/yr	tpy	%	%	lb/hr	tpy	%	lb/hr	tpy		
E-Coat (Emulsion) [h]	2.910		2.910	8.84	410,380	0.1051	21.56	20%	80%	95%	8,622	1,724	1.38	10,346	5.17	32.1%	100%	0.00	0.00	0.0%	0.00	0.00	131,732	
E-Coat (Pigment Paste) [h]	0.780		0.780	10.59	109,999	1.2686	69.77	20%	80%	95%	27,910	5,582	4.47	33,491	16.75	31.13%	100%	0.00	0.00	0.0%	0.00	0.00	34,243	
E-Coat Total							**91.33**				**36,532**	**7,306**	**5.85**	**43,838**	**21.92**			**0.00**	**0.00**		**0.00**	**0.00**	**165,975**	**0.26**
HVLP Robots Interior [i]	0.00	40%	0.73	11.684	100,093	4.24	212.25	90%	10%	95%	129,220	1,698	17.48	130,918	65.46	50.9%	60%	41.74	156.28	See Dry X PM Emissions Table			30,568	
Manual Cut-Ins & Underhood [i]	0.00	20%	0.36	11.684	50,047	4.24	106.13	90%	10%	95%	64,610	849	8.74	65,459	32.73	50.9%	40%	31.31	117.21				10,189	
ESTA Robot Exterior [i]	1.82	40%	0.73	11.684	106,918	4.24	226.73	90%	10%	95%	138,031	1,814	18.68	139,844	69.92	50.9%	75%	27.87	104.34				40,816	
Primer-Surfacer Totals	**1.82**		**1.82**				**545.11**				**331,861**	**4,361**	**44.90**	**336,222**	**168.11**			**100.92**	**377.84**		**0.13**	**0.58**	**81,574**	**4.12**
UB-PVC	0.00		4.33	8.304	594,101	0.00	0.00	100%	0.0%	0.0%	0.0	0.0	0.00	0.0	0.00	100%	95%	32.94	123.33	98.5%	0.49	1.85	564,396	0.00
Seam Sealer	0.00		0.64	10.68	87,831	0.00	0.00	100%	0.0%	0.0%	0.0	0.0	0.00	0.0	0.00	100%	100%	0.00	0.00	0.0%	0.00	0.00	87,831	0.00
Sika Sealing	0.00		0.04	10.85	5,300	0.29	0.77	100%	0.0%	0.0%	1,541	0.0	0.21	1,541	0.77	97%	100%	0.00	0.00	0.0%	0.00	0.00	5,158	0.30
(SAM) Sound Deadener Adhesive	0.00		0.961	13.77	131,875	0.14	9.08	100%	0.0%	0.0%	18,159	0.0	2.43	18,159	9.08	99%	100%	0.00	0.00	0.0%	0.00	0.00	130,556	0.14
Sealers and Adhesives Totals	**5.97**		**5.97**				**9.85**				**19,700**	**0**	**2.63**	**19,700**	**9.85**			**32.94**	**123.33**		**0.49**	**1.85**	**787,941**	**0.03**
						Total	**646.29**						**53.39**	**399,760**	**199.88**			**133.86**	**501.17**		**0.63**	**2.43**	**1,035,489**	

Coating Throughput Information

	# of Units	Notes
Paint Shop Bodies per Year	124,800	Based on maximum daily throughput and days of operation per year
Major Repair Equivalent Bodies per Year	12,480	Major repair area assumed to be equivalent to 10% of the total vehicle throughput.
Total Paint Shop Equivalent Bodies per Year	137,280	Based on total of maximum daily throughput and major repair area throughput.
Total Parts per Year	3,744	Parts painted area assumed to be equivalent to 3% of the total vehicle throughput.
Assembly Bodies per Year	164,250	Based on maximum daily throughput and days of operation per year
Operating Hours per year	7,488	Based on facility operating 24 hours/day and days of operation per year.

Coating Emission Calculations

Process	Parts	Bodies		Material Data		VOC										PM/PM$_{10}$/PM$_{2.5}$							lb/GACS	
								Capture & Control			Emissions													
	Application Rate	Split	Application Rate	Coating Density	Coating Usage	VOC In		Booth Split	Oven Split	RTO Eff.	Emissions from Booth	Emissions from Oven	Controlled VOC Emissions			Volume Solids	Transfer Eff.	Uncontrolled PM Emissions		Control Eff.	Controlled PM Emissions		GACS per year	lbs VOC/ GACS
	A_1		A_2	B	C [a]	D	E=C x D	G	J	K	L [b]	M [c]	N [d]	O = L + M	P	R	S	T [d]	U [e]	V	W [d]	X [f]	Y [g]	Z [h]
	gal/unit		gal/unit	lb/gal	gal/yr	lb/gal	tpy	%	%	%	lb/yr	lb/yr	lb/hr	lb/yr	tpy	%	%	lb/hr	tpy	%	lb/hr	tpy		
HVLP Robots Interior [i]	0.00	40%	1.32		181,328	3.84	348.1	90%	10%	95%	211,901	2,785	28.67	214,686	107.34	43.7%	60%	61.65	230.80				47,544	
Manual Cut-Ins & Underhood [i]	0.00	20%	0.66		90,664	3.84	174.0	90%	10%	95%	105,951	1,392	14.34	107,343	53.67	43.7%	40%	46.23	173.10	See Dry X PM Emissions Table			15,848	
ESTA Robot Exterior [i]	3.30	40%	1.32		193,692	3.84	371.8	90%	10%	95%	226,349	2,974	30.63	229,323	114.66	43.7%	75%	41.16	154.09				63,482	
Topcoat (Monocoat) Totals	**3.30**		**3.30**	10.26	**465,684**		**893.9**				**544,201**	**7,151**	**73.63**	**551,352**	**275.68**			**149.04**	**557.99**				**126,875**	**4.35**
								Topcoat Scenario 1			**544,201**	**7,151**	**73.63**	**551,352**	**275.68**								**126,875**	**4.35**
HVLP Robots Interior [i]	0.00	40%	0.94		129,106	5.94	383.3	90%	10%	95%	233,345	3,066	31.57	236,412	118.21	26.4%	60%	20.87	78.14				20,450	
Manual Cut-Ins & Underhood [i]	0.00	20%	0.47		64,553	5.94	191.6	90%	10%	95%	116,673	1,533	15.79	118,206	59.10	26.4%	40%	15.65	58.60				6,817	
ESTA Robot Exterior [i]	2.35	40%	0.94		137,908	5.94	409.4	90%	10%	95%	249,255	3,275	33.72	252,531	126.27	26.4%	75%	13.93	52.16				27,306	
Basecoat Totals	**2.35**		**2.35**	8.18	**331,567**		**984.4**				**599,273**	**7,875**	**81.08**	**607,148**	**303.57**			**50.45**	**188.90**	See Dry X PM Emissions Table			**54,573**	
HVLP Robots Interior [i]	0.00	40%	1.26		173,495	4.13	358.4	90%	10%	95%	218,164	2,867	29.52	221,031	110.52	42.0%	60%	38.67	144.79				43,721	
Manual Cut-Ins & Underhood [i]	0.00	20%	0.63		86,747	4.13	179.2	90%	10%	95%	109,082	1,433	14.76	110,515	55.26	42.0%	40%	29.00	108.59				14,574	
ESTA Robot Exterior [i]	3.16	40%	1.26		185,324	4.13	382.8	90%	10%	95%	233,039	3,062	31.53	236,101	118.05	42.0%	75%	25.82	96.66				58,377	
Clearcoat Totals	**3.16**		**3.16**	8.35	**445,566**		**920.3**				**560,285**	**7,362**	**75.81**	**567,647**	**283.82**			**93.49**	**350.04**				**116,671**	
								Topcoat Scenario 2			**1,159,558**	**15,237**	**156.89**	**1,174,795**	**587.40**								**171,244**	**6.86**
(Maximum Scenario 1 or 2) Total							**1,904.66**						**156.89**	**1,174,795**	**587.40**			**149.04**	**557.99**		**0.27**	**1.19**	**171,244**	**6.86**
Spot Repair - Topcoat [i]	0.00		0.03	10.26	567	3.84	1.09	100%	0%	0.0%	2,175	0.00	0.29	2,175	1.09	43.7%	40%	0.29	1.08	98.5%	0.004	0.016	99.05	
Spot Repair - Basecoat [i]	0.00		0.02	8.18	403	5.94	1.20	100%	0%	0.0%	2,396	0.00	0.32	2,396	1.20	26.4%	40%	0.10	0.37	98.5%	0.001	0.005	42.60	
Spot Repair - Clearcoat [i]	0.00		0.03	8.35	542	4.13	1.12	100%	0%	0.0%	2,240	0.00	0.30	2,240	1.12	42.0%	40%	0.18	0.68	98.5%	0.003	0.010	91.08	
Worst Case Spot Repair [k]							**2.32**				**4,635**	**0.00**	**0.62**	**4,635**	**2.32**			**0.289**	**1.082**		**0.004**	**0.016**	**133.69**	
Assembly Spot Repair - Topcoat [i]	0.00		0.10	10.26	1,405	3.84	2.70	100%	0%	0.0%	5,395	0.00	0.72	5,395	2.70	43.7%	40%	0.72	2.68	98.5%	0.011	0.040	245.65	
Assembly Spot Repair - Basecoat [i]	0.00		0.07	8.18	1,001	5.94	2.97	100%	0%	0.0%	5,941	0.00	0.79	5,941	2.97	26.4%	40%	0.24	0.91	98.5%	0.004	0.014	105.66	
Assembly Spot Repair - Clearcoat [i]	0.00		0.10	8.35	1,345	4.13	2.78	100%	0%	0.0%	5,554	0.00	0.74	5,554	2.78	42.0%	40%	0.45	1.68	98.5%	0.007	0.025	225.89	
Worst Case Assembly Repair [k]							**5.75**				**11,495**	**0.00**	**1.54**	**11,495**	**5.75**			**0.717**	**2.683**		**0.011**	**0.040**	**331.55**	
Cavity Wax	0.00		0.72	9.83	98,515	1.67	82.32	100%	0%	0.0%	52,027	0.00	6.95	164,642	26.01	74.0%	96%	4.40	16.46	98.5%	0.066	0.247	69,985	
Worst Case Repair and Cavity Wax Totals							**90.39**				**68,158**	**0.00**	**9.10**	**180,773**	**34.08**			**5.40**	**20.23**		**0.08**	**0.30**	**70,450**	
Coating Total (tpy)							**2,641.33**						**219.38**	**1,755,328**	**821.36**			**288.30**	**1,079.38**		**0.98**	**3.93**	**1,277,184**	

[a] Coating usage is calculated as follows: C = (A_1 * total parts per year) + (A_2 * total bodies per year)
[b] VOC emissions from the booth are calculated as follows: I = E * F * 2,000 lb/ton
[c] VOC emissions from the oven are calculated as follows: J = E * G * (1 - H) * 2,000 lb/ton
[d] Hourly emissions are calculated by dividing the annual emissions in tons/yr by the operating hours/yr, and multiplying by 2000 lb/ton.
[e] Annual Controlled PM emissions are calculated as follows: T = Q * (1 - R)
[f] GACS per year is calculated as follows: U = C * N * O
[g] Lb VOC/GACS is calculated as follows: V = L/U
[h] A safety factor of 10% was added to the VOC content of the material.
[i] Spot repair application rates are assumed to be equal to 1% of the application rate of the corresponding coating for a full vehicle body for every eighth vehicle. Assembly repair rates are assumed to be equal to 3.1% of the application rate of the corresponding coating for a full vehicle body for every tenth vehicle.
[k] Worst case spot repair and assembly repair for VOC emissions comes from basecoat and clearcoat application. Worst case spot repair and assembly repair for PM emissions comes from topcoat (monocoat) application.

Paint Shop Coating HAP Emissions - Excluding E-Coat Spot Repair

Total VOC Entering Process [a] (lb/yr)	Solids Application [a] (GACS/yr)	Controlled VOC Emissions [a] (lb/yr)	Lbs HAP per GACS [b]	Uncont. HAP Emissions (lb/yr)	Annual Rate, Uncont. HAP [c] (tpy)	Controlled HAP Emissions (lb/yr)	Annual Rate, HAP Out [c] (tpy)
5,282,667	1,277,184	1,755,328	0.50	1,921,845	960.92	638,592	319.30

[a] Calculated in Paint Shop Coating Tab.

[b] Combined HAP emission limit for Paint Shop Primecoat (E-coat), Guidecoat, Topcoat, and Purge Solvent Operations per 40 CFR 63 Subpart IIII because emissions are routed to a control device with greater than a 95% destruction efficiency.

[c] Potential hours are based on operation 24 hrs/day, 365 days/yr.

Underbody Coating VOC Emissions

Area/Process	Material Usage per Vehicle [a] (gal/veh)	Material Density [b] (lb/gal)	Material VOC Content [b] %	Application Area Emissions [d] %	Oven Emissions [d] %	Oven RTO Control Efficiency %	Maximum Annual Production Phase 1 (veh/yr)	Phase 2 (veh/yr)	Phase 3 (veh/yr)	Application Area VOC Emission Rates Phase 1 (tpy)	Phase 2 (tpy)	Phase 3 (tpy)	Oven VOC Emission Rates Phase 1 (tpy)	Phase 2 (tpy)	Phase 3 (tpy)	Total Uncontrolled VOC Emission Rates Phase 1 (tpy)	Phase 2 (tpy)	Phase 3 (tpy)	Total Controlled VOC Emission Rates Phase 1 (tpy)	Phase 2 (tpy)	Phase 3 (tpy)
Underbody Coating	0.185	11.684	36%	40%	60%	95%	50,544	74,880	124,800	7.93	11.75	19.58	0.59	0.88	1.47	19.82	29.36	48.94	8.52	12.63	21.04
Total										**7.93**	**11.75**	**19.58**	**0.59**	**0.88**	**1.47**	**19.82**	**29.36**	**48.94**	**8.52**	**12.63**	**21.04**

Underbody Coating PM Emissions

Process	Material Usage per Vehicle [a] (gal/veh)	Material Density [b] (lb/gal)	Weight % Solids [b] %	Transfer Efficiency [c] %	Maximum Annual Production Phase 1 (veh/yr)	Phase 2 (veh/yr)	Phase 3 (veh/yr)	Filter Efficiency (%)	Uncontrolled $PM/PM_{10}/PM_{2.5}$ Emissions Phase 1 (tpy)	Phase 2 (tpy)	Phase 3 (tpy)	Controlled $PM/PM_{10}/PM_{2.5}$ Emissions [4] Phase 1 (tpy)	Phase 2 (tpy)	Phase 3 (tpy)
Underbody Coating	0.185	11.684	67%	50%	50,544	74,880	124,800	98.5%	18.24	27.03	45.04	0.27	0.41	0.68
Total									**18.24**	**27.03**	**45.04**	**0.27**	**0.41**	**0.68**

[a] Material usage per vehicle estimate was provided by Mercedes on 2/4/2017 as 0.7 L/vehicle. Value was converted to gallons per vehicle using a conversion factor of 0.264172 gal/L.

[b] Based on BASF Primer UniBloc Solventborne primer.

[c] Transfer efficiency is assumed based on industry knowledge of underbody coating.

[d] BASF provided the application area/oven emission breakdown to Mercedes which was relayed on 1/4/2017 to Trinity Consultants as 37.5% of VOC emitted during application, and 62.5% emitted in the oven. Mercedes conservatively estimates that 40% is emitted during application.

[e] Annual operating hours assumed to be 7,448 hours per year.

Underbody Coating HAP/TAP Emissions

Material Usage per vehicle [a]	Material Density [b]	Application Area Emissions [c]	Oven Emissions [c]	Oven RTO Control Efficiency	Maximum Annual Production		
					Phase 1	Phase 2	Phase 3
(gal/veh)	(lb/gal)	%	%	%	(veh/yr)	(veh/yr)	(veh/yr)
0.185	11.684	40%	60%	95%	50,544	74,880	124,800

Underbody Coating HAP/TAP Emissions

Pollutant	CAS Number	Emission Factor [d] (%)	HAP? (Y/N)	TAP? (Y/N)	Application Area HAP Emissions (tpy)			Controlled Oven HAP Emissions (tpy)			Controlled HAP Emissions (tpy)		
					Phase 1	Phase 2	Phase 3	Phase 1	Phase 2	Phase 3	Phase 1	Phase 2	Phase 3
Naphtha	64742956	10%	N	N	-	-	-	-	-	-	-	-	-
Xylene	1330207	7%	Y	Y	1.53	2.26	3.77	0.11	0.17	0.28	1.64	2.43	4.06
1,2,4-trimethylbenzene	95636	5%	N	N	-	-	-	-	-	-	-	-	-
n-Butylacetate	123864	5%	N	N	-	-	-	-	-	-	-	-	-
2-Butoxyethyl Acetate	112072	3%	Y	N	0.66	0.97	1.62	0.05	0.07	0.12	0.70	1.04	1.74
n-Butanol	71363	2.5%	N	N	-	-	-	-	-	-	-	-	-
Mesitylene	108678	2%	N	N	-	-	-	-	-	-	-	-	-
n-Propylbenzene	103651	2%	N	N	-	-	-	-	-	-	-	-	-
Ethyl Benzene	100414	2%	Y	Y	0.44	0.65	1.08	0.03	0.05	0.08	0.47	0.70	1.16
Isopropylbenzene (Cumene)	98828	1%	Y	Y	0.22	0.32	0.54	0.02	0.02	0.04	0.23	0.35	0.58
Cyclohexane	110827	0.3%	N	N	-	-	-	-	-	-	-	-	-
Total Underbody Coating HAP Emissions					**2.84**	**4.21**	**7.01**	**0.21**	**0.32**	**0.53**	**3.05**	**4.52**	**7.54**

[a] Material usage per vehicle estimate was provided by Mercedes on 2/4/2017 as 0.7 L/vehicle. Value was convetered to gallons per vehicle using a conversion factor of 0.264172 gal/L.

[b] Based on BASF Primer UniBloc Solventborne primer.

[c] BASF provided the application area/oven emission breakdown to Mercedes which was relayed on 1/4/2017 to Trinity Consultants as 37.5% of VOC emitted during application, and 62.5% emitted in the oven. Mercedes conservatively estimates that 40% is emitted during application.

[d] Emission factors are from Section 3 Composition/Information on Ingredients on BASF UniBloc MB7746 silvergrey SDS (Revised 02/23/2015). HAP/TAP emissions assume that the maximum amount of each component is emitted.

Controlled Particulate Emissions from Sources Routed to Dry X

Description	Exhaust Flow Rate (m^3/hr)	Hours of Operation (hr/yr)	Outlet PM Loading [a] mg/m^3	Percent Recycled (%)	Potential $PM/PM_{10}/PM_{2.5}$ Emissions [b,c] (lb/hr)	(tpy)
Primer-Surfacer	157,352	8,760	1	73%	0.09	0.41
Primer-Surfacer 2	64,721	8,760	1	73%	0.04	0.17
Basecoat/Clearcoat	324,643	8,760	1	73%	0.19	0.85
Basecoat/Clearcoat 2	133,529	8,760	1	73%	0.08	0.35

[a] Manufacturer specification for outlet of PM separation system (Dry X).

[b] All PM is assumed to be equal to PM_{10} and $PM_{2.5}$. Annual emissions are based on paint shop hours of operation.

[c] Emissions (lb/hr) = Exhaust Flow (m^3/hr) * Outlet Loading (mg/m^3) * Conversion Factor (1 lb/453,592 mg) * (1-Percent Recycled (%))

E-Coat Spot Repair VOC Emissions

Area/Process	Material Usage per Vehicle [a] (gal/veh)	Material Density [b] (lb/gal)	Material VOC Content [b] %	Application Area Emissions %	Maximum Annual Production Phase 1 (veh/yr)	Phase 2 (veh/yr)	Phase 3 (veh/yr)	Application Area VOC Emission Rates Phase 1 (tpy)	Phase 2 (tpy)	Phase 3 (tpy)	Phase 3 (lb/hr) [d]
E-Coat Spot Repair	3.71E-04	11.684	0.36	100%	50,544	74,880	124,800	0.04	0.06	0.10	0.03
Total								**0.04**	**0.06**	**0.10**	**0.03**

E-Coat Spot Repair PM Emissions

Process	Material Usage per Vehicle [a] (gal/veh)	Material Density [b] (lb/gal)	Weight % Solids [b] %	Volume % Solids %	Transfer Efficiency [c] %	Maximum Annual Production Phase 1 (veh/yr)	Phase 2 (veh/yr)	Phase 3 (veh/yr)	Uncontrolled $PM/PM_{10}/PM_{2.5}$ Emissions Phase 1 (tpy)	Phase 2 (tpy)	Phase 3 (lb/hr) [d]	Phase 3 (tpy)	GACS per Year Phase 1 (tpy)	Phase 2 (tpy)	Phase 3 (tpy)
E-Coat Spot Repair	3.71E-04	11.684	67%	50.9%	40%	50,544	74,880	124,800	0.04	0.07	0.03	0.11	3.81	5.65	9.42
Total									**0.04**	**0.07**	**0.03**	**0.11**	**3.81**	**5.65**	**9.42**

[a] The material usage per vehicle was provided by Jae Park (Plant Engineer) via e-mail on 1/30/2017. The material usage per vehicle includes a 10% safety factor.

[b] Material density, VOC and solids content are based on BASF Primer UniBloc Solventborne primer.

[c] Transfer efficiency is assumed based on industry knowledge.

[d] Annual operating hours is assumed to be 7,448 hours per year.

Paint Shop Coating HAP Emissions - E-Coat Spot Repair HAP/TAP

Total VOC Entering Process [a] (lb/yr)	Solids Application [a] (GACS/yr)	Controlled VOC Emissions [a] (lb/yr)	Lbs HAP per GACS [b]	Uncont. HAP Emissions (lb/yr)	Annual Rate, Uncont. HAP [c] (tpy)	Controlled HAP Emissions (lb/yr)	Annual Rate, HAP Out [c] (tpy)
196	9	196	0.50	5	0.00	5	2.35E-03

[a] Calculated in Paint Shop Coating Tab.

[b] Combined HAP emission limit for Paint Shop Primecoat (E-coat), Guidecoat, Topcoat, and Purge Solvent Operations per 40 CFR 63 Subpart IIII because emissions are routed to a control device with greater than a 95% destruction efficiency.

[c] Potential hours are based on operation 24 hrs/day, 365 days/yr.

Paint Shop Adhesive Application Emissions

Welding area	Material Usage per vehicle (lb/veh)	Uncontrolled VOC Emission Factor [a] (%)	Hourly Production Rate (veh/hr)	Maximum Annual production (veh/yr)	Uncontrolled VOC Emissions [b] (lb/hr)	(lb/yr)	(tpy)
Anti-flutter adhesive	6.61	1%	17	124,800	1.10	8,254.02	4.13
Structure adhesive	4.41	1%	17	124,800	0.73	5,502.68	2.75
Total					**1.84**	**13,756.70**	**6.88**

[a] From manufacturer's SDS, all body shop adhesives have >99% solids content. Mercedes-Benz Vans conservatively assumes VOC content of 1% for all adhesives.

[b] Mercedes-Benz Vans assumes that adhesive applied following the topcoat oven will be performed on an open workdeck (i.e. without control).

Purge Solvent Emissions

Process	Usage Rate	Number of Units [a]	Hours of Operation	Annual Usage [b]	Recovery Rate	Non-Recovered Solvent	Solvent Density [c]	VOC Content [c]	HAP Content [c]	Capture & Control: Percent Lost	Capture & Control: Booth Capture	Capture & Control: ADW Capture	Capture & Control: Booth Control Eff.	Uncontrolled Total VOC		Controlled Total VOC		Total HAP	
	(gal/unit)	(units/yr)	(hrs/yr)	(gal/yr)	%	(gal/yr)	(lb/gal)	(lb/gal)	(lb/gal)	%	%		%	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
Primer	0.34	137,280	7,488	47,145	65%	16,501	7.26	7.26	0.76	20%	80%	90%	95%	16.00	59.90	5.06	18.93	0.53	1.99
Basecoat	0.40	137,280	7,488	54,398	65%	19,039	7.26	7.26	0.76	20%	80%	90%	95%	18.46	69.12	5.83	21.84	0.61	2.30
Clearcoat	0.40	137,280	7,488	54,398	65%	19,039	7.26	7.26	0.76	20%	80%	90%	95%	18.46	69.12	5.83	21.84	0.61	2.30
Repair	0.11	137,280	7,488	14,506	65%	5,077	7.26	7.26	0.76	0%	100%	0%	0%	4.92	18.43	4.92	18.43	0.52	1.94
Total														**57.84**	**216.57**	**21.65**	**81.04**	**2.28**	**8.52**

[a] The number of units for primer, basecoat, and clearcoat includes major repairs sent back through the paint shop equivalent to 10% of the maximum production per year.

[b] The annual usage conservatively assumes that the lines are purged after each unit in each booth.

[c] Information provided in purge solvent SDS.

Paint Shop Phosphate Cleaner Calculation Information [a]

Supply (Inlet) Air		
Temperature	75	°F
Humidity	50	% RH
Moisture Content	0.0092	lb H_2O/lb air
Exhaust (Outlet) Air		
Temperature	63	°F
Humidity	95	% RH
Moisture Content	0.012	lb H_2O/lb air
Flow Rate	21,761	ft^3/min
Density of Air at 63 °F	0.0757	lb/ft^3
Phosphate Cleaner		
Dissolved Solids	0.5	%
Hours of Operation [b]	7,488	hr/yr
Control Efficiency [c]	55	%

[a] Reduction in PM emissions through use of mist eliminators.
[b] Paint shop annual hours of operation.
[c] Mist eliminator control efficiency.

Paint Shop Phosphate Cleaner Emissions

Phosphate Cleaner Emissions	$PM/PM_{10}/PM_{2.5}$	
	Uncontrolled	Controlled
Hourly (lb/hr)	1.38	0.62
Annual (tpy)	5.18	2.33

Sample Calculation:

$$\text{Uncontrolled PM Emissions} = \frac{(0.012 - 0.0092)\text{ lb } H_2O}{\text{lb air}} \left| \frac{0.5\text{ lb solids}}{100\text{ lb } H_2O} \right| \frac{12{,}000\text{ ft}^3\text{ air}}{\text{min}} \left| \frac{0.0757\text{ lb air}}{\text{scf air}} \right| \frac{60\text{ min}}{\text{hour}}$$

Uncontrolled PM Emissions = 1.38 lb/hr

$$\text{Controlled PM Emissions} = \frac{(0.76\text{ lb PM})}{\text{hr}} \left| \frac{(100 - 55)}{100} \right. = 0.62\text{ lb/hr}$$

Paint Mix Room Emissions

Paint Shop Material Usage Rates

Process/Material	Usage (gal/yr)
E-coat	520,379
Seam Sealer	87,831
Underbody PVC	594,101
Sika Sealing	5,300
(SAM) Sound Deadener Adhesive	131,875
Primer-Surfacer	257,058
Basecoat	331,567
Clearcoat	445,566
Spot Repair	5,263
Cavity Wax	98,515
Purge Solvent	170,449
Facility Total	2,127,524

vapor (i.e. partial) pressure of toluene	0.468	psia	P_{atm}
molecular weight of toluene	92.130	lb/lb-mole	MW
atmosphereic vapor pressure	14.700	psia	$P_{toluene}$
ideal gas constant - R	10.730	ft^3-psia/lb-mole-°R	
absolute temperature	532	°R	T
vapor density = MW*n/V = MW*P/R*T	0.237	lb/ft^3	n = 1
volume of displaced toluene-saturated air	2,127,524	gallons	
volume of displaced toluene-saturated air	284,428	ft^3	vol. displaced air
volume of displaced toluene	9,055	ft^3	vol. displaced air * $P_{toluene}/P_{atm}$
vapor density = MW*n/V = MW*P/R*T	0.2373	lb/ft^3	

Paint Shop Hours of Operation	7,488	hr/yr
Total VOC Emissions	0.29	lb/hr
Total VOC Emissions	**1.07**	**tpy**

Workdecks - Insignificant Activity Emissions

Booth/Zone	Potential $PM/PM_{10}/PM_{2.5}$ Emissions				
	Exhaust Volume (scfm) [a,b]	PM Loading ($gr/10^3$ dscf) [c]	Hours of Operation (hr/yr)	Hourly (lb/hr)	Annual (ton/yr) [c]
E-coat Sand	62,978	0.1	7,488	0.05	0.20
Primer Sand	62,978	0.1	7,488	0.05	0.20
Metal/Body Repair #1	6,474	0.1	7,488	0.01	0.02
Metal/Body Repair #2	6,474	0.1	7,488	0.01	0.02
E-coat Touch-up	21,189	0.1	7,488	0.02	0.07
Primer Touch-up	21,189	0.1	7,488	0.02	0.07
Basecoat Touch-up	21,189	0.1	7,488	0.02	0.07
Inspect/Polish	84,167	0.1	7,488	0.07	0.27
Total				**0.25**	**0.92**

[a] Calculation assumes exhaust volume is on a dry basis.
[b] Exhaust volumes provided by equipment manufacturer.
[c] Estimated outlet PM loading for workdeck operations.
[d] Based on paint shop annual hours of operation: 7,488 hrs/yr

Sample Calculations (for E-Coat Sand)

$$\text{PM Emissions (lb/hr)} = \frac{62{,}978\ \text{scf}}{\text{min}} \times \frac{0.1\ \text{grains}}{1000\ \text{dscf}} \times \frac{60\ \text{min}}{\text{hr}} \times \frac{1\ \text{lb}}{7{,}000\ \text{gr.}} = \mathbf{0.05\ lb/hr}$$

$$\text{PM Emissions (tons/yr)} = \frac{0.05\ \text{lb}}{\text{hr}} \times \frac{7{,}488\ \text{hr}}{\text{yr}} \times \frac{\text{ton}}{2{,}000\ \text{lb}} = \mathbf{0.20\ ton/yr}$$

Mercedes-Benz Vans, LLC

Body Shop Welding Emissions

Area/Process	Welding Material Usage per Vehicle		Material Usage per vehicle (lb/veh)	Uncontrolled PM Emission Factor [a] (lb/1000 lb)	Hourly Production Rate (veh/hr)	Maximum Annual Production (veh/yr)	Control Efficiency [b] %	Building Capture Efficiency %	Uncontrolled $PM/PM_{10}/PM_{2.5}$ Emissions [c] (lb/hr)	(lb/yr)	(tpy)	Controlled $PM/PM_{10}/PM_{2.5}$ Emission [c] (lb/hr)	(lb/yr)	(tpy)
MAG Welding	8,000	mm	0.30	20	17	124,800	95%	90%	1.00E-02	7.52E+01	3.76E-02	5.02E-04	3.76E+00	1.88E-03
Spot Welding	9,000	spots	0.34	20	17	124,800	0%	90%	1.13E-02	8.46E+01	4.23E-02	1.13E-02	8.46E+01	4.23E-02
Laser Welding	28,000	mm	1.05	20	17	124,800	0%	90%	3.52E-02	2.63E+02	1.32E-01	3.52E-02	2.63E+02	1.32E-01
Laser Soldering	9,000	mm	0.34	20	17	124,800	0%	90%	1.13E-02	8.46E+01	4.23E-02	1.13E-02	8.46E+01	4.23E-02
Total									**6.78E-02**	**5.08E+02**	**2.54E-01**	**5.83E-02**	**4.36E+02**	**2.18E-01**

[a] Average emission factor for welding and soldering at the facility is conservatively assumed to be 20 lb/1, 000 lb.

[b] Based on HEPA filter control for MAG welding processes.

[c] A building capture efficiency of 90% is assumed for the body shop for both uncontrolled and controlled emissions based on building enclosure capture efficiency provided in Texas Commission on Environmental Quality, Rock Crushing Plants, Table 7, February, 2002. All welding and soldering operations are done inside the building.

Body Shop Welding HAP Emissions

Area/Process	Manganese Content %	lb/hr	tpy
MAG Welding	1.45	7.28E-06	2.73E-05
Spot Welding	0.0	0.00E+00	0.00E+00
Laser Welding	1.2	4.22E-04	1.58E-03
Laser Soldering	1.2	1.36E-04	5.08E-04
	Total	5.65E-04	2.12E-03

Welding Shield Gas CO_2 Emissions

Usage per Vehicle (kg)	Hourly Production Rate (veh/hr)	Maximum Annual Production (veh/yr)	CO_2 Content [a] %	CO_2 Emissions (lb/hr)	(tpy)
2.00	17	124,800	15%	1.10E+01	4.13E+01

[a] Based on Mercedes-Benz Vans shield gas specification.

Body Shop Adhesive Bonding Emissions

Welding area		Material Usage per vehicle (lb/veh)	Uncontrolled VOC Emission Factor [a] (%)	Hourly Production Rate (veh/hr)	Maximum Annual production (veh/yr)	Uncontrolled VOC Emissions (lb/hr)	(lb/yr)	(tpy)	Controlled VOC Emissions [b] (lb/hr)	(lb/yr)	(tpy)
Anti-flutter adhesive		6.61	1%	17	124,800	1.10	8,254.02	4.13	0.06	412.70	0.21
Structure adhesive		4.41	1%	17	124,800	0.73	5,502.68	2.75	0.04	275.13	0.14
Total						**1.84**	**13,756.70**	**6.88**	**0.09**	**687.84**	**0.34**

[a] From manufacturer's SDS, all body shop adhesives have >99% solids content. Mercedes-Benz Vans conservatively assumes VOC content of 1% for all adhesives.

[b] Mercedes-Benz Vans assumes 95% reduction in VOC emissions when body shop adhesives volatilize in the E-Coat oven.

Sample Calculations (for MAG Welding)

Material Usage (lb/veh) = $\pi \times r^2 \times$ Weld Length (mm) $\div 10^3 \times$ Material Specific Gravity (g/cm^3) $\div$ 453.59 g/lb

Material Usage (lb/veh) = $\pi \times (0.8\ mm)^2 \times 8{,}000\ mm \div 10^3 \times (8.5\ g/cm^3) \div 453.59\ g/lb$ = **0.30** **lb/veh**

PM Emissions (lb/yr) = $\frac{0.30\ lb}{veh} \times \frac{20\ lb}{1{,}000\ lb} \times \frac{124{,}800\ veh}{yr} \times (1-95\%) \times (1-90\%)$ = **3.762** **lb/yr**

PM Emissions (tons/yr) = $\frac{3.762\ lb}{yr} \times \frac{1\ ton}{2{,}000\ lb}$ = **1.88E-03** **ton/yr**

Assembly Combustion - Natural Gas Emission Factors

Hours of Operation [e] 6,072 hrs

Pollutant		NG Emission Factors [a,b,c]	Units
$PM/PM_{10}/PM_{2.5}$		0.0074	lb/MMBtu
SO_2		0.0006	lb/MMBtu
NO_X		0.049	lb/MMBtu
CO		0.082	lb/MMBtu
VOC		0.0054	lb/MMBtu
CO_2e [d]			
	CO_2	117.00	lb/MMBtu
	CH_4	2.21E-03	lb/MMBtu
	N_2O	2.21E-04	lb/MMBtu

[a] PM, SO_2, and VOC natural gas emission factors are from AP-42, Table 1.4-2, 07/98.
[b] NO_X and CO natural gas emission factors are from AP-42, Table 1.4-1, 07/98, Small Boilers w/ Low NO_X Control.
[c] The heating value of natural gas is assumed to be 1,026 Btu/scf.
[d] Emission factors from 40 CFR 98, Subpart C, Tables C-1 and C-2. Factors were converted to lb/MMBtu.

Assembly Combustion Non-HAP Emissions

			Emission Rates [e]																	
		Rated Capacity	$PM/PM_{10}/PM_{2.5}$		SO_2		NO_X		CO		VOC		CO_2		CH_4		N_2O		CO_2e	
Description	Equipment	(MMBtu/hr)	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
Assembly Oven	OV04	1.36	0.01	0.03	0.001	0.002	0.07	0.20	0.11	0.34	0.01	0.02	159.68	484.82	0.003	0.009	0.0003	0.001	159.85	485.32
Total		**1.36**	**0.01**	**0.03**	**0.001**	**0.002**	**0.07**	**0.20**	**0.11**	**0.34**	**0.01**	**0.02**	**#####**	**484.82**	**0.003**	**0.009**	**0.0003**	**0.001**	**159.85**	**485.32**

[e] Annual emissions are based on calculated hours of operation needed to remain below the proposed 75,000 tpy synthetic minor limit on greenhouse gas emissions (CO_2e). Mercedes-Benz Vans is not requesting limits on hours of operation for individual emission units.

Assembly Combustion HAP/TAP Emissions

Pollutants	NG Emission Factor [a] lb/10⁶ scf	Total Emissions [b] lb/hr	tpy
2-Methylnaphthalene	2.40E-05	3.19E-08	9.69E-08
3-Methylchloranthrene	1.80E-06	2.39E-09	7.27E-09
7,12-Dimethylbenz(a)anthracene	1.60E-05	2.13E-08	6.46E-08
Acenaphthene	1.80E-06	2.39E-09	7.27E-09
Acenaphthylene	1.80E-06	2.39E-09	7.27E-09
Anthracene	2.40E-06	3.19E-09	9.69E-09
Benz(a)anthracene	1.80E-06	2.39E-09	7.27E-09
Benzene	2.10E-03	2.79E-06	8.48E-06
Benzo(a)pyrene	1.20E-06	1.60E-09	4.85E-09
Benzo(b)fluoranthene	1.80E-06	2.39E-09	7.27E-09
Benzo(g,h,i)perylene	1.20E-06	1.60E-09	4.85E-09
Benzo(k)fluoranthene	1.80E-06	2.39E-09	7.27E-09
Chrysene	1.80E-06	2.39E-09	7.27E-09
Dibenzo(a,h)anthracene	1.20E-06	1.60E-09	4.85E-09
Dichlorobenzene	1.20E-03	1.60E-06	4.85E-06
Fluoranthene	3.00E-06	3.99E-09	1.21E-08
Fluorene	2.80E-06	3.72E-09	1.13E-08
Formaldehyde	7.50E-02	9.98E-05	3.03E-04
Hexane	1.80E+00	2.39E-03	7.27E-03
Indeno(1,2,3-cd)pyrene	1.80E-06	2.39E-09	7.27E-09
Naphthalene	6.10E-04	8.11E-07	2.46E-06
Phenanathrene	1.70E-05	2.26E-08	6.87E-08
Pyrene	5.00E-06	6.65E-09	2.02E-08
Toluene	3.40E-03	4.52E-06	1.37E-05
Arsenic	2.00E-04	2.66E-07	8.08E-07
Beryllium	1.20E-05	1.60E-08	4.85E-08
Cadmium	1.10E-03	1.46E-06	4.44E-06
Chromium	1.40E-03	1.86E-06	5.65E-06
Cobalt	8.40E-05	1.12E-07	3.39E-07
Lead	5.00E-04	6.65E-07	2.02E-06
Manganese	3.80E-04	5.06E-07	1.53E-06
Mercury	2.60E-04	3.46E-07	1.05E-06
Nickel	2.10E-03	2.79E-06	8.48E-06
Selenium	2.40E-05	3.19E-08	9.69E-08

Hours of Operation [b]	6,072	hrs
Total Rated Capacity	1.36	MMBtu/hr

[a] Natural Gas Emission Factors are from AP-42 Section 1.4, Tables 1.4-2, 1.4-3, and 1.4-4.
[b] Annual emissions are based on calculated hours of operation needed to remain below the proposed 75,000 tpy synthetic minor limit on greenhouse gas emissions (CO_2e). Mercedes-Benz Vans is not requesting limits on hours of operation for individual emission units.

Assembly Glazing VOC Emissions

Area/Process	Material Usage per vehicle		Uncontrolled VOC Emission Factor [a]	Hourly Production Rate	Maximum Annual Production	Product Usage	Potential VOC Emissions		
	(kg/veh)	(lb/veh)	(%)	(veh/hr)	(veh/yr)	(lb/yr)	(lb/hr)	(lb/yr)	(tpy)
Primer 1	0.04	0.09	65%	19	164,250	14,595	1.08	9,486.75	4.74
Primer 2	0.08	0.19	64%	19	164,250	30,510	2.23	19,526.34	9.76
Adhesive	2.75	6.06	0%	19	164,250	995,971	0.00	0.00	0.00
Total							**3.31**	**29,013.09**	**14.51**

HAP/TAP Potential Emissions

Area/Process	Material Usage per vehicle		Constituent Chemical Name	CAS#	Uncontrolled Component Emission Factor [a]	Hourly Production Rate	Maximum Annual Production	Potential Emission Rates		
	(kg/veh)	(lb/veh)			(%)	(veh/hr)	(veh/yr)	(lb/hr)	(lb/yr)	(tpy)
Primer 1	0.04	0.09	MEK	78-93-3	60%	19	164,250	1.00	8,757.00	4.38
	0.04	0.09	MDI	101-68-8	1%	19	164,250	0.02	145.95	0.07
Primer 2	0.08	0.19	MEK	78-93-3	60%	19	164,250	2.09	18,305.94	9.15
			Acrylic acid	79-10-7	1%	19	164,250	0.03	305.10	0.15
Adhesive	2.75	6.06	N/A					0.00	0.00	0.00
Total								**3.14**	**27,513.99**	**13.76**

[a] Information provided in SDS for each material.

Assembly Under Body Wax Emissions

Area/Process	Material Usage per vehicle (lb/veh)	Uncontrolled VOC Emission Factor (%)	Hourly Production Rate (veh/hr)	Maximum Annual Production (veh/yr)	Product Usage (lb/year)	Potential VOC Emission Rates (lb/hr)	(lb/yr)	(tpy)
Under body wax	1.94	0.0%	19	164,250	318,656	0.00	0.00	0.00
Total						**0.00**	**0.00**	**0.00**

Spray Deck PM Emissions

Process	Material Usage per vehicle (lb/veh)	Weight % Volatiles (%)	Weight % Solids (%)	%Transfer Efficiency (%)	Production Rates (units/hr)	Filter Efficiency (%)	Uncontrolled $PM/PM_{10}/PM_{2.5}$ Emissions (lb/hr)	(lb/yr)	(tpy)	Controlled $PM/PM_{10}/PM_{2.5}$ Emissions (lb/hr)	(lb/yr)	(tpy)
Under body wax	1.94	0.0%	100.0%	90%	19	98.0%	3.64	31,865.64	15.93	0.07	637.31	0.32
Total							**3.64**	**31,865.64**	**15.93**	**0.07**	**637.31**	**0.32**

Assembly Filling Emissions

Product	Material Usage per Vehicle (liter/veh)	True Vapor Pressure, VP (psia)	Molecular Weight (g/mol)	Vehicle Throughput (veh/hr)	Vehicle Throughput (veh/yr)	Uncontrolled VOC Emission Rates (lb/hr)	Uncontrolled VOC Emission Rates (lb/yr)	Uncontrolled VOC Emission Rates (tpy)	Controlled VOC Emission Rates [a] (lb/hr)	Controlled VOC Emission Rates [a] (lb/yr)	Controlled VOC Emission Rates [a] (tpy)
Gasoline	18.9	7.4	66	19	164,250	1.08E+00	9.49E+03	4.74E+00	5.42E-02	4.74E+02	2.37E-01
Diesel fuel	18.9	0.01	130	19	164,250	2.88E-03	2.53E+01	1.26E-02	2.88E-03	2.53E+01	1.26E-02
Brake fluid	1.2	0.02	75	19	164,250	2.13E-04	1.86E+00	9.32E-04	2.13E-04	1.86E+00	9.32E-04
Antifreeze	9.0	0.02	62	19	164,250	1.31E-03	1.15E+01	5.73E-03	1.31E-03	1.15E+01	5.73E-03
Windshield Cleaner [b]	4.0	0.77	28.14	19	164,250	1.02E-02	8.89E+01	4.45E-02	1.02E-02	8.89E+01	4.45E-02
Differential Gear Oil	0.5	0.02	75	19	164,250	8.79E-05	7.70E-01	3.85E-04	8.79E-05	7.70E-01	3.85E-04
Auto Transmission Fluid	0.7	0.02	150	19	164,250	2.40E-04	2.10E+00	1.05E-03	2.40E-04	2.10E+00	1.05E-03
Power Steering Fluid	0.8	0.02	76	19	164,250	1.42E-04	1.24E+00	6.20E-04	1.42E-04	1.24E+00	6.20E-04
Total						**1.10E+00**	**9.62E+03**	**4.81E+00**	**6.92E-02**	**6.06E+02**	**3.03E-01**

[a] Assumes 95% control from onboard refueling vapor recovery (ORVR) for gasoline.

[b] From windshield cleaner MSDS, material contains 23% volatiles (methanol and ethylene glycol). VOC emissions calculated based on vapor pressure provided in the MSDS and molecular weight calculated as the weighted average of 23% ethylene glycol and 77% water.

HAP/TAP Emissions from Assembly Filling

Pollutant	Material Usage per Vehicle (liter/veh)	Component Emission Factor [a] (liter/veh)	True Vapor Pressure, VP (psia)	Molecular Weight (g/mol)	Vehicle Throughput (veh/hr)	Vehicle Throughput (veh/yr)	Uncontrolled HAP/TAP Emission Rates (lb/hr)	Uncontrolled HAP/TAP Emission Rates (lb/yr)	Uncontrolled HAP/TAP Emission Rates (tpy)	Controlled HAP/TAP Emission Rates (lb/hr)	Controlled HAP/TAP Emission Rates (lb/yr)	Controlled HAP/TAP Emission Rates (tpy)
Windshield Cleaner	4.0											
Methanol		1.12	1.888	32.04	19	164,250	7.92E-03	6.94E+01	3.47E-02	7.92E-03	6.94E+01	3.47E-02
Ethylene Glycol		0.80	0.0725	62.07	19	164,250	4.19E-04	3.67E+00	1.84E-03	4.19E-04	3.67E+00	1.84E-03
Total							**8.34E-03**	**7.30E+01**	**3.65E-02**	**8.34E-03**	**7.30E+01**	**3.65E-02**

[a] From windshield cleaner MSDS, material is 23% volatile by mass. Windshield cleaner fluid was conservatively assumed to contain 23% methanol and 23% ethylene glycol.

Assembly Roll and Brake Testing Capacities

Hourly Production Rate	19	units/hr
Annual Production Rate	164,250	units/yr
Simulated Distance	3.0	miles/unit
Hours of Operation [a]	8,760	hr/yr

[a] Potential operating hours are based on operation 24 hours/day, 365 days/yr.

Assembly Roll and Brake Testing Emission Factors

Pollutant	Diesel g/mile [a]	Gasoline g/mile	Worst Case Fuel g/mile
PM	0.08	0.0	0.08
NO_X	0.3	0.3	0.3
CO	4.2	4.2	4.2
VOC	0.09	0.09	0.09
Formaldehyde	0.018	0.018	0.018
CO_2e [b,c]			
CO_2 [b]	417	417	417
CH_4 [d]	0.73	0.73	0.73
N_2O [d]	0.01	0.01	0.01

[a] Emission rates are based on 40 CFR 88 Subpart A Table A Table A104-2—Full Useful Life Standards (g/mi) for Light-Duty Vehicles, diesel vehicles.

[b] The CO_2 emission factor is from "Light-Duty Automotive Technology, Carbon Dioxide Emissions, and Fuel Economy Trends: 1975 Through 2010"

[c] When accounting for global warming potential, CO_2 is 95% of CO_2e. EPA Emission Facts: Greenhouse Gas Emissions from a Typical Passenger Vehicle, http://www.epa.gov/OMS/climate/420f05004.htm.

[d] 5% of CO_2e is assumed to be CH_4 and N_2O, when accounting for global warming potential. Emission factors for these pollutants are based on a ratio of CH_4 and N_2O emission factors for petroleum fuels from the GHG Mandatory Reporting Rule Subpart C, Table C-2.

Assembly Roll and Brake Testing Potential Emissions

Process	Potential Emissions																	
	$PM/PM_{10}/PM_{2.5}$		NO_X		CO		VOC		Formaldehyde		CO_2		CH_4		N_2O		CO_2e	
	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
Assembly Roll and Brake	0.010	0.043	0.037	0.163	0.521	2.281	0.011	0.049	0.002	0.010	51.71	226.50	0.091	0.40	0.002	0.01	54.43	238.42

Assembly Washer System Testing Compound Usage Data

Washer System Test [a]	mL/unit	% Ethylene Glycol [b]	Ethylene Glycol Density (lb/gal)	lb Ethylene Glycol/unit
Maximum Tested Windshield Cleaner Usage	100	23%	9.26	0.056

[a] Represents the maximum testing fluid usage per unit.

[b] From windshield cleaner MSDS, material contains 23% volatiles (methanol and ethylene glycol). Emissions from washer system testing calculated based on ethylene glycol density which represents the worst-case VOC emissions for the material.

Assembly Washer System Testing Emissions

	Production		VOC Emissions [a]			Maximum Ethylene Glycol Emissions [b]			Maximum Methanol Emissions [b]		
	(units/hr)	(units/yr)	(lb/hr)	(lb/yr)	(tpy)	(lb/hr)	(lb/yr)	(tpy)	(lb/hr)	(lb/yr)	(tpy)
Washer System Testing	19	164,250	1.06	9,244.66	4.62	1.06	9,244.66	4.62	0.75	6,579.53	3.29

[a] VOC emissions from washer system testing calculated based on ethylene glycol density which represents the worst-case VOC emissions for the material.

[b] Maximum HAP emissions are calculated assuming the maximum volatile content for both ethylene glycol and methanol. Therefore, the calculated VOC emissions are not equivalent to the sum c

Storage Tank Volumes

Tank ID	Consumption per Vehicle (gal/veh)	Max. Consumption per year[a] (gal/yr)	Fuel Type
TK-01	5.00	702,000	Gasoline
TK-02	5.00	702,000	Diesel
TK-03	----	100,000	Diesel

Storage Tank Emissions

Tank ID	Description[a]	Controls	Tank Size: Shell Length (ft)	Tank Size: Diameter (ft)	Capacity (gal)	Throughput (gal/yr)	Uncontrolled Emissions[b] (lb/yr): Working Loss	Uncontrolled Emissions[b] (lb/yr): Breathing Loss	Uncontrolled Emissions[b] (lb/yr): Total	Total VOC Emissions[c]: Total (lb/hr)	Total VOC Emissions[c]: Total (tpy)
TK-01	Gasoline	N/A	10.00	9.67	5,000	702,000	3,553.34	1,718.84	5,272.18	0.70	2.64
TK-02	Diesel fuel	N/A	15.08	11.00	10,000	702,000	10.79	2.27	13.06	0.002	0.01
TK-03	Diesel fuel	N/A	7.58	10.72	1,240	100,000	1.39	1.08	2.47	0.000	0.00
Tanks Total									**5,287.71**	**0.71**	**2.64**

[a] Max throughput for TK-01 and TK-02 based on the max. consumption per vehicle. TK-03 will be used to sources in the Marshalling yard.

[b] All the storage tanks are horizontal tanks.

[c] Storage Tank emissions taken from TANKS 4.09d output based on tank parameters and geographical information.

Emergency Generators and Fire Pumps Emission Factors [a,b]

Pollutant	Emergency Engines 19 ≤ kW < 37	Emergency Engines 37 ≤ kW < 75	Emergency Engines 225 ≤ kW < 450	Emergency Engines kW > 560	Fire Pumps 225 < kW < 450	Units
$PM/PM_{10}/PM_{2.5}$	0.45	0.30	0.15	0.15	0.15	g/hp-hr
SO_2 [c]	0.93	0.93	0.93	5.5E-03	0.93	g/hp-hr
NO_X	5.6	3.5	3.0	4.8	3.0	g/hp-hr
CO	4.1	3.7	2.6	2.6	2.6	g/hp-hr
VOC	5.6	3.5	3.0	4.8	3.0	g/hp-hr
CO_2e [d]						
CO_2	163.08	163.08	163.08	163.08	163.08	lb/MMBtu
CH_4	6.62E-03	6.62E-03	6.62E-03	6.62E-03	6.62E-03	lb/MMBtu
N_2O	1.32E-03	1.32E-03	1.32E-03	1.32E-03	1.32E-03	lb/MMBtu

[a] The emission factors are from 40 CFR 89.112(a), Table 1. VOC and NO_X emission factors are each assumed to be equivalent to NO_X + NMHC emission limit. The SO_2 emission factor is from AP-42, Table 3.4-1 for large diesel engines.

[b] The emission factors are from 40 CFR 89.112(a), Table 1. VOC and NO_X emission factors are each assumed to be equivalent to NO_X + NMHC emission limit. The SO_2 emission factor is from AP-42, Table 3.3-1.

[c] Sulfur content of diesel fuel equals the maximum sulfur content of 15 ppm, per 40 CFR 80.510(b).

[d] Emission factors from 40 CFR 98, Subpart C, Tables C-1 and C-2. Factors were converted to lb/MMBtu.

Emergency Generators and Fire Pumps Criteria Pollutant Emissions

Equipment ID	Fuel	Horsepower	Max. Rated Capacity	Max. hours per year [a]	$PM/PM_{10}/PM_{2.5}$		SO_2		NO_X		CO		VOC		CO_2		CH_4		N_2O		CO_2e	
		(hp)	(MMBtu/hr)	(hr/yr)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
EG01	Diesel	398	1.01	500	0.13	0.03	0.82	0.204	2.62	0.65	2.29	0.57	2.62	0.65	143.09	35.77	0.006	0.001	0.001	0.0003	143.59	35.90
EG02	Diesel	65	0.17	500	0.04	0.01	0.13	0.03	0.50	0.13	0.53	0.13	0.50	0.13	23.37	5.84	0.001	2E-04	0.0002	5E-05	23.45	5.86
EG03	Diesel	40	0.10	500	0.04	0.01	0.08	0.021	0.50	0.12	0.36	0.09	0.50	0.12	14.46	3.62	0.001	0.00	0.000	0.000	14.51	3.63
EG04	Diesel	1,500	3.82	500	0.49	0.12	0.02	0.005	15.78	3.95	8.63	2.16	15.78	3.95	539.30	134.83	0.022	0.01	0.004	0.001	541.15	135.29
FP01	Diesel	305	0.78	500	0.10	0.03	0.63	0.16	2.02	0.50	1.75	0.44	2.02	0.50	109.66	27.41	0.004	0.001	0.0009	0.0002	110.03	27.51
Total					**0.81**	**0.20**	**1.68**	**0.42**	**21.42**	**5.35**	**13.57**	**3.39**	**21.42**	**5.35**	**829.9**	**207.47**	**0.03**	**0.01**	**0.01**	**0.002**	**832.7**	**208.18**

[a] Potential hours of operation for emergency units.

Emergency Generators and Fire Pumps Combined Heat Input Capacities

	Large Units[a] (MMBtu/hr)
Total Large Diesel Heat Input	3.82
Total Diesel Heat Input	2.06

[a] Large diesel engines are those larger than 600 hp.

Emergency Generators and Fire Pumps HAP/TAP Emissions

Pollutant	Emission Factors (lb/MMBtu) Large Diesel[a]	Emission Factors (lb/MMBtu) Diesel[b]	Emergency Equipment Emissions (lb/hr)	(tpy)
Benzene	7.76E-04	9.33E-04	4.88E-03	1.22E-03
Toluene	2.81E-04	4.09E-04	1.91E-03	4.79E-04
Xylene	1.93E-04	2.85E-04	1.32E-03	3.31E-04
Formaldehyde	7.89E-05	1.18E-03	2.73E-03	6.82E-04
Acetaldehyde	2.52E-05	7.67E-05	2.54E-04	6.35E-05
Acrolein	7.88E-06	9.25E-05	2.20E-04	5.51E-05
Napthalene	1.30E-04	8.48E-05	6.71E-04	1.68E-04
Total PAH	2.12E-04	1.68E-04	1.15E-03	2.89E-04

[a] Emission factors from AP-42 Section 3.4 Large Stationary Diesel and All Stationary Duel-fuel Engines, Table 3.4-3 - 3.4-4.
[b] Emission factors from AP-42 Section 3.3 Gasoline and Diesel Industrial Engines, Table 3.3-2.

Cooling Tower Potential Emissions

Description	Circulating Water Flowrate (gal/hr)	Water Density (lb/gal)	Total Dissolved Solids [a] (ppm)	Drift Rate [b] (%)	Hours of Operation (hrs/yr)	Potential Emissions [c] PM (lb/hr)	PM (tpy)	PM_{10} (lb/hr)	PM_{10} (tpy)	$PM_{2.5}$ (lb/hr)	$PM_{2.5}$ (tpy)
Cooling Tower 1	412,500	8.34	650	0.001	7,488	2.24E-02	8.37E-02	3.33E-03	1.25E-02	2.00E-03	7.48E-03
Cooling Tower 2	412,500	8.34	650	0.001	7,488	2.24E-02	8.37E-02	3.33E-03	1.25E-02	2.00E-03	7.48E-03
Cooling Tower 3	412,500	8.34	650	0.001	7,488	2.24E-02	8.37E-02	3.33E-03	1.25E-02	2.00E-03	7.48E-03
Cooling Tower 4	73,800	8.34	650	0.001	7,488	4.00E-03	1.50E-02	5.96E-04	2.23E-03	3.58E-04	1.34E-03
Cooling Tower 5	484,900	8.34	650	0.001	7,488	2.63E-02	9.84E-02	3.92E-03	1.47E-02	2.35E-03	8.80E-03
Cooling Tower 6	484,900	8.34	650	0.001	7,488	2.63E-02	9.84E-02	3.92E-03	1.47E-02	2.35E-03	8.80E-03
Cooling Tower 7	484,900	8.34	650	0.001	7,488	2.63E-02	9.84E-02	3.92E-03	1.47E-02	2.35E-03	8.80E-03
Total						1.50E-01	5.61E-01	2.23E-02	8.36E-02	1.34E-02	5.02E-02

[a] TDS provided by Charleston Water System.

[b] Drift rate value supplied based on vendor guaranteed drift rate.

[c] PM emissions calculated using equation from AP-42 Chapter 13.4 - Wet Cooling Towers. PM_{10} emissions are 14.9% of PM emissions based on *Calculating Realistic PM_{10} Emissions from Cooling Towers* by Joel Reisman and Gordon Frisbie. $PM_{2.5}$ assumed to be 60% of PM_{10} based on California Emissions Inventory Development and Reporting System (CEIDARS).

Paved Roads - Emission Factor Equation[a]

$$E = [k\,(sL)^{0.91} * W^{1.02}] * (1 - 1.2*P/N)$$

where:	Value	Units	Data Source
k = particle size multiplier for PM	0.011	lb/VMT	AP-42, Table 13.2.1-1 [b]
k = particle size multiplier for PM_{10}	0.0022	lb/VMT	AP-42, Table 13.2.1-1 [b]
k = particle size multiplier for $PM_{2.5}$	0.00054	lb/VMT	AP-42, Table 13.2.1-1 [b]
sL = road surface silt loading	0.6	g/m^2	AP-42, Table 13.2.1-2 [c]
W_a = average weight of vehicles traveling the road	40.0	tons	SC DOT [d]
N = number of days in averaging period	365	days	AP-42, pg. 13.2.1-6
P = number of days in a year with at least 0.01 in of precipitation	120	days	AP-42, Fig. 13.2.1-2
E_a = PM emission factor	**0.18**	**lb/VMT**	**Calculation**
E_a = PM_{10} emission factor	**0.04**	**lb/VMT**	**Calculation**
E_a = $PM_{2.5}$ emission factor	**0.01**	**lb/VMT**	**Calculation**

[a] AP-42, Section 13.2.1.3, Equation 3.

[b] K value selected is for PM_{30}, PM_{10} and $PM_{2.5}$. The PM_{30} factor is used to calculate PM emissions.

[c] AP-42 Section 13.2.1, Table 13.2.1-2, Ubiquitous Silt Loading Default Values for sites with average daily traffic (ADT) for low volume roads, ADT category < 500 vehicles.

[d] Average weight conservatively set to maximum allowable gross vehicle weight rating is 80,000 lbs (40 tons), per SC §56-5-4140.

Paved Roads - Loads and Distance Inputs

Parameter	Value	Units
Distance traveled per load	1.71	VMT/load
Loads traveled	6	loads/hr
	150	loads/day
	54,750	loads/yr
Paved Vehicle Miles Traveled per Year [a]	93,349	VMT/yr
Paved Vehicle Miles Traveled per Hour [b]	10.66	VMT/hr

[a] Calculation: Paved Vehicle Miles Traveled per Year (VMT/yr) = (Potential Vehicle Production (tpy)) / Weight of Truck Load (tons/load) * Distance Traveled per Load (VMT/load).

[b] Calculation: Paved Vehicle Miles Traveled per Hour (VMT/hr) = (Potential Vehicle Production (tons/hr)) / Weight of Truck Load (tons/load) * Distance Traveled per Load (VMT/load).

Paved Roads - Potential Emissions

	PM		PM_{10}		$PM_{2.5}$	
	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
Paved Roads [a,b]	1.92	8.41	0.38	1.68	0.09	0.41

[a] Calculation: Potential Emissions (tpy) = Paved Vehicle Miles Traveled per Year (VMT/yr) * Emission Factor (lb/VMT) / (2,000 lb/ton).

[b] Calculation: Potential Emissions (lb/hr) = Paved Vehicle Miles Traveled per Year (VMT/hr) * Emission Factor (lb/VMT).

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification		
User Identification:	TK-01	
City:	Charleston	
State:	South Carolina	
Company:	Mercedes-Benz Vans, LLC	
Type of Tank:	Horizontal Tank	
Description:	5.000 gallon Gasoline Storage Tank	
Tank Dimensions		
Shell Length (ft):		10.00
Diameter (ft):		9.67
Volume (gallons):		5,000.00
Turnovers:		140.40
Net Throughput(gal/yr):		702,000.00
Is Tank Heated (y/n):	N	
Is Tank Underground (y/n):	N	
Paint Characteristics		
Shell Color/Shade:	White/White	
Shell Condition	Good	
Breather Vent Settings		
Vacuum Settings (psig):		-0.03
Pressure Settings (psig)		0.03

Meterological Data used in Emissions Calculations: Charleston AP, South Carolina (Avg Atmospheric Pressure = 14.75 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

TK-01 - Horizontal Tank
Charleston, South Carolina

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Gasoline (RVP 15.0)	All	67.43	62.24	72.62	65.60	9.3159	8.4871	10.2071	60.0000			92.00	Option 4: RVP=15, ASTM Slope=3

TAI +.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

TK-01 - Horizontal Tank
Charleston, South Carolina

Annual Emission Calcaulations	
Standing Losses (lb):	1,718.8435
Vapor Space Volume (cu ft):	467.7816
Vapor Density (lb/cu ft):	0.0988
Vapor Space Expansion Factor:	0.3451
Vented Vapor Saturation Factor:	0.2952
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	467.7816
Tank Diameter (ft):	9.6700
Effective Diameter (ft):	11.0989
Vapor Space Outage (ft):	4.8350
Tank Shell Length (ft):	10.0000
Vapor Density	
Vapor Density (lb/cu ft):	0.0988
Vapor Molecular Weight (lb/lb-mole):	60.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	9.3159
Daily Avg. Liquid Surface Temp. (deg. R):	527.0973
Daily Average Ambient Temp. (deg. F):	65.5833
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	525.2733
Tank Paint Solar Absorptance (Shell):	0.1700
Daily Total Solar Insulation Factor (Btu/sqft day):	1,364.6667
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.3451
Daily Vapor Temperature Range (deg. R):	20.7638
Daily Vapor Pressure Range (psia):	1.7200
Breather Vent Press. Setting Range(psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	9.3159
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	8.4871
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	10.2071
Daily Avg. Liquid Surface Temp. (deg R):	527.0973
Daily Min. Liquid Surface Temp. (deg R):	521.9063
Daily Max. Liquid Surface Temp. (deg R):	532.2882
Daily Ambient Temp. Range (deg. R):	19.8167
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.2952
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	9.3159
Vapor Space Outage (ft):	4.8350
Working Losses (lb):	3,553.3409
Vapor Molecular Weight (lb/lb-mole):	60.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	9.3159
Annual Net Throughput (gal/yr.):	702,000.0000
Annual Turnovers:	140.4000
Turnover Factor:	0.3803
Tank Diameter (ft):	9.6700
Working Loss Product Factor:	1.0000
Total Losses (lb):	5,272.1844

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

TK-01 - Horizontal Tank
Charleston, South Carolina

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Gasoline (RVP 15.0)	3,553.34	1,718.84	5,272.18

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	TK-02
City:	Charleston
State:	South Carolina
Company:	Mercedes-Benz Vans, LLC
Type of Tank:	Horizontal Tank
Description:	10,000 Gallon Diesel Storage Tank

Tank Dimensions

Shell Length (ft):	15.08
Diameter (ft):	11.00
Volume (gallons):	10,000.00
Turnovers:	70.20
Net Throughput(gal/yr):	702,000.00
Is Tank Heated (y/n):	N
Is Tank Underground (y/n):	N

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Charleston AP, South Carolina (Avg Atmospheric Pressure = 14.75 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

TK-02 - Horizontal Tank
Charleston, South Carolina

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Distillate fuel oil no. 2	All	67.43	62.24	72.62	65.60	0.0084	0.0071	0.0098	130.0000			188.00	Option 1: VP60 = .0065 VP70 = .009

TAI 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

TK-02 - Horizontal Tank
Charleston, South Carolina

Annual Emission Calcaulations	
Standing Losses (lb):	2.2666
Vapor Space Volume (cu ft):	912.8028
Vapor Density (lb/cu ft):	0.0002
Vapor Space Expansion Factor:	0.0355
Vented Vapor Saturation Factor:	0.9976
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	912.8028
Tank Diameter (ft):	11.0000
Effective Diameter (ft):	14.5366
Vapor Space Outage (ft):	5.5000
Tank Shell Length (ft):	15.0800
Vapor Density	
Vapor Density (lb/cu ft):	0.0002
Vapor Molecular Weight (lb/lb-mole):	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0084
Daily Avg. Liquid Surface Temp. (deg. R):	527.0973
Daily Average Ambient Temp. (deg. F):	65.5833
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	525.2733
Tank Paint Solar Absorptance (Shell):	0.1700
Daily Total Solar Insulation Factor (Btu/sqft day):	1,364.6667
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.0355
Daily Vapor Temperature Range (deg. R):	20.7638
Daily Vapor Pressure Range (psia):	0.0027
Breather Vent Press. Setting Range(psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0084
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.0071
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.0098
Daily Avg. Liquid Surface Temp. (deg R):	527.0973
Daily Min. Liquid Surface Temp. (deg R):	521.9063
Daily Max. Liquid Surface Temp. (deg R):	532.2882
Daily Ambient Temp. Range (deg. R):	19.8167
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.9976
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0084
Vapor Space Outage (ft):	5.5000
Working Losses (lb):	10.7863
Vapor Molecular Weight (lb/lb-mole):	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0084
Annual Net Throughput (gal/yr.):	702,000.0000
Annual Turnovers:	70.2000
Turnover Factor:	0.5940
Tank Diameter (ft):	11.0000
Working Loss Product Factor:	1.0000
Total Losses (lb):	13.0529

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

TK-02 - Horizontal Tank
Charleston, South Carolina

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Distillate fuel oil no. 2	10.79	2.27	13.05

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification		
User Identification:	TK-03	
City:	Charleston AP	
State:	South Carolina	
Company:	Mercedes-Benz Vans, LLC	
Type of Tank:	Horizontal Tank	
Description:	1,240 gallon Diesel Storage Tank	
Tank Dimensions		
Shell Length (ft):		7.58
Diameter (ft):		10.72
Volume (gallons):		1,240.00
Turnovers:		80.65
Net Throughput(gal/yr):		100,000.00
Is Tank Heated (y/n):	N	
Is Tank Underground (y/n):	N	
Paint Characteristics		
Shell Color/Shade:	White/White	
Shell Condition	Good	
Breather Vent Settings		
Vacuum Settings (psig):		-0.03
Pressure Settings (psig)		0.03

Meterological Data used in Emissions Calculations: Charleston AP, South Carolina (Avg Atmospheric Pressure = 14.75 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

TK-03 - Horizontal Tank
Charleston AP, South Carolina

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Distillate fuel oil no. 2	All	67.43	62.24	72.62	65.60	0.0084	0.0071	0.0098	130.0000			188.00	Option 1: VP60 = .0065 VP70 = .009

TANI 0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

TK-03 - Horizontal Tank
Charleston AP, South Carolina

Annual Emission Calcaulations	
Standing Losses (lb):	1.0821
Vapor Space Volume (cu ft):	435.7616
Vapor Density (lb/cu ft):	0.0002
Vapor Space Expansion Factor:	0.0355
Vented Vapor Saturation Factor:	0.9976
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	435.7616
Tank Diameter (ft):	10.7200
Effective Diameter (ft):	10.1741
Vapor Space Outage (ft):	5.3600
Tank Shell Length (ft):	7.5800
Vapor Density	
Vapor Density (lb/cu ft):	0.0002
Vapor Molecular Weight (lb/lb-mole):	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0084
Daily Avg. Liquid Surface Temp. (deg. R):	527.0973
Daily Average Ambient Temp. (deg. F):	65.5833
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	525.2733
Tank Paint Solar Absorptance (Shell):	0.1700
Daily Total Solar Insulation Factor (Btu/sqft day):	1,364.6667
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.0355
Daily Vapor Temperature Range (deg. R):	20.7638
Daily Vapor Pressure Range (psia):	0.0027
Breather Vent Press. Setting Range(psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0084
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.0071
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.0098
Daily Avg. Liquid Surface Temp. (deg R):	527.0973
Daily Min. Liquid Surface Temp. (deg R):	521.9063
Daily Max. Liquid Surface Temp. (deg R):	532.2882
Daily Ambient Temp. Range (deg. R):	19.8167
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.9976
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	0.0084
Vapor Space Outage (ft):	5.3600
Working Losses (lb):	1.3933
Vapor Molecular Weight (lb/lb-mole):	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0084
Annual Net Throughput (gal/yr.):	100,000.0000
Annual Turnovers:	80.6452
Turnover Factor:	0.5387
Tank Diameter (ft):	10.7200
Working Loss Product Factor:	1.0000
Total Losses (lb):	2.4755

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

TK-03 - Horizontal Tank
Charleston AP, South Carolina

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Distillate fuel oil no. 2	1.39	1.08	2.48

APPENDIX C: BACT SUPPORTING DOCUMENTATION

Table C.1.1 - RBLC Search Results - Motor Vehicles and Passenger Car Bodies - PM

RBLCID	FACILITY_NAME	COMPANY NAME	FACILITY STATE	PERMIT NUMBER	SIC CODE	PERMIT ISSUANCE DATE	PROCESS NAME	PROCCESS TYPE	THROUGHPUT	THROUGHPUT UNIT	POLLUTANT	CONTROL METHOD DESCRIPTION	EMISSION LIMIT 1	EMISSION LIMIT 1 UNIT	PERCENT EFFICIENCY	EMISSION LIMIT 2	EMISSION LIMIT 2 UNIT	COST EFFECTIVENESS	LIMIT (lb/MMscf)
Boilers - Table C.1.1.1																			
AL-0192	HONDA MANUFACTURING OF ALABAMA, LLC	HONDA MANUFACTURING OF ALABAMA, LLC	AL	309-0050 (X010-X014)	3711	10/18/2002	BOILERS, NATURAL GAS, (3)	13.31	30	MMBTU/H	Visible Emissions (VE)		10	% OPACITY	0	0		0	
AL-0192	HONDA MANUFACTURING OF ALABAMA, LLC	HONDA MANUFACTURING OF ALABAMA, LLC	AL	309-0050 (X010-X014)	3711	10/18/2002	BOILERS, NATURAL GAS, (3)	13.31	30	MMBTU/H	Particulate matter, filterable (FPM10)	CLEAN FUEL, GOOD COMBUSTION	0.228	LB/H	0	0.0076	LB/MMBTU	0	7.75
AL-0191	HYUNDAI MOTOR MANUFACTURING OF ALABAMA, LLC	HYUNDAI MOTOR MANUFACTURING OF ALABAMA, LLC	AL	209-0090-X001,X002,X003	3711	3/23/2004	BOILERS, NATURAL GAS, (3)	13.31	50	MMBTU/H	Particulate matter, filterable (FPM10)	CLEAN FUEL	0.38	LB/H	0	0.0075	LB/MMBTU	0	7.75
OH-0277	DAIMLER CHRYSLER CORPORATION BODY SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01357	3711	8/31/2004	HOT WATER BOILER, W/ NATURAL GAS, 2 UNITS	13.9	50	MMBTU/H	Particulate matter, filterable (FPM10)		0.38	LB/H	0	1.26	T/ROLLING 12-MO	0	7.75
OH-0277	DAIMLER CHRYSLER CORPORATION BODY SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01357	3711	8/31/2004	HOT WATER BOILER, W/ NATURAL GAS, 2 UNITS	13.9	50	MMBTU/H	Visible Emissions (VE)		5	% OPACITY	0	0		0	
OH-0279	DAIMLER CHRYSLER CORPORATION ASSEMBLY PLANT	DAIMLER CHRYSLER CORPORATION	OH	04-01359	3711	8/31/2004	HOT WATER BOILER, W/ NATURAL GAS, 2 UNITS	13.9	50	MMBTU/H	Particulate matter, filterable (FPM10)		0.38	LB/H	0	1.41	T/ROLLING 12-MO	0	7.75
OH-0279	DAIMLER CHRYSLER CORPORATION ASSEMBLY PLANT	DAIMLER CHRYSLER CORPORATION	OH	04-01359	3711	9/2/2004	HOT WATER BOILER, W/ NATURAL GAS, 2 UNITS	13.9	50	MMBTU/H	Visible Emissions (VE)		5	% OPACITY	0	0		0	
OH-0280	DAIMLER CHRYSLER CORPORATION PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	9/2/2004	HOT WATER BOILER, W/ NATURAL GAS, 2 UNITS	13.9	50	MMBTU/H	Visible Emissions (VE)		5	% OPACITY	0	0		0	
OH-0280	DAIMLER CHRYSLER CORPORATION PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	9/2/2004	HOT WATER BOILER, W/ NATURAL GAS, 2 UNITS	13.9	50	MMBTU/H	Particulate matter, filterable (FPM10)		0.38	LB/H	0	3.65	T/ROLLING 12-MO	0	7.75
OH-0309	TOLEDO SUPPLIER PARK- PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	5/3/2007	BOILER (2), NATURAL GAS	13.31	20.4	MMBTU/H	Visible Emissions (VE)		5	% OPACITY	0	0		0	
OH-0309	TOLEDO SUPPLIER PARK- PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	5/3/2007	BOILER (2), NATURAL GAS	13.31	20.4	MMBTU/H	Particulate Matter (PM)		0.04	LB/H	0	0.27	LB/YR	0	
OH-0309	TOLEDO SUPPLIER PARK- PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	5/3/2007	BOILER (2), NATURAL GAS	13.31	20.4	MMBTU/H	Particulate matter, filterable (FPM10)		0.15	LB/H	0	0.78	T/YR	0	7.50
AL-0191	HYUNDAI MOTOR MANUFACTURING OF ALABAMA, LLC	HYUNDAI MOTOR MANUFACTURING OF ALABAMA, LLC	AL	209-0090-X001,X002,X003	3711	3/23/2004	BOILERS, NATURAL GAS, (3)	13.31	50	MMBTU/H	Particulate matter, filterable (FPM10)	CLEAN FUEL	0.38	LB/H	0	0.0075	LB/MMBTU	0	7.75
AL-0192	HONDA MANUFACTURING OF ALABAMA, LLC	HONDA MANUFACTURING OF ALABAMA, LLC	AL	309-0050 (X010-X014)	3711	10/18/2002	BOILERS, NATURAL GAS, (3)	13.31	30	MMBTU/H	Visible Emissions (VE)		10	% OPACITY	0	0		0	
AL-0192	HONDA MANUFACTURING OF ALABAMA, LLC	HONDA MANUFACTURING OF ALABAMA, LLC	AL	309-0050 (X010-X014)	3711	10/18/2002	BOILERS, NATURAL GAS, (3)	13.31	30	MMBTU/H	Particulate matter, filterable (FPM10)	CLEAN FUEL, GOOD COMBUSTION	0.228	LB/H	0	0.0076	LB/MMBTU	0	7.75
OH-0277	DAIMLER CHRYSLER CORPORATION BODY SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01357	3711	8/31/2004	HOT WATER BOILER, W/ NATURAL GAS, 2 UNITS	13.9	50	MMBTU/H	Particulate matter, filterable (FPM10)		0.38	LB/H	0	1.26	T/ROLLING 12-MO	0	7.75
OH-0277	DAIMLER CHRYSLER CORPORATION BODY SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01357	3711	8/31/2004	HOT WATER BOILER, W/ NATURAL GAS, 2 UNITS	13.9	50	MMBTU/H	Visible Emissions (VE)		5	% OPACITY	0	0		0	
OH-0279	DAIMLER CHRYSLER CORPORATION ASSEMBLY PLANT	DAIMLER CHRYSLER CORPORATION	OH	04-01359	3711	9/2/2004	HOT WATER BOILER, W/ NATURAL GAS, 2 UNITS	13.9	50	MMBTU/H	Particulate matter, filterable (FPM10)		0.38	LB/H	0	1.41	T/ROLLING 12-MO	0	7.75
OH-0279	DAIMLER CHRYSLER CORPORATION ASSEMBLY PLANT	DAIMLER CHRYSLER CORPORATION	OH	04-01359	3711	9/2/2004	HOT WATER BOILER, W/ NATURAL GAS, 2 UNITS	13.9	50	MMBTU/H	Visible Emissions (VE)		5	% OPACITY	0	0		0	
OH-0280	DAIMLER CHRYSLER CORPORATION PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	9/2/2004	HOT WATER BOILER, W/ NATURAL GAS, 2 UNITS	13.9	50	MMBTU/H	Visible Emissions (VE)		5	% OPACITY	0	0		0	
OH-0280	DAIMLER CHRYSLER CORPORATION PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	9/2/2004	HOT WATER BOILER, W/ NATURAL GAS, 2 UNITS	13.9	50	MMBTU/H	Particulate matter, filterable (FPM10)		0.38	LB/H	0	3.65	T/ROLLING 12-MO	0	7.75

Table C.1.1 - RBLC Search Results - Motor Vehicles and Passenger Car Bodies - PM

RBLCID	FACILITY_NAME	COMPANY NAME	FACILITY STATE	PERMIT NUMBER	SIC CODE	PERMIT ISSUANCE DATE	PROCESS NAME	PROCCESS TYPE	THROUGHPUT	THROUGHPUT UNIT	POLLUTANT	CONTROL METHOD DESCRIPTION	EMISSION LIMIT 1	EMISSION LIMIT 1 UNIT	PERCENT EFFICIENCY	EMISSION LIMIT 2	EMISSION LIMIT 2 UNIT	COST EFFECTIVENESS	LIMIT (lb/MMscf)
Air Supply Units - Table C.1.1.2																			
OH-0277	DAIMLER CHRYSLER CORPORATION BODY SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01357	3711	8/31/2004	AIR SUPPLY MAKE UP UNITS (40 UNITS) AND BODY WASHERS (2 UNITS)	19.9	90	MMBTU/H	Particulate matter, filterable (FPM10)		0.68	LB/H	0	1.26	T/ROLLING 12-MO	0	7.71
OH-0277	DAIMLER CHRYSLER CORPORATION BODY SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01357	3711	8/31/2004	AIR SUPPLY MAKE UP UNITS (40 UNITS) AND BODY WASHERS (2 UNITS)	19.9	90	MMBTU/H	Visible Emissions (VE)		5	% OPACITY	0	0		0	
OH-0279	DAIMLER CHRYSLER CORPORATION ASSEMBLY PLANT	DAIMLER CHRYSLER CORPORATION	OH	04-01359	3711	9/2/2004	AIR SUPPLY MAKE UP UNITS	19.9	95	MMBTU/H	Particulate matter, filterable (FPM10)		0.72	LB/H	0	1.41	T/ROLLING 12-MO	0	7.73
OH-0279	DAIMLER CHRYSLER CORPORATION ASSEMBLY PLANT	DAIMLER CHRYSLER CORPORATION	OH	04-01359	3711	9/2/2004	AIR SUPPLY MAKE UP UNITS	19.9	95	MMBTU/H	Visible Emissions (VE)		5	% OPACITY	0	0		0	
OH-0280	DAIMLER CHRYSLER CORPORATION PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	9/2/2004	AIR SUPPLY MAKEUP UNITS (30 UNITS)	19.9	20	MMBTU/H	Visible Emissions (VE)		5	% OPACITY	0	0		0	
OH-0280	DAIMLER CHRYSLER CORPORATION PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	9/2/2004	AIR SUPPLY MAKEUP UNITS (30 UNITS)	19.9	20	MMBTU/H	Particulate matter, filterable (FPM10)		15	LB/H	0	3.65	T/ROLLING 12-MO	0	765.00
OH-0280	DAIMLER CHRYSLER CORPORATION PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	9/2/2004	AIR SUPPLY MAKE UP UNITS (17 UNITS)	19.9	10	MMBTU/H	Particulate matter, filterable (FPM10)		0.42	LB/H	0	3.65	T/ROLLING 12-MO	0	42.84
OH-0280	DAIMLER CHRYSLER CORPORATION PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	9/2/2004	AIR SUPPLY MAKE UP UNITS (17 UNITS)	19.9	10	MMBTU/H	Visible Emissions (VE)		5	% OPACITY	0	0		0	
OH-0309	TOLEDO SUPPLIER PARK- PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	5/3/2007	AIR SUPPLY MAKE UP UNITS (24)	19.9	20	MMBTU/H	Particulate matter, filterable (FPM10)		0.15	LB/H	0	0.66	T/YR	0	7.65
OH-0309	TOLEDO SUPPLIER PARK- PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	5/3/2007	AIR SUPPLY MAKE UP UNITS (24)	19.9	20	MMBTU/H	Particulate Matter (PM)		0.04	LB/H	0	0.18	T/YR	0	
OH-0309	TOLEDO SUPPLIER PARK- PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	5/3/2007	AIR SUPPLY MAKE UP UNITS (24)	19.9	20	MMBTU/H	Visible Emissions (VE)		5	% OPACITY	0	0		0	
OH-0309	TOLEDO SUPPLIER PARK- PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	5/3/2007	AIR SUPPLY MAKE UP UNITS	19.9	28.95	MMBTU/H	Particulate matter, filterable (FPM10)		0.22	LB/H	0	0.95	T/YR	0	7.75
OH-0309	TOLEDO SUPPLIER PARK- PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	5/3/2007	AIR SUPPLY MAKE UP UNITS	19.9	28.95	MMBTU/H	Particulate Matter (PM)		0.06	LB/H	0	0.24	T/YR	0	
OH-0309	TOLEDO SUPPLIER PARK- PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	5/3/2007	AIR SUPPLY MAKE UP UNITS	19.9	28.95	MMBTU/H	Visible Emissions (VE)		5	% OPACITY	0	0		0	
OH-0309	TOLEDO SUPPLIER PARK- PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	5/3/2007	AIR SUPPLY MAKE UP UNITS (6)	19.9	14	MMBTU/H	Particulate matter, filterable (FPM10)		0.11	LB/H	0	0.5	T/YR	0	8.01
OH-0309	TOLEDO SUPPLIER PARK- PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	5/3/2007	AIR SUPPLY MAKE UP UNITS (6)	19.9	14	MMBTU/H	Particulate Matter (PM)		0.03	LB/H	0	0.13	T/YR	0	
OH-0309	TOLEDO SUPPLIER PARK- PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	5/3/2007	AIR SUPPLY MAKE UP UNITS (6)	19.9	14	MMBTU/H	Visible Emissions (VE)		5	% OPACITY	0	0		0	
OH-0277	DAIMLER CHRYSLER CORPORATION BODY SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01357	3711	8/31/2004	AIR SUPPLY MAKE UP UNITS (40 UNITS) AND BODY WASHERS (2 UNITS)	19.9	90	MMBTU/H	Particulate matter, filterable (FPM10)		0.68	LB/H	0	1.26	T/ROLLING 12-MO	0	7.71
OH-0277	DAIMLER CHRYSLER CORPORATION BODY SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01357	3711	8/31/2004	AIR SUPPLY MAKE UP UNITS (40 UNITS) AND BODY WASHERS (2 UNITS)	19.9	90	MMBTU/H	Visible Emissions (VE)		5	% OPACITY	0	0		0	56.67
OH-0279	DAIMLER CHRYSLER CORPORATION ASSEMBLY PLANT	DAIMLER CHRYSLER CORPORATION	OH	04-01359	3711	9/2/2004	AIR SUPPLY MAKE UP UNITS	19.9	95	MMBTU/H	Particulate matter, filterable (FPM10)		0.72	LB/H	0	1.41	T/ROLLING 12-MO	0	

Table C.1.1 - RBLC Search Results - Motor Vehicles and Passenger Car Bodies - PM

RBLCID	FACILITY_NAME	COMPANY NAME	FACILITY STATE	PERMIT NUMBER	SIC CODE	PERMIT ISSUANCE DATE	PROCESS NAME	PROCCESS TYPE	THROUGHPUT	THROUGHPUT UNIT	POLLUTANT	CONTROL METHOD DESCRIPTION	EMISSION LIMIT 1	EMISSION LIMIT 1 UNIT	PERCENT EFFICIENCY	EMISSION LIMIT 2	EMISSION LIMIT 2 UNIT	COST EFFECTIVENESS	LIMIT (lb/MMscf)
OH-0279	DAIMLER CHRYSLER CORPORATION ASSEMBLY PLANT	DAIMLER CHRYSLER CORPORATION	OH	04-01359	3711	9/2/2004	AIR SUPPLY MAKE UP UNITS	19.9	95	MMBTU/H	Visible Emissions (VE)		5	% OPACITY	0	0		0	
OH-0280	DAIMLER CHRYSLER CORPORATION PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	9/2/2004	AIR SUPPLY MAKEUP UNITS (30 UNITS)	19.9	20	MMBTU/H	Visible Emissions (VE)		5	% OPACITY	0	0		0	
OH-0280	DAIMLER CHRYSLER CORPORATION PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	9/2/2004	AIR SUPPLY MAKEUP UNITS (30 UNITS)	19.9	20	MMBTU/H	Particulate matter, filterable (FPM10)		15	LB/H	0	3.65	T/ROLLING 12-MO	0	765.00
OH-0280	DAIMLER CHRYSLER CORPORATION PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	9/2/2004	AIR SUPPLY MAKE UP UNITS (17 UNITS)	19.9	10	MMBTU/H	Particulate matter, filterable (FPM10)		0.42	LB/H	0	3.65	T/ROLLING 12-MO	0	42.84
OH-0280	DAIMLER CHRYSLER CORPORATION PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	9/2/2004	AIR SUPPLY MAKE UP UNITS (17 UNITS)	19.9	10	MMBTU/H	Visible Emissions (VE)		5	% OPACITY	0	0		0	
OH-0309	TOLEDO SUPPLIER PARK- PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	5/3/2007	AIR SUPPLY MAKE UP UNITS (24)	19.9	20	MMBTU/H	Particulate matter, filterable (FPM10)		0.15	LB/H	0	0.66	T/YR	0	7.65
OH-0309	TOLEDO SUPPLIER PARK- PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	5/3/2007	AIR SUPPLY MAKE UP UNITS (24)	19.9	20	MMBTU/H	Particulate Matter (PM)		0.04	LB/H	0	0.18	T/YR	0	
OH-0309	TOLEDO SUPPLIER PARK- PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	5/3/2007	AIR SUPPLY MAKE UP UNITS (24)	19.9	20	MMBTU/H	Visible Emissions (VE)		5	% OPACITY	0	0		0	
OH-0309	TOLEDO SUPPLIER PARK- PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	5/3/2007	AIR SUPPLY MAKE UP UNITS	19.9	28.95	MMBTU/H	Particulate matter, filterable (FPM10)		0.22	LB/H	0	0.95	T/YR	0	7.75
OH-0309	TOLEDO SUPPLIER PARK- PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	5/3/2007	AIR SUPPLY MAKE UP UNITS	19.9	28.95	MMBTU/H	Particulate Matter (PM)		0.06	LB/H	0	0.24	T/YR	0	
OH-0309	TOLEDO SUPPLIER PARK- PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	5/3/2007	AIR SUPPLY MAKE UP UNITS	19.9	28.95	MMBTU/H	Visible Emissions (VE)		5	% OPACITY	0	0		0	
OH-0309	TOLEDO SUPPLIER PARK- PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	5/3/2007	AIR SUPPLY MAKE UP UNITS (6)	19.9	14	MMBTU/H	Particulate matter, filterable (FPM10)		0.11	LB/H	0	0.5	T/YR	0	8.01
OH-0309	TOLEDO SUPPLIER PARK- PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	5/3/2007	AIR SUPPLY MAKE UP UNITS (6)	19.9	14	MMBTU/H	Particulate Matter (PM)		0.03	LB/H	0	0.13	T/YR	0	
OH-0309	TOLEDO SUPPLIER PARK- PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	5/3/2007	AIR SUPPLY MAKE UP UNITS (6)	19.9	14	MMBTU/H	Visible Emissions (VE)		5	% OPACITY	0	0		0	
Body Shop - Table C.1.1.3																			
MS-0045	NISSAN NORTH AMERICA, INC.	NISSAN NORTH AMERICA, INC.	MS	1720-00073	3711	4/2/2001	BODY SHOP	41.002	500000	UNITS/YR	Particulate Matter (PM)	Electrostatic Precipitators with a control efficiency of 99%	99	% REDUCTION	99	0		0	
OH-0277	DAIMLER CHRYSLER CORPORATION BODY SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01357	3711	8/31/2004	BODY SHOP FINISH WELDING OPERATIONS	41.003	200064	JOBS/ROLLING 12-MO	Particulate matter, filterable (FPM10)		2.05	LB/H	0	2.5	T/ROLLING 12-MO	0	
OH-0277	DAIMLER CHRYSLER CORPORATION BODY SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01357	3711	8/31/2004	BODY SHOP FINISH WELDING OPERATIONS	41.003	200064	JOBS/ROLLING 12-MO	Visible Emissions (VE)		5	% OPACITY	0	0		0	
TX-0439	TOYOTA MOTOR MANUFACTURING TEXAS	TOYOTA MOTOR MANUFACTURING TEXAS INC	TX	P1036	3711	12/17/2003	STAMPING SHOP/BODY SHOP	41.003			Particulate matter, filterable (FPM10)		14.8	T/YR	0	0		0	

Table C.1.2 - RBLC Search Results - Motor Vehicle and Passenger Car Bodies - VOC

RBLCID	FACILITY NAME	COMPANY NAME	FACILITY STATE	PERMIT NUMBER	SIC CODE	PERMIT ISSUANCE DATE	PROCESS NAME	PROCCESS TYPE	THROUGHPUT	THROUGHPUT UNIT	CONTROL METHOD DESCRIPTION	EMISSION LIMIT 1	EMISSION LIMIT 1 UNIT	PERCENT EFFICIENCY	EMISSION LIMIT 2	EMISSION LIMIT 2 UNIT	COST EFFECTIVE NESS	LIMIT (lb/MMscf)
Boilers - Table C.1.2.1																		
OH-0277	DAIMLER CHRYSLER CORPORATION BODY SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01357	3711	8/31/2004	HOT WATER BOILER, W/ NATURAL GAS, 2 UNITS	13.9	50	MMBTU/H		0.27	LB/H	0	0.63	T/ROLLING 12-MO	0	5.51
OH-0279	DAIMLER CHRYSLER CORPORATION ASSEMBLY PLANT	DAIMLER CHRYSLER CORPORATION	OH	04-01359	3711	9/2/2004	HOT WATER BOILER, W/ NATURAL GAS, 2 UNITS	13.9	50	MMBTU/H		0.27	LB/H	0	0.74	T/ROLLING 12-MO	0	5.51
OH-0280	DAIMLER CHRYSLER CORPORATION PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	9/2/2004	HOT WATER BOILER, W/ NATURAL GAS, 2 UNITS	13.9	50	MMBTU/H		0.27	LB/H	0	2.36	T/ROLLING 12-MO	0	5.51
OH-0309	TOLEDO SUPPLIER PARK-PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	5/3/2007	BOILER (2), NATURAL GAS	13.31	20.4	MMBTU/H		0.11	LB/H	0	0.5	T/YR	0	5.50
OH-0277	DAIMLER CHRYSLER CORPORATION BODY SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01357	3711	8/31/2004	HOT WATER BOILER, W/ NATURAL GAS, 2 UNITS	13.9	50	MMBTU/H		0.27	LB/H	0	0.63	T/ROLLING 12-MO	0	5.51
OH-0279	DAIMLER CHRYSLER CORPORATION ASSEMBLY PLANT	DAIMLER CHRYSLER CORPORATION	OH	04-01359	3711	9/2/2004	HOT WATER BOILER, W/ NATURAL GAS, 2 UNITS	13.9	50	MMBTU/H		0.27	LB/H	0	0.74	T/ROLLING 12-MO	0	5.51
OH-0309	TOLEDO SUPPLIER PARK-PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	5/3/2007	BOILER (2), NATURAL GAS	13.31	20.4	MMBTU/H		0.11	LB/H	0	0.5	T/YR	0	5.50
OH-0280	DAIMLER CHRYSLER CORPORATION PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	9/2/2004	HOT WATER BOILER, W/ NATURAL GAS, 2 UNITS	13.9	50	MMBTU/H		0.27	LB/H	0	2.36	T/ROLLING 12-MO	0	5.51
Air Make-up Units - Table C.1.2.2																		
OH-0277	DAIMLER CHRYSLER CORPORATION BODY SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01357	3711	8/31/2004	AIR SUPPLY MAKE UP UNITS (40 UNITS) AND BODY WASHERS (2 UNITS)	19.9	90	MMBTU/H		0.49	LB/H	0	0.63	T/ROLLING 12-MO	0	5.55
IN-0149	SUBARU OF INDIANA AUTOTMOTIVE, INC.	SUBARU OF INDIANA AUTOMOTIVE, INC.	IN	157-31885-00050	3711	10/4/2012	BODY SHOP AIR HANDLING UNIT	41.002	1.73	MMBTU/H		0.0055	LB/MMBTU	0	0		0	5.56
OH-0280	DAIMLER CHRYSLER CORPORATION PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	9/2/2004	AIR SUPPLY MAKEUP UNITS (30 UNITS)	19.9	20	MMBTU/H		0.11	LB/H	0	2.36	T/ROLLING 12-MO	0	5.61
OH-0280	DAIMLER CHRYSLER CORPORATION PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	9/2/2004	AIR SUPPLY MAKE UP UNITS (17 UNITS)	19.9	10	MMBTU/H		0.3	LB/H	0	2.36	T/ROLLING 12-MO	0	30.60
OH-0309	TOLEDO SUPPLIER PARK-PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	5/3/2007	AIR SUPPLY MAKE UP UNITS (24)	19.9	20	MMBTU/H		0.11	LB/H	0	0.49	T/YR	0	5.61
OH-0309	TOLEDO SUPPLIER PARK-PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	5/3/2007	AIR SUPPLY MAKE UP UNITS	19.9	28.95	MMBTU/H		0.16	LB/H	0	0.68	T/YR	0	5.64
OH-0309	TOLEDO SUPPLIER PARK-PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	5/3/2007	AIR SUPPLY MAKE UP UNITS (6)	19.9	14	MMBTU/H		0.08	LB/H	0	0.35	T/YR	0	5.83
OH-0277	DAIMLER CHRYSLER CORPORATION BODY SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01357	3711	8/31/2004	AIR SUPPLY MAKE UP UNITS (40 UNITS) AND BODY WASHERS (2 UNITS)	19.9	90	MMBTU/H		0.49	LB/H	0	0.63	T/ROLLING 12-MO	0	5.55
OH-0279	DAIMLER CHRYSLER CORPORATION ASSEMBLY PLANT	DAIMLER CHRYSLER CORPORATION	OH	04-01359	3711	9/2/2004	AIR SUPPLY MAKE UP UNITS	19.9	95	MMBTU/H		0.52	LB/H	0	0.74	T/ROLLING 12-MO	0	5.58

Table C.1.2 - RBLC Search Results - Motor Vehicle and Passenger Car Bodies - VOC

RBLCID	FACILITY NAME	COMPANY NAME	FACILITY STATE	PERMIT NUMBER	SIC CODE	PERMIT ISSUANCE DATE	PROCESS NAME	PROCCESS TYPE	THROUGHPUT	THROUGHPUT UNIT	CONTROL METHOD DESCRIPTION	EMISSION LIMIT 1	EMISSION LIMIT 1 UNIT	PERCENT EFFICIENCY	EMISSION LIMIT 2	EMISSION LIMIT 2 UNIT	COST EFFECTIVE NESS	LIMIT (lb/MMscf)
OH-0280	DAIMLER CHRYSLER CORPORATION PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	9/2/2004	AIR SUPPLY MAKE UP UNITS (17 UNITS)	19.9	10	MMBTU/H		0.3	LB/H	0	2.36	T/ROLLING 12-MO	0	30.60
OH-0280	DAIMLER CHRYSLER CORPORATION PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	9/2/2004	AIR SUPPLY MAKEUP UNITS (30 UNITS)	19.9	20	MMBTU/H		0.11	LB/H	0	2.36	T/ROLLING 12-MO	0	5.61
OH-0309	TOLEDO SUPPLIER PARK-PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	5/3/2007	AIR SUPPLY MAKE UP UNITS (24)	19.9	20	MMBTU/H		0.11	LB/H	0	0.49	T/YR	0	5.61
OH-0309	TOLEDO SUPPLIER PARK-PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	5/3/2007	AIR SUPPLY MAKE UP UNITS	19.9	28.95	MMBTU/H		0.16	LB/H	0	0.68	T/YR	0	5.64
OH-0309	TOLEDO SUPPLIER PARK-PAINT SHOP	DAIMLER CHRYSLER CORPORATION	OH	04-01358	3711	5/3/2007	AIR SUPPLY MAKE UP UNITS (6)	19.9	14	MMBTU/H		0.08	LB/H	0	0.35	T/YR	0	5.83
IN-0149	SUBARU OF INDIANA AUTOTMOTIVE, INC.	SUBARU OF INDIANA AUTOMOTIVE, INC.	IN	157-31885-00050	3711	10/4/2012	BODY SHOP AIR HANDLING UNIT	41.002	1.73	MMBTU/H		0.0055	LB/MMBTU	0	0		0	5.56

Table C.2.1 - Cost Analysis Assumptions

Number of Years	10
Interest Rate	7%
CRF [1]	0.142

[1] Based on 10 year equipment lifetime. Interest rate conservatively set at 7.00%, based on EPA's seven percent social interest rate from the OAQPS CCM Sixth Edition.

Table C.2.2 - Chemical Engineering Plant Cost Index

Year	CEPCI [1]
2002	395.6
2014	576.1
Cost Escalation Factor	1.46

[1] Available at http://www.scribd.com/doc/277921333/CEPCI-2015#scribd.

Table C.2.3 - Oxidation Catalyst Costs [1]

Oxidation Catalyst Costs	EPA $/scfm (2002 Basis)	EPA $/scfm (2014 Basis)
Capital Cost	35.00	50.97
O&M Cost	6.00	8.74

[1] Based on EPA Air Pollution Control Technology Fact Sheet for Regenerative Incinerator (EPA-452/F-03-021). Capital costs range from $35 to $140 per cfm and O&M costs range from $6 to $20 per cfm. Minimum costs for regnerative incinerators are assumed to be representative of oxidation catalyst.

Table C.2.4 - Cost Effectiveness Calculations

A		B	C	D	E	H	I	J	K
Equipment	Heat Input Capacity (MMBtu/hr)	Potential VOC Emissions (tpy)	Control Efficiency (%)	Potential VOC Reduced (tpy)	Stack Flow (scfm) [1]	Capital Cost ($)	O&M Cost ($)	Annualized Cost ($)	Cost Effectiveness ($/ton) [2]
Boiler 1 (B01)	14.27	0.23	40	0.09	2,072	105,584.58	18,100.21	33,133.08	357,666.62
Boiler 2 (B02)	14.27	0.23	40	0.09	2,072	105,584.58	18,100.21	33,133.08	357,666.62
ASU Primer/BC/CC	6.49	0.11	40	0.04	942	48,019.90	8,231.98	15,068.94	357,666.62
ASU 2.1 Shop + Open WD	10.00	0.16	40	0.06	1,452	73,990.60	12,684.10	23,218.70	357,666.62
ASU 3 - UBP + Repair	7.44	0.12	40	0.05	1,080	55,049.01	9,436.97	17,274.71	357,666.62
ASU 2.2 Shop + Open WD	10.00	0.16	40	0.06	1,452	73,990.60	12,684.10	23,218.70	357,666.62
ASU 1 - Spot Repair	4.82	0.08	40	0.03	700	35,663.47	6,113.74	11,191.41	357,666.62
ASU 2.3 Shop	10.00	0.16	40	0.06	1,452	73,990.60	12,684.10	23,218.70	357,666.62
ASU 4 - Wax	4.84	0.08	40	0.03	703	35,811.45	6,139.11	11,237.85	357,666.62
Workdecks ASU 6 (Phase 2)	8.54	0.14	40	0.06	1,240	63,187.97	10,832.22	19,828.77	357,666.62
Workdecks ASU 5 (Phase 2)	5.83	0.09	40	0.04	846	43,136.52	7,394.83	13,536.50	357,666.62
ASU Cleanroom (Phase 2)	1.26	0.02	40	0.01	183	9,322.82	1,598.20	2,925.56	357,666.62
Primer Booth Air Supply Unit Phase 3	7.57	0.12	40	0.05	1,099	56,010.88	9,601.87	17,576.56	357,666.62
BC Booth Air Supply Unit Phase 3	7.68	0.12	40	0.05	1,115	56,824.78	9,741.39	17,831.96	357,666.62
Workdecks Air Supply Unit 1 Phase 3	4.96	0.08	40	0.03	720	36,699.34	6,291.31	11,516.47	357,666.62
Workdecks Air Supply Unit 2 Phase 3	2.56	0.04	40	0.02	372	18,941.59	3,247.13	5,943.99	357,666.62
Workdecks Air Supply Unit 3 Phase 3	8.05	0.13	40	0.05	1,169	59,562.43	10,210.70	18,691.05	357,666.62
Shop Ventilation Air Supply Unit Phase 3	3.07	0.05	40	0.02	446	22,715.11	3,894.02	7,128.14	357,666.62
Social Rooms Air Supply Unit Phase 3	1.53	0.02	40	0.01	222	11,320.56	1,940.67	3,552.46	357,666.62
Assembly - Rooftop Unit 1	0.80	0.01	40	0.01	116	5,919.25	1,014.73	1,857.50	357,666.62
Assembly - Rooftop Unit 4	0.80	0.01	40	0.01	116	5,919.25	1,014.73	1,857.50	357,666.62
Assembly - Rooftop Unit 6	0.80	0.01	40	0.01	116	5,919.25	1,014.73	1,857.50	357,666.62
Assembly - Rooftop Unit 8	0.80	0.01	40	0.01	116	5,919.25	1,014.73	1,857.50	357,666.62
Assembly - Rooftop Unit 10	0.80	0.01	40	0.01	116	5,919.25	1,014.73	1,857.50	357,666.62
Assembly - Rooftop Unit 11	0.80	0.01	40	0.01	116	5,919.25	1,014.73	1,857.50	357,666.62
Assembly - Rooftop Unit 13	0.80	0.01	40	0.01	116	5,919.25	1,014.73	1,857.50	357,666.62
Body Shop - Rooftop Unit 1	0.80	0.01	40	0.01	116	5,919.25	1,014.73	1,857.50	357,666.62
Body Shop - Rooftop Unit 2	0.80	0.01	40	0.01	116	5,919.25	1,014.73	1,857.50	357,666.62
Body Shop - Rooftop Unit 4	0.80	0.01	40	0.01	116	5,919.25	1,014.73	1,857.50	357,666.62
Body Shop - Rooftop Unit 5	0.80	0.01	40	0.01	116	5,919.25	1,014.73	1,857.50	357,666.62
Body Shop - Rooftop Unit 6	0.80	0.01	40	0.01	116	5,919.25	1,014.73	1,857.50	357,666.62
Body Shop - Rooftop Unit 7	0.80	0.01	40	0.01	116	5,919.25	1,014.73	1,857.50	357,666.62
Body Shop - Rooftop Unit 10	0.80	0.01	40	0.01	116	5,919.25	1,014.73	1,857.50	357,666.62
Body Shop - Rooftop Unit 17	0.80	0.01	40	0.01	116	5,919.25	1,014.73	1,857.50	357,666.62
Body Shop - Rooftop Unit 18	0.80	0.01	40	0.01	116	5,919.25	1,014.73	1,857.50	357,666.62
Body Shop - Rooftop Unit 23	0.80	0.01	40	0.01	116	5,919.25	1,014.73	1,857.50	357,666.62
Body Shop - Rooftop Unit 25	0.80	0.01	40	0.01	116	5,919.25	1,014.73	1,857.50	357,666.62
Body Shop - Rooftop Unit 26	0.80	0.01	40	0.01	116	5,919.25	1,014.73	1,857.50	357,666.62
Body Shop - Rooftop Unit 30	0.80	0.01	40	0.01	116	5,919.25	1,014.73	1,857.50	357,666.62
Body Shop - Rooftop Unit 32	0.80	0.01	40	0.01	116	5,919.25	1,014.73	1,857.50	357,666.62
Body Shop - Rooftop Unit 33	0.80	0.01	40	0.01	116	5,919.25	1,014.73	1,857.50	357,666.62
Body Shop - Rooftop Unit 35	0.80	0.01	40	0.01	116	5,919.25	1,014.73	1,857.50	357,666.62
Calculation				= B x C%				=(H x CRF) + I	=J/D

[1] Stack flows (scfm) were estimated using EPA Method 19 factor of 8,710 dscf/MMBtu.

[2] Exhaust temperatures were estimated by Mercedes-Benz Vans.

[3] Cost effectiveness values for paint shop combustion sources differ from values for all other combustion sources due to a difference in annual hours of operation and the impact on annual emissions.

APPENDIX D: EQUIPMENT BY PHASE

Installed Equipment By Phase

Unit ID	Equipment Description	Equipment ID	Phase 1	Phase 2	Phase 3
1	**Paint Shop Boiler**				
	Boiler 01	B01	X	X	X
	Boiler 02	B02	X	X	X
2	**Process Combustion Sources**				
	RTO #1	RTO1	X		
	RTO #1 (add)	RTO1		X	X
	ADW Desorption Heater #1	ADH01	X	X	X
	ADW Desorption Heater #2	ADH02			X
	E-Coat Oven Burners	OV01	X	X	X
	Primer (Guidecoat) Oven #1 Burners	OV02	X	X	X
	Topcoat Oven #1 Burners	OV03	X	X	X
	Primer (Guidecoat) Oven #2 Burners	OV22			X
	Topcoat Oven #2 Burners	OV23			X
	Assembly Oven Burners	OV04	X	X	X
3	**Paint Shop E-coat Operations**				
	E-coat Dip Tank	ED01	X	X	X
	E-coat Oven	EO01	X	X	X
4	**Paint Shop Guidecoat Operations**				
	Guidecoat Booth 1	GC01	X	X	X
	Guidecoat Oven #1	GO01	X	X	X
	Guidecoat Booth 2	GC21			X
	Guidecoat Oven #2	GO21			X
5	**Paint Shop Sealers and Adhesives Application**				
	Sound Deadener Adhesive (SAM) Area 1	SAM01	X	X	X
	Sound Deadener Adhesive (SAM) Area 2	SAM21			X
	Underbody (UB) PVC Sealer Deck 1	UBS01	X	X	X
	Underbody (UB) PVC Sealer Deck 2	UBS21			X
	Seam Sealing 1	SS01	X	X	X
	Seam Sealer Deck 2	SS21			X
	Sika Sealing 1	SKS01	X	X	X
	Sika Sealing 2	SKS21			X
	Paint Shop Adhesive Application	PSA	X	X	X
6	**Paint Shop Topcoat Operations**				
	Basecoat/Clearcoat Booth 1	BC01	X	X	X
	Clearcoat Booth 1	CC01		X	X
	Topcoat Oven #1	TO01	X	X	X
	Basecoat/Clearcoat Booth 2	BC21			X
	Topcoat Oven #2	TO21			X
	Spot Repair Booth 1	SR01	X	X	X
	Spot Repair Booth 2	SR02		X	X
	Spot Repair Booth 3	SR03			X
	Assembly Repair Booth 1	AR01	X	X	X
	Cavity Wax Operations	CW	X	X	X
	Underbody Coating Booth #1	UBC01	X	X	X
	Underbody Coating Booth #2	UBC21			X
7	**Paint Shop Purge Solvent Operations**				
	Purge solvent	PS01	X	X	X
8	**Body Shop Adhesives Application**				
	Body shop adhesives application	BS02	X	X	X
9	**Assembly Windshield Glazing Operations**				
	Window glazing	AW	X	X	X
10	**Assembly UB Wax Application**				
	Assembly UB Wax Application	AUW	X	X	X
PC	**Paint Shop Phosphate Cleaning Operations**				
	Phosphate Cleaning	PC	X	X	X
BS	**Body Shop Welding Areas**				
	Welding, Soldering	BS01	X	X	X
PMR	**Paint Shop Mixing Operations**				
	Paint Mix Room	PMR	X	X	X
RB	**Assembly Roll and Brake Testing**				
	Roll and brake testing 1	RB1	X	X	X
	Roll and brake testing 2	RB2		X	X
	Roll and brake testing 3	RB3			X

Installed Equipment By Phase

Unit ID	Equipment Description	Equipment ID	Phase 1	Phase 2	Phase 3
FF	**Assembly Fluid Fill Operations**				
	Fluid fill	AFF	X	X	X
WST	**Assembly Windshield Washer System Testing**				
	Washer system testing	AWT	X	X	X
WD	**Sand, Touch-up & Polish Operations**	WD			
	E-coat Sand & Spot Repair		X	X	X
	Primer Sand		X	X	X
	Metal/Body Repair		X	X	X
	E-coat Touch-up		X	X	X
	Primer Touch-up		X	X	X
	Basecoat Touch-up		X	X	X
	Inspect/Polish		X	X	X
ASU	**Air Supply Units**				
	ASU Primer/BC/CC	ASU P/BC/CC	X	X	X
	ASU 2.1 Shop + Open WD	ASU 2.1	X	X	X
	ASU 3 - UBP + Repair	ASU 3	X	X	X
	ASU 2.2 Shop + Open WD	ASU 2.2	X	X	X
	ASU 1 - Spot Repair	ASU 1	X	X	X
	ASU 2.3 Shop	ASU 2.3	X	X	X
	ASU 4 - Wax	ASU 4	X	X	X
	Workdecks ASU 6 (Phase 2)	ASU 6		X	X
	Workdecks ASU 5 (Phase 2)	ASU 5		X	X
	ASU Cleanroom (Phase 2)	ASU CR2		X	X
	Primer Booth Air Supply Unit Phase 3	ASU31			X
	BC Booth Air Supply Unit Phase 3	ASU32			X
	Workdecks Air Supply Unit 1 Phase 3	ASU33			X
	Workdecks Air Supply Unit 2 Phase 3	ASU34			X
	Workdecks Air Supply Unit 3 Phase 3	ASU35			X
	Shop Ventilation Air Supply Unit Phase 3	ASU36			X
	Social Rooms Air Supply Unit Phase 3	ASU37			X
	Assembly - Rooftop Unit 1	AS-RTU01	X	X	X
	Assembly - Rooftop Unit 4	AS-RTU04	X	X	X
	Assembly - Rooftop Unit 6	AS-RTU06	X	X	X
	Assembly - Rooftop Unit 8	AS-RTU08	X	X	X
	Assembly - Rooftop Unit 10	AS-RTU10	X	X	X
	Assembly - Rooftop Unit 11	AS-RTU11	X	X	X
	Assembly - Rooftop Unit 13	AS-RTU13	X	X	X
	Body Shop - Rooftop Unit 1	BS-RTU01	X	X	X
	Body Shop - Rooftop Unit 7	BS-RTU07	X	X	X
	Body Shop - Rooftop Unit 10	BS-RTU10	X	X	X
	Body Shop - Rooftop Unit 17	BS-RTU17	X	X	X
	Body Shop - Rooftop Unit 18	BS-RTU18	X	X	X
	Body Shop - Rooftop Unit 23	BS-RTU23	X	X	X
	Body Shop - Rooftop Unit 25	BS-RTU25	X	X	X
	Body Shop - Rooftop Unit 26	BS-RTU26	X	X	X
	Body Shop - Rooftop Unit 30	BS-RTU30	X	X	X
	Body Shop - Rooftop Unit 32	BS-RTU32	X	X	X
	Body Shop - Rooftop Unit 33	BS-RTU33	X	X	X
	Body Shop - Rooftop Unit 35	BS-RTU35	X	X	X
EE	**Emergency Generators**				
	Diesel-fired emergency generator 01	EG01	X	X	X
	Diesel-fired emergency generator 02	EG02	X	X	X
	Diesel-fired emergency generator 03	EG03	X	X	X
	Diesel-fired emergency generator 04	EG04			X
	Diesel-fired emergency fire pump 01	FP-01	X	X	X
CT	**Cooling Tower**				
	Cooling Tower 1	CT01	X	X	X
	Cooling Tower 2	CT02	X	X	X
	Cooling Tower 3	CT03	X	X	X
	Cooling Tower 4	CT04	X	X	X
	Cooling Tower 5	CT05	X	X	X
	Cooling Tower 6	CT06	X	X	X
	Cooling Tower 7	CT07	X	X	X
TK	**Storage Tanks**				
	Gasoline tank	TK01	X	X	X
	Diesel tank	TK02	X	X	X
	Diesel tank	TK03	X	X	X
RD	**Roads**				
	Paved Roads	RD	X	X	X

APPENDIX E: ELECTRONIC APPLICATION AND SUPPORTING DOCUMENTATION

Healthy People. Healthy Communities.

February 26, 2018

Catherine Collins
USPHS
Bureau of Air & Water Resources
US Fish and Wildlife Service
7333 West Jefferson Ave.
Suite 375
Lakewood, CO 80235

Sarah Dawsey
Cape Romain Wilderness Area
5801 Highway 17 North
Awendaw, SC 29429

Re: Prevention of Significant Deterioration (PSD) Air Permit Application Revision
Mercedes Benz Vans, LLC
Permit No. 0560-0385-CA-R3, Charleston County

Dear Ms. Collins and Dawsey:

The Bureau of Air Quality (BAQ) received a PSD permit application revision from Mercedes Benz Vans, LLC, Ladson, SC on February 20, 2018. The application was for revisions/modifications to the new automobile manufacturing plant. The completeness review period for the application officially began on this date and the application has been deemed technically complete as of February 26, 2018. It will now undergo technical review for a preliminary determination under the requirements of SC Regulation 61-62.5, Standard No. 7 (PSD).

An electronic copy of the PSD construction permit application is available for review upon your request. Please direct all written comments to my attention at the address below. If I can be of further assistance, please contact me at (803) 898-4072 or by E-mail at clarkfaw@dhec.sc.gov.

Sincerely,

Fatina Ann Washburn Clark

Fatina Ann Washburn Clark
Air Permitting Division
Bureau of Air Quality

cc: Permit File: 0560-0385
ec: Wendy Boswell, BEHS

Bureau of Air Quality
Construction Permit Application
Emissions

APPLICATION IDENTIFICATION *(Please ensure that the information list in this table is the same on all of the forms and required information submitted in this construction permit application package.)*		
Facility Name *(This should be the name used to identify the facility)*	SC Air Permit Number (8-digits only) *(Leave blank if one has never been assigned)*	Application Date
Mercedes-Benz Vans, LLC	0560 - 0385	February 2018

ATTACHMENTS *(Check all the appropriate checkboxes if included as an attachment)*	
☒ Sample Calculations, Emission Factors Used, etc.	☒ Detailed Explanation of Assumptions, Bottlenecks, etc.
☒ Supporting Information: Manufacturer's Data, etc.	☐ Source Test Information
☒ Details on Limits Being Taken for Limited Emissions	☒ NSR Analysis

SUMMARY OF PROJECTED CHANGE IN FACILITY WIDE POTENTIAL EMISSIONS
(Calculated at maximum design capacity.)

Pollutants	**Emission Rates Prior to Construction / Modification (tons/year)**			**Emission Rates After Construction / Modification (tons/year)**		
	Uncontrolled	**Controlled**	**Limited**	**Uncontrolled**	**Controlled**	**Limited**
Particulate Matter (PM)	1,353.39	29.51	26.97	1,353.99	24.65	21.94
Particulate Matter <10 Microns (PM_{10})	1,346.10	22.23	19.77	1,346.70	17.36	14.73
Particulate Matter <2.5 Microns ($PM_{2.5}$)	1,344.79	20.92	18.46	1,345.39	16.05	13.43
Sulfur Dioxide (SO_2)	0.72	0.72	0.59	0.93	0.93	0.79
Nitrogen Oxides (NO_x)	48.94	48.94	38.55	46.37	46.37	35.42
Carbon Monoxide (CO)	77.43	77.43	59.16	76.98	76.98	57.76
Volatile Organic Compounds (VOC)	3,442.84	1,110.37	952.04	3,446.70	1,114.23	955.85
Lead (Pb)	4.18E-04	4.18E-04	3.09E-04	4.24E-04	4.24E-04	3.10E-04
Highest HAP Prior to Construction (CAS #:)	Multiple >10	Multiple >10		Multiple >10	Multiple >10	
Highest HAP After Construction (CAS #:)						
Total HAP Emissions*	415.56	415.56	358.18	415.58	415.58	358.18
Carbon Dioxide Equivalent (CO_2e)	101,146	101,146	74,999	102,498	102,498	74,999

Include emissions from exempt equipment and emission increases from process changes that were exempt from construction permits.
(*All HAP emitted from the various equipment or processes must be listed in the appropriate "Potential Emission Rates at Maximum Design Capacity" Table)

PSD Permit Application - Unrestricted Emission Calculations

Mercedes-Benz Vans, LLC

Charleston, South Carolina Facility

Facility-wide Potential Emissions

Pollutants	Unrestricted Uncontrolled Emissions tpy	Unrestricted Controlled Emissions tpy	Limited Emissions tpy
PM	1,353.99	24.65	21.94
PM_{10}	1,346.70	17.36	14.73
$PM_{2.5}$	1,345.39	16.05	13.43
SO_2	0.93	0.93	0.79
CO	76.98	76.98	57.76
NO_X	46.37	46.37	35.42
VOC	3,446.70	1,114.23	955.85
Lead	4.24E-04	4.24E-04	3.10E-04
CO_2e	102,498	102,498	74,999
Total HAP	415.58	415.58	358.18

Facility-wide Unrestricted Potential Emissions

	Uncontrolled Emissions		Controlled Emissions	
Pollutants	**lb/hr**	**tpy**	**lb/hr**	**tpy**
PM	309.89	1,353.99	6.39	24.65
PM_{10}	308.23	1,346.70	4.72	17.36
$PM_{2.5}$	307.93	1,345.39	4.43	16.05
SO_2	1.79	0.93	1.79	0.93
CO	30.37	76.98	30.37	76.98
NO_X	30.78	46.37	30.78	46.37
VOC	808.95	3,446.70	274.58	1114.23
Lead	9.69E-05	4.24E-04	9.69E-05	4.24E-04
CO_2e	24,186.53	102,497.82	24,186.53	102,497.82
CO_2	24,156.94	102,379.94	24,156.94	102,379.94
CH_4	0.56	2.33	0.56	2.33
N_2O	0.05	0.20	0.05	0.20

Facility-wide Unrestricted Potential HAP/TAP Emissions

	Total Emissions	
Pollutants	**lb/hr**	**tpy**
2-Methylnaphthalene	4.65E-06	2.04E-05
3-Methylchloranthrene	3.49E-07	1.53E-06
7,12-Dimethylbenz(a)anthracene	3.10E-06	1.36E-05
Acenaphthene	3.49E-07	1.53E-06
Acenaphthylene	3.49E-07	1.53E-06
Anthracene	4.65E-07	2.04E-06
Benz(a)anthracene	3.49E-07	1.53E-06
Benzene	5.29E-03	3.00E-03
Benzo(a)pyrene	2.33E-07	1.02E-06
Benzo(b)fluoranthene	3.49E-07	1.53E-06
Benzo(g,h,i)perylene	2.33E-07	1.02E-06
Benzo(k)fluoranthene	3.49E-07	1.53E-06
Butylglycol Acetate	4.65E-01	2.03E+00
Chrysene	3.49E-07	1.53E-06
Isopropylbenzene (Cumene)	1.55E-01	6.78E-01
Dibenzo(a,h)anthracene	2.33E-07	1.02E-06
Dichlorobenzene	2.33E-04	1.02E-03
Ethyl Benzene	3.10E-01	1.36E+00
Fluoranthene	5.81E-07	2.55E-06
Fluorene	5.43E-07	2.38E-06
Formaldehyde	1.95E-02	8.39E-02
Hexane	3.49E-01	1.53E+00
Indeno(1,2,3-cd)pyrene	3.49E-07	1.53E-06
Naphthalene	7.89E-04	6.85E-04
Phenanathrene	3.29E-06	1.44E-05
Pyrene	9.69E-07	4.24E-06
Toluene	2.57E-03	3.36E-03
Arsenic	3.88E-05	1.70E-04
Beryllium	2.33E-06	1.02E-05
Cadmium	2.13E-04	9.34E-04
Chromium	2.71E-04	1.19E-03
Cobalt	1.63E-05	7.13E-05
Lead	9.69E-05	4.24E-04
Manganese	6.39E-04	2.80E-03
Mercury	5.04E-05	2.21E-04
Nickel	4.07E-04	1.78E-03
Selenium	4.65E-06	2.04E-05
Xylene	1.09E+00	4.75E+00
Acetaldehyde	2.54E-04	6.35E-05
Acrolein	2.20E-04	5.51E-05
Total PAH	1.15E-03	2.89E-04
Methyl Ethyl Ketone	3.09E+00	1.35E+01
Acrylic acid	3.48E-02	1.53E-01
Methanol	7.59E-01	3.32E+00
Ethylene Glycol	1.06E+00	4.62E+00
Total HAP [a]	94.89	415.58

[a] Includes total HAP from paint shop and purge solvent.

Inputs

Phase	Paint Shop Operation (days/yr)	Assembly Operation (days/yr)	Paint Shop/Body Shop Throughput (units/hr)	(units/day)	(units/yr)	Assembly Throughput [a] (units/hr)	(units/day)	(units/yr)
Phase 3	365	365	17	400	146,000	19	450	164,250

[a] Assembly throughput includes existing re-assembly throughput as well as proposed expansion throughput.

Daily Operation	
24	hours/day

Combustion Average Utilization [b] Percent	Hours of Operation
100.0%	8,760

[b] Calculations assume 8,760 hours of operation for unrestricted emission calculations.

Hours of Operation [e] 8,760 hrs

Boiler Information

Equipment	Heat Input Capacity MMBtu/hr
Boiler 1 (B01)	14.27
Boiler 2 (B02)	14.27

Boiler Natural Gas Emission Factors

Pollutant	Emission Factor [a,b,c] lb/MMBtu
PM [d]	0.0074
SO_2	0.0006
CO	0.0819
NO_X	0.0360
VOC	0.0054
CO_2e	
CO_2	117.00
CH_4	2.21E-03
N_2O	2.21E-04

[a] Emission factors are from AP-42, Table 1.4-1 and 1.4-2 for small boilers with low NO_X burners. NO_X emission factor is from SC Standard No. 5.2, Section III, Table 1.
[b] Emission factors calculated using the default natural gas heating value of 1,026 Btu/scf from 40 CFR 98.
[c] Emission factors from 40 CFR 98, Subpart C, Tables C-1 and C-2. Factors were converted to lb/MMBtu.
[d] PM_{10} and $PM_{2.5}$ are assumed to be equal to PM for natural gas combustion.

Boilers Non-HAP Unrestricted Potential Emissions

Pollutant	Emission Rates [e]					
	B01		B02		Total	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
$PM/PM_{10}/PM_{2.5}$	0.11	0.46	0.11	0.46	0.21	0.93
SO_2	0.01	0.04	0.01	0.04	0.02	0.07
CO	1.17	5.12	1.17	5.12	2.34	10.23
NO_X	0.51	2.25	0.51	2.25	1.03	4.50
VOC	0.08	0.34	0.08	0.34	0.15	0.67
CO_2e	1,671	7,320	1,671	7320.19	3,342.55	14,640
CO_2	1,670	7,313	1670	7312.64	3,339.10	14,625
CH_4	0.03	0.14	0.03	0.14	0.06	0.28
N_2O	0.003	0.01	0.00	0.01	0.01	0.03

[e] Hours of operation for unrestricted emission calculations are 8,760.

Appendix B.2.2 - Boilers

Mercedes-Benz Vans, LLC

Boilers HAP/TAP Unrestricted Potential Emissions

Pollutant	Emission Factor [a] lb/MMscf	Boilers Total	
		lb/hr	tpy
2-Methylnaphthalene	2.4E-05	6.7E-07	2.9E-06
3-Methylchloranthrene	1.8E-06	5.0E-08	2.2E-07
7,12-Dimethylbenz(a)anthracene	1.6E-05	4.5E-07	1.9E-06
Acenaphthene	1.8E-06	5.0E-08	2.2E-07
Acenaphthylene	1.8E-06	5.0E-08	2.2E-07
Anthracene	2.4E-06	6.7E-08	2.9E-07
Benz(a)anthracene	1.8E-06	5.0E-08	2.2E-07
Benzene	2.1E-03	5.8E-05	2.6E-04
Benzo(a)pyrene	1.2E-06	3.3E-08	1.5E-07
Benzo(b)fluoranthene	1.8E-06	5.0E-08	2.2E-07
Benzo(g,h,i)perylene	1.2E-06	3.3E-08	1.5E-07
Benzo(k)fluoranthene	1.8E-06	5.0E-08	2.2E-07
Chrysene	1.8E-06	5.0E-08	2.2E-07
Dibenzo(a,h)anthracene	1.2E-06	3.3E-08	1.5E-07
Dichlorobenzene	1.2E-03	3.3E-05	1.5E-04
Fluoranthene	3.0E-06	8.3E-08	3.7E-07
Fluorene	2.8E-06	7.8E-08	3.4E-07
Formaldehyde	7.5E-02	2.1E-03	9.1E-03
Hexane	1.8E+00	5.0E-02	2.2E-01
Indeno(1,2,3-cd)pyrene	1.8E-06	5.0E-08	2.2E-07
Naphthalene	6.1E-04	1.7E-05	7.4E-05
Phenanathrene	1.7E-05	4.7E-07	2.1E-06
Pyrene	5.0E-06	1.4E-07	6.1E-07
Toluene	3.4E-03	9.5E-05	4.1E-04
Arsenic	2.0E-04	5.6E-06	2.4E-05
Beryllium	1.2E-05	3.3E-07	1.5E-06
Cadmium	1.1E-03	3.1E-05	1.3E-04
Chromium	1.4E-03	3.9E-05	1.7E-04
Cobalt	8.4E-05	2.3E-06	1.0E-05
Lead	5.0E-04	1.4E-05	6.1E-05
Manganese	3.8E-04	1.1E-05	4.6E-05
Mercury	2.6E-04	7.2E-06	3.2E-05
Nickel	2.1E-03	5.8E-05	2.6E-04
Selenium	2.4E-05	6.7E-07	2.9E-06

[a] Emission factors are from AP-42, Table 1.4-2, 1.4-3, and 1.4-4.

Air Supply and Rooftop Units - Natural Gas Emission Factors

Hours of Operation [e] 8,760 hrs

Pollutant	NG Emission Factors [a,b,c] (lb/MMBtu)
$PM/PM_{10}/PM_{2.5}$	0.0074
SO_2	0.0006
NO_X	0.0487
CO	0.0819
VOC	0.0054
CO_2e [d]	
CO_2	117.00
CH_4	2.21E-03
N_2O	2.21E-04

[a] PM, SO_2, and VOC natural gas emission factors are from AP-42, Table 1.4-2, 07/98.
[b] NO_X and CO natural gas emission factors are from AP-42, Table 1.4-1, 07/98, Small Boilers w/ Low NO_X Control.
[c] The heating value of natural gas is assumed to be 1,026 Btu/scf.
[d] Emission factors from 40 CFR 98, Subpart C, Tables C-1 and C-2. Factors were converted to lb/MMBtu.

Air Supply Units Non-HAP Emissions

			Emission Rates [e]																	
		Rated Capacity	$PM/PM_{10}/PM_{2.5}$		SO_2		NO_X		CO		VOC		CO_2		CH_4		N_2O		CO_2e	
Description	Equipment	(MMBtu/hr)	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
ASU Primer/BC/CC	ASU P/BC/CC	6.49	Routed to Dry X. See Dry X PM Emissions Table.		0.004	0.017	0.316	1.385	0.531	2.327	0.035	0.152	759.31	3,326	0.014	0.063	0.001	0.006	760.10	3,329
ASU 2.1 Shop + Open WD	ASU 2.1	10.00	0.07	0.32	0.006	0.026	0.49	2.13	0.82	3.59	0.05	0.23	1,169.97	5,124	0.022	0.097	0.002	0.010	1,171.18	5,130
ASU 3 - UBP + Repair	ASU 3	7.44	0.06	0.24	0.004	0.019	0.36	1.59	0.61	2.67	0.04	0.17	870.46	3,813	0.016	0.072	0.002	0.007	871.36	3,817
ASU 2.2 Shop + Open WD	ASU 2.2	10.00	0.07	0.32	0.006	0.026	0.49	2.13	0.82	3.59	0.05	0.23	1,169.97	5,124	0.022	0.097	0.002	0.010	1,171.18	5,130
ASU 1 - Spot Repair	ASU 1	4.82	0.04	0.16	0.003	0.012	0.23	1.03	0.39	1.73	0.03	0.11	563.93	2,470	0.011	0.047	0.001	0.005	564.51	2,473
ASU 2.3 Shop	ASU 2.3	10.00	0.07	0.32	0.006	0.026	0.49	2.13	0.82	3.59	0.05	0.23	1,169.97	5,124	0.022	0.097	0.0022	0.010	1,171.18	5,130
ASU 4 - Wax	ASU 4	4.84	0.04	0.16	0.003	0.012	0.24	1.03	0.40	1.74	0.03	0.11	566.27	2,480	0.011	0.047	0.001	0.005	566.85	2,483
Workdecks ASU 6 (Phase 2)	ASU 6	8.54	0.06	0.28	0.005	0.022	0.42	1.82	0.70	3.06	0.05	0.20	999.16	4,376	0.019	0.082	0.002	0.008	1,000.19	4,381
Workdecks ASU 5 (Phase 2)	ASU 5	5.83	0.04	0.19	0.003	0.015	0.28	1.24	0.48	2.09	0.03	0.14	682.09	2,988	0.013	0.056	0.001	0.006	682.80	2,991
ASU Cleanroom (Phase 2)	ASU CR2	1.26	0.01	0.04	0.001	0.003	0.06	0.27	0.10	0.45	0.01	0.03	147.42	646	0.003	0.012	0.000	0.001	147.57	646
Primer Booth Air Supply Unit Phase 3	ASU31	7.57	Routed to Dry X. See Dry X PM Emissions Table.		0.004	0.019	0.37	1.62	0.62	2.71	0.04	0.18	885.67	3,879	0.017	0.073	0.002	0.007	886.58	3,883
BC Booth Air Supply Unit Phase 3	ASU32	7.68			0.004	0.020	0.37	1.64	0.63	2.75	0.04	0.18	898.54	3,936	0.017	0.074	0.002	0.007	899.47	3,940
Workdecks Air Supply Unit 1 Phase 3	ASU33	4.96	0.04	0.16	0.003	0.013	0.24	1.06	0.41	1.78	0.03	0.12	580.31	2,542	0.011	0.048	0.0011	0.005	580.91	2,544
Workdecks Air Supply Unit 2 Phase 3	ASU34	2.56	0.02	0.08	0.001	0.007	0.12	0.55	0.21	0.92	0.01	0.06	299.51	1,312	0.006	0.025	0.001	0.002	299.82	1,313
Workdecks Air Supply Unit 3 Phase 3	ASU35	8.05	0.06	0.26	0.005	0.021	0.39	1.72	0.66	2.89	0.04	0.19	941.83	4,125	0.018	0.078	0.002	0.008	942.80	4,129
Shop Ventilation Air Supply Unit Phase 3	ASU36	3.07	0.02	0.10	0.002	0.008	0.15	0.66	0.25	1.10	0.02	0.07	359.18	1,573	0.007	0.030	0.001	0.003	359.55	1,575
Social Rooms Air Supply Unit Phase 3	ASU37	1.53	0.01	0.05	0.001	0.004	0.07	0.33	0.13	0.55	0.01	0.04	179.01	784	0.003	0.015	0.000	0.001	179.19	785
ASU Total		**104.64**	**0.61**	**2.69**	**0.06**	**0.27**	**5.10**	**22.34**	**8.57**	**37.52**	**0.56**	**2.46**	**12,243**	**53,623**	**0.23**	**1.01**	**0.02**	**0.10**	**12,255**	**53,678**

[e] Hours of operation for unrestricted emission calculations are 8,760.

Rooftop Units Non-HAP Emissions

Description	Equipment	Rated Capacity (MMBtu/hr)	Emission Rates [e] $PM/PM_{10}/PM_{2.5}$		SO_2		NO_X		CO		VOC		CO_2		CH_4		N_2O		CO_2e	
			lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
Assembly - Rooftop Unit 1	AS-RTU01	0.80	5.93E-03	2.60E-02	4.68E-04	2.05E-03	3.90E-02	1.71E-01	6.55E-02	2.87E-01	4.29E-03	1.88E-02	93.60	410	1.76E-03	7.73E-03	1.76E-04	7.73E-04	93.69	410
Assembly - Rooftop Unit 4	AS-RTU04	0.80	5.93E-03	2.60E-02	4.68E-04	2.05E-03	3.90E-02	1.71E-01	6.55E-02	2.87E-01	4.29E-03	1.88E-02	93.60	410	1.76E-03	7.73E-03	1.76E-04	7.73E-04	93.69	410
Assembly - Rooftop Unit 6	AS-RTU06	0.80	5.93E-03	2.60E-02	4.68E-04	2.05E-03	3.90E-02	1.71E-01	6.55E-02	2.87E-01	4.29E-03	1.88E-02	93.60	410	1.76E-03	7.73E-03	1.76E-04	7.73E-04	93.69	410
Assembly - Rooftop Unit 8	AS-RTU08	0.80	5.93E-03	2.60E-02	4.68E-04	2.05E-03	3.90E-02	1.71E-01	6.55E-02	2.87E-01	4.29E-03	1.88E-02	93.60	410	1.76E-03	7.73E-03	1.76E-04	7.73E-04	93.69	410
Assembly - Rooftop Unit 10	AS-RTU10	0.80	5.93E-03	2.60E-02	4.68E-04	2.05E-03	3.90E-02	1.71E-01	6.55E-02	2.87E-01	4.29E-03	1.88E-02	93.60	410	1.76E-03	7.73E-03	1.76E-04	7.73E-04	93.69	410
Assembly - Rooftop Unit 11	AS-RTU11	0.80	5.93E-03	2.60E-02	4.68E-04	2.05E-03	3.90E-02	1.71E-01	6.55E-02	2.87E-01	4.29E-03	1.88E-02	93.60	410	1.76E-03	7.73E-03	1.76E-04	7.73E-04	93.69	410
Assembly - Rooftop Unit 13	AS-RTU13	0.80	5.93E-03	2.60E-02	4.68E-04	2.05E-03	3.90E-02	1.71E-01	6.55E-02	2.87E-01	4.29E-03	1.88E-02	93.60	410	1.76E-03	7.73E-03	1.76E-04	7.73E-04	93.69	410
Body Shop - Rooftop Unit 1	BS-RTU01	0.80	5.93E-03	2.60E-02	4.68E-04	2.05E-03	3.90E-02	1.71E-01	6.55E-02	2.87E-01	4.29E-03	1.88E-02	93.60	410	1.76E-03	7.73E-03	1.76E-04	7.73E-04	93.69	410
Body Shop - Rooftop Unit 2	BS-RTU02	0.80	5.93E-03	2.60E-02	4.68E-04	2.05E-03	3.90E-02	1.71E-01	6.55E-02	2.87E-01	4.29E-03	1.88E-02	93.60	410	1.76E-03	7.73E-03	1.76E-04	7.73E-04	93.69	410
Body Shop - Rooftop Unit 4	BS-RTU04	0.80	5.93E-03	2.60E-02	4.68E-04	2.05E-03	3.90E-02	1.71E-01	6.55E-02	2.87E-01	4.29E-03	1.88E-02	93.60	410	1.76E-03	7.73E-03	1.76E-04	7.73E-04	93.69	410
Body Shop - Rooftop Unit 5	BS-RTU05	0.80	5.93E-03	2.60E-02	4.68E-04	2.05E-03	3.90E-02	1.71E-01	6.55E-02	2.87E-01	4.29E-03	1.88E-02	93.60	410	1.76E-03	7.73E-03	1.76E-04	7.73E-04	93.69	410
Body Shop - Rooftop Unit 6	BS-RTU06	0.80	5.93E-03	2.60E-02	4.68E-04	2.05E-03	3.90E-02	1.71E-01	6.55E-02	2.87E-01	4.29E-03	1.88E-02	93.60	410	1.76E-03	7.73E-03	1.76E-04	7.73E-04	93.69	410
Body Shop - Rooftop Unit 7	BS-RTU07	0.80	5.93E-03	2.60E-02	4.68E-04	2.05E-03	3.90E-02	1.71E-01	6.55E-02	2.87E-01	4.29E-03	1.88E-02	93.60	410	1.76E-03	7.73E-03	1.76E-04	7.73E-04	93.69	410
Body Shop - Rooftop Unit 10	BS-RTU10	0.80	5.93E-03	2.60E-02	4.68E-04	2.05E-03	3.90E-02	1.71E-01	6.55E-02	2.87E-01	4.29E-03	1.88E-02	93.60	410	1.76E-03	7.73E-03	1.76E-04	7.73E-04	93.69	410
Body Shop - Rooftop Unit 17	BS-RTU17	0.80	5.93E-03	2.60E-02	4.68E-04	2.05E-03	3.90E-02	1.71E-01	6.55E-02	2.87E-01	4.29E-03	1.88E-02	93.60	410	1.76E-03	7.73E-03	1.76E-04	7.73E-04	93.69	410
Body Shop - Rooftop Unit 18	BS-RTU18	0.80	5.93E-03	2.60E-02	4.68E-04	2.05E-03	3.90E-02	1.71E-01	6.55E-02	2.87E-01	4.29E-03	1.88E-02	93.60	410	1.76E-03	7.73E-03	1.76E-04	7.73E-04	93.69	410
Body Shop - Rooftop Unit 23	BS-RTU23	0.80	5.93E-03	2.60E-02	4.68E-04	2.05E-03	3.90E-02	1.71E-01	6.55E-02	2.87E-01	4.29E-03	1.88E-02	93.60	410	1.76E-03	7.73E-03	1.76E-04	7.73E-04	93.69	410
Body Shop - Rooftop Unit 25	BS-RTU25	0.80	5.93E-03	2.60E-02	4.68E-04	2.05E-03	3.90E-02	1.71E-01	6.55E-02	2.87E-01	4.29E-03	1.88E-02	93.60	410	1.76E-03	7.73E-03	1.76E-04	7.73E-04	93.69	410
Body Shop - Rooftop Unit 26	BS-RTU26	0.80	5.93E-03	2.60E-02	4.68E-04	2.05E-03	3.90E-02	1.71E-01	6.55E-02	2.87E-01	4.29E-03	1.88E-02	93.60	410	1.76E-03	7.73E-03	1.76E-04	7.73E-04	93.69	410
Body Shop - Rooftop Unit 30	BS-RTU30	0.80	5.93E-03	2.60E-02	4.68E-04	2.05E-03	3.90E-02	1.71E-01	6.55E-02	2.87E-01	4.29E-03	1.88E-02	93.60	410	1.76E-03	7.73E-03	1.76E-04	7.73E-04	93.69	410
Body Shop - Rooftop Unit 32	BS-RTU32	0.80	5.93E-03	2.60E-02	4.68E-04	2.05E-03	3.90E-02	1.71E-01	6.55E-02	2.87E-01	4.29E-03	1.88E-02	93.60	410	1.76E-03	7.73E-03	1.76E-04	7.73E-04	93.69	410
Body Shop - Rooftop Unit 33	BS-RTU33	0.80	5.93E-03	2.60E-02	4.68E-04	2.05E-03	3.90E-02	1.71E-01	6.55E-02	2.87E-01	4.29E-03	1.88E-02	93.60	410	1.76E-03	7.73E-03	1.76E-04	7.73E-04	93.69	410
Body Shop - Rooftop Unit 35	BS-RTU35	0.80	5.93E-03	2.60E-02	4.68E-04	2.05E-03	3.90E-02	1.71E-01	6.55E-02	2.87E-01	4.29E-03	1.88E-02	93.60	410	1.76E-03	7.73E-03	1.76E-04	7.73E-04	93.69	410
RTU Total		18.40	1.36E-01	5.97E-01	1.08E-02	4.71E-02	8.97E-01	3.93E+00	1.51E+00	6.60E+00	9.86E-02	4.32E-01	2,152.75	9,429	4.06E-02	1.78E-01	4.06E-03	1.78E-02	2,154.97	9,439
ASU + RTU Total		**123.04**	**7.50E-01**	**3.29E+00**	**7.20E-02**	**3.15E-01**	**6.00E+00**	**2.63E+01**	**1.01E+01**	**4.41E+01**	**6.60E-01**	**2.89E+00**	**14,395**	**63,052**	**2.71E-01**	**1.19E+00**	**2.71E-02**	**1.19E-01**	**14,410**	**63,117**

[e] Hours of operation for unrestricted emission calculations are 8,760.

Appendix B.2.3 - Air Supply Units
Mercedes-Benz Vans, LLC

Hours of Operation [a]	8,760	hrs
Total Rated Capacity	123.04	MMBtu/hr

Air Supply and Rooftop Units HAP/TAP Emissions

Pollutants	NG Emission Factor [a] lb/10^6 scf	HAP/TAP lb/hr	HAP/TAP tpy
2-Methylnaphthalene	2.40E-05	2.88E-06	1.26E-05
3-Methylchloranthrene	1.80E-06	2.16E-07	9.45E-07
7,12-Dimethylbenz(a)anthracene	1.60E-05	1.92E-06	8.40E-06
Acenaphthene	1.80E-06	2.16E-07	9.45E-07
Acenaphthylene	1.80E-06	2.16E-07	9.45E-07
Anthracene	2.40E-06	2.88E-07	1.26E-06
Benz(a)anthracene	1.80E-06	2.16E-07	9.45E-07
Benzene	2.10E-03	2.52E-04	1.10E-03
Benzo(a)pyrene	1.20E-06	1.44E-07	6.30E-07
Benzo(b)fluoranthene	1.80E-06	2.16E-07	9.45E-07
Benzo(g,h,i)perylene	1.20E-06	1.44E-07	6.30E-07
Benzo(k)fluoranthene	1.80E-06	2.16E-07	9.45E-07
Chrysene	1.80E-06	2.16E-07	9.45E-07
Dibenzo(a,h)anthracene	1.20E-06	1.44E-07	6.30E-07
Dichlorobenzene	1.20E-03	1.44E-04	6.30E-04
Fluoranthene	3.00E-06	3.60E-07	1.58E-06
Fluorene	2.80E-06	3.36E-07	1.47E-06
Formaldehyde	7.50E-02	8.99E-03	3.94E-02
Hexane	1.80E+00	2.16E-01	9.45E-01
Indeno(1,2,3-cd)pyrene	1.80E-06	2.16E-07	9.45E-07
Naphthalene	6.10E-04	7.32E-05	3.20E-04
Phenanathrene	1.70E-05	2.04E-06	8.93E-06
Pyrene	5.00E-06	6.00E-07	2.63E-06
Toluene	3.40E-03	4.08E-04	1.79E-03
Arsenic	2.00E-04	2.40E-05	1.05E-04
Beryllium	1.20E-05	1.44E-06	6.30E-06
Cadmium	1.10E-03	1.32E-04	5.78E-04
Chromium	1.40E-03	1.68E-04	7.35E-04
Cobalt	8.40E-05	1.01E-05	4.41E-05
Lead	5.00E-04	6.00E-05	2.63E-04
Manganese	3.80E-04	4.56E-05	2.00E-04
Mercury	2.60E-04	3.12E-05	1.37E-04
Nickel	2.10E-03	2.52E-04	1.10E-03
Selenium	2.40E-05	2.88E-06	1.26E-05

[a] Unrestricted hours of operation (8,760 hr/yr).
[b] Natural Gas Emission Factors are from AP-42 Section 1.4, Tables 1.4-2, 1.4-3, and 1.4-4.

Coating Throughput Information

	# of Units	Notes
Paint Shop Bodies per Year	**146,000**	Based on maximum daily throughput and days of operation per year
Major Repair Equivalent Bodies per Year	**14,600**	Major repair area assumed to be equivalent to 10% of the total vehicle throughput.
Total Paint Shop Equivalent Bodies per Year	**160,600**	Major repair area assumed to be equivalent to 10% of the total vehicle throughput.
Total Parts per Year	**4,380**	Parts painted area assumed to be equivalent to 3% of the total vehicle throughput.
Assembly Bodies per Year	**164,250**	Based on maximum daily throughput and days of operation per year
Operating Hours per year	**8,760**	Based on facility operating 24 hours/day and days of operation per year.

Coating Emission Calculations

Process	Parts	Bodies		Material Data		VOC													PM/PM$_{10}$/PM$_{2.5}$								lb/GACS	
								Capture & Control						Emissions														
	Application Rate	Split	Application Rate	Coating Density	Coating Usage	VOC In		% Lost Booth and Oven	Booth Split	ADW Capture	RTO Eff.	Oven Split	RTO Eff.	Emissions from Booth	Emissions from Oven	Controlled VOC Emissions			Weight Solids	Volume Solids	Transfer Eff.	Uncontrolled PM Emissions		Control Eff.	Controlled PM Emissions		GACS per year	lbs VOC/ GACS
	A_1		A_2	B	C [a]	D	E=C x D	F	G	H	I	J	K	L [b]	M [c]	N [d]	O = L + M	P	Q	R	S	T [d]	U [e]	V	W [d]	X [f]	Y [g]	Z [h]
	gal/unit		gal/unit	lb/gal	gal/yr	lb/gal	tpy	%	%	%	%	%	%	lb/yr	lb/yr	lb/hr	lb/yr	tpy	%	%	%	lb/hr	tpy	%	lb/hr	tpy		
E-Coat (Emulsion) [i]	2.91		2.91	8.84	480,092	0.11	25.22	0.0%	20%	0.0%	0.0%	80%	95%	10,087	2,017	1.38	12,104	6.05	36.3%	32.1%	100%	0.00	0.00	0.0%	0.00	0.00	154,109	
E-Coat (Pigment Paste) [i]	0.78		0.78	10.59	128,684	1.27	81.63	0.0%	20%	0.0%	0.0%	80%	95%	32,651	6,530	4.47	39,181	19.59	47.2%	31.1%	100%	0.00	0.00	0.0%	0.00	0.00	40,059	
E-Coat Total							**106.84**							**42,737**	**8,547**	**5.85**	**51,285**	**25.64**				**0.00**	**0.00**		**0.00**	**0.00**	**194,169**	**0.26**
HVLP Robots Interior [i]	0.00	40%	0.73	11.684	117,096	4.24	248.31	20%	90%	90%	95%	10%	95%	151,171	1,986	17.48	153,157	76.58	67%	50.9%	60%	41.74	182.83	See Dry X PM Emissions Table			35,761	
Manual Cut-Ins & Underhood [i]	0.00	20%	0.36	11.684	58,548	4.24	124.15	20%	90%	90%	95%	10%	95%	75,586	993	8.74	76,579	38.29	67%	50.9%	40%	31.31	137.12				11,920	
ESTA Robot Exterior [i]	1.82	40%	0.73	11.684	125,080	4.24	265.24	20%	90%	90%	95%	10%	95%	161,478	2,122	18.68	163,600	81.80	67%	50.9%	75%	27.87	122.06				47,749	
Primer-Surfacer Totals	**1.82**		**1.82**				**637.70**							**388,235**	**5,102**	**44.90**	**393,336**	**196.67**				**100.92**	**442.02**		**0.13**	**0.58**	**95,431**	**4.12**
UB-PVC	0.00		4.33	8.304	695,022	0.00	0.00	0.0%	100%	0.0%	0.0%	0.0%	0.0%	0.0	0.0	0.00	0.0	0.00	100%	100%	95%	32.94	144.28	98.5%	0.49	2.16	660,270	0.00
Seam Sealer	0.00		0.64	10.68	102,751	0.00	0.00	0.0%	100%	0.0%	0.0%	0.0%	0.0%	0.0	0.0	0.00	0.0	0.00	100%	100%	100%	0.00	0.00	0.0%	0.00	0.00	102,751	0.00
Sika Sealing	0.00		0.04	10.85	6,201	0.29	0.90	0.0%	100%	0.0%	0.0%	0.0%	0.0%	1,803	0.0	0.21	1,803	0.90	97%	97%	100%	0.00	0.00	0.0%	0.00	0.00	6,035	0.30
(SAM) Sound Deadener Adhesive	0.00		0.961	13.77	154,277	0.14	10.62	0.0%	100%	0.0%	0.0%	0.0%	0.0%	21,244	0.0	2.43	21,244	10.62	99%	99%	100%	0.00	0.00	0.0%	0.00	0.00	152,734	0.14
Sealers and Adhesives Totals	**5.97**		**5.97**				**11.52**							**23,047**	**0**	**2.63**	**23,047**	**11.52**				**32.94**	**144.28**		**0.49**	**2.16**	**921,790**	**0.03**
						Total	**756.07**									**53.39**	**467,668**	**233.83**				**133.86**	**586.30**		**0.63**	**2.74**	**1,211,390**	

Process	Parts		Bodies	Material Data		VOC													PM/PM$_{10}$/PM$_{2.5}$								lb/GACS	
								Capture & Control						Emissions														
	Application Rate	Split	Application Rate	Coating Density	Coating Usage	VOC In		% Lost Booth and Oven	Booth Split	ADW Capture	RTO Eff.	Oven Split	RTO Eff.	Emissions from Booth	Emissions from Oven	Controlled VOC Emissions			Weight Solids	Volume Solids	Transfer Eff.	Uncontrolled PM Emissions		Control Eff.	Controlled PM Emissions		GACS per year	lbs VOC/ GACS
	A_1		A_2	B	C [a]	D	E=C x D	F	G	H	I	J	K	L [b]	M [c]	N [d]	O = L + M	P	Q	R	S	T [d]	U [e]	V	W [d]	X [f]	Y [g]	Z [h]
	gal/unit		gal/unit	lb/gal	gal/yr	lb/gal	tpy	%	%	%	%	%	%	lb/yr	lb/yr	lb/hr	lb/yr	tpy	%	%	%	lb/hr	tpy	%	lb/hr	tpy		
HVLP Robots Interior [i]	0.00	40%	1.32		212,131	3.84	407.2	20%	90%	90%	95%	10%	95%	247,897	3,258	28.67	251,155	125.58	62%	43.7%	60%	61.65	270.01				55,621	
Manual Cut-Ins & Underhood [i]	0.00	20%	0.66		106,065	3.84	203.6	20%	90%	90%	95%	10%	95%	123,949	1,629	14.34	125,577	62.79	62%	43.7%	40%	46.23	202.51	See Dry X PM Emissions Table			18,540	
ESTA Robot Exterior [i]	3.30	40%	1.32		226,594	3.84	435.0	20%	90%	90%	95%	10%	95%	264,799	3,480	30.63	268,279	134.14	62%	43.7%	75%	41.16	180.26				74,266	
Topcoat (Monocoat) Totals	**3.30**		**3.30**	10.26	**544,791**		**1,045.7**							**636,645**	**8,366**	**73.63**	**645,011**	**322.51**				**149.04**	**652.78**				**148,427**	**4.35**
													Topcoat Scenario 1	**636,645**	**8,366**	**73.63**	**645,011**	**322.51**									**148,427**	**4.35**
HVLP Robots Interior [i]	0.00	40%	0.94		151,037	5.94	448.4	20%	90%	90%	95%	10%	95%	272,984	3,587	31.57	276,571	138.29	37%	26.4%	60%	20.87	91.41				23,924	
Manual Cut-Ins & Underhood [i]	0.00	20%	0.47		75,519	5.94	224.2	20%	90%	90%	95%	10%	95%	136,492	1,794	15.79	138,286	69.14	37%	26.4%	40%	15.65	68.56				7,975	
ESTA Robot Exterior [i]	2.35	40%	0.94		161,335	5.94	479.0	20%	90%	90%	95%	10%	95%	291,597	3,832	33.72	295,429	147.71	37%	26.4%	75%	13.93	61.03				31,944	
Basecoat Totals	**2.35**		**2.35**	8.18	**387,891**		**1,151.6**							**701,073**	**9,213**	**81.08**	**710,286**	**355.14**				**50.45**	**220.99**	See Dry X PM Emissions Table			**63,843**	
HVLP Robots Interior [i]	0.00	40%	1.26		202,967	4.13	419.2	20%	90%	90%	95%	10%	95%	255,224	3,354	29.52	258,578	129.29	50%	42.0%	60%	38.67	169.38				51,148	
Manual Cut-Ins & Underhood [i]	0.00	20%	0.63		101,483	4.13	209.6	20%	90%	90%	95%	10%	95%	127,612	1,677	14.76	129,289	64.64	50%	42.0%	40%	29.00	127.04				17,049	
ESTA Robot Exterior [i]	3.16	40%	1.26		216,805	4.13	447.8	20%	90%	90%	95%	10%	95%	272,625	3,582	31.53	276,208	138.10	50%	42.0%	75%	25.82	113.08				68,294	
Clearcoat Totals	**3.16**		**3.16**	8.35	**521,256**		**1,076.6**							**655,461**	**8,613**	**75.81**	**664,074**	**332.04**				**93.49**	**409.50**				**136,491**	
													Topcoat Scenario 2	**1,356,534**	**17,826**	**156.89**	**1,374,360**	**687.18**									**200,334**	**6.86**
(Maximum Scenario 1 or 2) Total							**2,228.21**									**156.89**	**1,374,360**	**687.18**				**149.04**	**652.78**		**0.27**	**1.19**	**200,334**	**6.86**
Spot Repair - Topcoat [j]	0.00		0.03	10.26	663	3.84	1.27	0.0%	100%	0.0%	0.0%	0%	0.0%	2,545	0.00	0.29	2,545	1.27	62%	43.7%	40%	0.29	1.27	98.5%	0.004	0.019	115.88	
Spot Repair - Basecoat [j]	0.00		0.02	8.18	472	5.94	1.40	0.0%	100%	0.0%	0.0%	0%	0.0%	2,802	0.00	0.32	2,802	1.40	37%	26.4%	40%	0.10	0.43	98.5%	0.001	0.006	49.84	
Spot Repair - Clearcoat [j]	0.00		0.03	8.35	634	4.13	1.31	0.0%	100%	0.0%	0.0%	0%	0.0%	2,620	0.00	0.30	2,620	1.31	50%	42.0%	40%	0.18	0.79	98.5%	0.003	0.012	106.56	
Worst Case Spot Repair [k]							**2.71**							**5,423**	**0.00**	**0.62**	**5,423**	**2.71**				**0.289**	**1.266**		**0.004**	**0.019**	**156.40**	
Assembly Spot Repair - Topcoat [j]	0.00		0.10	10.26	1,644	3.84	3.16	0.0%	100%	0.0%	0.0%	0%	0.0%	6,311	0.00	0.72	6,311	3.16	62%	43.7%	40%	0.72	3.14	98.5%	0.011	0.047	287.37	
Assembly Spot Repair - Basecoat [j]	0.00		0.07	8.18	1,171	5.94	3.48	0.0%	100%	0.0%	0.0%	0%	0.0%	6,950	0.00	0.79	6,950	3.48	37%	26.4%	40%	0.24	1.06	98.5%	0.004	0.016	123.61	
Assembly Spot Repair - Clearcoat [j]	0.00		0.10	8.35	1,573	4.13	3.25	0.0%	100%	0.0%	0.0%	0%	0.0%	6,498	0.00	0.74	6,498	3.25	50%	42.0%	40%	0.45	1.97	98.5%	0.007	0.030	264.26	
Worst Case Assembly Repair [k]							**6.72**							**13,448**	**0.00**	**1.54**	**13,448**	**6.72**				**0.717**	**3.139**		**0.011**	**0.047**	**387.87**	
Cavity Wax	0.00		0.72	9.83	115,249	1.67	96.31	20%	100%	90.0%	95%	0%	0.0%	60,865	0.00	6.95	192,610	30.43	85%	74.0%	96%	4.40	19.26	98.5%	0.066	0.289	81,873	
Worst Case Repair and Cavity Wax Totals							**105.74**							**79,736**	**0.00**	**9.10**	**211,481**	**39.87**				**5.40**	**23.67**		**0.08**	**0.35**	**82,417**	
Coating Total (tpy)							**3,090.02**									**219.38**	**2,053,508**	**960.88**				**288.30**	**1,262.74**		**0.98**	**4.29**	**1,494,141**	

[a] Coating usage is calculated as follows: C = (A_1 * total parts per year) + (A_2 * total bodies per year)
[b] VOC emissions from the booth are calculated as follows: L = C *D * (F + (1-F) * G * (H * (1 - I) + (1-H))
[c] VOC emissions from the oven are calculated as follows: M = C * D * (1 - F) * (J * (1 - K))
[d] Hourly emissions are calculated by dividing the annual emissions in tons/yr by the operating hours/yr, and multiplying by 2000 lb/ton.
[e] Annual Uncontrolled PM emissions are calculated as follows: U = (B * Q * C / 2000) * (1 - S)
[f] Annual Controlled PM emissions are calculated as follows: X = (B * Q * C / 2000) * (1 - V) * (1 - S)
[g] GACS per year is calculated as follows: Y = C * R * S
[h] Lb VOC/GACS is calculated as follows: Z = O / Y
[i] A safety factor of 10% was added to the VOC content of the material.
[j] Spot repair application rates are assumed to be equal to 1% of the application rate of the corresponding coating for a full vehicle body for every eighth vehicle. Assembly repair rates are assumed to be equal to 3.1% of the application rate of the corresponding coating for a full vehicle body for every tenth vehicle.
[k] Worst case spot repair and assembly repair for VOC emissions comes from basecoat and clearcoat application. Worst case spot repair and assembly repair for PM emissions comes from topcoat (monocoat) application.

gal/year = gal/unit x units/year
Before Controls (tpy) = gal/year x voc lbs/gal
After Controls (tpy) = Before Controls (tpy) x (1-(capture x destruction efficiency))
gacs/year = gal/year x volume solids x te
lbs voc/gacs =(lbs voc/year) / (gacs/year)

tpy = tons/year
te = (paint solids) transfer efficiency
cap -capture efficiency
gacs - gallon applied coating solids

Paint Shop Coating HAP Emissions - Excluding E-Coat Spot Repair

Total VOC Entering Process [a] (lb/yr)	Solids Application [a] (GACS/yr)	Controlled VOC Emissions [a] (lb/yr)	Lbs HAP per GACS [b]	Uncont. HAP Emissions (lb/yr)	Annual Rate, Uncont. HAP [c] (tpy)	Controlled HAP Emissions (lb/yr)	Annual Rate, HAP Out [c] (tpy)
6,180,043	1,494,141	2,053,508	0.50	2,248,313	1,124.16	747,071	373.54

[a] Calculated in Paint Shop Coating Tab.

[b] Combined HAP emission limit for Paint Shop Primecoat (E-coat), Guidecoat, Topcoat, and Purge Solvent Operations per 40 CFR 63 Subpart IIII because emissions are routed to a control device with greater than a 95% destruction efficiency.

[c] Potential hours are based on operation 24 hrs/day, 365 days/yr.

Underbody Coating VOC Emissions

Area/Process	Material Usage per Vehicle [a] (gal/veh)	Material Density [b] (lb/gal)	Material VOC Content [b] %	Application Area Emissions [d] %	Oven Emissions [d] %	Oven RTO Control Efficiency %	Maximum Annual Production Phase 1 (veh/yr)	Phase 2 (veh/yr)	Phase 3 (veh/yr)	Application Area VOC Emission Rates Phase 1 (tpy)	Phase 2 (tpy)	Phase 3 (tpy)	Oven VOC Emission Rates Phase 1 (tpy)	Phase 2 (tpy)	Phase 3 (tpy)	Total Uncontrolled VOC Emission Rates Phase 1 (tpy)	Phase 2 (tpy)	Phase 3 (tpy)	Total Controlled VOC Emission Rates Phase 1 (tpy)	Phase 2 (tpy)	Phase 3 (tpy)
Underbody Coating	0.185	11.684	36%	40%	60%	95%	50,544	74,880	146,000	7.93	11.75	22.90	0.59	0.88	1.72	19.82	29.36	57.25	8.52	12.63	24.62
Total										**7.93**	**11.75**	**22.90**	**0.59**	**0.88**	**1.72**	**19.82**	**29.36**	**57.25**	**8.52**	**12.63**	**24.62**

Underbody Coating PM Emissions

Process	Material Usage per Vehicle [a] (gal/veh)	Material Density [b] (lb/gal)	Weight % Solids [b] %	Transfer Efficiency [c] %	Maximum Annual Production Phase 1 (veh/yr)	Phase 2 (veh/yr)	Phase 3 (veh/yr)	Filter Efficiency (%)	Uncontrolled $PM/PM_{10}/PM_{2.5}$ Emissions Phase 1 (tpy)	Phase 2 (tpy)	Phase 3 (tpy)	Controlled $PM/PM_{10}/PM_{2.5}$ Emissions[4] Phase 1 (tpy)	Phase 2 (tpy)	Phase 3 (tpy)
Underbody Coating	0.185	11.684	67%	50%	50,544	74,880	146,000	98.5%	18.24	27.03	52.69	0.27	0.41	0.79
Total									**18.24**	**27.03**	**52.69**	**0.27**	**0.41**	**0.79**

[a] Material usage per vehicle estimate was provided by Mercedes on 2/4/2017 as 0.7 L/vehicle. Value was convetered to gallons per vehicle using a conversion factor of 0.264172 gal/L.

[b] Based on BASF Primer UniBloc Solventborne primer.

[c] Transfer efficiency is assumed based on industry knowledge of underbody coating.

[d] BASF provided the application area/oven emission breakdown to Mercedes which was relayed on 1/4/2017 to Trinity Consultants as 37.5% of VOC emitted during application, and 62.5% emitted in the oven. Mercedes conservatively estimates that 40% is emitted during application.

[e] Annual operating hours assumed to be 8,760 hours per year.

Underbody Coating HAP/TAP Emissions

Material Usage per vehicle [a]	Material Density [b]	Application Area Emissions [c]	Oven Emissions [c]	Oven RTO Control Efficiency	Maximum Annual Production		
					Phase 1	Phase 2	Phase 3
(gal/veh)	(lb/gal)	%	%	%	(veh/yr)	(veh/yr)	(veh/yr)
0.185	11.684	40%	60%	95%	50,544	74,880	146,000

Underbody Coating HAP/TAP Emissions

Pollutant	CAS Number	Emission Factor [d] (%)	HAP? (Y/N)	TAP? (Y/N)	Application Area HAP Emissions (tpy)			Controlled Oven HAP Emissions (tpy)			Controlled HAP Emissions (tpy)		
					Phase 1	Phase 2	Phase 3	Phase 1	Phase 2	Phase 3	Phase 1	Phase 2	Phase 3
Naphtha	64742956	10%	N	N	-	-	-	-	-	-	-	-	-
Xylene	1330207	7%	Y	Y	1.53	2.26	4.42	0.11	0.17	0.33	1.64	2.43	4.75
1,2,4-trimethylbenzene	95636	5%	N	N	-	-	-	-	-	-	-	-	-
n-Butylacetate	123864	5%	N	N	-	-	-	-	-	-	-	-	-
2-Butoxyethyl Acetate	112072	3%	Y	N	0.66	0.97	1.89	0.05	0.07	0.14	0.70	1.04	2.03
n-Butanol	71363	2.5%	N	N	-	-	-	-	-	-	-	-	-
Mesitylene	108678	2%	N	N	-	-	-	-	-	-	-	-	-
n-Propylbenzene	103651	2%	N	N	-	-	-	-	-	-	-	-	-
Ethyl Benzene	100414	2%	Y	Y	0.44	0.65	1.26	0.03	0.05	0.09	0.47	0.70	1.36
Isopropylbenzene (Cumene)	98828	1%	Y	Y	0.22	0.32	0.63	0.02	0.02	0.05	0.23	0.35	0.68
Cyclohexane	110827	0.3%	N	N	-	-	-	-	-	-	-	-	-
Total Underbody Coating HAP Emissions					**2.84**	**4.21**	**8.20**	**0.21**	**0.32**	**0.62**	**3.05**	**4.52**	**8.82**

[a] Material usage per vehicle estimate was provided by Mercedes on 2/4/2017 as 0.7 L/vehicle. Value was convetered to gallons per vehicle using a conversion factor of 0.264172 gal/L.
[b] Based on BASF Primer UniBloc Solventborne primer.
[c] BASF provided the application area/oven emission breakdown to Mercedes which was relayed on 1/4/2017 to Trinity Consultants as 37.5% of VOC emitted during application, and 62.5% emitted in the oven. Mercedes conservatively estimates that 40% is emitted during application.
[d] Emission factors are from Section 3 Composition/Information on Ingredients on BASF UniBloc MB7746 silvergrey SDS (Revised 02/23/2015). HAP/TAP emissions assume that the maximum amount of each component is emitted.

E-Coat Spot Repair VOC Emissions

Area/Process	Material Usage per Vehicle [a] (gal/veh)	Material Density [b] (lb/gal)	Material VOC Content [b] (%)	Application Area Emissions %	Maximum Annual Production Phase 1 (veh/yr)	Phase 2 (veh/yr)	Phase 3 (veh/yr)	Application Area VOC Emission Rates Phase 1 (tpy)	Phase 2 (tpy)	Phase 3 (tpy)
E-Coat Spot Repair	3.71E-04	11.684	0.36	100%	50,544	74,880	146,000	0.04	0.06	0.11
Total								**0.04**	**0.06**	**0.11**

E-Coat Spot Repair PM Emissions

Process	Material Usage per Vehicle [a] (gal/veh)	Material Density [b] (lb/gal)	Weight % Solids [b] %	Volume % Solids %	Transfer Efficiency [c] %	Maximum Annual Production Phase 1 (veh/yr)	Phase 2 (veh/yr)	Phase 3 (veh/yr)	Uncontrolled $PM/PM_{10}/PM_{2.5}$ Emissions Phase 1 (tpy)	Phase 2 (tpy)	Phase 3 (tpy)	GACS per Year Phase 1 (tpy)	Phase 2 (tpy)	Phase 3 (tpy)
E-Coat Spot Repair	3.71E-04	11.684	67%	50.9%	40%	50,544	74,880	146,000	0.04	0.07	0.13	3.81	5.65	11.02
Total									**0.04**	**0.07**	**0.13**	**3.81**	**5.65**	**11.02**

[a] The material usage per vehicle was provided by Jae Park (Plant Engineer) via e-mail on 1/30/2017. The material usage per vehicle includes a 10% safety factor.
[b] Material density, VOC and solids content are based on BASF Primer UniBloc Solventborne primer.
[c] Transfer efficiency is assumed based on industry knowledge.
[d] Annual operating hours is assumed to be 8,760 hours per year.

Paint Shop Coating HAP Emissions - E-Coat Spot Repair HAP/TAP

Total VOC Entering Process [a] (lb/yr)	Solids Application [a] (GACS/yr)	Controlled VOC Emissions [a] (lb/yr)	Lbs HAP per GACS [b]	Uncont. HAP Emissions (lb/yr)	Annual Rate, Uncont. HAP [c] (tpy)	Controlled HAP Emissions (lb/yr)	Annual Rate, HAP Out [c] (tpy)
230	11	230	0.50	6	0.00	6	2.75E-03

[a] Calculated in Paint Shop Coating Tab.
[b] Combined HAP emission limit for Paint Shop Primecoat (E-coat), Guidecoat, Topcoat, and Purge Solvent Operations per 40 CFR 63 Subpart IIII because emissions are routed to a control device with greater than a 95% destruction efficiency.
[c] Potential hours are based on operation 24 hrs/day, 365 days/yr.

Paint Shop Adhesive Application Emissions

Welding area	Material Usage per vehicle (lb/veh)	Uncontrolled VOC Emission Factor [a] (%)	Hourly Production Rate (veh/hr)	Maximum Annual production (veh/yr)	Uncontrolled VOC Emissions [b] (lb/hr)	(lb/yr)	(tpy)
Anti-flutter adhesive	6.61	1%	17	146,000	1.10	9,656.15	4.83
Structure adhesive	4.41	1%	17	146,000	0.73	6,437.43	3.22
Total					**1.84**	**16,093.58**	**8.05**

[a] From manufacturer's SDS, all body shop adhesives have >99% solids content. Mercedes-Benz Vans conservatively assumes VOC content of 1% for all adhesives.

[b] Mercedes-Benz Vans assumes that adhesive applied following the topcoat oven will be performed on an open workdeck (i.e. without control).

Paint Shop Combustion - Natural Gas Emission Factors

Hours of Operation [e] 8,760 hrs

Pollutant	NG Emission Factors [a,b,c] (lb/MMBtu)
$PM/PM_{10}/PM_{2.5}$	0.0074
SO_2	0.0006
NO_X	0.0487
CO	0.0819
VOC	0.0054
CO_2e [d]	
CO_2	117.00
CH_4	2.21E-03
N_2O	2.21E-04

[a] PM, SO_2, and VOC natural gas emission factors are from AP-42, Table 1.4-2, 07/98.
[b] NO_X and CO natural gas emission factors are from AP-42, Table 1.4-1, 07/98, Small Boilers w/ Low NO_X Control.
[c] The heating value of natural gas is assumed to be 1,026 Btu/scf.
[d] Emission factors from 40 CFR 98, Subpart C, Tables C-1 and C-2. Factors were converted to lb/MMBtu.

Paint Shop Combustion Non-HAP Emissions

			Emission Rates [e]																	
		Rated Capacity	$PM/PM_{10}/PM_{2.5}$		SO_2		NO_X		CO		VOC		CO_2		CH_4		N_2O		CO_2e	
Description	Equipment	(MMBtu/hr)	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
RTO #1	RTO1	8.00	0.06	0.26	0.005	0.020	0.39	1.71	0.65	2.87	0.04	0.19	935.98	4,100	0.018	0.077	0.002	0.008	936.95	4,104
RTO #1 (add) [f]	RTO1	8.00	0.06	0.26	0.005	0.020	0.39	1.71	0.65	2.87	0.04	0.19	935.98	4,100	0.018	0.077	0.002	0.008	936.95	4,104
ADW Desorption Heater #1	ADH1	3.50	0.03	0.11	0.002	0.009	0.17	0.75	0.29	1.26	0.02	0.08	409.49	1,794	0.008	0.034	0.001	0.003	409.91	1,795
ADW Desorption Heater #2	ADH2	2.13	0.02	0.07	0.001	0.005	0.10	0.45	0.17	0.76	0.01	0.05	249.20	1,092	0.005	0.021	0.000	0.002	249.46	1,093
E-Coat Oven	OV01	4.85	0.04	0.16	0.003	0.012	0.24	1.04	0.40	1.74	0.03	0.11	567.44	2,485	0.011	0.047	0.001	0.005	568.02	2,488
Primer (Guidecoat) Oven #1	OV02	4.30	0.03	0.14	0.003	0.011	0.21	0.92	0.35	1.54	0.02	0.10	503.09	2,204	0.009	0.042	0.001	0.004	503.61	2,206
Topcoat Oven #1	OV03	4.27	0.03	0.14	0.002	0.011	0.21	0.91	0.35	1.53	0.02	0.10	499.58	2,188	0.009	0.041	0.001	0.004	500.09	2,190
Primer (Guidecoat) Oven #2	OV22	5.12	0.04	0.17	0.003	0.013	0.25	1.09	0.42	1.84	0.03	0.12	599.03	2,624	0.011	0.049	0.001	0.005	599.64	2,626
Topcoat Oven #2	OV23	5.73	0.04	0.19	0.003	0.015	0.28	1.22	0.47	2.05	0.03	0.13	670.39	2,936	0.013	0.055	0.001	0.006	671.09	2,939
Total		**45.90**	**0.34**	**1.49**	**0.03**	**0.12**	**2.24**	**9.80**	**3.76**	**16.46**	**0.25**	**1.08**	**5,370.18**	**23,521**	**0.10**	**0.44**	**0.01**	**0.04**	**5,375.72**	**23,546**

[e] Annual emissions are based on paint shop hours of operation.
[f] Phase II or III RTO will replace Phase I RTO (RTO #1 @ 8 MMBtu/hr), with a new unit that has 8 MMBtu/hr additional heat input, for a total of 16 MMBtu/hr. Emissions include combustion emissions from both RTO #1 and RTO #1 (add).

Appendix B.2.4 - Paint Shop
Mercedes-Benz Vans, LLC

Hours of Operation [a]	8,760	hrs
Total Rated Capacity	45.90	MMBtu/hr

Paint Shop Combustion HAP/TAP Emissions

Pollutants	NG Emission Factor [b] lb/10^6 scf	HAP/TAP lb/hr	HAP/TAP tpy
2-Methylnaphthalene	2.40E-05	1.07E-06	4.70E-06
3-Methylchloranthrene	1.80E-06	8.05E-08	3.53E-07
7,12-Dimethylbenz(a)anthracene	1.60E-05	7.16E-07	3.14E-06
Acenaphthene	1.80E-06	8.05E-08	3.53E-07
Acenaphthylene	1.80E-06	8.05E-08	3.53E-07
Anthracene	2.40E-06	1.07E-07	4.70E-07
Benz(a)anthracene	1.80E-06	8.05E-08	3.53E-07
Benzene	2.10E-03	9.39E-05	4.11E-04
Benzo(a)pyrene	1.20E-06	5.37E-08	2.35E-07
Benzo(b)fluoranthene	1.80E-06	8.05E-08	3.53E-07
Benzo(g,h,i)perylene	1.20E-06	5.37E-08	2.35E-07
Benzo(k)fluoranthene	1.80E-06	8.05E-08	3.53E-07
Chrysene	1.80E-06	8.05E-08	3.53E-07
Dibenzo(a,h)anthracene	1.20E-06	5.37E-08	2.35E-07
Dichlorobenzene	1.20E-03	5.37E-05	2.35E-04
Fluoranthene	3.00E-06	1.34E-07	5.88E-07
Fluorene	2.80E-06	1.25E-07	5.49E-07
Formaldehyde	7.50E-02	3.36E-03	1.47E-02
Hexane	1.80E+00	8.05E-02	3.53E-01
Indeno(1,2,3-cd)pyrene	1.80E-06	8.05E-08	3.53E-07
Naphthalene	6.10E-04	2.73E-05	1.20E-04
Phenanathrene	1.70E-05	7.61E-07	3.33E-06
Pyrene	5.00E-06	2.24E-07	9.80E-07
Toluene	3.40E-03	1.52E-04	6.66E-04
Arsenic	2.00E-04	8.95E-06	3.92E-05
Beryllium	1.20E-05	5.37E-07	2.35E-06
Cadmium	1.10E-03	4.92E-05	2.16E-04
Chromium	1.40E-03	6.26E-05	2.74E-04
Cobalt	8.40E-05	3.76E-06	1.65E-05
Lead	5.00E-04	2.24E-05	9.80E-05
Manganese	3.80E-04	1.70E-05	7.45E-05
Mercury	2.60E-04	1.16E-05	5.09E-05
Nickel	2.10E-03	9.39E-05	4.11E-04
Selenium	2.40E-05	1.07E-06	4.70E-06

[a] Annual emissions are based on paint shop hours of operation.

[b] Natural Gas Emission Factors are from AP-42 Section 1.4, Tables 1.4-2, 1.4-3, and 1.4-4.

Controlled Particulate Emissions from Sources Routed to Dry X

Description	Exhaust Flow Rate (m^3/hr)	Hours of Operation (hr/yr)	Outlet PM Loading [a] (mg/m^3)	Percent Recycled (%)	Potential $PM/PM_{10}/PM_{2.5}$ Emissions [b] (lb/hr)	(tpy)
Primer-Surfacer	157,352	8,760	1	73%	0.09	0.41
Primer-Surfacer 2	64,721	8,760	1	73%	0.04	0.17
Basecoat/Clearcoat	324,643	8,760	1	73%	0.19	0.85
Basecoat/Clearcoat 2	133,529	8,760	1	73%	0.08	0.35

[a] Manufacturer specification for outlet of PM separation system (Dry X).
[b] All PM is assumed to be equal to PM_{10} and $PM_{2.5}$. Annual emissions are based on paint shop hours of operation.
[c] Emissions (lb/hr) = Exhaust Flow (m^3/hr) * Outlet Loading (mg/m^3) * Conversion Factor (1 lb/453,592 mg) * (1-Percent Recycled (%))

Purge Solvent Emissions

Process	Usage Rate	Number of Units [a]	Hours of Operation	Annual Usage [b]	Recovery Rate	Non-Recovered Solvent	Solvent Density [c]	VOC Content [c]	HAP Content [c]	Capture & Control: Percent Lost	Capture & Control: Booth Capture	Capture & Control: ADW Capture	Capture & Control: Booth Control Eff.	Uncontrolled Total VOC		Controlled Total VOC		Total HAP	
	(gal/unit)	(units/yr)	(hrs/yr)	(gal/yr)	%	(gal/yr)	(lb/gal)	(lb/gal)	(lb/gal)	%	%		%	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
Primer	0.34	160,600	8,760	55,154	65%	19,304	7.26	7.26	0.76	20%	80%	90%	95%	16.00	70.08	5.06	22.14	0.53	2.33
Basecoat	0.40	160,600	8,760	63,639	65%	22,274	7.26	7.26	0.76	20%	80%	90%	95%	18.46	80.86	5.83	25.55	0.61	2.69
Clearcoat	0.40	160,600	8,760	63,639	65%	22,274	7.26	7.26	0.76	20%	80%	90%	95%	18.46	80.86	5.83	25.55	0.61	2.69
Repair	0.11	160,600	8,760	16,970	65%	5,940	7.26	7.26	0.76	0%	100%	0%	0%	4.92	21.56	4.92	21.56	0.52	2.27
Total														**57.84**	**253.36**	**21.65**	**94.81**	**2.28**	**9.97**

[a] The number of units for primer, basecoat, and clearcoat includes major repairs sent back through the paint shop equivalent to 10% of the maximum production per year.

[b] The annual usage conservatively assumes that the lines are purged after each unit in each booth.

[c] Information provided in purge solvent SDS.

Paint Shop Phosphate Cleaner Calculation Information [a]

Supply (Inlet) Air		
Temperature	75	°F
Humidity	50	% RH
Moisture Content	0.0092	lb H_2O/lb air
Exhaust (Outlet) Air		
Temperature	63	°F
Humidity	95	% RH
Moisture Content	0.012	lb H_2O/lb air
Flow Rate	21,761	ft^3/min
Density of Air at 63 °F	0.0757	lb/ft^3
Phosphate Cleaner		
Dissolved Solids	0.5	%
Hours of Operation [b]	8,760	hr/yr
Control Efficiency [c]	55	%

[a] Reduction in PM emissions through use of mist eliminators.
[b] Paint shop annual hours of operation.
[c] Mist eliminator control efficiency.

Paint Shop Phosphate Cleaner Emissions

Phosphate Cleaner Emissions	$PM/PM_{10}/PM_{2.5}$	
	Uncontrolled	**Controlled**
Hourly (lb/hr)	1.38	0.62
Annual (tpy)	6.06	2.73

Sample Calculation:

$$\text{Uncontrolled PM Emissions} = \frac{(0.012 - 0.0092)\text{ lb } H_2O}{\text{lb air}} \times \frac{0.5\text{ lb solids}}{100\text{ lb } H_2O} \times \frac{12{,}000\text{ ft}^3\text{ air}}{\text{min}} \times \frac{0.0757\text{ lb air}}{\text{scf air}} \times \frac{60\text{ min}}{\text{hour}}$$

Uncontrolled PM Emissions = 1.38 lb/hr

$$\text{Controlled PM Emissions} = \frac{(0.76\text{ lb PM})}{\text{hr}} \times \frac{(100 - 55)}{100} = 0.62\text{ lb/hr}$$

Appendix B.2.4 - Paint Shop
Mercedes-Benz Vans, LLC

Paint Mix Room Emissions

Paint Shop Material Usage Rates

Process/Material	Usage (gal/yr)
E-coat	608,776
Seam Sealer	102,751
Underbody PVC	695,022
Sika Sealing	6,201
(SAM) Sound Deadener Adhesive	154,277
Primer-Surfacer	300,724
Basecoat	387,891
Clearcoat	521,256
Spot Repair	6,157
Cavity Wax	115,249
Purge Solvent	199,403
Facility Total	2,488,930

vapor (I.e. partial) pressure of toluene	0.468	psia	P_{atm}
molecular weight of toluene	92.130	lb/lb-mole	MW
atmosphereic vapor pressure	14.700	psia	$P_{toluene}$
ideal gas constant - R	10.730	ft^3-psia/lb-mole-°R	
absolute temperature	532	°R	T
vapor density = MW*n/V = MW*P/R*T	0.237	lb/ft^3	n = 1
volume of displaced toluene-saturated air	2,488,930	gallons	
volume of displaced toluene-saturated air	332,745	ft^3	vol. displaced air
volume of displaced toluene	10,594	ft^3	vol. displaced air * $P_{toluene}/P_{atm}$
vapor density = MW*n/V = MW*P/R*T	0.2373	lb/ft^3	

Paint Shop Hours of Operation	8,760	hr/yr
Total VOC Emissions	0.29	lb/hr
Total VOC Emissions	**1.26**	**tpy**

Workdecks - Insignificant Activity Emissions

Booth/Zone	Potential $PM/PM_{10}/PM_{2.5}$ Emissions Exhaust Volume (scfm) [a,b]	PM Loading ($gr/10^3$ dscf) [c]	Hours of Operation (hr/yr)	Hourly (lb/hr)	Annual (ton/yr) [c]
E-coat Sand	62,978	0.1	8,760	0.05	0.24
Primer Sand	62,978	0.1	8,760	0.05	0.24
Metal/Body Repair #1	6,474	0.1	8,760	0.01	0.02
Metal/Body Repair #2	6,474	0.1	8,760	0.01	0.02
E-coat Touch-up	21,189	0.1	8,760	0.02	0.08
Primer Touch-up	21,189	0.1	8,760	0.02	0.08
Basecoat Touch-up	21,189	0.1	8,760	0.02	0.08
Inspect/Polish	84,167	0.1	8,760	0.07	0.32
Total				**0.25**	**1.08**

[a] Calculation assumes exhaust volume is on a dry basis.
[b] Exhaust volumes provided by equipment manufacturer.
[c] Estimated outlet PM loading for workdeck operations.
[d] Based on paint shop annual hours of operation: 8,760 hrs/yr

Sample Calculations (for E-Coat Sand)

PM Emissions (lb/hr) = $\frac{62{,}978 \text{ scf}}{\text{min}} \left| \frac{0.1 \text{ grains}}{1000 \text{ dscf}} \right| \frac{60 \text{ min}}{\text{hr}} \left| \frac{1 \text{ lb}}{7000 \text{ gr.}} \right. =$ **0.05 lb/hr**

PM Emissions (tons/yr) = $\frac{0.05398104 \text{ lb}}{\text{hr}} \left| \frac{8{,}760 \text{ hr}}{\text{yr}} \right| \frac{\text{ton}}{2000 \text{ lb}} =$ **0.24 ton/yr**

Appendix B.2.5 - Body Shop

Mercedes-Benz Vans, LLC

Body Shop Welding Emissions

Area/Process	Welding Material Usage per Vehicle		Material Usage per vehicle (lb/veh)	Uncontrolled PM Emission Factor [a] (lb/1000 lb)	Hourly Production Rate (veh/hr)	Maximum Annual Production (veh/yr)	Control Efficiency [b] %	Building Capture Efficiency %	Uncontrolled $PM/PM_{10}/PM_{2.5}$ Emissions [c] (lb/hr)	(lb/yr)	(tpy)	Controlled $PM/PM_{10}/PM_{2.5}$ Emission [c] (lb/hr)	(lb/yr)	(tpy)
MAG Welding	8,000	mm	0.30	20	17	146,000	95%	90%	1.00E-02	8.80E+01	4.40E-02	5.02E-04	4.40E+00	2.20E-03
Spot Welding	9,000	spots	0.34	20	17	146,000	0%	90%	1.13E-02	9.90E+01	4.95E-02	1.13E-02	9.90E+01	4.95E-02
Laser Welding	28,000	mm	1.05	20	17	146,000	0%	90%	3.52E-02	3.08E+02	1.54E-01	3.52E-02	3.08E+02	1.54E-01
Laser Soldering	9,000	mm	0.34	20	17	146,000	0%	90%	1.13E-02	9.90E+01	4.95E-02	1.13E-02	9.90E+01	4.95E-02
Total									**6.78E-02**	**5.94E+02**	**2.97E-01**	**5.83E-02**	**5.10E+02**	**2.55E-01**

[a] Average emission factor for welding and soldering at the facility is conservatively assumed to be 20 lb/1000 lb.
[b] Based on ESP control for MAG welding processes.
[c] A building capture efficiency of 90% is assumed for the body shop for both uncontrolled and controlled emissions based on building enclosure capture efficiency provided in Texas Commission on Environmental Quality, Rock Crushing Plants, Table 7, February, 2002. All welding and soldering operations are done inside the building.

Body Shop Welding HAP Emissions

Area/Process	Manganese Content %	lb/hr	tpy
MAG Welding	1.45	7.28E-06	3.19E-05
Spot Welding	0.0	0.00E+00	0.00E+00
Laser Welding	1.2	4.22E-04	1.85E-03
Laser Soldering	1.2	1.36E-04	5.94E-04
	Total	5.65E-04	2.47E-03

Welding Shield Gas CO_2 Emissions

Usage per Vehicle (kg)	Hourly Production Rate (veh/hr)	Maximum Annual Production (veh/yr)	CO_2 Content [a] %	CO_2 Emissions (lb/hr)	(tpy)
2.00	17	146,000	15%	1.10E+01	4.83E+01

[a] Based on Mercedes-Benz Vans shield gas specification.

Body Shop Adhesive Bonding Emissions

Welding area		Material Usage per vehicle (lb/veh)	Uncontrolled VOC Emission Factor [a] (%)	Hourly Production Rate (veh/hr)	Maximum Annual production (veh/yr)	Uncontrolled VOC Emissions (lb/hr)	(lb/yr)	(tpy)	Controlled VOC Emissions [b] (lb/hr)	(lb/yr)	(tpy)
Anti-flutter adhesive		6.61	1%	17	146,000	1.10	9,656.15	4.83	0.06	482.81	0.24
Structure adhesive		4.41	1%	17	146,000	0.73	6,437.43	3.22	0.04	321.87	0.16
Total						**1.84**	**16,093.58**	**8.05**	**0.09**	**804.68**	**0.40**

[a] From manufacturer's SDS, all body shop adhesives have >99% solids content. Mercedes-Benz Vans conservatively assumes VOC content of 1% for all adhesives.
[b] Mercedes-Benz Vans assumes 95% reduction in VOC emissions when body shop adhesives volatilize in the E-Coat oven.

Sample Calculations (for MAG Welding)

Material Usage (lb/veh) = $\pi \times r^2 \times$ Weld Length (mm) $\div 10^3 \times$ Material Specific Gravity (g/cm^3) $\div$ 453.59 g/lb

Material Usage (lb/veh) = $\pi \times (0.8\ mm)^2 \times 8{,}000\ mm \div 10^3 \times (8.5\ g/cm^3) \div 453.59\ g/lb$: **0.30 lb/veh**

PM Emissions (lb/yr) = 0.30 lb / veh | 20 lb / 1000 lb | 146,000 veh / yr | (1-95%) | (1-90%) = **4.401** **lb/yr**

PM Emissions (tons/yr) = 4.401 lb / yr | 1 ton / 2000 lb = **0.002 ton/yr**

Assembly Combustion - Natural Gas Emission Factors

Hours of Operation [e] 8,760 hrs

Pollutant		NG Emission Factors [a,b,c]	Units
$PM/PM_{10}/PM_{2.5}$		0.0074	lb/MMBtu
SO_2		0.0006	lb/MMBtu
NO_X		0.049	lb/MMBtu
CO		0.082	lb/MMBtu
VOC		0.0054	lb/MMBtu
CO_2e [d]			
	CO_2	117.00	lb/MMBtu
	CH_4	2.21E-03	lb/MMBtu
	N_2O	2.21E-04	lb/MMBtu

[a] PM, SO_2, and VOC natural gas emission factors are from AP-42, Table 1.4-2, 07/98.
[b] NO_X and CO natural gas emission factors are from AP-42, Table 1.4-1, 07/98, Small Boilers w/ Low NO_X Control.
[c] The heating value of natural gas is assumed to be 1,026 Btu/scf.
[d] Emission factors from 40 CFR 98, Subpart C, Tables C-1 and C-2. Factors were converted to lb/MMBtu.

Assembly Combustion Non-HAP Emissions

Description	Equipment	Rated Capacity (MMBtu/hr)	Emission Rates [e]																	
			$PM/PM_{10}/PM_{2.5}$		SO_2		NO_X		CO		VOC		CO_2		CH_4		N_2O		CO_2e	
			lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
Assembly Oven	OV04	1.36	0.01	0.04	0.001	0.003	0.07	0.29	0.11	0.49	0.01	0.03	159.68	699.42	0.003	0.013	0.0003	0.001	159.85	700.14
Total		**1.36**	**0.01**	**0.04**	**0.001**	**0.003**	**0.07**	**0.29**	**0.11**	**0.49**	**0.01**	**0.03**	**159.68**	**699.42**	**0.003**	**0.013**	**0.0003**	**0.001**	**159.85**	**700.14**

[e] Hours of operation for unrestricted emission calculations are 8,760.

Assembly Combustion HAP/TAP Emissions

Hours of Operation [b]	8,760 hrs
Total Rated Capacity	1.36 MMBtu/hr

Pollutants	NG Emission Factor [a] lb/10^6 scf	Total Emissions [b] lb/hr	tpy
2-Methylnaphthalene	2.40E-05	3.19E-08	1.40E-07
3-Methylchloranthrene	1.80E-06	2.39E-09	1.05E-08
7,12-Dimethylbenz(a)anthracene	1.60E-05	2.13E-08	9.32E-08
Acenaphthene	1.80E-06	2.39E-09	1.05E-08
Acenaphthylene	1.80E-06	2.39E-09	1.05E-08
Anthracene	2.40E-06	3.19E-09	1.40E-08
Benz(a)anthracene	1.80E-06	2.39E-09	1.05E-08
Benzene	2.10E-03	2.79E-06	1.22E-05
Benzo(a)pyrene	1.20E-06	1.60E-09	6.99E-09
Benzo(b)fluoranthene	1.80E-06	2.39E-09	1.05E-08
Benzo(g,h,i)perylene	1.20E-06	1.60E-09	6.99E-09
Benzo(k)fluoranthene	1.80E-06	2.39E-09	1.05E-08
Chrysene	1.80E-06	2.39E-09	1.05E-08
Dibenzo(a,h)anthracene	1.20E-06	1.60E-09	6.99E-09
Dichlorobenzene	1.20E-03	1.60E-06	6.99E-06
Fluoranthene	3.00E-06	3.99E-09	1.75E-08
Fluorene	2.80E-06	3.72E-09	1.63E-08
Formaldehyde	7.50E-02	9.98E-05	4.37E-04
Hexane	1.80E+00	2.39E-03	1.05E-02
Indeno(1,2,3-cd)pyrene	1.80E-06	2.39E-09	1.05E-08
Naphthalene	6.10E-04	8.11E-07	3.55E-06
Phenanathrene	1.70E-05	2.26E-08	9.91E-08
Pyrene	5.00E-06	6.65E-09	2.91E-08
Toluene	3.40E-03	4.52E-06	1.98E-05
Arsenic	2.00E-04	2.66E-07	1.17E-06
Beryllium	1.20E-05	1.60E-08	6.99E-08
Cadmium	1.10E-03	1.46E-06	6.41E-06
Chromium	1.40E-03	1.86E-06	8.16E-06
Cobalt	8.40E-05	1.12E-07	4.89E-07
Lead	5.00E-04	6.65E-07	2.91E-06
Manganese	3.80E-04	5.06E-07	2.21E-06
Mercury	2.60E-04	3.46E-07	1.51E-06
Nickel	2.10E-03	2.79E-06	1.22E-05
Selenium	2.40E-05	3.19E-08	1.40E-07

[a] Natural Gas Emission Factors are from AP-42 Section 1.4, Tables 1.4-2, 1.4-3, and 1.4-4.
[b] Hours of operation for unrestricted emission calculations are 8,760.

Appendix B.2.6 - Assembly Operations
Mercedes-Benz Vans, LLC

Assembly Glazing VOC Emissions

Area/Process	Material Usage per vehicle		Uncontrolled VOC Emission Factor [a]	Hourly Production Rate	Maximum Annual Production	Product Usage	Potential VOC Emissions		
	(kg/veh)	(lb/veh)	(%)	(veh/hr)	(veh/yr)	(lb/yr)	(lb/hr)	(lb/yr)	(tpy)
Primer 1	0.04	0.09	65%	19	164,250	14,595	1.08	9,486.75	4.74
Primer 2	0.08	0.19	64%	19	164,250	30,510	2.23	19,526.34	9.76
Adhesive	2.75	6.06	0%	19	164,250	995,971	0.00	0.00	0.00
Total							**3.31**	**29,013.09**	**14.51**

HAP/TAP Potential Emissions

Area/Process	Material Usage per vehicle		Constituent Chemical Name	CAS#	Uncontrolled Component Emission Factor [a]	Hourly Production Rate	Maximum Annual Production	Potential Emission Rates		
	(kg/veh)	(lb/veh)			(%)	(veh/hr)	(veh/yr)	(lb/hr)	(lb/yr)	(tpy)
Primer 1	0.04	0.09	MEK	78-93-3	60%	19	164,250	1.00	8,757.00	4.38
	0.04	0.09	MDI	101-68-8	1%	19	164,250	0.02	145.95	0.07
Primer 2	0.08	0.19	MEK	78-93-3	60%	19	164,250	2.09	18,305.94	9.15
			Acrylic acid	79-10-7	1%	19	164,250	0.03	305.10	0.15
Adhesive	2.75	6.06	N/A					0.00	0.00	0.00
Total								**3.14**	**27,513.99**	**13.76**

[a] Information provided in SDS for each material.

Assembly Under Body Wax Emissions

Area/Process	Material Usage per vehicle (lb/veh)	Uncontrolled VOC Emission Factor (%)	Hourly Production Rate (veh/hr)	Maximum Annual Production (veh/yr)	Product Usage (lb/year)	Potential VOC Emission Rates (lb/hr)	(lb/yr)	(tpy)
Under body wax	1.94	0.0%	19	164,250	318,656	0.00	0.00	0.00
Total						**0.00**	**0.00**	**0.00**

Spray Deck PM Emissions

Process	Material Usage per vehicle (lb/veh)	Weight % Volatiles (%)	Weight % Solids (%)	%Transfer Efficiency (%)	Production Rates (units/hr)	Filter Efficiency (%)	Uncontrolled $PM/PM_{10}/PM_{2.5}$ Emissions (lb/hr)	(lb/yr)	(tpy)	Controlled $PM/PM_{10}/PM_{2.5}$ Emissions (lb/hr)	(lb/yr)	(tpy)
Under body wax	1.94	0.0%	100.0%	90%	19	98.0%	3.64	31,865.64	15.93	0.07	637.31	0.32
Total							**3.64**	**31,865.64**	**15.93**	**0.07**	**637.31**	**0.32**

Appendix B.2.6 - Assembly Operations
Mercedes-Benz Vans, LLC

Assembly Filling Emissions

Product	Material Usage per Vehicle (liter/veh)	True Vapor Pressure, VP (psia)	Molecular Weight (g/mol)	Vehicle Throughput (veh/hr)	Vehicle Throughput (veh/yr)	Uncontrolled VOC Emission Rates (lb/hr)	Uncontrolled VOC Emission Rates (lb/yr)	Uncontrolled VOC Emission Rates (tpy)	Controlled VOC Emission Rates [a] (lb/hr)	Controlled VOC Emission Rates [a] (lb/yr)	Controlled VOC Emission Rates [a] (tpy)
Gasoline	18.9	7.4	66	19	164,250	1.08E+00	9.49E+03	4.74E+00	5.42E-02	4.74E+02	2.37E-01
Diesel fuel	18.9	0.01	130	19	164,250	2.88E-03	2.53E+01	1.26E-02	2.88E-03	2.53E+01	1.26E-02
Brake fluid	1.2	0.02	75	19	164,250	2.13E-04	1.86E+00	9.32E-04	2.13E-04	1.86E+00	9.32E-04
Antifreeze	9.0	0.02	62	19	164,250	1.31E-03	1.15E+01	5.73E-03	1.31E-03	1.15E+01	5.73E-03
Windshield Cleaner [b]	4.0	0.77	28.14	19	164,250	1.02E-02	8.89E+01	4.45E-02	1.02E-02	8.89E+01	4.45E-02
Differential Gear Oil	0.5	0.02	75	19	164,250	8.79E-05	7.70E-01	3.85E-04	8.79E-05	7.70E-01	3.85E-04
Auto Transmission Fluid	0.7	0.02	150	19	164,250	2.40E-04	2.10E+00	1.05E-03	2.40E-04	2.10E+00	1.05E-03
Power Steering Fluid	0.8	0.02	76	19	164,250	1.42E-04	1.24E+00	6.20E-04	1.42E-04	1.24E+00	6.20E-04
Total						**1.10E+00**	**9.62E+03**	**4.81E+00**	**6.92E-02**	**6.06E+02**	**3.03E-01**

[a] Assumes 95% control from onboard refueling vapor recovery (ORVR) for gasoline.

[b] From windshield cleaner MSDS, material contains 23% volatiles (methanol and ethylene glycol). VOC emissions calculated based on vapor pressure provided in the MSDS and molecular weight calculated as the weighted average of 23% ethylene glycol and 77% water.

HAP/TAP Emissions from Assembly Filling

Pollutant	Material Usage per Vehicle (liter/veh)	Component Emission Factor [a] (liter/veh)	True Vapor Pressure, VP (psia)	Molecular Weight (g/mol)	Vehicle Throughput (veh/hr)	Vehicle Throughput (veh/yr)	Uncontrolled HAP/TAP Emission Rates (lb/hr)	Uncontrolled HAP/TAP Emission Rates (lb/yr)	Uncontrolled HAP/TAP Emission Rates (tpy)	Controlled HAP/TAP Emission Rates (lb/hr)	Controlled HAP/TAP Emission Rates (lb/yr)	Controlled HAP/TAP Emission Rates (tpy)
Windshield Cleaner	4.0											
Methanol		1.12	1.888	32.04	19	164,250	7.92E-03	6.94E+01	3.47E-02	7.92E-03	6.94E+01	3.47E-02
Ethylene Glycol		0.80	0.0725	62.07	19	164,250	4.19E-04	3.67E+00	1.84E-03	4.19E-04	3.67E+00	1.84E-03
Total							**8.34E-03**	**7.30E+01**	**3.65E-02**	**8.34E-03**	**7.30E+01**	**3.65E-02**

[a] From windshield cleaner MSDS, material is 23% volatile by mass. Windshield cleaner fluid was conservatively assumed to contain 23% methanol and 23% ethylene glycol.

Appendix B.2.6 - Assembly Operations
Mercedes-Benz Vans, LLC

Assembly Roll and Brake Testing Capacities

Hourly Production Rate	19	units/hr
Annual Production Rate	164,250	units/yr
Simulated Distance	3.0	miles/unit
Hours of Operation [a]	8,760	hr/yr

[a] Potential operating hours are based on operation 24 hours/day, 365 days/yr.

Assembly Roll and Brake Testing Emission Factors

Pollutant	Diesel g/mile [a]	Gasoline g/mile	Worst Case Fuel g/mile
PM	0.08	0.0	0.08
NO_X	0.3	0.3	0.3
CO	4.2	4.2	4.2
VOC	0.09	0.09	0.09
Formaldehyde	0.018	0.018	0.018
CO_2e [b,c]			
CO_2 [b]	417	417	417
CH_4 [d]	0.73	0.73	0.73
N_2O [d]	0.01	0.01	0.01

[a] Emission rates are based on 40 CFR 88 Subpart A Table A Table A104–2—Full Useful Life Standards (g/mi) for Light-Duty Vehicles, diesel vehicles.

[b] The CO_2 emission factor is from "Light-Duty Automotive Technology, Carbon Dioxide Emissions, and Fuel Economy Trends: 1975 Through 2010"

[c] When accounting for global warming potential, CO_2 is 95% of CO_2e. EPA Emission Facts: Greenhouse Gas Emissions from a Typical Passenger Vehicle, http://www.epa.gov/OMS/climate/420f05004.htm.

[d] 5% of CO_2e is assumed to be CH_4 and N_2O, when accounting for global warming potential. Emission factors for these pollutants are based on a ratio of CH_4 and N_2O emission factors for petroleum fuels from the GHG Mandatory Reporting Rule Subpart C, Table C-2.

Assembly Roll and Brake Testing Potential Emissions

Process	Potential Emissions																	
	$PM/PM_{10}/PM_{2.5}$		NO_X		CO		VOC		Formaldehyde		CO_2		CH_4		N_2O		CO_2e	
	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr	(tpy)	(lb/hr	(tpy)	(lb/hr	(tpy)	(lb/hr)	(tpy)
Assembly Roll and Brake	0.010	0.043	0.037	0.163	0.521	2.281	0.011	0.049	0.002	0.010	51.71	226.50	0.091	0.40	0.002	0.01	54.43	238.42

Assembly Washer System Testing Compound Usage Data

Washer System Test [a]	mL/unit	% Ethylene Glycol [b]	Density Ethylene Glycol (lb/gal)	lb Ethylene Glycol/unit
Maximum Tested Windshield Cleaner Usage	100	23%	9.26	0.056

[a] Represents the maximum testing fluid usage per unit.
[b] From windshield cleaner MSDS, material contains 23% volatiles (methanol and ethylene glycol). Emissions from washer system testing calculated based on ethylene glycol density which represents the worst-case VOC emissions for the material.

Assembly Washer System Testing Emissions

	Production		VOC Emissions [a]			Maximum Ethylene Glycol Emissions [b]			Maximum Methanol Emissions [b]		
	(units/hr)	(units/yr)	(lb/hr)	(lb/yr)	(tpy)	(lb/hr)	(lb/yr)	(tpy)	(lb/hr)	(lb/yr)	(tpy)
Washer System Testing	19	164,250	1.06	9,244.66	4.62	1.06	9,244.66	4.62	0.75	6,579.53	3.29

[a] VOC emissions from washer system testing calculated based on ethylene glycol density which represents the worst-case VOC emissions for the material.
[b] Maximum HAP emissions are calculated assuming the maximum volatile content for both ethylene glycol and methanol. Therefore, the calculated VOC emissions are not equivalent to the sum of the HAP emissions.

Appendix B.2.7 - Storage Tanks
Mercedes-Benz Vans, LLC

Storage Tank Volumes

Tank ID	Consumption per Vehicle (gal/veh)	Max. Consumption per year[a] (gal/yr)	Fuel Type
TK-01	5.00	821,250	Gasoline
TK-02	5.00	821,250	Diesel
TK-03	----	100,000	Diesel

Storage Tank Emissions

Tank ID	Description [a]	Controls	Tank Size		Capacity	Throughput	Uncontrolled Emissions [b] (lb/yr)			Total VOC Emissions [b]	
			Shell Length (ft)	Diameter (ft)	(gal)	(gal/yr)	Working Loss	Breathing Loss	Total	Total (lb/hr)	Total (tpy)
TK-01	Gasoline	N/A	10.00	9.67	5,000	821,250	3,553.34	1,718.84	5,272.18	0.60	2.64
TK-02	Diesel fuel	N/A	15.08	11.00	10,000	821,250	10.79	2.27	13.06	0.001	0.01
TK-03	Diesel fuel	N/A	7.58	2.92	1,240	100,000	1.39	1.08	2.47	0.000	0.00
Tanks Total									**5,287.71**	**0.60**	**2.64**

[a] Max throughput for TK-01 and TK-02 based on the max. consumption per vehicle. TK-03 will be used to fuel sources in the Marshalling yard.

[b] All the storage tanks are horizontal tanks.

[c] Storage Tank emissions taken from TANKS 4.09d output based on tank parameters and geographical information.

Emergency Generators and Fire Pumps Emission Factors [a,b]

Pollutant	Emergency Engines $19 \leq kW < 37$	Emergency Engines $37 \leq kW < 75$	Emergency Engines $225 \leq kW < 450$	Emergency Engines $kW > 560$	Fire Pumps $225 < kW < 450$	Units
$PM/PM_{10}/PM_{2.5}$	0.45	0.30	0.15	0.15	0.15	g/hp-hr
SO_2 [c]	0.93	0.93	0.93	5.5E-03	0.93	g/hp-hr
NO_X	5.59	3.5	3.0	4.8	3.0	g/hp-hr
CO	4.10	3.7	2.6	2.6	2.6	g/hp-hr
VOC	5.6	3.5	3.0	4.8	3.0	g/hp-hr
CO_2e [d]						
CO_2	163.08	163.08	163.08	163.08	163.08	lb/MMBtu
CH_4	6.62E-03	6.62E-03	6.62E-03	6.62E-03	6.62E-03	lb/MMBtu
N_2O	1.32E-03	1.32E-03	1.32E-03	1.32E-03	1.32E-03	lb/MMBtu

[a] The emission factors are from 40 CFR 89.112(a), Table 1. VOC and NO_X emission factors are each assumed to be equivalent to NO_X + NMHC emission limit. The SO_2 emission factor is from AP-42, Table 3.4-1 for large diesel engines.

[b] The emission factors are from 40 CFR 89.112(a), Table 1. VOC and NO_X emission factors are each assumed to be equivalent to NO_X + NMHC emission limit. The SO_2 emission factor is from AP-42, Table 3.3-1.

[c] Sulfur content of diesel fuel equals the maximum sulfur content of 15 ppm, per 40 CFR 80.510(b).

[d] Emission factors from 40 CFR 98, Subpart C, Tables C-1 and C-2. Factors were converted to lb/MMBtu.

Emergency Generators and Fire Pumps Criteria Pollutant Emissions

Equipment ID	Fuel	Horsepower	Max. Rated Capacity	Max. hours per year [a]	$PM/PM_{10}/PM_{2.5}$		SO_2		NO_X		CO		VOC		CO_2		CH_4		N_2O		CO_2e	
		(hp)	(MMBtu/hr)	(hr)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
EG01	Diesel	398	1.01	500	0.13	0.03	0.82	0.204	2.62	0.65	2.29	0.57	2.62	0.65	143.09	35.77	0.006	0.001	0.001	0.0003	143.59	35.90
EG02	Diesel	65	0.17	500	0.04	0.01	0.13	0.03	0.50	0.13	0.53	0.13	0.50	0.13	23.37	5.84	0.001	2E-04	0.0002	5E-05	23.45	5.86
EG03	Diesel	40	0.10	500	0.04	0.01	0.08	0.021	0.50	0.12	0.36	0.09	0.50	0.12	14.46	3.62	0.001	0.00	0.000	0.000	14.51	3.63
EG04	Diesel	1,500	3.82	500	0.49	0.12	0.02	0.005	15.78	3.95	8.63	2.16	15.78	3.95	539.30	134.83	0.022	0.01	0.004	0.001	541.15	135.29
FP01	Diesel	305	0.78	500	0.10	0.03	0.63	0.16	2.02	0.50	1.75	0.44	2.02	0.50	109.66	27.41	0.004	0.001	0.0009	0.0002	110.03	27.51
Total					**0.81**	**0.20**	**1.68**	**0.42**	**21.42**	**5.35**	**13.57**	**3.39**	**21.42**	**5.35**	**829.9**	**207.47**	**0.03**	**0.01**	**0.01**	**0.002**	**832.7**	**208.18**

[a] Hours based on maximum allowable hours for maintenance and readiness testing under NSPS Subpart IIII.

Emergency Generators and Fire Pumps Combined Heat Input Capacities

	Capacity (MMBtu/hr)
Total Large Diesel Heat Input	3.82
Total Diesel Heat Input	2.06

[a] Large diesel engines are those larger than 600 hp.

Emergency Generators and Fire Pumps HAP/TAP Emissions

Pollutant	Emission Factors (lb/MMBtu) Large Diesel [a]	Emission Factors (lb/MMBtu) Diesel [b]	Emergency Equipment Emissions (lb/hr)	Emergency Equipment Emissions (tpy)
Benzene	7.76E-04	9.33E-04	4.88E-03	1.22E-03
Toluene	2.81E-04	4.09E-04	1.91E-03	4.79E-04
Xylene	1.93E-04	2.85E-04	1.32E-03	3.31E-04
Formaldehyde	7.89E-05	1.18E-03	2.73E-03	6.82E-04
Acetaldehyde	2.52E-05	7.67E-05	2.54E-04	6.35E-05
Acrolein	7.88E-06	9.25E-05	2.20E-04	5.51E-05
Napthalene	1.30E-04	8.48E-05	6.71E-04	1.68E-04
Total PAH	2.12E-04	1.68E-04	1.15E-03	2.89E-04

[a] Emission factors from AP-42 Section 3.4 Large Stationary Diesel and All Stationary Duel-fuel Engines, Table 3.4-3 - 3.4-4.
[b] Emission factors from AP-42 Section 3.3 Gasoline and Diesel Industrial Engines, Table 3.3-2.

Cooling Tower Potential Emissions

Description	Circulating Water Flowrate (gal/hr)	Water Density (lb/gal)	Total Dissolved Solids [a] (ppm)	Drift Rate[b] (%)	Hours of Operation (hrs/yr)	Potential Emissions [c] PM (lb/hr)	PM (tpy)	PM_{10} (lb/hr)	PM_{10} (tpy)	$PM_{2.5}$ (lb/hr)	$PM_{2.5}$ (tpy)
Cooling Tower 1	412,500	8.34	650	0.001	8,760	2.24E-02	9.79E-02	3.33E-03	1.46E-02	2.00E-03	8.76E-03
Cooling Tower 2	412,500	8.34	650	0.001	8,760	2.24E-02	9.79E-02	3.33E-03	1.46E-02	2.00E-03	8.76E-03
Cooling Tower 3	412,500	8.34	650	0.001	8,760	2.24E-02	9.79E-02	3.33E-03	1.46E-02	2.00E-03	8.76E-03
Cooling Tower 4	73,800	8.34	650	0.001	8,760	4.00E-03	1.75E-02	5.96E-04	2.61E-03	3.58E-04	1.57E-03
Cooling Tower 5	484,900	8.34	650	0.001	8,760	2.63E-02	1.15E-01	3.92E-03	1.72E-02	2.35E-03	1.03E-02
Cooling Tower 6	484,900	8.34	650	0.001	8,760	2.63E-02	1.15E-01	3.92E-03	1.72E-02	2.35E-03	1.03E-02
Cooling Tower 7	484,900	8.34	650	0.001	8,760	2.63E-02	1.15E-01	3.92E-03	1.72E-02	2.35E-03	1.03E-02
Total						1.50E-01	6.57E-01	2.23E-02	9.79E-02	1.34E-02	5.87E-02

[a] TDS provided by Charleston Water System.

[b] Drift rate value supplied based on vendor guaranteed drift rate.

[c] PM emissions calculated using equation from AP-42 Chapter 13.4 - Wet Cooling Towers. PM_{10} emissions are 14.9% of PM emissions based on *Calculating Realistic PM $_{10}$ Emissions from Cooling Towers* by Joel Reisman and Gordon Frisbie. $PM_{2.5}$ assumed to be 60% of PM_{10} based on California Emissions Inventory Development and Reporting System (CEIDARS).

Paved Roads - Emission Factor Equation [1]

$$E = [k\ (sL)^{0.91} * W^{1.02}] * (1 - 1.2*P/N)$$

where:	Value	Units	Data Source
k = particle size multiplier for PM	0.011	lb/VMT	AP-42, Table 13.2.1-1 [2]
k = particle size multiplier for PM_{10}	0.0022	lb/VMT	AP-42, Table 13.2.1-1 [2]
k = particle size multiplier for $PM_{2.5}$	0.00054	lb/VMT	AP-42, Table 13.2.1-1 [2]
sL = road surface silt loading	0.6	g/m^2	AP-42, Table 13.2.1-2 [3]
W_a = average weight of vehicles traveling the road	40.0	tons	SC DOT [4]
N = number of days in averaging period	365	days	AP-42, pg. 13.2.1-6
P = number of days in a year with at least 0.01 in of precipitation	120	days	AP-42, Fig. 13.2.1-2
E_a = PM emission factor	**0.18**	**lb/VMT**	**Calculation**
E_a = PM_{10} emission factor	**0.04**	**lb/VMT**	**Calculation**
E_a = $PM_{2.5}$ emission factor	**0.01**	**lb/VMT**	**Calculation**

[1] AP-42, Section 13.2.1.3, Equation 3.

[2] K value selected is for PM_{30}, PM_{10} and $PM_{2.5}$. The PM_{30} factor is used to calculate PM emissions.

[3] AP-42 Section 13.2.1, Table 13.2.1-2, Ubiquitous Silt Loading Default Values for sites with average daily traffic (ADT) for low volume roads, ADT category < 500 vehicles.

[4] Average weight conservatively set to maximum allowable gross vehicle weight rating is 80,000 lbs (40 tons), per SC §56-5-4140.

Paved Roads - Loads and Distance Inputs

Parameter	Value	Units
Distance traveled per load	1.71	VMT/load
Loads traveled	6	loads/hr
	150	loads/day
	54,750	loads/yr
Paved Vehicle Miles Traveled per Year [1]	93,349	VMT/yr
Paved Vehicle Miles Traveled per Hour [2]	10.66	VMT/hr

[1] Calculation: Paved Vehicle Miles Traveled per Year (VMT/yr) = (Potential Vehicle Production (tpy)) / Weight of Truck Load (tons/load) * Distance Traveled per Load (VMT/load).

[2] Calculation: Paved Vehicle Miles Traveled per Hour (VMT/hr) = (Potential Vehicle Production (tons/hr)) / Weight of Truck Load (tons/load) * Distance Traveled per Load (VMT/load).

Paved Roads - Potential Emissions

	PM		**PM_{10}**		**$PM_{2.5}$**	
	(lb/hr)	**(tpy)**	**(lb/hr)**	**(tpy)**	**(lb/hr)**	**(tpy)**
Paved Roads [1,2]	1.92	8.41	0.38	1.68	0.09	0.41

[1] Calculation: Potential Emissions (tpy) = Paved Vehicle Miles Traveled per Year (VMT/yr) * Emission Factor (lb/VMT) / (2,000 lb/ton).

[2] Calculation: Potential Emissions (lb/hr) = Paved Vehicle Miles Traveled per Year (VMT/hr) * Emission Factor (lb/VMT).

Table 3-5. Modeled Source Locations and Parameters

Model ID	Description	UTM-E (m)	UTM-N (m)	Elevation (m)	Height (m)	Temperature (K)	Velocity (m/s)	Diameter (m)	PM_{10} Rate (g/s)	$PM_{2.5}$ Rate (g/s)
O1	RTO and ADW Heater#1 & Burner Desorption	583,613.0	3,647,439.0	13.4	27.43	353.15	10.00	3.81	7.952E-02	7.952E-02
B01	Paint Shop Boiler No. 1	583,657.0	3,647,572.0	13.4	12.95	415.37	0.001	0.51	1.332E-02	1.332E-02
B02	Paint Shop Boiler No. 2	583,656.0	3,647,569.0	13.4	12.95	415.37	0.001	0.51	1.332E-02	1.332E-02
CT1	Cooling Tower 01	583,689.0	3,647,685.0	13.4	10.67	300.37	1.36	5.49	4.198E-04	2.519E-04
CT2	Cooling Tower 02	583,685.0	3,647,674.0	13.4	10.67	300.37	1.36	5.49	4.198E-04	2.519E-04
CT3	Cooling Tower 03	583,682.0	3,647,663.0	13.4	10.67	300.37	1.36	5.49	4.198E-04	2.519E-04
CT4A	Cooling Tower 04A	583,686.0	3,647,652.0	13.4	6.17	300.37	1.40	1.63	3.755E-05	2.253E-05
CT04B	Cooling Tower 04B	583,685.0	3,647,652.0	13.4	6.17	300.37	1.40	1.63	3.755E-05	2.253E-05
CT5	Cooling Tower 05	583,716.0	3,647,617.0	13.4	10.67	300.37	1.36	5.49	4.935E-04	2.961E-04
CT6	Cooling Tower 06	583,706.0	3,647,620.0	13.4	10.67	300.37	1.36	5.49	4.935E-04	2.961E-04
CT7	Cooling Tower 07	583,695.0	3,647,623.0	13.4	10.67	300.37	1.36	5.49	4.935E-04	2.961E-04
PC01A	PT Dip Booth A	583,722.0	3,647,562.0	13.4	27.20	310.00	11.05	0.40	3.923E-02	3.923E-02
PC01B	PT Dip Booth B	583,698.0	3,647,483.0	13.4	28.00	310.00	11.61	0.80	3.923E-02	3.923E-02
OV01A	ED Oven Burners	583,682.0	3,647,436.0	13.4	27.66	580.00	29.25	0.15	4.527E-03	4.527E-03
OV02A	Primer Oven Burners	583,660.0	3,647,493.0	13.4	27.66	580.00	29.25	0.15	4.013E-03	4.013E-03
OV03A	Topcoat Oven Burners	583,665.0	3,647,500.0	13.4	27.66	580.00	29.25	0.15	3.985E-03	3.985E-03
WD03TU	Workdecks 3 ED Touch-Up	583,659.0	3,647,381.0	13.4	27.80	300.00	9.51	1.64	5.954E-03	5.954E-03
UBS01	Workdecks 3 Closed	583,671.0	3,647,471.0	13.4	27.80	300.00	9.53	1.47	3.933E-02	3.933E-02
WD4TU	Workdecks 4 PR Touch-Up	583,652.0	3,647,527.0	13.4	27.80	300.00	9.51	1.64	1.367E-02	1.367E-02
UBC01	Workdecks 4 Closed	583,675.0	3,647,470.0	13.4	27.80	300.00	5.92	1.47	2.954E-02	2.954E-02
SR01	Workdecks Spot Repair	583,669.0	3,647,524.0	13.4	26.90	300.00	9.26	1.49	1.074E-03	1.074E-03
ASU02	ASU 2.1 Shop + Open WD	583,641.0	3,647,353.0	13.4	25.00	0.00	0.001	3.20	9.333E-03	9.333E-03
ASU03	ASU 3 - UBS + Repair	583,656.0	3,647,380.0	13.4	25.00	0.00	0.001	2.75	6.944E-03	6.944E-03
ASU04	ASU 2.2 Shop + Open WD	583,650.0	3,647,476.0	13.4	25.00	0.00	0.001	3.27	9.333E-03	9.333E-03
ASU05	ASU 1 - Spot Repair	583,647.0	3,647,504.0	13.4	25.00	0.00	0.001	2.51	4.499E-03	4.499E-03
ASU06	ASU 2.3 Shop	583,661.0	3,647,551.0	13.4	25.00	0.00	0.001	3.27	9.333E-03	9.333E-03
ASU07	ASU 4 - Wax	583,668.0	3,647,572.0	13.4	25.00	0.00	0.001	2.51	4.517E-03	4.517E-03
ASU08	Primer Oven Cooling Zone Exhaust	583,676.0	3,647,586.0	13.4	25.00	0.00	0.001	1.64	7.971E-03	7.971E-03
ASU11	Primer Oven Cooling ASU	583,679.0	3,647,529.0	13.4	25.00	0.00	0.001	1.43	5.441E-03	5.441E-03
OV4	Assembly Repair Booth	583,253.0	3,647,490.0	13.4	14.94	294.15	8.84	0.98	3.936E-03	3.936E-03
RB1	Roll and Brake Booth 1	583,261.0	3,647,541.0	13.4	14.94	294.15	14.34	1.50	4.167E-04	4.167E-04
RB2	Roll and Brake Booth 2	583,270.0	3,647,539.0	13.4	14.94	294.15	14.34	1.50	4.167E-04	4.167E-04
AUW	Underbody Wax	583,290.0	3,647,535.0	13.4	14.94	294.15	9.16	1.09	9.167E-03	9.167E-03
ASRTU01	Assembly - Rooftop Unit 1	583,254.0	3,647,582.0	13.4	14.94	410.00	0.001	0.10	7.467E-04	7.467E-04
ASRTU04	Assembly - Rooftop Unit 4	583,327.0	3,647,570.0	13.4	14.94	410.00	0.001	0.10	7.467E-04	7.467E-04
ASRTU06	Assembly - Rooftop Unit 6	583,372.0	3,647,556.0	13.4	14.94	410.00	0.001	0.10	7.467E-04	7.467E-04
ASRTU08	Assembly - Rooftop Unit 8	583,417.0	3,647,542.0	13.4	14.94	410.00	0.001	0.10	7.467E-04	7.467E-04
ASRTU10	Assembly - Rooftop Unit 10	583,461.0	3,647,528.0	13.4	14.94	410.00	0.001	0.10	7.467E-04	7.467E-04
ASRTU11	Assembly - Rooftop Unit 11	583,502.0	3,647,556.0	13.4	14.94	410.00	0.001	0.10	7.467E-04	7.467E-04
ASRTU13	Assembly - Rooftop Unit 13	583,500.0	3,647,512.0	13.4	14.94	410.00	0.001	0.10	7.467E-04	7.467E-04
BSRTU01	Body Shop - Rooftop Unit 1	583,783.0	3,647,328.0	13.4	14.78	410.00	0.001	0.15	7.467E-04	7.467E-04
BSRTU02	Body Shop - Rooftop Unit 2	583,816.0	3,647,318.0	13.4	14.78	410.00	0.001	0.15	7.467E-04	7.467E-04
BSRTU04	Body Shop - Rooftop Unit 4	583,841.0	3,647,312.0	13.4	14.78	410.00	0.001	0.15	7.467E-04	7.467E-04
BSRTU05	Body Shop - Rooftop Unit 5	583,841.0	3,647,312.0	13.4	14.78	410.00	0.001	0.15	7.467E-04	7.467E-04
BSRTU06	Body Shop - Rooftop Unit 6	583,875.0	3,647,301.0	13.4	14.78	410.00	0.001	0.15	7.467E-04	7.467E-04
BSRTU07	Body Shop - Rooftop Unit 7	583,889.0	3,647,330.0	13.4	14.78	410.00	0.001	0.15	7.467E-04	7.467E-04
BSRTU10	Body Shop - Rooftop Unit 10	583,804.0	3,647,373.0	13.4	14.78	410.00	0.001	0.15	7.467E-04	7.467E-04
BSRTU17	Body Shop - Rooftop Unit 17	583,915.0	3,647,414.0	13.4	14.78	410.00	0.001	0.15	7.467E-04	7.467E-04
BSRTU18	Body Shop - Rooftop Unit 18	583,926.0	3,647,448.0	13.4	14.78	410.00	0.001	0.15	7.467E-04	7.467E-04
BSRTU23	Body Shop - Rooftop Unit 23	583,804.0	3,647,484.0	13.4	14.78	410.00	0.001	0.15	7.467E-04	7.467E-04
BSRTU25	Body Shop - Rooftop Unit 25	583,790.0	3,647,451.0	13.4	14.78	410.00	0.001	0.15	7.467E-04	7.467E-04
BSRTU26	Body Shop - Rooftop Unit 26	583,941.0	3,647,499.0	13.4	14.78	410.00	0.001	0.15	7.467E-04	7.467E-04
BSRTU30	Body Shop - Rooftop Unit 30	583,915.0	3,647,530.0	13.4	14.78	410.00	0.001	0.15	7.467E-04	7.467E-04
BSRTU32	Body Shop - Rooftop Unit 32	583,883.0	3,647,538.0	13.4	14.78	410.00	0.001	0.15	7.467E-04	7.467E-04
BSRTU33	Body Shop - Rooftop Unit 33	583,856.0	3,647,546.0	13.4	14.78	410.00	0.001	0.15	7.467E-04	7.467E-04
BSRTU35	Body Shop - Rooftop Unit 35	583,827.0	3,647,555.0	13.4	14.78	410.00	0.001	0.15	7.467E-04	7.467E-04
ASU33	Workdecks Air Supply Unit 21 (Phase 3)	583,660.0	3,647,382.0	13.4	25.00	0.00	6.89	3.20	4.629E-03	4.629E-03
ASU34	Workdecks Air Supply Unit 22 (Phase 3)	583,672.0	3,647,472.0	13.4	25.00	0.00	6.89	3.20	2.389E-03	2.389E-03
ASU35	Workdecks Air Supply Unit 23 (Phase 3)	583,653.0	3,647,528.0	13.4	25.00	0.00	6.89	3.20	7.513E-03	7.513E-03
ASU36	Clean Room 21 Air Supply Unit (Phase 3)	583,669.0	3,647,473.0	13.4	25.00	0.00	6.89	3.20	1.176E-03	1.176E-03
ASU37	Shop Ventilation 21 Air Supply Unit (Phase 3)	583,670.0	3,647,525.0	13.4	25.00	0.00	6.89	3.20	2.865E-03	2.865E-03
ASU38	Social Rooms Air Supply Unit 2 (Phase 3)	583,696.0	3,647,583.0	13.4	25.00	0.00	6.89	3.20	1.428E-03	1.428E-03
OV22	Primer Oven Burners (Phase 3)	583,661.0	3,647,492.0	13.4	27.66	580.00	29.25	0.15	4.779E-03	4.779E-03
OV23	Topcoat Oven Burners (Phase 3)	583,666.0	3,647,501.0	13.4	27.66	580.00	29.25	0.15	5.348E-03	5.348E-03
UBS21	Workdecks 3 Closed (Phase 3)	583,674.0	3,647,473.0	13.4	27.80	300.00	9.53	1.47	3.113E-02	3.113E-02
RB3	Roll and Brake Booth 3	583,277.0	3,647,537.0	13.4	14.94	294.15	14.34	1.50	4.167E-04	4.167E-04
BS01 *	Body Shop Fugitive Welding Emissions	583,876.0	3,647,446.0	13.4	6.71	N/A	74.45	6.24	7.342E-03	7.342E-03

* Modeled as a volume Source, release height, initial lateral and initial vertical dimensions (in m) are listed in the height, exit velocity and diameter columns.

Modeling guidance released by DHEC states that sources which emit less than 1.14 lb/hr (or 5 tpy) of total PM, PM_{10}, $PM_{2.5}$, SO_2, and NO_2, or less than 10.0 lb/hr of CO, are not required to be included in a facility-wide Standard No. 2 compliance demonstration. As provided in the application submittal, maximum emission rates of each of the above listed pollutants from the modified facility are below the modeling thresholds stated by DHEC, with the exception of PM_{10}, $PM_{2.5}$, and NO_2. For the purposes of this analysis, all NO_X emissions are conservatively assumed to be NO_2. The project triggered Major NSR permitting for $PM_{2.5}$ and the facility submitted an ambient air modeling demonstration for PM_{10} and $PM_{2.5}$.

This document is being provided by Mercedes-Benz Vans as a compliance demonstration for Standard No. 2 for NO_2 emissions from the proposed project. The only vent from the facility that may exceed the modeling exemption threshold of 1.14 lb/hr is the RTO stack. The RTO stack releases emissions from several sources of NO_2 at the facility. The sources of NO_2 vented through the RTO stack are the air supply units (ASU) for primer (ASU P), base coat (ASU BC) and clear coat (ASU CC). Additionally, the NO_2 emissions from RTO combustion are emitted via the RTO stack.

OTHER INFORMATION

SC Regulation 61-62.1 Section II.C.3.n requires that facilities submit, as part of a construction permit application, an air dispersion modeling analysis or "other information" demonstrating that the facility will continue to comply with ambient air quality standards. On September 8, 2014, DHEC released a guidance memo detailing criteria for acceptable "other information" in place of dispersion modeling.[1] Mercedes-Benz Vans has elected to provide "other information" to demonstrate compliance with NO_X air quality standards in Standard No. 2, specifically using the "Weight of Evidence" approach provided in the guidance.

BACKGROUND CONCENTRATION DATA

Page 3 of the *Guidance Concerning Other Information* document states that background data must be identified and justified when the "Weight of Evidence" approach is used. The closest air monitor to Mercedes-Benz Vans is located at 3840 Jenkins Ave., North Charleston, SC, longitude -79.97755 degrees west and latitude 32.8823 degrees north [AQS Site ID 45-019-0003]. This monitor is located roughly 15 kilometers from the Charleston plant, and is therefore the most representative data for background concentrations at the Charleston plant. Land use characteristics near the monitor and around the Charleston plant are similar, as both areas are paved, trafficked on both foot and automobile, and have a dense collection of buildings of various sizes. Therefore, data from the Jenkins Ave. Fire Station monitor at is used in this analysis. Recent monitoring data as compared to the 1-hour and annual standards for NO_2 is provided in Table 1.

[1] "Guidance Concerning Other Information Used for Permitting Requirements in Demonstrating Emissions Do Not Interfere With Attainment or Maintenance of any State or Federal Standard." Available at http://www.scdhec.gov/Environment/AirQuality/ComplianceandReporting/AirDispersionModeling/FormsGuidelinesSoftware/.

Table 1. Jenkins Avenue Fire Station North Charleston, SC Ambient Air Monitoring Data for NO_2

Pollutant	Standard	Form	Year	Design Value (ppb)
NO_2 1-hour	100 ppb	98th percentile of 1-hour daily, maximum concentrations, averaged over 3 years	2011	65.8
			2012	80.9
			2013	69.6
NO_2 Annual	53 ppb	Arithmetic Mean	2011	12.4
			2012	12.4
			2013	12.6

As shown in Table 1, ambient monitored values of NO_2 near Mercedes-Benz Vans are, on average, 72.11% of the 1-hour standard and, on average, 23.47% of the annual standard provided in Standard No. 2.

FACILITY-WIDE OR PROJECT EMISSIONS LESS THAN PSD SIGNIFICANCE THRESHOLDS

DHEC considers project emissions increases less than PSD SER levels to support the conclusion that a project will not interfere with the attainment or maintenance of ambient air quality standards for a particular pollutant. As shown in Table 1 and Appendix B, this project will not have emissions increases exceeding the SER for any criteria pollutant. Therefore, this project will not interfere with attainment or maintenance of the NO_2 standards.

LEVEL OF CONTROL

Mercedes-Benz Vans will fire natural gas only, which has a lower uncontrolled hourly emission rate of NO_2 than alternative fuels (e.g., fuel oil). In addition to firing a lower-emitting fuel, Mercedes-Benz Vans will utilize low-NO_X burners the in the air supply units that vent to the RTO. Mercedes-Benz Vans satisfies the Level of Control piece of the "Weight of Evidence" approach by firing lower-emitting fuels and using low-NO_X burners for NO_2 emissions.

EMISSIONS INVENTORY

DHEC allows for an analysis of the relative changes in emissions inventory for a project compared to existing facility emissions, county or region emissions, and/or background monitoring data to be included in the "Weight of Evidence" approach to demonstrating compliance. DHEC has supplied emissions inventory data for the state of South Carolina from 2008, 2011, and 2014 on its website.[2]

Charleston County, where the representative ambient air monitor is located, shows an inventory of 20,490.86 tons of NO_2 in 2008, 15,622.31 tons in 2011, and 16,762.35 tons in 2014. The potential increase in NO_2 emissions from this project is 35.42 tpy, which is 0.21% of the 2014 emissions inventory in Charleston County, a very low percentage.

This satisfies the "Weight of Evidence" approach by showing that the area around Mercedes-Benz Vans will maintain compliance with Standard No. 2 after the proposed project.

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[2] Retrieved from http://www.scdhec.gov/Environment/AirQuality/ComplianceandReporting/AirDispersionModeling/ModelingData/.

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MERCEDES-BENZ VANS, LLC

Charleston Plant Expansion Revisions
Ladson, South Carolina

Construction and Operating Permit Application Addendum

April 2018

Trinity Consultants

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Mercedes-Benz

Mercedes-Benz Vans, LLC

April 10, 2018

Steve McCaslin, P.E.
South Carolina DHEC
Bureau of Air Quality
2600 Bull Street
Columbia, SC 29201

RE: Mercedes-Benz Vans, LLC – Ladson, SC
PSD Permit Revision Application - Addendum

Dear Mr. McCaslin:

Mercedes-Benz Vans, LLC (Mercedes-Benz Vans) owns and operates a van assembly plant in Ladson, Charleston County, South Carolina (the Charleston plant). Mercedes-Benz Vans submitted a Prevention of Significant Deterioration (PSD) construction and operating permit application in October 2015 and later submitted a revised application in February 2016 for the expansion of existing assembly processes and addition of new processes, including a body shop, paint shop, and energy center. Construction Permit No. 0560-0385-CA was issued on April 15, 2016 for the initial permit application. Construction Permit No. 0560-0385-CA-R1 was issued on July 21, 2017 to include design changes and additional operations that will be needed at the Charleston plant that were not included in the previous permit application. Construction Permit No. 0560-0385-CA-R2 was issued on January 26, 2018 to include changes to the E-coat operations. Mercedes-Benz Vans submitted a PSD permit revision application in February 2018 to request changes to Construction Permit No. 0560-0385-CA-R2. Mercedes-Benz Vans is submitting this letter addendum to the February 2018 application to request additional changes to Construction Permit No. 0560-0385-CA-R2, including:

- Updating the NO_X emission factors for natural gas-fired combustion units based on vendor data;
- Correcting the heat input capacity of the existing assembly oven burners from (Equipment ID OV04) from 1.36 to 4.3 MMBtu/hr;
- Updating the VOC Best Available Control Technology (BACT) emission limit for E-coat spot repair operations; and
- Requesting an exemption from SC Standard No. 5.2 for Boilers B01 and B02.

The following sections of this permit application addendum includes all required elements to revise the PSD permit, including updated project emission calculations, Best Available Control Technology (BACT) analyses, and regulatory applicability reviews. Updated facility-wide emissions are provided in Appendix A, updated BACT cost analyses for E-coat spot repair operations are presenting in Appendix B, revised DHEC permit application forms have been provided in Appendix C, and additional supporting documentation has been provided in Appendix D.

1.1. UPDATE NO_X EMISSION FACTORS FOR NATURAL GAS-FIRED UNITS

With this addendum, facility-wide potential emissions for natural gas-fired combustion units have been updated based on oxides of nitrogen (NO_X) emissions data from combustion unit vendors. Based on the revised emission factors, the average combustion unit utilization (hours of operation per year) has been decreased to keep emissions less than the established greenhouse gas (CO_2e) and NO_X synthetic minor emission limits. Mercedes-Benz Vans is not requesting utilization limits for individual emission units.

Total emissions of other regulated pollutants from combustion units are slightly lower due to changes in the NO_X emission factors. There is no increase in short term emissions or annual emissions from combustion units, and the emission factor updates have not resulted in an increase of emissions of other pollutants. Therefore, no updated modeling demonstration is needed due to this change in emission factors.

Updated facility-wide emissions have been provided in Appendix A to this submittal.

1.2. UPDATE HEAT INPUT CAPACITY FOR THE ASSEMBLY OVEN BURNERS (EQUIPMENT ID OV04)

Construction Permit No. 0560-0385-CA-R2 includes natural gas-fired assembly oven burners. Mercedes-Benz Vans requests that the heat input capacity be updated from 1.36 to 4.3 MMBtu/hr. The assembly oven is an existing unit and has not been modified as part of this project. However, the heat input capacity in the original application was incorrect and requires revision. The increase in heat input capacity results in a 0.02 lb/hr increase in short term potential PM emissions. This increase is expected to have a negligible impact on the National Ambient Air Quality Standards (NAAQS) and increment modeling, as the emission increase is less than 1% of the facility-wide PM emissions. No long-term increase in PM emissions is expected since annual emissions are restricted by PSD avoidance limits.

Updated facility-wide emissions have been provided in Appendix A to this submittal. Updated equipment forms have been provided in Appendix C to this submittal.

1.3. UPDATE VOC BACT FOR E-COAT SPOT REPAIR

Construction Permit No. 0560-0385-CA-R2 includes a monthly average limit of 4.25 lb VOC/gal of material applied (VOC BACT) for E-coat spot repair operations. With this application, Mercedes-Benz Vans is proposing to revise the VOC BACT limit to allow flexibility of spot repair materials and to be consistent with the BACT limit established for other spot repair booths at the Charleston plant. Based on material currently selected for use at the Charleston plant and the spot repair booth VOC limits, Mercedes-Benz Vans is proposing to revise the BACT emission limit to 6.0 lb VOC/gal.

Mercedes-Benz Vans has revised the BACT analysis for the E-coat spot repair operations at the facility for PSD-regulated pollutants exceeding the major source threshold applicable to the spot repair (VOC only). There is no change to the PM emissions from the spot repair operations due to this change, therefore a revised BACT analysis for $PM/PM_{10}/PM_{2.5}$ is not included in this submittal.

The BACT analysis follows the "top-down" approach suggested by U.S. EPA. The top-down process begins by ranking all potentially relevant control technologies in descending order of control effectiveness. The most stringent or "top" control option is BACT unless the applicant demonstrates, and the permitting authority in its informed opinion agrees, that energy, environmental, and/or economic impacts justify the conclusion that the most stringent control option does not meet the definition of BACT. Where the top option is not determined to be BACT, the next most stringent alternative is evaluated in the same manner. This process continues until BACT is determined.

Based on the BACT review, Mercedes-Benz Vans proposes that the BACT limit for E-coat spot repair operations during periods of normal operation be revised as presented in Table 1.

Table 1. Proposed BACT Emission Limits Summary

Unit ID	Unit Description	$PM/PM_{10}/PM_{2.5}$ BACT Limit	Units	Avg. Period	VOC BACT Limit	Units	Avg. Period
WD	E-Coat Spot Repair Operations	N/A	N/A	N/A	6.0	lb/gal	Monthly

As required in Regulation 61-62.5, Standard No. 7, Section (aa)(11)(c), Mercedes-Benz Vans is including a revised BACT analysis for the proposed E-coat spot repair operations. This following sections provide a revised VOC "top-down" BACT analyses for the E-coat spot repair operations.

1.3.1. Identification of Potential Control Techniques (Step 1)

Candidate control options identified from the RBLC search, permit review, and the literature review include the following VOC reduction options:

- Coating materials
  - Powder coating material
  - Low VOC coating material
  - Waterborne coating material

- Coating application methods
  - High volume electrostatic
  - Low volume electrostatic
  - High volume low pressure (HVLP)
  - Low volume low pressure (LVLP)

- Add-on controls
  - RTO with or without ADW

1.3.2. Elimination of Technically Infeasible Control Options (Step 2)

Coating materials

As discussed in the original permit application for the facility, powder coatings are not technically feasible for the primer application process and traditional coatings will be used. Since there will be no curing between the E-coat spot repair operation and the primer application booth, it is not technically feasible to utilize powder coating for the E-coat spot repair operation and traditional coating materials in the primer booth and achieve the quality finish needed for the vehicles. Therefore, powder coatings are eliminated from consideration.

Coating application methods
Since repairs will occur in various areas of the vehicles, and it is not technically feasible to use ESTA technology for repairs in certain areas, Mercedes-Benz Vans does not consider ESTA technology technically feasible for the E-coat spot repair booth. Robotic application is also not technically feasible for the repair booth since the location of the repairs will be impossible to predict.

Add-on controls
The use of add-on controls such as an RTO or RCO is technically feasible, although it would not likely achieve any measurable reduction in VOC emissions due to the very low concentration of VOC emissions from the exhaust stream.

1.3.3. Rank of Remaining Control Technologies (Step 3)

Table 2. VOC Control Technologies (Spot Repair Operations**)**

Rank	Control Technology	Potential Control Efficiency of Captured VOC (%)
1	RTO/RCO with or without ADW	90-95
2	Aerosol Coating	Varies
2	HVLP Coating	Varies
2	Low-VOC materials	Varies

1.3.4. Evaluation of Most Stringent Controls (Step 4)

Because spot repairs are required for such small surface areas of the coated vehicle bodies, the spot repair operations use very little coating material. As such, emissions from spot repair operations are very low. Due to the very low concentration of VOC emissions from the exhaust stream, add-on VOC controls are not economically feasible. Mercedes-Benz Vans has completed annualized cost analyses of the operating costs associated with routing the emissions from the repair booths to the RTO. The cost analyses provided in Appendix B show that the annual natural gas and electricity operating costs for E-coat spot repair is approximately $477,577 per ton of VOC removed.

Because spot repairs are required for such small surface areas of the coated vehicle bodies, both aerosol (spray cans) and HVLP coating are appropriate coating technologies with minimal VOC emissions. Mercedes-Benz Vans will utilize low-VOC materials if possible.

The remaining control technologies (aerosol coating, HVLP coating, and low VOC materials) will be utilized to reduce VOC emissions to the extent possible.

1.3.5. Selection of BACT (Step 5)

As discussed in Step 4, Mercedes-Benz Vans will utilize aerosol coating, HVLP spraying technology and low VOC materials when possible to meet BACT requirements for the paint repair operations. Due to the very small quantities of materials used in these operations on an hourly basis, evaluating compliance with an emission limit with a short-term averaging period is very difficult. Therefore, Mercedes-Benz Vans is proposing a VOC content limit of 6.00 lb VOC/gal material on a monthly average basis. The proposed emission limit is included in Table 1.

Mercedes-Benz Vans conducted a review of the RBLC database and found no entries for E-coat spot repair operations. Based on the low emissions from the E-coat spot repair operations, add-on controls are economically infeasible. The proposed limit is based on the maximum coating VOC content included in the revised potential emission calculations.

1.4. STANDARD NO. 5.2 – BOILER EXEMPTION REQUEST

Mercedes-Benz Vans operates two (2) natural gas-fired boilers at the Charleston plant, B01 and B02. B01 and B02 each have a maximum heat input capacity of 14.27 MMBtu/hr and are each equipped with low NO_X burners and oxygen (O_2) trim systems. South Carolina Regulation 61-62.5 Standard No. 5.2 - Control of Oxides of Nitrogen (NO_X) applies to stationary sources that emit or have the potential to emit NO_X generated from fuel combustion. However, Section I(B)(16) of Standard 5.2 states that the Department can consider exemptions from this regulation on a case-by-case basis. Mercedes-Benz Vans requests that B01 and B02 be granted a case-by-case exemption from Standard 5.2 based on the information provided below.

Boilers B01 and B02 are equipped with low NO_X burners. Low NO_X burners limit NO_X formation by controlling both the stoichiometric and temperature profiles of the combustion process. This control is achieved with design features that regulate the aerodynamic distribution and mixing of the fuel and air, yielding reduced O_2 in the primary combustion zone, reduced flame temperature and reduced residence time at peak combustion temperatures. The combination of these techniques produces lower NO_X emissions during the combustion process. A review of the technical literature and the RBLC database indicates that low NO_X burners are one of the most commonly applied technologies for the control of NO_X from natural gas-fired boilers. There are no other available control technologies that are applied to boilers in this size range as part of a BACT determination. Therefore, low NO_X burners are considered BACT for small boilers.

Boilers B01 and B02 are also equipped with O_2 trim systems. O_2 trim systems are designed to continuously measure and maintain an optimum air-to-fuel ratio in the boiler combustion zone. Boilers B01 and B02 are also subject to the requirements of 40 CFR 63 Subpart DDDDD (Boiler MACT). Pursuant to §63.7540(a)(12), Mercedes-Benz Vans is required to conduct tune-ups once every 5 years for boilers with continuous O_2 trim systems. The oxygen level on the O_2 trim systems must be set no lower than the oxygen concentration measured during the most recent tune-up. The frequency of tune-ups is limited to once every 5 years because continuous O_2 trim systems are designed to maintain an optimum air-to-fuel ratio thereby reducing excess air and minimizing NO_X formation and fuel usage. Pursuant to the definition of "oxygen analyzer system" (which includes O_2 trim systems") in §63.7575, Mercedes-Benz Vans is required to install, calibrate, maintain, and operate the O_2 trim systems in accordance with the manufacturer's recommendations. Standard No. 5.2 does not contain any monitoring or testing requirements for natural gas-fired units rated less than 30 MMBtu/hr, therefore, the monitoring and work practice requirements contained in the Boiler MACT are equivalent or greater than the monitoring and work practice requirements contained in Standard No. 5.2.

As noted above, the low NO_X burners installed on boilers B01 and B02 meet BACT requirements for small boilers by lowering NO_X emissions during the combustion process. Boilers B01 and B02 are each equipped with O_2 trim systems that optimize the air-to-fuel ratio on a continuous basis in accordance with the provisions in the Boiler MACT. The monitoring and work practice requirements contained in the Boiler

MACT are equivalent or greater than the monitoring and work practice requirements contained in Standard No. 5.2. Therefore, Mercedes-Benz Vans requests that B01 and B02 be granted a case-by-case exemption from Standard 5.2.

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If you have any questions or comments about the information presented in this submittal, please contact Jae Park of Mercedes-Benz Vans at (843) 695-5095 or Tony Jabon of Trinity Consultants at (704) 553-7747.

Sincerely,

MERCEDES-BENZ VANS, LLC.

Michael Balke
President/CEO

cc: Jae Park – Mercedes Benz Vans, LLC
Russell Revell – Mercedes-Benz Vans, LLC
Nicole Saniti, P.E. – Trinity Consultants, Inc.
Tony Jabon, P.E. – Trinity Consultants, Inc.

Enclosures

APPENDIX A: UPDATED FACILITY-WIDE EMISSION CALCULATIONS

PSD Permit Application - Phase 3 Emission Calculations

Mercedes-Benz Vans, LLC
Charleston, South Carolina Facility

Facility-wide Potential Emissions

Pollutants		Uncontrolled Emissions		Controlled Emissions	
		lb/hr	tpy	lb/hr	tpy
PM		309.97	1,159.64	6.41	21.32
PM_{10}		308.31	1,152.43	4.74	14.11
$PM_{2.5}$		308.01	1,151.13	4.44	12.81
SO_2		1.79	0.73	1.79	0.73
CO		30.61	49.63	30.61	49.63
NO_X		34.33	39.90	34.33	39.90
VOC		809.14	2,949.80	274.74	955.36
Lead		9.83E-05	2.62E-04	9.83E-05	2.62E-04
CO_2e		24,530	63,367	24,530	63,367
	CO_2	24,500	63,290	24,500	63,290
	CH_4	0.57	1.59	0.57	1.59
	N_2O	0.05	0.13	0.05	0.13

Facility-wide Potential HAP/TAP Emissions

Pollutants	Total Emissions	
	lb/hr	tpy
2-Methylnaphthalene	4.72E-06	1.26E-05
3-Methylchloranthrene	3.54E-07	9.42E-07
7,12-Dimethylbenz(a)anthracene	3.15E-06	8.37E-06
Acenaphthene	3.54E-07	9.42E-07
Acenaphthylene	3.54E-07	9.42E-07
Anthracene	4.72E-07	1.26E-06
Benz(a)anthracene	3.54E-07	9.42E-07
Benzene	5.29E-03	2.32E-03
Benzo(a)pyrene	2.36E-07	6.28E-07
Benzo(b)fluoranthene	3.54E-07	9.42E-07
Benzo(g,h,i)perylene	2.36E-07	6.28E-07
Benzo(k)fluoranthene	3.54E-07	9.42E-07
Butylglycol Acetate	4.65E-01	1.74E+00
Chrysene	3.54E-07	9.42E-07
Isopropylbenzene (Cumene)	1.55E-01	5.80E-01
Dibenzo(a,h)anthracene	2.36E-07	6.28E-07
Dichlorobenzene	2.36E-04	6.28E-04
Ethyl Benzene	3.10E-01	1.16E+00
Fluoranthene	5.90E-07	1.57E-06
Fluorene	5.51E-07	1.47E-06
Formaldehyde	1.97E-02	5.95E-02
Hexane	3.54E-01	9.42E-01
Indeno(1,2,3-cd)pyrene	3.54E-07	9.42E-07
Naphthalene	7.91E-04	4.87E-04
Phenanathrene	3.34E-06	8.90E-06
Pyrene	9.83E-07	2.62E-06
Toluene	2.58E-03	2.26E-03
Arsenic	3.93E-05	1.05E-04
Beryllium	2.36E-06	6.28E-06
Cadmium	2.16E-04	5.76E-04
Chromium	2.75E-04	7.33E-04
Cobalt	1.65E-05	4.40E-05
Lead	9.83E-05	2.62E-04
Manganese	6.40E-04	2.31E-03
Mercury	5.11E-05	1.36E-04
Nickel	4.13E-04	1.10E-03
Selenium	4.72E-06	1.26E-05
Xylene	1.09E+00	4.06E+00
Acetaldehyde	2.54E-04	6.35E-05
Acrolein	2.20E-04	5.51E-05
Total PAH	1.15E-03	2.89E-04
Methyl Ethyl Ketone	3.09E+00	1.35E+01
Acrylic acid	3.48E-02	1.53E-01
Methanol	7.59E-01	3.32E+00
Ethylene Glycol	1.06E+00	4.62E+00
Total HAP [a]	94.90	358.00

[a] Includes total HAP from paint shop and purge solvent.

Facility-wide Potential Emissions and PSD Applicability

Pollutants	Project Emissions (tpy)	PSD Significant Emission Rates (tpy)	PSD Permitting Required? (Yes/No)
PM	21.32	25	No
PM_{10}	14.11	15	No
$PM_{2.5}$	12.81	10	**Yes**
SO_2	0.73	40	No
CO	49.63	100	No
NO_X	39.90	40	No
VOC	955.36	40	**Yes**
H_2SO_4	0.00E+00	7	No
Fluorides	0.00E+00	3	No
Lead	2.62E-04	0.6	No
CO_2e	63,367	75,000	No

[a] Mercedes-Benz Vans has chosen to request a 75,000 tpy synthetic minor limit on greenhouse gas emissions (CO_2e) to remain below the PSD significant emission rate.

Inputs

Phase	Paint Shop Operation (days/yr)	Assembly Operation (days/yr)	Paint Shop/Body Shop Throughput			Assembly Throughput [a]		
			(units/hr)	(units/day)	(units/yr)	(units/hr)	(units/day)	(units/yr)
Phase 3	312	365	17	400	124,800	19	450	164,250

[a] Assembly throughput includes existing re-assembly throughput as well as proposed expansion throughput.

Daily Operation
24 hours/day

Combustion Average Utilization [b]	
Percent	Hours of Operation
53.5%	4,684

[b] Average combustion unit utilization for boiler, air supply units, and assembly oven is based on calculated utilization needed to remain below the proposed 75,000 tpy synthetic minor limit on greenhouse gas emissions (CO_2e). Paint shop RTO, ovens, and ADW desorb heater utilization is based on paint shop hours of operation. Mercedes-Benz Vans is not requesting utilization limits for individual emission units.

Hours of Operation [e] 4,684 hrs

Boiler Information

Equipment	Heat Input Capacity MMBtu/hr
Boiler 1 (B01)	14.27
Boiler 2 (B02)	14.27

Boiler Natural Gas Emission Factors

Pollutant	Emission Factor [a,b,c] lb/MMBtu
PM [d]	0.0074
SO_2	0.0006
CO	0.0819
NO_X	0.0360
VOC	0.0054
CO_2e	
CO_2	117.00
CH_4	2.21E-03
N_2O	2.21E-04

[a] Emission factors are from AP-42, Table 1.4-1 and 1.4-2 for small boilers with low NO_X burners. NO_X emission factor is from SC Standard No. 5.2, Section III, Table 1.
[b] Emission factors calculated using the default natural gas heating value of 1,026 Btu/scf from 40 CFR 98.
[c] Emission factors from 40 CFR 98, Subpart C, Tables C-1 and C-2. Factors were converted to lb/MMBtu.
[d] PM_{10} and $PM_{2.5}$ are assumed to be equal to PM for natural gas combustion.

Boilers Non-HAP Potential Emissions

Pollutant	Emission Rates [e]					
	B01		B02		Total	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
$PM/PM_{10}/PM_{2.5}$	0.11	0.25	0.11	0.25	0.21	0.50
SO_2	0.01	0.02	0.01	0.02	0.02	0.04
CO	1.17	2.74	1.17	2.74	2.34	5.47
NO_X	0.51	1.20	0.51	1.20	1.03	2.41
VOC	0.08	0.18	0.08	0.18	0.15	0.36
CO_2e	1,671	3,914	1,671	3,914	3,343	7,828
CO_2	1,670	3,910	1670	3,910	3,339	7,819
CH_4	0.03	0.07	0.03	0.07	0.06	0.15
N_2O	0.003	0.01	0.00	0.01	0.01	0.01

[e] Annual emissions are based on calculated hours of operation needed to remain below the proposed 75,000 tpy synthetic minor limit on greenhouse gas emissions (CO_2e). Mercedes-Benz Vans is not requesting limits on hours of operation for individual emission units.

Appendix B.3.2 - Boilers

Mercedes-Benz Vans, LLC

Boilers HAP/TAP Potential Emissions

Pollutant	Emission Factor [a] lb/MMscf	Boilers Total	
		lb/hr	tpy
2-Methylnaphthalene	2.4E-05	6.7E-07	1.6E-06
3-Methylchloranthrene	1.8E-06	5.0E-08	1.2E-07
7,12-Dimethylbenz(a)anthracene	1.6E-05	4.5E-07	1.0E-06
Acenaphthene	1.8E-06	5.0E-08	1.2E-07
Acenaphthylene	1.8E-06	5.0E-08	1.2E-07
Anthracene	2.4E-06	6.7E-08	1.6E-07
Benz(a)anthracene	1.8E-06	5.0E-08	1.2E-07
Benzene	2.1E-03	5.8E-05	1.4E-04
Benzo(a)pyrene	1.2E-06	3.3E-08	7.8E-08
Benzo(b)fluoranthene	1.8E-06	5.0E-08	1.2E-07
Benzo(g,h,i)perylene	1.2E-06	3.3E-08	7.8E-08
Benzo(k)fluoranthene	1.8E-06	5.0E-08	1.2E-07
Chrysene	1.8E-06	5.0E-08	1.2E-07
Dibenzo(a,h)anthracene	1.2E-06	3.3E-08	7.8E-08
Dichlorobenzene	1.2E-03	3.3E-05	7.8E-05
Fluoranthene	3.0E-06	8.3E-08	2.0E-07
Fluorene	2.8E-06	7.8E-08	1.8E-07
Formaldehyde	7.5E-02	2.1E-03	4.9E-03
Hexane	1.8E+00	5.0E-02	1.2E-01
Indeno(1,2,3-cd)pyrene	1.8E-06	5.0E-08	1.2E-07
Naphthalene	6.1E-04	1.7E-05	4.0E-05
Phenanathrene	1.7E-05	4.7E-07	1.1E-06
Pyrene	5.0E-06	1.4E-07	3.3E-07
Toluene	3.4E-03	9.5E-05	2.2E-04
Arsenic	2.0E-04	5.6E-06	1.3E-05
Beryllium	1.2E-05	3.3E-07	7.8E-07
Cadmium	1.1E-03	3.1E-05	7.2E-05
Chromium	1.4E-03	3.9E-05	9.1E-05
Cobalt	8.4E-05	2.3E-06	5.5E-06
Lead	5.0E-04	1.4E-05	3.3E-05
Manganese	3.8E-04	1.1E-05	2.5E-05
Mercury	2.6E-04	7.2E-06	1.7E-05
Nickel	2.1E-03	5.8E-05	1.4E-04
Selenium	2.4E-05	6.7E-07	1.6E-06

[a] Emission factors are from AP-42, Table 1.4-2, 1.4-3, and 1.4-4.

Air Supply and Rooftop Units - Natural Gas Emission Factors

Hours of Operation [g] 4,684 hrs

Pollutant		NG Emission Factors [a,b,e] (lb/MMBtu)
$PM/PM_{10}/PM_{2.5}$		0.0074
SO_2		0.0006
ASU-Durr (low-NO_X) [c]		0.0073
Other ASU (NO_X) [c]		0.0971
RTU-NO_X [d]		0.0110
CO		0.0819
VOC		0.0054
CO_2e [f]		
	CO_2	117.00
	CH_4	2.21E-03
	N_2O	2.21E-04

[a] PM, SO_2, and VOC natural gas emission factors are from AP-42, Table 1.4-2, 07/98.
[b] CO natural gas emission factor is from AP-42, Table 1.4-1, 07/98, Small Boilers.
[c] The ASU-Durr Low NO_X emission factor (for units routed to Dry X) is based on vendor-specific data stating a maximum NO_X concentration of 6 ppm. The Other ASU (NO_X) emission factor is based on vendor-specific data stating a maximum NO_X concentration of 80 ppm.
[d] RTU Burners meet the Low NO_X requirements of California Air Resources Board (CARB) Rule 1146.1, Table 1146.1-1, Units Fired on Natural Gas.
[e] The heating value of natural gas is assumed to be 1,026 Btu/scf.
[f] Emission factors from 40 CFR 98, Subpart C, Tables C-1 and C-2. Factors were converted to lb/MMBtu.

Air Supply Units Non-HAP Emissions

			Emission Rates [g]																	
		Rated Capacity	$PM/PM_{10}/PM_{2.5}$		SO_2		NO_X		CO		VOC		CO_2		CH_4		N_2O		CO_2e	
Description	Equipment	(MMBtu/hr)	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
ASU Primer/BC/CC	ASU P/BC/CC	6.49	Routed to Dry X. See Dry X PM Emissions Table.		0.004	0.009	0.05	0.11	0.53	1.24	0.03	0.08	759.31	1,778	0.014	0.034	0.001	0.003	760.10	1,780
ASU 2.1 Shop + Open WD	ASU 2.1	10.00	0.07	0.17	0.006	0.014	0.97	2.27	0.82	1.92	0.05	0.13	1,169.97	2,740	0.022	0.052	0.002	0.005	1,171.18	2,743
ASU 3 - UBP + Repair	ASU 3	7.44	0.06	0.13	0.004	0.010	0.72	1.69	0.61	1.43	0.04	0.09	870.46	2,038	0.016	0.038	0.002	0.004	871.36	2,041
ASU 2.2 Shop + Open WD	ASU 2.2	10.00	0.07	0.17	0.006	0.014	0.97	2.27	0.82	1.92	0.05	0.13	1,169.97	2,740	0.022	0.052	0.002	0.005	1,171.18	2,743
ASU 1 - Spot Repair	ASU 1	4.82	0.04	0.08	0.003	0.007	0.47	1.10	0.39	0.92	0.03	0.06	563.93	1,321	0.011	0.025	0.001	0.002	564.51	1,322
ASU 2.3 Shop	ASU 2.3	10.00	0.07	0.17	0.006	0.014	0.97	2.27	0.82	1.92	0.05	0.13	1,169.97	2,740	0.022	0.052	0.0022	0.005	1,171.18	2,743
ASU 4 - Wax	ASU 4	4.84	0.04	0.08	0.003	0.007	0.47	1.10	0.40	0.93	0.03	0.06	566.27	1,326	0.011	0.025	0.001	0.002	566.85	1,327
Workdecks ASU 6 (Phase 2)	ASU 6	8.54	0.06	0.15	0.005	0.012	0.83	1.94	0.70	1.64	0.05	0.11	999.16	2,340	0.019	0.044	0.002	0.004	1,000.19	2,342
Workdecks ASU 5 (Phase 2)	ASU 5	5.83	0.04	0.10	0.003	0.008	0.57	1.33	0.48	1.12	0.03	0.07	682.09	1,597	0.013	0.030	0.0013	0.003	682.80	1,599
ASU Cleanroom (Phase 2)	ASU CR2	1.26	0.01	0.02	0.001	0.002	0.12	0.29	0.10	0.24	0.01	0.02	147.42	345	0.003	0.007	0.000	0.001	147.57	346
Primer Booth Air Supply Unit (Phase 3)	ASU31	7.57	Routed to Dry X. See Dry X PM Emissions Table.		0.004	0.010	0.06	0.13	0.62	1.45	0.04	0.10	885.67	2,074	0.017	0.039	0.002	0.004	886.58	2,076
BC Booth Air Supply Unit (Phase 3)	ASU32	7.68			0.004	0.011	0.06	0.13	0.63	1.47	0.04	0.10	898.54	2,104	0.017	0.040	0.002	0.004	899.47	2,106
Workdecks Air Supply Unit 1 Phase 3	ASU33	4.96	0.04	0.09	0.003	0.007	0.48	1.13	0.41	0.95	0.03	0.06	580.31	1,359	0.011	0.026	0.001	0.003	580.91	1,360
Workdecks Air Supply Unit 2 Phase 3	ASU34	2.56	0.02	0.04	0.001	0.004	0.25	0.58	0.21	0.49	0.01	0.03	299.51	701	0.006	0.013	0.001	0.001	299.82	702
Workdecks Air Supply Unit 3 Phase 3	ASU35	8.05	0.06	0.14	0.005	0.011	0.78	1.83	0.66	1.54	0.04	0.10	941.83	2,206	0.018	0.042	0.002	0.004	942.80	2,208
Shop Ventilation Air Supply Unit Phase 3	ASU36	3.07	0.02	0.05	0.002	0.004	0.30	0.70	0.25	0.59	0.02	0.04	359.18	841	0.007	0.016	0.001	0.002	359.55	842
Social Rooms Air Supply Unit Phase 3	ASU37	1.53	0.01	0.03	0.001	0.002	0.15	0.35	0.13	0.29	0.01	0.02	179.01	419	0.003	0.008	0.000	0.001	179.19	420
ASU Total		**104.64**	**0.61**	**1.44**	**0.06**	**0.14**	**8.21**	**19.23**	**8.57**	**20.06**	**0.56**	**1.31**	**12,243**	**28,670**	**0.23**	**0.54**	**0.02**	**0.05**	**12,255**	**28,699**

[g] Annual emissions are based on calculated hours of operation needed to remain below the proposed 75,000 tpy synthetic minor limit on greenhouse gas emissions (CO_2e). Mercedes-Benz Vans is not requesting limits on hours of operation for individual emission units.

Appendix B.3.3 - Air Supply Units
Mercedes-Benz Vans, LLC

Rooftop Units Non-HAP Emissions

Description	Equipment	Rated Capacity (MMBtu/hr)	Emission Rates [g]																	
			$PM/PM_{10}/PM_{2.5}$		SO_2		NO_X		CO		VOC		CO_2		CH_4		N_2O		CO_2e	
			lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
Assembly - Rooftop Unit 1	AS-RTU01	0.80	5.93E-03	1.39E-02	4.68E-04	1.10E-03	8.80E-03	2.06E-02	6.55E-02	1.53E-01	4.29E-03	1.00E-02	93.60	219	1.76E-03	4.13E-03	1.76E-04	4.13E-04	93.69	219
Assembly - Rooftop Unit 4	AS-RTU04	0.80	5.93E-03	1.39E-02	4.68E-04	1.10E-03	8.80E-03	2.06E-02	6.55E-02	1.53E-01	4.29E-03	1.00E-02	93.60	219	1.76E-03	4.13E-03	1.76E-04	4.13E-04	93.69	219
Assembly - Rooftop Unit 6	AS-RTU06	0.80	5.93E-03	1.39E-02	4.68E-04	1.10E-03	8.80E-03	2.06E-02	6.55E-02	1.53E-01	4.29E-03	1.00E-02	93.60	219	1.76E-03	4.13E-03	1.76E-04	4.13E-04	93.69	219
Assembly - Rooftop Unit 8	AS-RTU08	0.80	5.93E-03	1.39E-02	4.68E-04	1.10E-03	8.80E-03	2.06E-02	6.55E-02	1.53E-01	4.29E-03	1.00E-02	93.60	219	1.76E-03	4.13E-03	1.76E-04	4.13E-04	93.69	219
Assembly - Rooftop Unit 10	AS-RTU10	0.80	5.93E-03	1.39E-02	4.68E-04	1.10E-03	8.80E-03	2.06E-02	6.55E-02	1.53E-01	4.29E-03	1.00E-02	93.60	219	1.76E-03	4.13E-03	1.76E-04	4.13E-04	93.69	219
Assembly - Rooftop Unit 11	AS-RTU11	0.80	5.93E-03	1.39E-02	4.68E-04	1.10E-03	8.80E-03	2.06E-02	6.55E-02	1.53E-01	4.29E-03	1.00E-02	93.60	219	1.76E-03	4.13E-03	1.76E-04	4.13E-04	93.69	219
Assembly - Rooftop Unit 13	AS-RTU13	0.80	5.93E-03	1.39E-02	4.68E-04	1.10E-03	8.80E-03	2.06E-02	6.55E-02	1.53E-01	4.29E-03	1.00E-02	93.60	219	1.76E-03	4.13E-03	1.76E-04	4.13E-04	93.69	219
Body Shop - Rooftop Unit 1	BS-RTU01	0.80	5.93E-03	1.39E-02	4.68E-04	1.10E-03	8.80E-03	2.06E-02	6.55E-02	1.53E-01	4.29E-03	1.00E-02	93.60	219	1.76E-03	4.13E-03	1.76E-04	4.13E-04	93.69	219
Body Shop - Rooftop Unit 2	BS-RTU02	0.80	5.93E-03	1.39E-02	4.68E-04	1.10E-03	8.80E-03	2.06E-02	6.55E-02	1.53E-01	4.29E-03	1.00E-02	93.60	219	1.76E-03	4.13E-03	1.76E-04	4.13E-04	93.69	219
Body Shop - Rooftop Unit 4	BS-RTU04	0.80	5.93E-03	1.39E-02	4.68E-04	1.10E-03	8.80E-03	2.06E-02	6.55E-02	1.53E-01	4.29E-03	1.00E-02	93.60	219	1.76E-03	4.13E-03	1.76E-04	4.13E-04	93.69	219
Body Shop - Rooftop Unit 5	BS-RTU05	0.80	5.93E-03	1.39E-02	4.68E-04	1.10E-03	8.80E-03	2.06E-02	6.55E-02	1.53E-01	4.29E-03	1.00E-02	93.60	219	1.76E-03	4.13E-03	1.76E-04	4.13E-04	93.69	219
Body Shop - Rooftop Unit 6	BS-RTU06	0.80	5.93E-03	1.39E-02	4.68E-04	1.10E-03	8.80E-03	2.06E-02	6.55E-02	1.53E-01	4.29E-03	1.00E-02	93.60	219	1.76E-03	4.13E-03	1.76E-04	4.13E-04	93.69	219
Body Shop - Rooftop Unit 7	BS-RTU07	0.80	5.93E-03	1.39E-02	4.68E-04	1.10E-03	8.80E-03	2.06E-02	6.55E-02	1.53E-01	4.29E-03	1.00E-02	93.60	219	1.76E-03	4.13E-03	1.76E-04	4.13E-04	93.69	219
Body Shop - Rooftop Unit 10	BS-RTU10	0.80	5.93E-03	1.39E-02	4.68E-04	1.10E-03	8.80E-03	2.06E-02	6.55E-02	1.53E-01	4.29E-03	1.00E-02	93.60	219	1.76E-03	4.13E-03	1.76E-04	4.13E-04	93.69	219
Body Shop - Rooftop Unit 17	BS-RTU17	0.80	5.93E-03	1.39E-02	4.68E-04	1.10E-03	8.80E-03	2.06E-02	6.55E-02	1.53E-01	4.29E-03	1.00E-02	93.60	219	1.76E-03	4.13E-03	1.76E-04	4.13E-04	93.69	219
Body Shop - Rooftop Unit 18	BS-RTU18	0.80	5.93E-03	1.39E-02	4.68E-04	1.10E-03	8.80E-03	2.06E-02	6.55E-02	1.53E-01	4.29E-03	1.00E-02	93.60	219	1.76E-03	4.13E-03	1.76E-04	4.13E-04	93.69	219
Body Shop - Rooftop Unit 23	BS-RTU23	0.80	5.93E-03	1.39E-02	4.68E-04	1.10E-03	8.80E-03	2.06E-02	6.55E-02	1.53E-01	4.29E-03	1.00E-02	93.60	219	1.76E-03	4.13E-03	1.76E-04	4.13E-04	93.69	219
Body Shop - Rooftop Unit 25	BS-RTU25	0.80	5.93E-03	1.39E-02	4.68E-04	1.10E-03	8.80E-03	2.06E-02	6.55E-02	1.53E-01	4.29E-03	1.00E-02	93.60	219	1.76E-03	4.13E-03	1.76E-04	4.13E-04	93.69	219
Body Shop - Rooftop Unit 26	BS-RTU26	0.80	5.93E-03	1.39E-02	4.68E-04	1.10E-03	8.80E-03	2.06E-02	6.55E-02	1.53E-01	4.29E-03	1.00E-02	93.60	219	1.76E-03	4.13E-03	1.76E-04	4.13E-04	93.69	219
Body Shop - Rooftop Unit 30	BS-RTU30	0.80	5.93E-03	1.39E-02	4.68E-04	1.10E-03	8.80E-03	2.06E-02	6.55E-02	1.53E-01	4.29E-03	1.00E-02	93.60	219	1.76E-03	4.13E-03	1.76E-04	4.13E-04	93.69	219
Body Shop - Rooftop Unit 32	BS-RTU32	0.80	5.93E-03	1.39E-02	4.68E-04	1.10E-03	8.80E-03	2.06E-02	6.55E-02	1.53E-01	4.29E-03	1.00E-02	93.60	219	1.76E-03	4.13E-03	1.76E-04	4.13E-04	93.69	219
Body Shop - Rooftop Unit 33	BS-RTU33	0.80	5.93E-03	1.39E-02	4.68E-04	1.10E-03	8.80E-03	2.06E-02	6.55E-02	1.53E-01	4.29E-03	1.00E-02	93.60	219	1.76E-03	4.13E-03	1.76E-04	4.13E-04	93.69	219
Body Shop - Rooftop Unit 35	BS-RTU35	0.80	5.93E-03	1.39E-02	4.68E-04	1.10E-03	8.80E-03	2.06E-02	6.55E-02	1.53E-01	4.29E-03	1.00E-02	93.60	219	1.76E-03	4.13E-03	1.76E-04	4.13E-04	93.69	219
RTU Total		18.40	1.36E-01	3.19E-01	1.08E-02	2.52E-02	2.02E-01	4.74E-01	1.51E+00	3.53E+00	9.86E-02	2.31E-01	2,152.75	5,041	4.06E-02	9.50E-02	4.06E-03	9.50E-03	2,154.97	5,046
ASU + RTU Total		**123.04**	**7.50E-01**	**1.76**	**7.20E-02**	**1.68E-01**	**8.41E+00**	**1.97E+01**	**1.01E+01**	**2.36E+01**	**6.60E-01**	**1.54**	**14,395**	**33,711**	**2.71E-01**	**6.35E-01**	**2.71E-02**	**6.35E-02**	**14,410**	**33,746**

[g] Annual emissions are based on calculated hours of operation needed to remain below the proposed 75,000 tpy synthetic minor limit on greenhouse gas emissions (CO_2e). Mercedes-Benz Vans is not requesting limits on hours of operation for individual emission units.

Hours of Operation [a]	4,684	hrs
Total Rated Capacity	123.04	MMBtu/hr

Air Supply and Rooftop Units HAP/TAP Emissions

Pollutants	NG Emission Factor [b] lb/10^6 scf	HAP/TAP lb/hr	HAP/TAP tpy
2-Methylnaphthalene	2.40E-05	2.88E-06	6.74E-06
3-Methylchloranthrene	1.80E-06	2.16E-07	5.05E-07
7,12-Dimethylbenz(a)anthracene	1.60E-05	1.92E-06	4.49E-06
Acenaphthene	1.80E-06	2.16E-07	5.05E-07
Acenaphthylene	1.80E-06	2.16E-07	5.05E-07
Anthracene	2.40E-06	2.88E-07	6.74E-07
Benz(a)anthracene	1.80E-06	2.16E-07	5.05E-07
Benzene	2.10E-03	2.52E-04	5.90E-04
Benzo(a)pyrene	1.20E-06	1.44E-07	3.37E-07
Benzo(b)fluoranthene	1.80E-06	2.16E-07	5.05E-07
Benzo(g,h,i)perylene	1.20E-06	1.44E-07	3.37E-07
Benzo(k)fluoranthene	1.80E-06	2.16E-07	5.05E-07
Chrysene	1.80E-06	2.16E-07	5.05E-07
Dibenzo(a,h)anthracene	1.20E-06	1.44E-07	3.37E-07
Dichlorobenzene	1.20E-03	1.44E-04	3.37E-04
Fluoranthene	3.00E-06	3.60E-07	8.42E-07
Fluorene	2.80E-06	3.36E-07	7.86E-07
Formaldehyde	7.50E-02	8.99E-03	2.11E-02
Hexane	1.80E+00	2.16E-01	5.05E-01
Indeno(1,2,3-cd)pyrene	1.80E-06	2.16E-07	5.05E-07
Naphthalene	6.10E-04	7.32E-05	1.71E-04
Phenanathrene	1.70E-05	2.04E-06	4.77E-06
Pyrene	5.00E-06	6.00E-07	1.40E-06
Toluene	3.40E-03	4.08E-04	9.55E-04
Arsenic	2.00E-04	2.40E-05	5.62E-05
Beryllium	1.20E-05	1.44E-06	3.37E-06
Cadmium	1.10E-03	1.32E-04	3.09E-04
Chromium	1.40E-03	1.68E-04	3.93E-04
Cobalt	8.40E-05	1.01E-05	2.36E-05
Lead	5.00E-04	6.00E-05	1.40E-04
Manganese	3.80E-04	4.56E-05	1.07E-04
Mercury	2.60E-04	3.12E-05	7.30E-05
Nickel	2.10E-03	2.52E-04	5.90E-04
Selenium	2.40E-05	2.88E-06	6.74E-06

[a] Annual emissions are based on calculated hours of operation needed to remain below the proposed 75,000 tpy synthetic minor limit on greenhouse gas emissions (CO_2e). Mercedes-Benz Vans is not requesting limits on hours of operation for individual emission units.

[b] Natural Gas Emission Factors are from AP-42 Section 1.4, Tables 1.4-2, 1.4-3, and 1.4-4.

Paint Shop Combustion - Natural Gas Emission Factors

Hours of Operation [e] 7,488 hrs

Pollutant		NG Emission Factors [a,b,c] (lb/MMBtu)
$PM/PM_{10}/PM_{2.5}$		0.0074
SO_2		0.0006
NO_X (low-NO_X)		0.0487
NO_X		0.0975
CO		0.0819
VOC		0.0054
CO_2e [d]		
	CO_2	117.00
	CH_4	2.21E-03
	N_2O	2.21E-04

[a] PM, SO_2, and VOC natural gas emission factors are from AP-42, Table 1.4-2, 07/98.
[b] NO_X and CO natural gas emission factors are from AP-42, Table 1.4-1, 07/98.
[c] The heating value of natural gas is assumed to be 1,026 Btu/scf.
[d] Emission factors from 40 CFR 98, Subpart C, Tables C-1 and C-2. Factors were converted to lb/MMBtu.

Paint Shop Combustion Non-HAP Emissions

			Emission Rates [e]																	
		Rated Capacity	$PM/PM_{10}/PM_{2.5}$		SO_2		NO_X		CO		VOC		CO_2		CH_4		N_2O		CO_2e	
Description	Equipment	(MMBtu/hr)	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
RTO #1 [f]	RTO1	8.00	0.06	0.22	0.005	0.018	0.78	2.92	0.65	2.45	0.04	0.16	935.98	3,504	0.018	0.066	0.002	0.007	936.95	3,508
RTO #1 (add) [f,g]	RTO1	8.00	0.06	0.22	0.005	0.018	0.78	2.92	0.65	2.45	0.04	0.16	935.98	3,504	0.018	0.066	0.002	0.007	936.95	3,508
ADW Desorption Heater #1	ADH1	3.50	0.03	0.10	0.002	0.008	0.17	0.64	0.29	1.07	0.02	0.07	409.49	1,533	0.008	0.029	0.001	0.003	409.91	1,535
ADW Desorption Heater #2	ADH2	2.13	0.02	0.06	0.001	0.005	0.10	0.39	0.17	0.65	0.01	0.04	249.20	933	0.005	0.018	0.000	0.002	249.46	934
E-Coat Oven	OV01	4.85	0.04	0.13	0.003	0.011	0.24	0.88	0.40	1.49	0.03	0.10	567.44	2,124	0.011	0.040	0.001	0.004	568.02	2,127
Primer (Guidecoat) Oven #1	OV02	4.30	0.03	0.12	0.003	0.009	0.21	0.78	0.35	1.32	0.02	0.09	503.09	1,884	0.009	0.035	0.001	0.004	503.61	1,886
Topcoat Oven #1	OV03	4.27	0.03	0.12	0.002	0.009	0.21	0.78	0.35	1.31	0.02	0.09	499.58	1,870	0.009	0.035	0.001	0.004	500.09	1,872
Primer (Guidecoat) Oven #2	OV22	5.12	0.04	0.14	0.003	0.011	0.25	0.93	0.42	1.57	0.03	0.10	599.03	2,243	0.011	0.042	0.001	0.004	599.64	2,245
Topcoat Oven #2	OV23	5.73	0.04	0.16	0.003	0.013	0.28	1.05	0.47	1.76	0.03	0.12	670.39	2,510	0.013	0.047	0.001	0.005	671.09	2,513
Total		**45.90**	**0.34**	**1.27**	**0.03**	**0.10**	**3.02**	**11.29**	**3.76**	**14.07**	**0.25**	**0.92**	**5,370.18**	**20,106**	**0.10**	**0.38**	**0.01**	**0.04**	**5,375.72**	**20,127**

[e] Annual emissions are based on paint shop hours of operation.
[f] NO_X emissions for RTOs calculated using the natural gas emission factors from AP-42, Table 1.4-1, 07/98, Small Boilers (uncontrolled). NO_X emissions from the remaining combustion units are calculated using the AP-42, Table 1.4-1 factor for small boilers (controlled - Low NOx burners).
[g] Phase II or III RTO will replace Phase I RTO (RTO #1 @ 8 MMBtu/hr), with a new unit that has 8 MMBtu/hr additional heat input, for a total of 16 MMBtu/hr. Emissions include combustion emissions from both RTO #1 and RTO #1 (add).

Hours of Operation [a]	7,488	hrs
Total Rated Capacity	45.90	MMBtu/hr

Paint Shop Combustion HAP/TAP Emissions

Pollutants	NG Emission Factor [b] lb/10^6 scf	HAP/TAP	
		lb/hr	tpy
2-Methylnaphthalene	2.40E-05	1.07E-06	4.02E-06
3-Methylchloranthrene	1.80E-06	8.05E-08	3.01E-07
7,12-Dimethylbenz(a)anthracene	1.60E-05	7.16E-07	2.68E-06
Acenaphthene	1.80E-06	8.05E-08	3.01E-07
Acenaphthylene	1.80E-06	8.05E-08	3.01E-07
Anthracene	2.40E-06	1.07E-07	4.02E-07
Benz(a)anthracene	1.80E-06	8.05E-08	3.01E-07
Benzene	2.10E-03	9.39E-05	3.52E-04
Benzo(a)pyrene	1.20E-06	5.37E-08	2.01E-07
Benzo(b)fluoranthene	1.80E-06	8.05E-08	3.01E-07
Benzo(g,h,i)perylene	1.20E-06	5.37E-08	2.01E-07
Benzo(k)fluoranthene	1.80E-06	8.05E-08	3.01E-07
Chrysene	1.80E-06	8.05E-08	3.01E-07
Dibenzo(a,h)anthracene	1.20E-06	5.37E-08	2.01E-07
Dichlorobenzene	1.20E-03	5.37E-05	2.01E-04
Fluoranthene	3.00E-06	1.34E-07	5.02E-07
Fluorene	2.80E-06	1.25E-07	4.69E-07
Formaldehyde	7.50E-02	3.36E-03	1.26E-02
Hexane	1.80E+00	8.05E-02	3.01E-01
Indeno(1,2,3-cd)pyrene	1.80E-06	8.05E-08	3.01E-07
Naphthalene	6.10E-04	2.73E-05	1.02E-04
Phenanathrene	1.70E-05	7.61E-07	2.85E-06
Pyrene	5.00E-06	2.24E-07	8.37E-07
Toluene	3.40E-03	1.52E-04	5.69E-04
Arsenic	2.00E-04	8.95E-06	3.35E-05
Beryllium	1.20E-05	5.37E-07	2.01E-06
Cadmium	1.10E-03	4.92E-05	1.84E-04
Chromium	1.40E-03	6.26E-05	2.34E-04
Cobalt	8.40E-05	3.76E-06	1.41E-05
Lead	5.00E-04	2.24E-05	8.37E-05
Manganese	3.80E-04	1.70E-05	6.36E-05
Mercury	2.60E-04	1.16E-05	4.35E-05
Nickel	2.10E-03	9.39E-05	3.52E-04
Selenium	2.40E-05	1.07E-06	4.02E-06

[a] Annual emissions are based on paint shop hours of operation.

[b] Natural Gas Emission Factors are from AP-42 Section 1.4, Tables 1.4-2, 1.4-3, and 1.4-4.

Coating Throughput Information

	# of Units	Notes
Paint Shop Bodies per Year	**124,800**	Based on maximum daily throughput and days of operation per year
Major Repair Equivalent Bodies per Year	**12,480**	Major repair area assumed to be equivalent to 10% of the total vehicle throughput.
Total Paint Shop Equivalent Bodies per Year	**137,280**	Based on total of maximum daily throughput and major repair area throughput.
Total Parts per Year	**3,744**	Parts painted area assumed to be equivalent to 3% of the total vehicle throughput.
Assembly Bodies per Year	**164,250**	Based on maximum daily throughput and days of operation per year
Operating Hours per year	**7,488**	Based on facility operating 24 hours/day and days of operation per year.

Coating Emission Calculations

Process	Parts		Bodies	Material Data		VOC										PM/PM$_{10}$/PM$_{2.5}$							lb/GACS	
								Capture & Control			Emissions													
	Application Rate	Split	Application Rate	Coating Density	Coating Usage	VOC In		Dip Tank Split	Oven Split	RTO Eff.	Emissions from Dip Tank	Emissions from Oven	Controlled VOC Emissions			Volume Solids	Transfer Eff.	Uncontrolled PM Emissions		Control Eff.	Controlled PM Emissions		GACS per year	lbs VOC/ GACS
	A_1		A_2	B	C[a]	D	E=C x D	F	G	H	I[b]	J[c]	K[d]	L = I + J	M	N	O	P[d]	Q	R	S[d]	T[e]	U[f]	V[g]
	gal/unit		gal/unit	lb/gal	gal/yr	lb/gal	tpy	%	%	%	lb/yr	lb/yr	lb/hr	lb/yr	tpy	%	%	lb/hr	tpy	%	lb/hr	tpy		
E-Coat (Emulsion)[h]	2.910		2.910	8.84	410,380	0.1051	21.56	20%	80%	95%	8,622	1,724	1.38	10,346	5.17	32.1%	100%	0.00	0.00	0.0%	0.00	0.00	131,732	
E-Coat (Pigment Paste)[h]	0.780		0.780	10.59	109,999	1.2686	69.77	20%	80%	95%	27,910	5,582	4.47	33,491	16.75	31.13%	100%	0.00	0.00	0.0%	0.00	0.00	34,243	
E-Coat Total							**91.33**				**36,532**	**7,306**	**5.85**	**43,838**	**21.92**			**0.00**	**0.00**		**0.00**	**0.00**	**165,975**	**0.26**
HVLP Robots Interior[i]	0.00	40%	0.73	11.684	100,093	4.24	212.25	90%	10%	95%	129,220	1,698	17.48	130,918	65.46	50.9%	60%	41.74	156.28	See Dry X PM Emissions Table			30,568	
Manual Cut-Ins & Underhood[i]	0.00	20%	0.36	11.684	50,047	4.24	106.13	90%	10%	95%	64,610	849	8.74	65,459	32.73	50.9%	40%	31.31	117.21				10,189	
ESTA Robot Exterior[i]	1.82	40%	0.73	11.684	106,918	4.24	226.73	90%	10%	95%	138,031	1,814	18.68	139,844	69.92	50.9%	75%	27.87	104.34				40,816	
Primer-Surfacer Totals	**1.82**		**1.82**				**545.11**				**331,861**	**4,361**	**44.90**	**336,222**	**168.11**			**100.92**	**377.84**		**0.13**	**0.58**	**81,574**	**4.12**
UB-PVC	0.00		4.33	8.304	594,101	0.00	0.00	100%	0.0%	0.0%	0.0	0.0	0.00	0.0	0.00	100%	95%	32.94	123.33	98.5%	0.49	1.85	564,396	0.00
Seam Sealer	0.00		0.64	10.68	87,831	0.00	0.00	100%	0.0%	0.0%	0.0	0.0	0.00	0.0	0.00	100%	100%	0.00	0.00	0.0%	0.00	0.00	87,831	0.00
Sika Sealing	0.00		0.04	10.85	5,300	0.29	0.77	100%	0.0%	0.0%	1,541	0.0	0.21	1,541	0.77	97%	100%	0.00	0.00	0.0%	0.00	0.00	5,158	0.30
(SAM) Sound Deadener Adhesive	0.00		0.961	13.77	131,875	0.14	9.08	100%	0.0%	0.0%	18,159	0.0	2.43	18,159	9.08	99%	100%	0.00	0.00	0.0%	0.00	0.00	130,556	0.14
Sealers and Adhesives Totals	**5.97**		**5.97**				**9.85**				**19,700**	**0**	**2.63**	**19,700**	**9.85**			**32.94**	**123.33**		**0.49**	**1.85**	**787,941**	**0.03**
						Total	**646.29**						**53.39**	**399,760**	**199.88**			**133.86**	**501.17**		**0.63**	**2.43**	**1,035,489**	

Coating Throughput Information

	# of Units	Notes
Paint Shop Bodies per Year	**124,800**	Based on maximum daily throughput and days of operation per year
Major Repair Equivalent Bodies per Year	**12,480**	Major repair area assumed to be equivalent to 10% of the total vehicle throughput.
Total Paint Shop Equivalent Bodies per Year	**137,280**	Based on total of maximum daily throughput and major repair area throughput.
Total Parts per Year	**3,744**	Parts painted area assumed to be equivalent to 3% of the total vehicle throughput.
Assembly Bodies per Year	**164,250**	Based on maximum daily throughput and days of operation per year
Operating Hours per year	**7,488**	Based on facility operating 24 hours/day and days of operation per year.

Coating Emission Calculations

Process	Parts	Bodies		Material Data		VOC										$PM/PM_{10}/PM_{2.5}$							lb/GACS	
								Capture & Control			Emissions													
	Application Rate	Split	Application Rate	Coating Density	Coating Usage	VOC In		Booth Split	Oven Split	RTO Eff.	Emissions from Booth	Emissions from Oven	Controlled VOC Emissions			Volume Solids	Transfer Eff.	Uncontrolled PM Emissions		Control Eff.	Controlled PM Emissions		GACS per year	lbs VOC/ GACS
	A_1		A_2	B	C [a]	D	E=C x D	G	J	K	L [b]	M [c]	N [d]	O = L + M	P	R	S	T [d]	U [e]	V	W [d]	X [f]	Y [g]	Z [h]
	gal/unit		gal/unit	lb/gal	gal/yr	lb/gal	tpy	%	%	%	lb/yr	lb/yr	lb/hr	lb/yr	tpy	%	%	lb/hr	tpy	%	lb/hr	tpy		
HVLP Robots Interior [i]	0.00	40%	1.32		181,328	3.84	348.1	90%	10%	95%	211,901	2,785	28.67	214,686	107.34	43.7%	60%	61.65	230.80	See Dry X PM Emissions Table			47,544	
Manual Cut-Ins & Underhood [i]	0.00	20%	0.66		90,664	3.84	174.0	90%	10%	95%	105,951	1,392	14.34	107,343	53.67	43.7%	40%	46.23	173.10				15,848	
ESTA Robot Exterior [i]	3.30	40%	1.32		193,692	3.84	371.8	90%	10%	95%	226,349	2,974	30.63	229,323	114.66	43.7%	75%	41.16	154.09				63,482	
Topcoat (Monocoat) Totals	**3.30**		**3.30**	10.26	**465,684**		**893.9**				**544,201**	**7,151**	**73.63**	**551,352**	**275.68**			**149.04**	**557.99**				**126,875**	**4.35**
								Topcoat Scenario 1			**544,201**	**7,151**	**73.63**	**551,352**	**275.68**								**126,875**	**4.35**
HVLP Robots Interior [i]	0.00	40%	0.94		129,106	5.94	383.3	90%	10%	95%	233,345	3,066	31.57	236,412	118.21	26.4%	60%	20.87	78.14				20,450	
Manual Cut-Ins & Underhood [i]	0.00	20%	0.47		64,553	5.94	191.6	90%	10%	95%	116,673	1,533	15.79	118,206	59.10	26.4%	40%	15.65	58.60				6,817	
ESTA Robot Exterior [i]	2.35	40%	0.94		137,908	5.94	409.4	90%	10%	95%	249,255	3,275	33.72	252,531	126.27	26.4%	75%	13.93	52.16				27,306	
Basecoat Totals	**2.35**		**2.35**	8.18	**331,567**		**984.4**				**599,273**	**7,875**	**81.08**	**607,148**	**303.57**			**50.45**	**188.90**	See Dry X PM Emissions Table			**54,573**	
HVLP Robots Interior [i]	0.00	40%	1.26		173,495	4.13	358.4	90%	10%	95%	218,164	2,867	29.52	221,031	110.52	42.0%	60%	38.67	144.79				43,721	
Manual Cut-Ins & Underhood [i]	0.00	20%	0.63		86,747	4.13	179.2	90%	10%	95%	109,082	1,433	14.76	110,515	55.26	42.0%	40%	29.00	108.59				14,574	
ESTA Robot Exterior [i]	3.16	40%	1.26		185,324	4.13	382.8	90%	10%	95%	233,039	3,062	31.53	236,101	118.05	42.0%	75%	25.82	96.66				58,377	
Clearcoat Totals	**3.16**		**3.16**	8.35	**445,566**		**920.3**				**560,285**	**7,362**	**75.81**	**567,647**	**283.82**			**93.49**	**350.04**				**116,671**	
								Topcoat Scenario 2			**1,159,558**	**15,237**	**156.89**	**1,174,795**	**587.40**								**171,244**	**6.86**
(Maximum Scenario 1 or 2) Total							**1,904.66**						**156.89**	**1,174,795**	**587.40**			**149.04**	**557.99**		**0.27**	**1.19**	**171,244**	**6.86**
Spot Repair - Topcoat [j]	0.00		0.03	10.26	567	3.84	1.09	100%	0%	0.0%	2,175	0.00	0.29	2,175	1.09	43.7%	40%	0.29	1.08	98.5%	0.004	0.016	99.05	
Spot Repair - Basecoat [j]	0.00		0.02	8.18	403	5.94	1.20	100%	0%	0.0%	2,396	0.00	0.32	2,396	1.20	26.4%	40%	0.10	0.37	98.5%	0.001	0.005	42.60	
Spot Repair - Clearcoat [j]	0.00		0.03	8.35	542	4.13	1.12	100%	0%	0.0%	2,240	0.00	0.30	2,240	1.12	42.0%	40%	0.18	0.68	98.5%	0.003	0.010	91.08	
Worst Case Spot Repair [k]							**2.32**				**4,635**	**0.00**	**0.62**	**4,635**	**2.32**			**0.289**	**1.082**		**0.004**	**0.016**	**133.69**	
Assembly Spot Repair - Topcoat [j]	0.00		0.10	10.26	1,405	3.84	2.70	100%	0%	0.0%	5,395	0.00	0.72	5,395	2.70	43.7%	40%	0.72	2.68	98.5%	0.011	0.040	245.65	
Assembly Spot Repair - Basecoat [j]	0.00		0.07	8.18	1,001	5.94	2.97	100%	0%	0.0%	5,941	0.00	0.79	5,941	2.97	26.4%	40%	0.24	0.91	98.5%	0.004	0.014	105.66	
Assembly Spot Repair - Clearcoat [j]	0.00		0.10	8.35	1,345	4.13	2.78	100%	0%	0.0%	5,554	0.00	0.74	5,554	2.78	42.0%	40%	0.45	1.68	98.5%	0.007	0.025	225.89	
Worst Case Assembly Repair [k]							**5.75**				**11,495**	**0.00**	**1.54**	**11,495**	**5.75**			**0.717**	**2.683**		**0.011**	**0.040**	**331.55**	
Cavity Wax	0.00		0.72	9.83	98,515	1.67	82.32	100%	0%	0.0%	52,027	0.00	6.95	164,642	26.01	74.0%	96%	4.40	16.46	98.5%	0.066	0.247	69,985	
Worst Case Repair and Cavity Wax Totals							**90.39**				**68,158**	**0.00**	**9.10**	**180,773**	**34.08**			**5.40**	**20.23**		**0.08**	**0.30**	**70,450**	
Coating Total (tpy)							**2,641.33**						**219.38**	**1,755,328**	**821.36**			**288.30**	**1,079.38**		**0.98**	**3.93**	**1,277,184**	

[a] Coating usage is calculated as follows: C = (A_1 * total parts per year) + (A_2 * total bodies per year)
[b] VOC emissions from the booth are calculated as follows: I = E * F * 2,000 lb/ton
[c] VOC emissions from the oven are calculated as follows: J = E * G * (1 - H) * 2,000 lb/ton
[d] Hourly emissions are calculated by dividing the annual emissions in tons/yr by the operating hours/yr, and multiplying by 2000 lb/ton.
[e] Annual Controlled PM emissions are calculated as follows: T = Q * (1 - R)
[f] GACS per year is calculated as follows: U = C * N * O
[g] Lb VOC/GACS is calculated as follows: V = L/U
[h] A safety factor of 10% was added to the VOC content of the material.
[j] Spot repair application rates are assumed to be equal to 1% of the application rate of the corresponding coating for a full vehicle body for every eighth vehicle. Assembly repair rates are assumed to be equal to 3.1% of the application rate of the corresponding coating for a full vehicle body for every tenth vehicle.
[k] Worst case spot repair and assembly repair for VOC emissions comes from basecoat and clearcoat application. Worst case spot repair and assembly repair for PM emissions comes from topcoat (monocoat) application.

Paint Shop Coating HAP Emissions - Excluding E-Coat Spot Repair

Total VOC Entering Process [a] (lb/yr)	Solids Application [a] (GACS/yr)	Controlled VOC Emissions [a] (lb/yr)	Lbs HAP per GACS [b]	Uncont. HAP Emissions (lb/yr)	Annual Rate, Uncont. HAP [c] (tpy)	Controlled HAP Emissions (lb/yr)	Annual Rate, HAP Out [c] (tpy)
5,282,667	1,277,184	1,755,328	0.50	1,921,845	960.92	638,592	319.30

[a] Calculated in Paint Shop Coating Tab.

[b] Combined HAP emission limit for Paint Shop Primecoat (E-coat), Guidecoat, Topcoat, and Purge Solvent Operations per 40 CFR 63 Subpart IIII because emissions are routed to a control device with greater than a 95% destruction efficiency.

[c] Potential hours are based on operation 24 hrs/day, 365 days/yr.

Underbody Coating VOC Emissions

Area/Process	Material Usage per Vehicle[a] (gal/veh)	Material Density[b] (lb/gal)	Material VOC Content[b] %	Application Area Emissions[d] %	Oven Emissions[d] %	Oven RTO Control Efficiency %	Maximum Annual Production Phase 1 (veh/yr)	Phase 2 (veh/yr)	Phase 3 (veh/yr)	Application Area VOC Emission Rates Phase 1 (tpy)	Phase 2 (tpy)	Phase 3 (tpy)	Oven VOC Emission Rates Phase 1 (tpy)	Phase 2 (tpy)	Phase 3 (tpy)	Total Uncontrolled VOC Emission Rates Phase 1 (tpy)	Phase 2 (tpy)	Phase 3 (tpy)	Total Controlled VOC Emission Rates Phase 1 (tpy)	Phase 2 (tpy)	Phase 3 (tpy)
Underbody Coating	0.185	11.684	36%	40%	60%	95%	50,544	74,880	124,800	7.93	11.75	19.58	0.59	0.88	1.47	19.82	29.36	48.94	8.52	12.63	21.04
Total										**7.93**	**11.75**	**19.58**	**0.59**	**0.88**	**1.47**	**19.82**	**29.36**	**48.94**	**8.52**	**12.63**	**21.04**

Underbody Coating PM Emissions

Process	Material Usage per Vehicle[a] (gal/veh)	Material Density[b] (lb/gal)	Weight % Solids[b] %	Transfer Efficiency[c] %	Maximum Annual Production Phase 1 (veh/yr)	Phase 2 (veh/yr)	Phase 3 (veh/yr)	Filter Efficiency (%)	Uncontrolled $PM/PM_{10}/PM_{2.5}$ Emissions Phase 1 (tpy)	Phase 2 (tpy)	Phase 3 (tpy)	Controlled $PM/PM_{10}/PM_{2.5}$ Emissions[e] Phase 1 (tpy)	Phase 2 (tpy)	Phase 3 (tpy)
Underbody Coating	0.185	11.684	67%	50%	50,544	74,880	124,800	98.5%	18.24	27.03	45.04	0.27	0.41	0.68
Total									**18.24**	**27.03**	**45.04**	**0.27**	**0.41**	**0.68**

[a] Material usage per vehicle estimate was provided by Mercedes on 2/4/2017 as 0.7 L/vehicle. Value was converted to gallons per vehicle using a conversion factor of 0.264172 gal/L.
[b] Based on BASF Primer UniBloc Solventborne primer.
[c] Transfer efficiency is assumed based on industry knowledge of underbody coating.
[d] BASF provided the application area/oven emission breakdown to Mercedes which was relayed on 1/4/2017 to Trinity Consultants as 37.5% of VOC emitted during application, and 62.5% emitted in the oven. Mercedes conservatively estimates that 40% is emitted during application.
[e] Annual operating hours assumed to be 7,448 hours per year.

Underbody Coating HAP/TAP Emissions

Material Usage per vehicle [a]	Material Density [b]	Application Area Emissions [c]	Oven Emissions [c]	Oven RTO Control Efficiency	Maximum Annual Production		
					Phase 1	Phase 2	Phase 3
(gal/veh)	(lb/gal)	%	%	%	(veh/yr)	(veh/yr)	(veh/yr)
0.185	11.684	40%	60%	95%	50,544	74,880	124,800

Underbody Coating HAP/TAP Emissions

Pollutant	CAS Number	Emission Factor [d] (%)	HAP? (Y/N)	TAP? (Y/N)	Application Area HAP Emissions (tpy)			Controlled Oven HAP Emissions (tpy)			Controlled HAP Emissions (tpy)		
					Phase 1	Phase 2	Phase 3	Phase 1	Phase 2	Phase 3	Phase 1	Phase 2	Phase 3
Naphtha	64742956	10%	N	N	-	-	-	-	-	-	-	-	-
Xylene	1330207	7%	Y	Y	1.53	2.26	3.77	0.11	0.17	0.28	1.64	2.43	4.06
1,2,4-trimethylbenzene	95636	5%	N	N	-	-	-	-	-	-	-	-	-
n-Butylacetate	123864	5%	N	N	-	-	-	-	-	-	-	-	-
2-Butoxyethyl Acetate	112072	3%	Y	N	0.66	0.97	1.62	0.05	0.07	0.12	0.70	1.04	1.74
n-Butanol	71363	2.5%	N	N	-	-	-	-	-	-	-	-	-
Mesitylene	108678	2%	N	N	-	-	-	-	-	-	-	-	-
n-Propylbenzene	103651	2%	N	N	-	-	-	-	-	-	-	-	-
Ethyl Benzene	100414	2%	Y	Y	0.44	0.65	1.08	0.03	0.05	0.08	0.47	0.70	1.16
Isopropylbenzene (Cumene)	98828	1%	Y	Y	0.22	0.32	0.54	0.02	0.02	0.04	0.23	0.35	0.58
Cyclohexane	110827	0.3%	N	N	-	-	-	-	-	-	-	-	-
Total Underbody Coating HAP Emissions					**2.84**	**4.21**	**7.01**	**0.21**	**0.32**	**0.53**	**3.05**	**4.52**	**7.54**

[a] Material usage per vehicle estimate was provided by Mercedes on 2/4/2017 as 0.7 L/vehicle. Value was convetered to gallons per vehicle using a conversion factor of 0.264172 gal/L.
[b] Based on BASF Primer UniBloc Solventborne primer.
[c] BASF provided the application area/oven emission breakdown to Mercedes which was relayed on 1/4/2017 to Trinity Consultants as 37.5% of VOC emitted during application, and 62.5% emitted in the oven. Mercedes conservatively estimates that 40% is emitted during application.
[d] Emission factors are from Section 3 Composition/Information on Ingredients on BASF UniBloc MB7746 silvergrey SDS (Revised 02/23/2015). HAP/TAP emissions assume that the maximum amount of each component is emitted.

Controlled Particulate Emissions from Sources Routed to Dry X

Description	Exhaust Flow Rate (m^3/hr)	Hours of Operation (hr/yr)	Outlet PM Loading [a] mg/m^3	Percent Recycled (%)	Potential $PM/PM_{10}/PM_{2.5}$ Emissions [b,c] (lb/hr)	(tpy)
Primer-Surfacer	157,352	8,760	1	73%	0.09	0.41
Primer-Surfacer 2	64,721	8,760	1	73%	0.04	0.17
Basecoat/Clearcoat	324,643	8,760	1	73%	0.19	0.85
Basecoat/Clearcoat 2	133,529	8,760	1	73%	0.08	0.35

[a] Manufacturer specification for outlet of PM separation system (Dry X).
[b] All PM is assumed to be equal to PM_{10} and $PM_{2.5}$. Annual emissions are based on paint shop hours of operation.
[c] Emissions (lb/hr) = Exhaust Flow (m^3/hr) * Outlet Loading (mg/m^3) * Conversion Factor (1 lb/453,592 mg) * (1-Percent Recycled (%))

E-Coat Spot Repair VOC Emissions

Area/Process	Material Usage per Vehicle[a] (gal/veh)	Material Density[b] (lb/gal)	Material VOC Content[b] (lb/gal)	Application Area Emissions %	Maximum Annual Production Phase 1 (veh/yr)	Phase 2 (veh/yr)	Phase 3 (veh/yr)	Application Area VOC Emission Rates Phase 1 (tpy)	Phase 2 (tpy)	Phase 3 (tpy)	Phase 3 (lb/hr)[d]
E-Coat Spot Repair	3.71E-04	11.684	6.00	100%	50,544	74,880	124,800	0.06	0.08	0.14	0.03
Total								**0.06**	**0.08**	**0.14**	**0.03**

E-Coat Spot Repair PM Emissions

Process	Material Usage per Vehicle[a] (gal/veh)	Material Density[b] (lb/gal)	Weight % Solids[b] %	Volume % Solids %	Transfer Efficiency[c] %	Maximum Annual Production Phase 1 (veh/yr)	Phase 2 (veh/yr)	Phase 3 (veh/yr)	Uncontrolled $PM/PM_{10}/PM_{2.5}$ Emissions Phase 1 (tpy)	Phase 2 (tpy)	Phase 3 (lb/hr)[d]	Phase 3 (tpy)	GACS per Year Phase 1 (tpy)	Phase 2 (tpy)	Phase 3 (tpy)
E-Coat Spot Repair	3.71E-04	11.684	67%	50.9%	40%	50,544	74,880	124,800	0.04	0.07	0.02	0.11	3.81	5.65	9.42
Total									**0.04**	**0.07**	**0.02**	**0.11**	**3.81**	**5.65**	**9.42**

[a] The material usage per vehicle was provided by Jae Park (Plant Engineer) via e-mail on 1/30/2017. The material usage per vehicle includes a 10% safety factor.

[b] Material density, VOC and solids content are based on BASF Primer UniBloc Solventborne primer.

[c] Transfer efficiency is assumed based on industry knowledge.

[d] Annual operating hours is assumed to be 8,760 hours per year.

Paint Shop Coating HAP Emissions - E-Coat Spot Repair HAP/TAP

Total VOC Entering Process [a] (lb/yr)	Solids Application [a] (GACS/yr)	Controlled VOC Emissions [a] (lb/yr)	Lbs HAP per GACS [b]	Uncont. HAP Emissions (lb/yr)	Annual Rate, Uncont. HAP [c] (tpy)	Controlled HAP Emissions (lb/yr)	Annual Rate, HAP Out [c] (tpy)
278	9	278	0.50	5	0.00	5	2.35E-03

[a] Calculated in Paint Shop Coating Tab.

[b] Combined HAP emission limit for Paint Shop Primecoat (E-coat), Guidecoat, Topcoat, and Purge Solvent Operations per 40 CFR 63 Subpart IIII because emissions are routed to a control device with greater than a 95% destruction efficiency.

[c] Potential hours are based on operation 24 hrs/day, 365 days/yr.

Paint Shop Adhesive Application Emissions

Adhesive Type	Material Usage per vehicle (lb/veh)	Uncontrolled VOC Emission Factor [a] (%)	Hourly Production Rate (veh/hr)	Maximum Annual production (veh/yr)	Uncontrolled VOC Emissions [b] (lb/hr)	(lb/yr)	(tpy)
Anti-flutter adhesive	6.61	1%	17	124,800	1.10	8,254.02	4.13
Structure adhesive	4.41	1%	17	124,800	0.73	5,502.68	2.75
Total					**1.84**	**13,756.70**	**6.88**

[a] From manufacturer's SDS, all body shop adhesives have >99% solids content. Mercedes-Benz Vans conservatively assumes VOC content of 1% for all adhesives.

[b] Mercedes-Benz Vans assumes that adhesive applied following the topcoat oven will be performed on an open workdeck (i.e. without control).

Purge Solvent Emissions

Process	Usage Rate	Number of Units [a]	Hours of Operation	Annual Usage [b]	Recovery Rate	Non-Recovered Solvent	Solvent Density [c]	VOC Content [c]	HAP Content [c]	Capture & Control: Percent Lost	Capture & Control: Booth Capture	Capture & Control: ADW Capture	Capture & Control: Booth Control Eff.	Uncontrolled Total VOC		Controlled Total VOC		Total HAP	
	(gal/unit)	(units/yr)	(hrs/yr)	(gal/yr)	%	(gal/yr)	(lb/gal)	(lb/gal)	(lb/gal)	%	%		%	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
Primer	0.34	137,280	7,488	47,145	65%	16,501	7.26	7.26	0.76	20%	80%	90%	95%	16.00	59.90	5.06	18.93	0.53	1.99
Basecoat	0.40	137,280	7,488	54,398	65%	19,039	7.26	7.26	0.76	20%	80%	90%	95%	18.46	69.12	5.83	21.84	0.61	2.30
Clearcoat	0.40	137,280	7,488	54,398	65%	19,039	7.26	7.26	0.76	20%	80%	90%	95%	18.46	69.12	5.83	21.84	0.61	2.30
Repair	0.11	137,280	7,488	14,506	65%	5,077	7.26	7.26	0.76	0%	100%	0%	0%	4.92	18.43	4.92	18.43	0.52	1.94
Total														**57.84**	**216.57**	**21.65**	**81.04**	**2.28**	**8.52**

[a] The number of units for primer, basecoat, and clearcoat includes major repairs sent back through the paint shop equivalent to 10% of the maximum production per year.

[b] The annual usage conservatively assumes that the lines are purged after each unit in each booth.

[c] Information provided in purge solvent SDS.

Paint Shop Phosphate Cleaner Calculation Information [a]

Supply (Inlet) Air		
Temperature	75	°F
Humidity	50	% RH
Moisture Content	0.0092	lb H_2O/lb air
Exhaust (Outlet) Air		
Temperature	63	°F
Humidity	95	% RH
Moisture Content	0.012	lb H_2O/lb air
Flow Rate	21,761	ft^3/min
Density of Air at 63 °F	0.0757	lb/ft^3
Phosphate Cleaner		
Dissolved Solids	0.5	%
Hours of Operation [b]	7,488	hr/yr
Control Efficiency [c]	55	%

[a] Reduction in PM emissions through use of mist eliminators.
[b] Paint shop annual hours of operation.
[c] Mist eliminator control efficiency.

Paint Shop Phosphate Cleaner Emissions

Phosphate Cleaner Emissions	$PM/PM_{10}/PM_{2.5}$	
	Uncontrolled	Controlled
Hourly (lb/hr)	1.38	0.62
Annual (tpy)	5.18	2.33

Sample Calculation:

$$\text{Uncontrolled PM Emissions} = \frac{(0.012 - 0.0092)\text{ lb } H_2O}{\text{lb air}} \left| \frac{0.5 \text{ lb solids}}{100 \text{ lb } H_2O} \right| \frac{12{,}000 \text{ ft}^3 \text{ air}}{\text{min}} \left| \frac{0.0757 \text{ lb air}}{\text{scf air}} \right| \frac{60 \text{ min}}{\text{hour}}$$

Uncontrolled PM Emissions = 1.38 lb/hr

$$\text{Controlled PM Emissions} = \frac{(0.76 \text{ lb PM})}{\text{hr}} \left| \frac{(100 - 55)}{100} \right. = 0.62 \text{ lb/hr}$$

Paint Mix Room Emissions

Paint Shop Material Usage Rates

Process/Material	Usage (gal/yr)
E-coat	520,379
Seam Sealer	87,831
Underbody PVC	594,101
Sika Sealing	5,300
(SAM) Sound Deadener Adhesive	131,875
Primer-Surfacer	257,058
Basecoat	331,567
Clearcoat	445,566
Spot Repair	5,263
Cavity Wax	98,515
Purge Solvent	170,449
Facility Total	2,127,524

vapor (i.e. partial) pressure of toluene	0.468	psia	P_{atm}
molecular weight of toluene	92.130	lb/lb-mole	MW
atmosphereic vapor pressure	14.700	psia	$P_{toluene}$
ideal gas constant - R	10.730	ft^3-psia/lb-mole-°R	
absolute temperature	532	°R	T
vapor density = MW*n/V = MW*P/R*T	0.237	lb/ft^3	n = 1
volume of displaced toluene-saturated air	2,127,524	gallons	
volume of displaced toluene-saturated air	284,428	ft^3	vol. displaced air
volume of displaced toluene	9,055	ft^3	vol. displaced air * $P_{toluene}/P_{atm}$
vapor density = MW*n/V = MW*P/R*T	0.2373	lb/ft^3	

Paint Shop Hours of Operation	7,488	hr/yr
Total VOC Emissions	0.29	lb/hr
Total VOC Emissions	**1.07**	**tpy**

Workdecks - Insignificant Activity Emissions

Booth/Zone	Potential $PM/PM_{10}/PM_{2.5}$ Emissions				
	Exhaust Volume (scfm) [a,b]	PM Loading ($gr/10^3$ dscf) [c]	Hours of Operation (hr/yr)	Hourly (lb/hr)	Annual (ton/yr) [c]
E-coat Sand	62,978	0.1	7,488	0.05	0.20
Primer Sand	62,978	0.1	7,488	0.05	0.20
Metal/Body Repair #1	6,474	0.1	7,488	0.01	0.02
Metal/Body Repair #2	6,474	0.1	7,488	0.01	0.02
E-coat Touch-up	21,189	0.1	7,488	0.02	0.07
Primer Touch-up	21,189	0.1	7,488	0.02	0.07
Basecoat Touch-up	21,189	0.1	7,488	0.02	0.07
Inspect/Polish	84,167	0.1	7,488	0.07	0.27
Total				**0.25**	**0.92**

[a] Calculation assumes exhaust volume is on a dry basis.
[b] Exhaust volumes provided by equipment manufacturer.
[c] Estimated outlet PM loading for workdeck operations.
[d] Based on paint shop annual hours of operation: 7,488 hrs/yr

Sample Calculations (for E-Coat Sand)

PM Emissions (lb/hr) = $\frac{62{,}978 \text{ scf}}{\text{min}} \times \frac{0.1 \text{ grains}}{1000 \text{ dscf}} \times \frac{60 \text{ min}}{\text{hr}} \times \frac{1 \text{ lb}}{7{,}000 \text{ gr.}}$ = **0.05 lb/hr**

PM Emissions (tons/yr) = $\frac{0.05 \text{ lb}}{\text{hr}} \times \frac{7{,}488 \text{ hr}}{\text{yr}} \times \frac{\text{ton}}{2{,}000 \text{ lb}}$ = **0.20 ton/yr**

Mercedes-Benz Vans, LLC

Body Shop Welding Emissions

Area/Process	Welding Material Usage per Vehicle		Material Usage per vehicle (lb/veh)	Uncontrolled PM Emission Factor [a] (lb/1000 lb)	Hourly Production Rate (veh/hr)	Maximum Annual Production (veh/yr)	Control Efficiency [b] %	Building Capture Efficiency %	Uncontrolled $PM/PM_{10}/PM_{2.5}$ Emissions [c] (lb/hr)	(lb/yr)	(tpy)	Controlled $PM/PM_{10}/PM_{2.5}$ Emission [c] (lb/hr)	(lb/yr)	(tpy)
MAG Welding	8,000	mm	0.30	20	17	124,800	95%	90%	1.00E-02	7.52E+01	3.76E-02	5.02E-04	3.76E+00	1.88E-03
Spot Welding	9,000	spots	0.34	20	17	124,800	0%	90%	1.13E-02	8.46E+01	4.23E-02	1.13E-02	8.46E+01	4.23E-02
Laser Welding	28,000	mm	1.05	20	17	124,800	0%	90%	3.52E-02	2.63E+02	1.32E-01	3.52E-02	2.63E+02	1.32E-01
Laser Soldering	9,000	mm	0.34	20	17	124,800	0%	90%	1.13E-02	8.46E+01	4.23E-02	1.13E-02	8.46E+01	4.23E-02
Total									**6.78E-02**	**5.08E+02**	**2.54E-01**	**5.83E-02**	**4.36E+02**	**2.18E-01**

[a] Average emission factor for welding and soldering at the facility is conservatively assumed to be 20 lb/1, 000 lb.

[b] Based on HEPA filter control for MAG welding processes.

[c] A building capture efficiency of 90% is assumed for the body shop for both uncontrolled and controlled emissions based on building enclosure capture efficiency provided in Texas Commission on Environmental Quality, Rock Crushing Plants, Table 7, February, 2002. All welding and soldering operations are done inside the building.

Body Shop Welding HAP Emissions

Area/Process	Manganese Content %	lb/hr	tpy
MAG Welding	1.45	7.28E-06	2.73E-05
Spot Welding	0.0	0.00E+00	0.00E+00
Laser Welding	1.2	4.22E-04	1.58E-03
Laser Soldering	1.2	1.36E-04	5.08E-04
	Total	5.65E-04	2.12E-03

Welding Shield Gas CO_2 Emissions

Usage per Vehicle (kg)	Hourly Production Rate (veh/hr)	Maximum Annual Production (veh/yr)	CO_2 Content [a] %	CO_2 Emissions (lb/hr)	(tpy)
2.00	17	124,800	15%	1.10E+01	4.13E+01

[a] Based on Mercedes-Benz Vans shield gas specification.

Body Shop Adhesive Bonding Emissions

Adhesive Type		Material Usage per vehicle (lb/veh)	Uncontrolled VOC Emission Factor [a] (%)	Hourly Production Rate (veh/hr)	Maximum Annual production (veh/yr)	Uncontrolled VOC Emissions (lb/hr)	(lb/yr)	(tpy)	Controlled VOC Emissions [b] (lb/hr)	(lb/yr)	(tpy)
Anti-flutter adhesive		6.61	1%	17	124,800	1.10	8,254.02	4.13	0.06	412.70	0.21
Structure adhesive		4.41	1%	17	124,800	0.73	5,502.68	2.75	0.04	275.13	0.14
Total						**1.84**	**13,756.70**	**6.88**	**0.09**	**687.84**	**0.34**

[a] From manufacturer's SDS, all body shop adhesives have >99% solids content. Mercedes-Benz Vans conservatively assumes VOC content of 1% for all adhesives.

[b] Mercedes-Benz Vans assumes 95% reduction in VOC emissions when body shop adhesives volatilize in the E-Coat oven.

Sample Calculations (for MAG Welding)

Material Usage (lb/veh) = $\pi \times r^2 \times$ Weld Length (mm) $\div 10^3 \times$ Material Specific Gravity (g/cm^3) $\div$ 453.59 g/lb

Material Usage (lb/veh) = $\pi \times (0.8\ mm)^2 \times 8{,}000\ mm \div 10^3 \times (8.5\ g/cm^3) \div 453.59\ g/lb$ = **0.30** **lb/veh**

PM Emissions (lb/yr) = $\frac{0.30\ lb}{veh} \times \frac{20\ lb}{1{,}000\ lb} \times \frac{124{,}800\ veh}{yr} \times (1-95\%) \times (1-90\%)$ = **3.762** **lb/yr**

PM Emissions (tons/yr) = $\frac{3.762\ lb}{yr} \times \frac{1\ ton}{2{,}000\ lb}$ = **1.88E-03** **ton/yr**

Assembly Combustion - Natural Gas Emission Factors

Hours of Operation [e] 4,684 hrs

Pollutant		NG Emission Factors [a,b,c]	Units
$PM/PM_{10}/PM_{2.5}$		0.0074	lb/MMBtu
SO_2		0.0006	lb/MMBtu
NO_X		0.097	lb/MMBtu
CO		0.082	lb/MMBtu
VOC		0.0054	lb/MMBtu
CO_2e [d]			
	CO_2	117.00	lb/MMBtu
	CH_4	2.21E-03	lb/MMBtu
	N_2O	2.21E-04	lb/MMBtu

[a] PM, SO_2, and VOC natural gas emission factors are from AP-42, Table 1.4-2, 07/98.
[b] NO_X and CO natural gas emission factors are from AP-42, Table 1.4-1, 07/98, Small Boilers (uncontrolled).
[c] The heating value of natural gas is assumed to be 1,026 Btu/scf.
[d] Emission factors from 40 CFR 98, Subpart C, Tables C-1 and C-2. Factors were converted to lb/MMBtu.

Assembly Combustion Non-HAP Emissions

Description	Equipment	Rated Capacity (MMBtu/hr)	Emission Rates [e] $PM/PM_{10}/PM_{2.5}$ lb/hr	$PM/PM_{10}/PM_{2.5}$ tpy	SO_2 lb/hr	SO_2 tpy	NO_X lb/hr	NO_X tpy	CO lb/hr	CO tpy	VOC lb/hr	VOC tpy	CO_2 lb/hr	CO_2 tpy	CH_4 lb/hr	CH_4 tpy	N_2O lb/hr	N_2O tpy	CO_2e lb/hr	CO_2e tpy
Assembly Oven	OV04	4.30	0.03	0.07	0.003	0.006	0.42	0.98	0.35	0.82	0.02	0.05	503.09	1,178.13	0.009	0.022	0.0009	0.002	503.61	1,179.34
Total		**4.30**	**0.03**	**0.07**	**0.003**	**0.006**	**0.42**	**0.98**	**0.35**	**0.82**	**0.02**	**0.05**	**503.09**	**1,178.13**	**0.009**	**0.022**	**0.0009**	**0.002**	**503.61**	**1,179.34**

[e] Annual emissions are based on calculated hours of operation needed to remain below the proposed 75,000 tpy synthetic minor limit on greenhouse gas emissions (CO_2e). Mercedes-Benz Vans is not requesting limits on hours of operation for individual emission units.

Assembly Combustion HAP/TAP Emissions

Pollutants	NG Emission Factor[a] lb/10⁶ scf	Total Emissions[b] lb/hr	tpy
2-Methylnaphthalene	2.40E-05	1.01E-07	2.36E-07
3-Methylchloranthrene	1.80E-06	7.54E-09	1.77E-08
7,12-Dimethylbenz(a)anthracene	1.60E-05	6.71E-08	1.57E-07
Acenaphthene	1.80E-06	7.54E-09	1.77E-08
Acenaphthylene	1.80E-06	7.54E-09	1.77E-08
Anthracene	2.40E-06	1.01E-08	2.36E-08
Benz(a)anthracene	1.80E-06	7.54E-09	1.77E-08
Benzene	2.10E-03	8.80E-06	2.06E-05
Benzo(a)pyrene	1.20E-06	5.03E-09	1.18E-08
Benzo(b)fluoranthene	1.80E-06	7.54E-09	1.77E-08
Benzo(g,h,i)perylene	1.20E-06	5.03E-09	1.18E-08
Benzo(k)fluoranthene	1.80E-06	7.54E-09	1.77E-08
Chrysene	1.80E-06	7.54E-09	1.77E-08
Dibenzo(a,h)anthracene	1.20E-06	5.03E-09	1.18E-08
Dichlorobenzene	1.20E-03	5.03E-06	1.18E-05
Fluoranthene	3.00E-06	1.26E-08	2.94E-08
Fluorene	2.80E-06	1.17E-08	2.75E-08
Formaldehyde	7.50E-02	3.14E-04	7.36E-04
Hexane	1.80E+00	7.54E-03	1.77E-02
Indeno(1,2,3-cd)pyrene	1.80E-06	7.54E-09	1.77E-08
Naphthalene	6.10E-04	2.56E-06	5.99E-06
Phenanathrene	1.70E-05	7.12E-08	1.67E-07
Pyrene	5.00E-06	2.10E-08	4.91E-08
Toluene	3.40E-03	1.42E-05	3.34E-05
Arsenic	2.00E-04	8.38E-07	1.96E-06
Beryllium	1.20E-05	5.03E-08	1.18E-07
Cadmium	1.10E-03	4.61E-06	1.08E-05
Chromium	1.40E-03	5.87E-06	1.37E-05
Cobalt	8.40E-05	3.52E-07	8.24E-07
Lead	5.00E-04	2.10E-06	4.91E-06
Manganese	3.80E-04	1.59E-06	3.73E-06
Mercury	2.60E-04	1.09E-06	2.55E-06
Nickel	2.10E-03	8.80E-06	2.06E-05
Selenium	2.40E-05	1.01E-07	2.36E-07

Hours of Operation[b]	4,684	hrs
Total Rated Capacity	4.30	MMBtu/hr

[a] Natural Gas Emission Factors are from AP-42 Section 1.4, Tables 1.4-2, 1.4-3, and 1.4-4.
[b] Annual emissions are based on calculated hours of operation needed to remain below the proposed 75,000 tpy synthetic minor limit on greenhouse gas emissions (CO_2e). Mercedes-Benz Vans is not requesting limits on hours of operation for individual emission units.

Assembly Glazing VOC Emissions

Area/Process	Material Usage per vehicle		Uncontrolled VOC Emission Factor [a]	Hourly Production Rate	Maximum Annual Production	Product Usage	Potential VOC Emissions		
	(kg/veh)	(lb/veh)	(%)	(veh/hr)	(veh/yr)	(lb/yr)	(lb/hr)	(lb/yr)	(tpy)
Primer 1	0.04	0.09	65%	19	164,250	14,595	1.08	9,486.75	4.74
Primer 2	0.08	0.19	64%	19	164,250	30,510	2.23	19,526.34	9.76
Adhesive	2.75	6.06	0%	19	164,250	995,971	0.00	0.00	0.00
Total							**3.31**	**29,013.09**	**14.51**

HAP/TAP Potential Emissions

Area/Process	Material Usage per vehicle		Constituent Chemical Name	CAS#	Uncontrolled Component Emission Factor [a]	Hourly Production Rate	Maximum Annual Production	Potential Emission Rates		
	(kg/veh)	(lb/veh)			(%)	(veh/hr)	(veh/yr)	(lb/hr)	(lb/yr)	(tpy)
Primer 1	0.04	0.09	MEK	78-93-3	60%	19	164,250	1.00	8,757.00	4.38
	0.04	0.09	MDI	101-68-8	1%	19	164,250	0.02	145.95	0.07
Primer 2	0.08	0.19	MEK	78-93-3	60%	19	164,250	2.09	18,305.94	9.15
			Acrylic acid	79-10-7	1%	19	164,250	0.03	305.10	0.15
Adhesive	2.75	6.06	N/A					0.00	0.00	0.00
Total								**3.14**	**27,513.99**	**13.76**

[a] Information provided in SDS for each material.

Assembly Under Body Wax Emissions

Area/Process	Material Usage per vehicle (lb/veh)	Uncontrolled VOC Emission Factor (%)	Hourly Production Rate (veh/hr)	Maximum Annual Production (veh/yr)	Product Usage (lb/year)	Potential VOC Emission Rates (lb/hr)	(lb/yr)	(tpy)
Under body wax	1.94	0.0%	19	164,250	318,656	0.00	0.00	0.00
Total						**0.00**	**0.00**	**0.00**

Spray Deck PM Emissions

Process	Material Usage per vehicle (lb/veh)	Weight % Volatiles (%)	Weight % Solids (%)	%Transfer Efficiency (%)	Production Rates (units/hr)	Filter Efficiency (%)	Uncontrolled $PM/PM_{10}/PM_{2.5}$ Emissions (lb/hr)	(lb/yr)	(tpy)	Controlled $PM/PM_{10}/PM_{2.5}$ Emissions (lb/hr)	(lb/yr)	(tpy)
Under body wax	1.94	0.0%	100.0%	90%	19	98.0%	3.64	31,865.64	15.93	0.07	637.31	0.32
Total							**3.64**	**31,865.64**	**15.93**	**0.07**	**637.31**	**0.32**

Assembly Filling Emissions

	Material Usage per Vehicle	True Vapor Pressure, VP	Molecular Weight	Vehicle Throughput		Uncontrolled VOC Emission Rates			Controlled VOC Emission Rates [a]		
Product	(liter/veh)	(psia)	(g/mol)	(veh/hr)	(veh/yr)	(lb/hr)	(lb/yr)	(tpy)	(lb/hr)	(lb/yr)	(tpy)
Gasoline	18.9	7.4	66	19	164,250	1.08E+00	9.49E+03	4.74E+00	5.42E-02	4.74E+02	2.37E-01
Diesel fuel	18.9	0.01	130	19	164,250	2.88E-03	2.53E+01	1.26E-02	2.88E-03	2.53E+01	1.26E-02
Brake fluid	1.2	0.02	75	19	164,250	2.13E-04	1.86E+00	9.32E-04	2.13E-04	1.86E+00	9.32E-04
Antifreeze	9.0	0.02	62	19	164,250	1.31E-03	1.15E+01	5.73E-03	1.31E-03	1.15E+01	5.73E-03
Windshield Cleaner [b]	4.0	0.77	28.14	19	164,250	1.02E-02	8.89E+01	4.45E-02	1.02E-02	8.89E+01	4.45E-02
Differential Gear Oil	0.5	0.02	75	19	164,250	8.79E-05	7.70E-01	3.85E-04	8.79E-05	7.70E-01	3.85E-04
Auto Transmission Fluid	0.7	0.02	150	19	164,250	2.40E-04	2.10E+00	1.05E-03	2.40E-04	2.10E+00	1.05E-03
Power Steering Fluid	0.8	0.02	76	19	164,250	1.42E-04	1.24E+00	6.20E-04	1.42E-04	1.24E+00	6.20E-04
Total						**1.10E+00**	**9.62E+03**	**4.81E+00**	**6.92E-02**	**6.06E+02**	**3.03E-01**

[a] Assumes 95% control from onboard refueling vapor recovery (ORVR) for gasoline.

[b] From windshield cleaner MSDS, material contains 23% volatiles (methanol and ethylene glycol). VOC emissions calculated based on vapor pressure provided in the MSDS and molecular weight calculated as the weighted average of 23% ethylene glycol and 77% water.

HAP/TAP Emissions from Assembly Filling

	Material Usage per Vehicle	Component Emission Factor [a]	True Vapor Pressure, VP	Molecular Weight	Vehicle Throughput		Uncontrolled HAP/TAP Emission Rates			Controlled HAP/TAP Emission Rates		
Pollutant	(liter/veh)	(liter/veh)	(psia)	(g/mol)	(veh/hr)	(veh/yr)	(lb/hr)	(lb/yr)	(tpy)	(lb/hr)	(lb/yr)	(tpy)
Windshield Cleaner	4.0											
Methanol		1.12	1.888	32.04	19	164,250	7.92E-03	6.94E+01	3.47E-02	7.92E-03	6.94E+01	3.47E-02
Ethylene Glycol		0.80	0.0725	62.07	19	164,250	4.19E-04	3.67E+00	1.84E-03	4.19E-04	3.67E+00	1.84E-03
Total							**8.34E-03**	**7.30E+01**	**3.65E-02**	**8.34E-03**	**7.30E+01**	**3.65E-02**

[a] From windshield cleaner MSDS, material is 23% volatile by mass. Windshield cleaner fluid was conservatively assumed to contain 23% methanol and 23% ethylene glycol.

Assembly Roll and Brake Testing Capacities

Hourly Production Rate	19	units/hr
Annual Production Rate	164,250	units/yr
Simulated Distance	3.0	miles/unit
Hours of Operation [a]	8,760	hr/yr

[a] Potential operating hours are based on operation 24 hours/day, 365 days/yr.

Assembly Roll and Brake Testing Emission Factors

Pollutant	Diesel g/mile [a]	Gasoline g/mile	Worst Case Fuel g/mile
PM	0.08	0.0	0.08
NO_X	0.3	0.3	0.3
CO	4.2	4.2	4.2
VOC	0.09	0.09	0.09
Formaldehyde	0.018	0.018	0.018
CO_2e [b,c]			
CO_2 [b]	417	417	417
CH_4 [d]	0.73	0.73	0.73
N_2O [d]	0.01	0.01	0.01

[a] Emission rates are based on 40 CFR 88 Subpart A Table A Table A104-2—Full Useful Life Standards (g/mi) for Light-Duty Vehicles, diesel vehicles.

[b] The CO_2 emission factor is from "Light-Duty Automotive Technology, Carbon Dioxide Emissions, and Fuel Economy Trends: 1975 Through 2010"

[c] When accounting for global warming potential, CO_2 is 95% of CO_2e. EPA Emission Facts: Greenhouse Gas Emissions from a Typical Passenger Vehicle, http://www.epa.gov/OMS/climate/420f05004.htm.

[d] 5% of CO_2e is assumed to be CH_4 and N_2O, when accounting for global warming potential. Emission factors for these pollutants are based on a ratio of CH_4 and N_2O emission factors for petroleum fuels from the GHG Mandatory Reporting Rule Subpart C, Table C-2.

Assembly Roll and Brake Testing Potential Emissions

Process	Potential Emissions																	
	$PM/PM_{10}/PM_{2.5}$		NO_X		CO		VOC		Formaldehyde		CO_2		CH_4		N_2O		CO_2e	
	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
Assembly Roll and Brake	0.010	0.043	0.037	0.163	0.521	2.281	0.011	0.049	0.002	0.010	51.71	226.50	0.091	0.40	0.002	0.01	54.43	238.42

Assembly Washer System Testing Compound Usage Data

Washer System Test [a]	mL/unit	% Ethylene Glycol [b]	Ethylene Glycol Density (lb/gal)	lb Ethylene Glycol/unit
Maximum Tested Windshield Cleaner Usage	100	23%	9.26	0.056

[a] Represents the maximum testing fluid usage per unit.

[b] From windshield cleaner MSDS, material contains 23% volatiles (methanol and ethylene glycol). Emissions from washer system testing calculated based on ethylene glycol density which represents the worst-case VOC emissions for the material.

Assembly Washer System Testing Emissions

	Production		VOC Emissions [a]			Maximum Ethylene Glycol Emissions [b]			Maximum Methanol Emissions [b]		
	(units/hr)	(units/yr)	(lb/hr)	(lb/yr)	(tpy)	(lb/hr)	(lb/yr)	(tpy)	(lb/hr)	(lb/yr)	(tpy)
Washer System Testing	19	164,250	1.06	9,244.66	4.62	1.06	9,244.66	4.62	0.75	6,579.53	3.29

[a] VOC emissions from washer system testing calculated based on ethylene glycol density which represents the worst-case VOC emissions for the material.

[b] Maximum HAP emissions are calculated assuming the maximum volatile content for both ethylene glycol and methanol. Therefore, the calculated VOC emissions are not equivalent to the sum c

Storage Tank Volumes

Tank ID	Consumption per Vehicle (gal/veh)	Max. Consumption per year[a] (gal/yr)	Fuel Type
TK-01	5.00	702,000	Gasoline
TK-02	5.00	702,000	Diesel
TK-03	----	100,000	Diesel

Storage Tank Emissions

Tank ID	Description[a]	Controls	Tank Size		Capacity	Throughput	Uncontrolled Emissions[b] (lb/yr)			Total VOC Emissions[c]	
			Shell Length (ft)	Diameter (ft)	(gal)	(gal/yr)	Working Loss	Breathing Loss	Total	Total (lb/hr)	Total (tpy)
TK-01	Gasoline	N/A	10.00	9.67	5,000	702,000	3,553.34	1,718.84	5,272.18	0.70	2.64
TK-02	Diesel fuel	N/A	15.08	11.00	10,000	702,000	10.79	2.27	13.06	0.002	0.01
TK-03	Diesel fuel	N/A	7.58	10.72	1,240	100,000	1.39	1.08	2.47	0.000	0.00
Tanks Total									**5,287.71**	**0.71**	**2.64**

[a] Max throughput for TK-01 and TK-02 based on the max. consumption per vehicle. TK-03 will be used to sources in the Marshalling yard.
[b] All the storage tanks are horizontal tanks.
[c] Storage Tank emissions taken from TANKS 4.09d output based on tank parameters and geographical information.

Emergency Generators and Fire Pumps Emission Factors [a,b]

Pollutant	Emergency Engines 19 ≤ kW < 37	Emergency Engines 37 ≤ kW < 75	Emergency Engines 225 ≤ kW < 450	Emergency Engines kW > 560	Fire Pumps 225 < kW < 450	Units
$PM/PM_{10}/PM_{2.5}$	0.45	0.30	0.15	0.15	0.15	g/hp-hr
SO_2 [c]	0.93	0.93	0.93	5.5E-03	0.93	g/hp-hr
NO_X	5.6	3.5	3.0	4.8	3.0	g/hp-hr
CO	4.1	3.7	2.6	2.6	2.6	g/hp-hr
VOC	5.6	3.5	3.0	4.8	3.0	g/hp-hr
CO_2e [d]						
CO_2	163.08	163.08	163.08	163.08	163.08	lb/MMBtu
CH_4	6.62E-03	6.62E-03	6.62E-03	6.62E-03	6.62E-03	lb/MMBtu
N_2O	1.32E-03	1.32E-03	1.32E-03	1.32E-03	1.32E-03	lb/MMBtu

[a] The emission factors are from 40 CFR 89.112(a), Table 1. VOC and NO_X emission factors are each assumed to be equivalent to NO_X + NMHC emission limit. The SO_2 emission factor is from AP-42, Table 3.4-1 for large diesel engines.
[b] The emission factors are from 40 CFR 89.112(a), Table 1. VOC and NO_X emission factors are each assumed to be equivalent to NO_X + NMHC emission limit. The SO_2 emission factor is from AP-42, Table 3.3-1.
[c] Sulfur content of diesel fuel equals the maximum sulfur content of 15 ppm, per 40 CFR 80.510(b).
[d] Emission factors from 40 CFR 98, Subpart C, Tables C-1 and C-2. Factors were converted to lb/MMBtu.

Emergency Generators and Fire Pumps Criteria Pollutant Emissions

Equipment ID	Fuel	Horsepower	Max. Rated Capacity	Max. hours per year [a]	$PM/PM_{10}/PM_{2.5}$		SO_2		NO_X		CO		VOC		CO_2		CH_4		N_2O		CO_2e	
		(hp)	(MMBtu/hr)	(hr/yr)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
EG01	Diesel	398	1.01	500	0.13	0.03	0.82	0.204	2.62	0.65	2.29	0.57	2.62	0.65	143.09	35.77	0.006	0.001	0.001	0.0003	143.59	35.90
EG02	Diesel	65	0.17	500	0.04	0.01	0.13	0.03	0.50	0.13	0.53	0.13	0.50	0.13	23.37	5.84	0.001	2E-04	0.0002	5E-05	23.45	5.86
EG03	Diesel	40	0.10	500	0.04	0.01	0.08	0.021	0.50	0.12	0.36	0.09	0.50	0.12	14.46	3.62	0.001	0.00	0.000	0.000	14.51	3.63
EG04	Diesel	1,500	3.82	500	0.49	0.12	0.02	0.005	15.78	3.95	8.63	2.16	15.78	3.95	539.30	134.83	0.022	0.01	0.004	0.001	541.15	135.29
FP01	Diesel	305	0.78	500	0.10	0.03	0.63	0.16	2.02	0.50	1.75	0.44	2.02	0.50	109.66	27.41	0.004	0.001	0.0009	0.0002	110.03	27.51
Total					**0.81**	**0.20**	**1.68**	**0.42**	**21.42**	**5.35**	**13.57**	**3.39**	**21.42**	**5.35**	**829.9**	**207.47**	**0.03**	**0.01**	**0.01**	**0.002**	**832.7**	**208.18**

[a] Potential hours of operation for emergency units.

Emergency Generators and Fire Pumps Combined Heat Input Capacities

	Large Units[a] (MMBtu/hr)
Total Large Diesel Heat Input	3.82
Total Diesel Heat Input	2.06

[a] Large diesel engines are those larger than 600 hp.

Emergency Generators and Fire Pumps HAP/TAP Emissions

Pollutant	Emission Factors (lb/MMBtu) Large Diesel[a]	Emission Factors (lb/MMBtu) Diesel[b]	Emergency Equipment Emissions (lb/hr)	Emergency Equipment Emissions (tpy)
Benzene	7.76E-04	9.33E-04	4.88E-03	1.22E-03
Toluene	2.81E-04	4.09E-04	1.91E-03	4.79E-04
Xylene	1.93E-04	2.85E-04	1.32E-03	3.31E-04
Formaldehyde	7.89E-05	1.18E-03	2.73E-03	6.82E-04
Acetaldehyde	2.52E-05	7.67E-05	2.54E-04	6.35E-05
Acrolein	7.88E-06	9.25E-05	2.20E-04	5.51E-05
Napthalene	1.30E-04	8.48E-05	6.71E-04	1.68E-04
Total PAH	2.12E-04	1.68E-04	1.15E-03	2.89E-04

[a] Emission factors from AP-42 Section 3.4 Large Stationary Diesel and All Stationary Duel-fuel Engines, Table 3.4-3 - 3.4-4.
[b] Emission factors from AP-42 Section 3.3 Gasoline and Diesel Industrial Engines, Table 3.3-2.

Cooling Tower Potential Emissions

Description	Circulating Water Flowrate	Water Density	Total Dissolved Solids [a]	Drift Rate [b]	Hours of Operation	Potential Emissions [c]					
						PM		PM_{10}		$PM_{2.5}$	
	(gal/hr)	(lb/gal)	(ppm)	(%)	(hrs/yr)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
Cooling Tower 1	412,500	8.34	650	0.001	7,488	2.24E-02	8.37E-02	3.33E-03	1.25E-02	2.00E-03	7.48E-03
Cooling Tower 2	412,500	8.34	650	0.001	7,488	2.24E-02	8.37E-02	3.33E-03	1.25E-02	2.00E-03	7.48E-03
Cooling Tower 3	412,500	8.34	650	0.001	7,488	2.24E-02	8.37E-02	3.33E-03	1.25E-02	2.00E-03	7.48E-03
Cooling Tower 4	73,800	8.34	650	0.001	7,488	4.00E-03	1.50E-02	5.96E-04	2.23E-03	3.58E-04	1.34E-03
Cooling Tower 5	484,900	8.34	650	0.001	7,488	2.63E-02	9.84E-02	3.92E-03	1.47E-02	2.35E-03	8.80E-03
Cooling Tower 6	484,900	8.34	650	0.001	7,488	2.63E-02	9.84E-02	3.92E-03	1.47E-02	2.35E-03	8.80E-03
Cooling Tower 7	484,900	8.34	650	0.001	7,488	2.63E-02	9.84E-02	3.92E-03	1.47E-02	2.35E-03	8.80E-03
Total						1.50E-01	5.61E-01	2.23E-02	8.36E-02	1.34E-02	5.02E-02

[a] TDS provided by Charleston Water System.

[b] Drift rate value supplied based on vendor guaranteed drift rate.

[c] PM emissions calculated using equation from AP-42 Chapter 13.4 - Wet Cooling Towers. PM_{10} emissions are 14.9% of PM emissions based on *Calculating Realistic PM_{10} Emissions from Cooling Towers* by Joel Reisman and Gordon Frisbie. $PM_{2.5}$ assumed to be 60% of PM_{10} based on California Emissions Inventory Development and Reporting System (CEIDARS).

Paved Roads - Emission Factor Equation[a]

$$E = [k\,(sL)^{0.91} * W^{1.02}] * (1 - 1.2*P/N)$$

where:	Value	Units	Data Source
k = particle size multiplier for PM	0.011	lb/VMT	AP-42, Table 13.2.1-1 [b]
k = particle size multiplier for PM_{10}	0.0022	lb/VMT	AP-42, Table 13.2.1-1 [b]
k = particle size multiplier for $PM_{2.5}$	0.00054	lb/VMT	AP-42, Table 13.2.1-1 [b]
sL = road surface silt loading	0.6	g/m^2	AP-42, Table 13.2.1-2 [c]
W_a = average weight of vehicles traveling the road	40.0	tons	SC DOT [d]
N = number of days in averaging period	365	days	AP-42, pg. 13.2.1-6
P = number of days in a year with at least 0.01 in of precipitation	120	days	AP-42, Fig. 13.2.1-2
E_a = PM emission factor	**0.18**	**lb/VMT**	**Calculation**
E_a = PM_{10} emission factor	**0.04**	**lb/VMT**	**Calculation**
E_a = $PM_{2.5}$ emission factor	**0.01**	**lb/VMT**	**Calculation**

[a] AP-42, Section 13.2.1.3, Equation 3.

[b] K value selected is for PM_{30}, PM_{10} and $PM_{2.5}$. The PM_{30} factor is used to calculate PM emissions.

[c] AP-42 Section 13.2.1, Table 13.2.1-2, Ubiquitous Silt Loading Default Values for sites with average daily traffic (ADT) for low volume roads, ADT category < 500 vehicles.

[d] Average weight conservatively set to maximum allowable gross vehicle weight rating is 80,000 lbs (40 tons), per SC §56-5-4140.

Paved Roads - Loads and Distance Inputs

Parameter	Value	Units
Distance traveled per load	1.71	VMT/load
Loads traveled	6	loads/hr
	150	loads/day
	54,750	loads/yr
Paved Vehicle Miles Traveled per Year [a]	93,349	VMT/yr
Paved Vehicle Miles Traveled per Hour [b]	10.66	VMT/hr

[a] Calculation: Paved Vehicle Miles Traveled per Year (VMT/yr) = (Potential Vehicle Production (tpy)) / Weight of Truck Load (tons/load) * Distance Traveled per Load (VMT/load).

[b] Calculation: Paved Vehicle Miles Traveled per Hour (VMT/hr) = (Potential Vehicle Production (tons/hr)) / Weight of Truck Load (tons/load) * Distance Traveled per Load (VMT/load).

Paved Roads - Potential Emissions

	PM		PM_{10}		$PM_{2.5}$	
	(lb/hr)	**(tpy)**	**(lb/hr)**	**(tpy)**	**(lb/hr)**	**(tpy)**
Paved Roads [a,b]	1.92	8.41	0.38	1.68	0.09	0.41

[a] Calculation: Potential Emissions (tpy) = Paved Vehicle Miles Traveled per Year (VMT/yr) * Emission Factor (lb/VMT) / (2,000 lb/ton).

[b] Calculation: Potential Emissions (lb/hr) = Paved Vehicle Miles Traveled per Year (VMT/hr) * Emission Factor (lb/VMT).

PSD Permit Application - Unrestricted Emission Calculations

Mercedes-Benz Vans, LLC
Charleston, South Carolina Facility

Facility-wide Potential Emissions

Pollutants	Unrestricted Uncontrolled Emissions tpy	Unrestricted Controlled Emissions tpy	Limited Emissions tpy
PM	1,354.08	24.74	21.32
PM_{10}	1,346.79	17.45	14.11
$PM_{2.5}$	1,345.49	16.15	12.81
SO_2	0.94	0.94	0.73
CO	78.03	78.03	49.63
NO_X	61.91	61.91	39.90
VOC	3,446.82	1,114.35	955.36
Lead	4.31E-04	4.31E-04	2.62E-04
CO_2e	104,003	104,003	63,367
Total HAP	415.61	415.61	358.00

Facility-wide Unrestricted Potential Emissions

	Uncontrolled Emissions		Controlled Emissions	
Pollutants	lb/hr	tpy	lb/hr	tpy
PM	309.91	1,354.08	6.41	24.74
PM_{10}	308.25	1,346.79	4.75	17.45
$PM_{2.5}$	307.95	1,345.49	4.45	16.15
SO_2	1.79	0.94	1.79	0.94
CO	30.61	78.03	30.61	78.03
NO_X	34.33	61.91	34.33	61.91
VOC	808.98	3,446.82	274.61	1114.35
Lead	9.83E-05	4.31E-04	9.83E-05	4.31E-04
CO_2e	24,530.29	104,003.48	24,530.29	104,003.48
CO_2	24,500.34	103,884.05	24,500.34	103,884.05
CH_4	0.57	2.35	0.57	2.35
N_2O	0.05	0.20	0.05	0.20

Facility-wide Unrestricted Potential HAP/TAP Emissions

	Total Emissions	
Pollutants	lb/hr	tpy
2-Methylnaphthalene	4.72E-06	2.07E-05
3-Methylchloranthrene	3.54E-07	1.55E-06
7,12-Dimethylbenz(a)anthracene	3.15E-06	1.38E-05
Acenaphthene	3.54E-07	1.55E-06
Acenaphthylene	3.54E-07	1.55E-06
Anthracene	4.72E-07	2.07E-06
Benz(a)anthracene	3.54E-07	1.55E-06
Benzene	5.29E-03	3.03E-03
Benzo(a)pyrene	2.36E-07	1.03E-06
Benzo(b)fluoranthene	3.54E-07	1.55E-06
Benzo(g,h,i)perylene	2.36E-07	1.03E-06
Benzo(k)fluoranthene	3.54E-07	1.55E-06
Butylglycol Acetate	4.65E-01	2.03E+00
Chrysene	3.54E-07	1.55E-06
Isopropylbenzene (Cumene)	1.55E-01	6.78E-01
Dibenzo(a,h)anthracene	2.36E-07	1.03E-06
Dichlorobenzene	2.36E-04	1.03E-03
Ethyl Benzene	3.10E-01	1.36E+00
Fluoranthene	5.90E-07	2.58E-06
Fluorene	5.51E-07	2.41E-06
Formaldehyde	1.97E-02	8.48E-02
Hexane	3.54E-01	1.55E+00
Indeno(1,2,3-cd)pyrene	3.54E-07	1.55E-06
Naphthalene	7.91E-04	6.93E-04
Phenanathrene	3.34E-06	1.46E-05
Pyrene	9.83E-07	4.31E-06
Toluene	2.58E-03	3.41E-03
Arsenic	3.93E-05	1.72E-04
Beryllium	2.36E-06	1.03E-05
Cadmium	2.16E-04	9.48E-04
Chromium	2.75E-04	1.21E-03
Cobalt	1.65E-05	7.24E-05
Lead	9.83E-05	4.31E-04
Manganese	6.40E-04	2.80E-03
Mercury	5.11E-05	2.24E-04
Nickel	4.13E-04	1.81E-03
Selenium	4.72E-06	2.07E-05
Xylene	1.09E+00	4.75E+00
Acetaldehyde	2.54E-04	6.35E-05
Acrolein	2.20E-04	5.51E-05
Total PAH	1.15E-03	2.89E-04
Methyl Ethyl Ketone	3.09E+00	1.35E+01
Acrylic acid	3.48E-02	1.53E-01
Methanol	7.59E-01	3.32E+00
Ethylene Glycol	1.06E+00	4.62E+00
Total HAP [a]	94.90	415.61

[a] Includes total HAP from paint shop and purge solvent.

Inputs

Phase	Paint Shop Operation (days/yr)	Assembly Operation (days/yr)	Paint Shop/Body Shop Throughput (units/hr)	(units/day)	(units/yr)	Assembly Throughput [a] (units/hr)	(units/day)	(units/yr)
Phase 3	365	365	17	400	146,000	19	450	164,250

[a] Assembly throughput includes existing re-assembly throughput as well as proposed expansion throughput.

Daily Operation
24 hours/day

Combustion Average Utilization [b]	
Percent	Hours of Operation
100.0%	8,760

[b] Calculations assume 8,760 hours of operation for unrestricted emission calculations.

Hours of Operation [e] 8,760 hrs

Boiler Information

Equipment	Heat Input Capacity MMBtu/hr
Boiler 1 (B01)	14.27
Boiler 2 (B02)	14.27

Boiler Natural Gas Emission Factors

Pollutant	Emission Factor [a,b,c] lb/MMBtu
PM [d]	0.0074
SO_2	0.0006
CO	0.0819
NO_X	0.0360
VOC	0.0054
CO_2e	
CO_2	117.00
CH_4	2.21E-03
N_2O	2.21E-04

[a] Emission factors are from AP-42, Table 1.4-1 and 1.4-2 for small boilers with low NO_X burners. NO_X emission factor is from SC Standard No. 5.2, Section III, Table 1.
[b] Emission factors calculated using the default natural gas heating value of 1,026 Btu/scf from 40 CFR 98.
[c] Emission factors from 40 CFR 98, Subpart C, Tables C-1 and C-2. Factors were converted to lb/MMBtu.
[d] PM_{10} and $PM_{2.5}$ are assumed to be equal to PM for natural gas combustion.

Boilers Non-HAP Unrestricted Potential Emissions

Pollutant	Emission Rates [e]					
	B01		B02		Total	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
$PM/PM_{10}/PM_{2.5}$	0.11	0.46	0.11	0.46	0.21	0.93
SO_2	0.01	0.04	0.01	0.04	0.02	0.07
CO	1.17	5.12	1.17	5.12	2.34	10.23
NO_X	0.51	2.25	0.51	2.25	1.03	4.50
VOC	0.08	0.34	0.08	0.34	0.15	0.67
CO_2e	1,671	7,320	1,671	7320.19	3,342.55	14,640
CO_2	1,670	7,313	1670	7312.64	3,339.10	14,625
CH_4	0.03	0.14	0.03	0.14	0.06	0.28
N_2O	0.003	0.01	0.00	0.01	0.01	0.03

[e] Hours of operation for unrestricted emission calculations are 8,760.

Appendix B.2.2 - Boilers
Mercedes-Benz Vans, LLC

Boilers HAP/TAP Unrestricted Potential Emissions

Pollutant	Emission Factor [a] lb/MMscf	Boilers Total	
		lb/hr	tpy
2-Methylnaphthalene	2.4E-05	6.7E-07	2.9E-06
3-Methylchloranthrene	1.8E-06	5.0E-08	2.2E-07
7,12-Dimethylbenz(a)anthracene	1.6E-05	4.5E-07	1.9E-06
Acenaphthene	1.8E-06	5.0E-08	2.2E-07
Acenaphthylene	1.8E-06	5.0E-08	2.2E-07
Anthracene	2.4E-06	6.7E-08	2.9E-07
Benz(a)anthracene	1.8E-06	5.0E-08	2.2E-07
Benzene	2.1E-03	5.8E-05	2.6E-04
Benzo(a)pyrene	1.2E-06	3.3E-08	1.5E-07
Benzo(b)fluoranthene	1.8E-06	5.0E-08	2.2E-07
Benzo(g,h,i)perylene	1.2E-06	3.3E-08	1.5E-07
Benzo(k)fluoranthene	1.8E-06	5.0E-08	2.2E-07
Chrysene	1.8E-06	5.0E-08	2.2E-07
Dibenzo(a,h)anthracene	1.2E-06	3.3E-08	1.5E-07
Dichlorobenzene	1.2E-03	3.3E-05	1.5E-04
Fluoranthene	3.0E-06	8.3E-08	3.7E-07
Fluorene	2.8E-06	7.8E-08	3.4E-07
Formaldehyde	7.5E-02	2.1E-03	9.1E-03
Hexane	1.8E+00	5.0E-02	2.2E-01
Indeno(1,2,3-cd)pyrene	1.8E-06	5.0E-08	2.2E-07
Naphthalene	6.1E-04	1.7E-05	7.4E-05
Phenanathrene	1.7E-05	4.7E-07	2.1E-06
Pyrene	5.0E-06	1.4E-07	6.1E-07
Toluene	3.4E-03	9.5E-05	4.1E-04
Arsenic	2.0E-04	5.6E-06	2.4E-05
Beryllium	1.2E-05	3.3E-07	1.5E-06
Cadmium	1.1E-03	3.1E-05	1.3E-04
Chromium	1.4E-03	3.9E-05	1.7E-04
Cobalt	8.4E-05	2.3E-06	1.0E-05
Lead	5.0E-04	1.4E-05	6.1E-05
Manganese	3.8E-04	1.1E-05	4.6E-05
Mercury	2.6E-04	7.2E-06	3.2E-05
Nickel	2.1E-03	5.8E-05	2.6E-04
Selenium	2.4E-05	6.7E-07	2.9E-06

[a] Emission factors are from AP-42, Table 1.4-2, 1.4-3, and 1.4-4.

Air Supply and Rooftop Units - Natural Gas Emission Factors

Hours of Operation [g] 8,760 hrs

Pollutant		NG Emission Factors [a,b,e] (lb/MMBtu)
$PM/PM_{10}/PM_{2.5}$		0.0074
SO_2		0.0006
ASU-Durr (low-NO_X) [c]		0.0073
Other ASU (NO_X) [c]		0.0971
RTU-NO_X [d]		0.0110
CO		0.0819
VOC		0.0054
CO_2e [f]		
	CO_2	117.00
	CH_4	2.21E-03
	N_2O	2.21E-04

[a] PM, SO_2, and VOC natural gas emission factors are from AP-42, Table 1.4-2, 07/98.
[b] CO natural gas emission factor is from AP-42, Table 1.4-1, 07/98, Small Boilers.
[c] The ASU-Durr Low NO_X emission factor (for units routed to Dry X) is based on vendor-specific data stating a maximum NO_X concentration of 6 ppm. The Other ASU (NO_X) emission factor is based on vendor-specific data stating a maximum NO_X concentration of 80 ppm.
[d] RTU Burners meet the Low NO_X requirements of California Air Resources Board (CARB) Rule 1146.1, Table 1146.1-1, Units Fired on Natural Gas.
[e] The heating value of natural gas is assumed to be 1,026 Btu/scf.
[f] Emission factors from 40 CFR 98, Subpart C, Tables C-1 and C-2. Factors were converted to lb/MMBtu.

Air Supply Units Non-HAP Emissions

			Emission Rates [g]																	
		Rated Capacity	$PM/PM_{10}/PM_{2.5}$		SO_2		NO_X		CO		VOC		CO_2		CH_4		N_2O		CO_2e	
Description	Equipment	(MMBtu/hr)	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
ASU Primer/BC/CC	ASU P/BC/CC	6.49	Routed to Dry X. See Dry X PM Emissions Table.		0.004	0.017	0.05	0.207	0.531	2.327	0.035	0.152	759.31	3,326	0.014	0.063	0.001	0.006	760.10	3,329
ASU 2.1 Shop + Open WD	ASU 2.1	10.00	0.07	0.32	0.006	0.026	0.97	4.25	0.82	3.59	0.05	0.23	1,169.97	5,124	0.022	0.097	0.002	0.010	1,171.18	5,130
ASU 3 - UBP + Repair	ASU 3	7.44	0.06	0.24	0.004	0.019	0.72	3.17	0.61	2.67	0.04	0.17	870.46	3,813	0.016	0.072	0.002	0.007	871.36	3,817
ASU 2.2 Shop + Open WD	ASU 2.2	10.00	0.07	0.32	0.006	0.026	0.97	4.25	0.82	3.59	0.05	0.23	1,169.97	5,124	0.022	0.097	0.002	0.010	1,171.18	5,130
ASU 1 - Spot Repair	ASU 1	4.82	0.04	0.16	0.003	0.012	0.47	2.05	0.39	1.73	0.03	0.11	563.93	2,470	0.011	0.047	0.001	0.005	564.51	2,473
ASU 2.3 Shop	ASU 2.3	10.00	0.07	0.32	0.006	0.026	0.97	4.25	0.82	3.59	0.05	0.23	1,169.97	5,124	0.022	0.097	0.0022	0.010	1,171.18	5,130
ASU 4 - Wax	ASU 4	4.84	0.04	0.16	0.003	0.012	0.47	2.06	0.40	1.74	0.03	0.11	566.27	2,480	0.011	0.047	0.001	0.005	566.85	2,483
Workdecks ASU 6 (Phase 2)	ASU 6	8.54	0.06	0.28	0.005	0.022	0.83	3.63	0.70	3.06	0.05	0.20	999.16	4,376	0.019	0.082	0.002	0.008	1,000.19	4,381
Workdecks ASU 5 (Phase 2)	ASU 5	5.83	0.04	0.19	0.003	0.015	0.57	2.48	0.48	2.09	0.03	0.14	682.09	2,988	0.013	0.056	0.001	0.006	682.80	2,991
ASU Cleanroom (Phase 2)	ASU CR2	1.26	0.01	0.04	0.001	0.003	0.12	0.54	0.10	0.45	0.01	0.03	147.42	646	0.003	0.012	0.000	0.001	147.57	646
Primer Booth Air Supply Unit (Phase 3)	ASU31	7.57	Routed to Dry X. See Dry X PM Emissions Table.		0.004	0.019	0.06	0.24	0.62	2.71	0.04	0.18	885.67	3,879	0.017	0.073	0.002	0.007	886.58	3,883
BC Booth Air Supply Unit (Phase 3)	ASU32	7.68			0.004	0.020	0.06	0.24	0.63	2.75	0.04	0.18	898.54	3,936	0.017	0.074	0.002	0.007	899.47	3,940
Workdecks Air Supply Unit 1 Phase 3	ASU33	4.96	0.04	0.16	0.003	0.013	0.48	2.11	0.41	1.78	0.03	0.12	580.31	2,542	0.011	0.048	0.0011	0.005	580.91	2,544
Workdecks Air Supply Unit 2 Phase 3	ASU34	2.56	0.02	0.08	0.001	0.007	0.25	1.09	0.21	0.92	0.01	0.06	299.51	1,312	0.006	0.025	0.001	0.002	299.82	1,313
Workdecks Air Supply Unit 3 Phase 3	ASU35	8.05	0.06	0.26	0.005	0.021	0.78	3.42	0.66	2.89	0.04	0.19	941.83	4,125	0.018	0.078	0.002	0.008	942.80	4,129
Shop Ventilation Air Supply Unit Phase 3	ASU36	3.07	0.02	0.10	0.002	0.008	0.30	1.31	0.25	1.10	0.02	0.07	359.18	1,573	0.007	0.030	0.001	0.003	359.55	1,575
Social Rooms Air Supply Unit Phase 3	ASU37	1.53	0.01	0.05	0.001	0.004	0.15	0.65	0.13	0.55	0.01	0.04	179.01	784	0.003	0.015	0.000	0.001	179.19	785
ASU Total		**104.64**	**0.61**	**2.69**	**0.06**	**0.27**	**8.21**	**35.96**	**8.57**	**37.52**	**0.56**	**2.46**	**12,243**	**53,623**	**0.23**	**1.01**	**0.02**	**0.10**	**12,255**	**53,678**

[g] Hours of operation for unrestricted emission calculations are 8,760.

Rooftop Units Non-HAP Emissions

		Rated Capacity	Emission Rates [g]																	
			$PM/PM_{10}/PM_{2.5}$		SO_2		NO_X		CO		VOC		CO_2		CH_4		N_2O		CO_2e	
Description	Equipment	(MMBtu/hr)	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
Assembly - Rooftop Unit 1	AS-RTU01	0.80	5.93E-03	2.60E-02	4.68E-04	2.05E-03	8.80E-03	3.85E-02	6.55E-02	2.87E-01	4.29E-03	1.88E-02	93.60	410	1.76E-03	7.73E-03	1.76E-04	7.73E-04	93.69	410
Assembly - Rooftop Unit 4	AS-RTU04	0.80	5.93E-03	2.60E-02	4.68E-04	2.05E-03	8.80E-03	3.85E-02	6.55E-02	2.87E-01	4.29E-03	1.88E-02	93.60	410	1.76E-03	7.73E-03	1.76E-04	7.73E-04	93.69	410
Assembly - Rooftop Unit 6	AS-RTU06	0.80	5.93E-03	2.60E-02	4.68E-04	2.05E-03	8.80E-03	3.85E-02	6.55E-02	2.87E-01	4.29E-03	1.88E-02	93.60	410	1.76E-03	7.73E-03	1.76E-04	7.73E-04	93.69	410
Assembly - Rooftop Unit 8	AS-RTU08	0.80	5.93E-03	2.60E-02	4.68E-04	2.05E-03	8.80E-03	3.85E-02	6.55E-02	2.87E-01	4.29E-03	1.88E-02	93.60	410	1.76E-03	7.73E-03	1.76E-04	7.73E-04	93.69	410
Assembly - Rooftop Unit 10	AS-RTU10	0.80	5.93E-03	2.60E-02	4.68E-04	2.05E-03	8.80E-03	3.85E-02	6.55E-02	2.87E-01	4.29E-03	1.88E-02	93.60	410	1.76E-03	7.73E-03	1.76E-04	7.73E-04	93.69	410
Assembly - Rooftop Unit 11	AS-RTU11	0.80	5.93E-03	2.60E-02	4.68E-04	2.05E-03	8.80E-03	3.85E-02	6.55E-02	2.87E-01	4.29E-03	1.88E-02	93.60	410	1.76E-03	7.73E-03	1.76E-04	7.73E-04	93.69	410
Assembly - Rooftop Unit 13	AS-RTU13	0.80	5.93E-03	2.60E-02	4.68E-04	2.05E-03	8.80E-03	3.85E-02	6.55E-02	2.87E-01	4.29E-03	1.88E-02	93.60	410	1.76E-03	7.73E-03	1.76E-04	7.73E-04	93.69	410
Body Shop - Rooftop Unit 1	BS-RTU01	0.80	5.93E-03	2.60E-02	4.68E-04	2.05E-03	8.80E-03	3.85E-02	6.55E-02	2.87E-01	4.29E-03	1.88E-02	93.60	410	1.76E-03	7.73E-03	1.76E-04	7.73E-04	93.69	410
Body Shop - Rooftop Unit 2	BS-RTU02	0.80	5.93E-03	2.60E-02	4.68E-04	2.05E-03	8.80E-03	3.85E-02	6.55E-02	2.87E-01	4.29E-03	1.88E-02	93.60	410	1.76E-03	7.73E-03	1.76E-04	7.73E-04	93.69	410
Body Shop - Rooftop Unit 4	BS-RTU04	0.80	5.93E-03	2.60E-02	4.68E-04	2.05E-03	8.80E-03	3.85E-02	6.55E-02	2.87E-01	4.29E-03	1.88E-02	93.60	410	1.76E-03	7.73E-03	1.76E-04	7.73E-04	93.69	410
Body Shop - Rooftop Unit 5	BS-RTU05	0.80	5.93E-03	2.60E-02	4.68E-04	2.05E-03	8.80E-03	3.85E-02	6.55E-02	2.87E-01	4.29E-03	1.88E-02	93.60	410	1.76E-03	7.73E-03	1.76E-04	7.73E-04	93.69	410
Body Shop - Rooftop Unit 6	BS-RTU06	0.80	5.93E-03	2.60E-02	4.68E-04	2.05E-03	8.80E-03	3.85E-02	6.55E-02	2.87E-01	4.29E-03	1.88E-02	93.60	410	1.76E-03	7.73E-03	1.76E-04	7.73E-04	93.69	410
Body Shop - Rooftop Unit 7	BS-RTU07	0.80	5.93E-03	2.60E-02	4.68E-04	2.05E-03	8.80E-03	3.85E-02	6.55E-02	2.87E-01	4.29E-03	1.88E-02	93.60	410	1.76E-03	7.73E-03	1.76E-04	7.73E-04	93.69	410
Body Shop - Rooftop Unit 10	BS-RTU10	0.80	5.93E-03	2.60E-02	4.68E-04	2.05E-03	8.80E-03	3.85E-02	6.55E-02	2.87E-01	4.29E-03	1.88E-02	93.60	410	1.76E-03	7.73E-03	1.76E-04	7.73E-04	93.69	410
Body Shop - Rooftop Unit 17	BS-RTU17	0.80	5.93E-03	2.60E-02	4.68E-04	2.05E-03	8.80E-03	3.85E-02	6.55E-02	2.87E-01	4.29E-03	1.88E-02	93.60	410	1.76E-03	7.73E-03	1.76E-04	7.73E-04	93.69	410
Body Shop - Rooftop Unit 18	BS-RTU18	0.80	5.93E-03	2.60E-02	4.68E-04	2.05E-03	8.80E-03	3.85E-02	6.55E-02	2.87E-01	4.29E-03	1.88E-02	93.60	410	1.76E-03	7.73E-03	1.76E-04	7.73E-04	93.69	410
Body Shop - Rooftop Unit 23	BS-RTU23	0.80	5.93E-03	2.60E-02	4.68E-04	2.05E-03	8.80E-03	3.85E-02	6.55E-02	2.87E-01	4.29E-03	1.88E-02	93.60	410	1.76E-03	7.73E-03	1.76E-04	7.73E-04	93.69	410
Body Shop - Rooftop Unit 25	BS-RTU25	0.80	5.93E-03	2.60E-02	4.68E-04	2.05E-03	8.80E-03	3.85E-02	6.55E-02	2.87E-01	4.29E-03	1.88E-02	93.60	410	1.76E-03	7.73E-03	1.76E-04	7.73E-04	93.69	410
Body Shop - Rooftop Unit 26	BS-RTU26	0.80	5.93E-03	2.60E-02	4.68E-04	2.05E-03	8.80E-03	3.85E-02	6.55E-02	2.87E-01	4.29E-03	1.88E-02	93.60	410	1.76E-03	7.73E-03	1.76E-04	7.73E-04	93.69	410
Body Shop - Rooftop Unit 30	BS-RTU30	0.80	5.93E-03	2.60E-02	4.68E-04	2.05E-03	8.80E-03	3.85E-02	6.55E-02	2.87E-01	4.29E-03	1.88E-02	93.60	410	1.76E-03	7.73E-03	1.76E-04	7.73E-04	93.69	410
Body Shop - Rooftop Unit 32	BS-RTU32	0.80	5.93E-03	2.60E-02	4.68E-04	2.05E-03	8.80E-03	3.85E-02	6.55E-02	2.87E-01	4.29E-03	1.88E-02	93.60	410	1.76E-03	7.73E-03	1.76E-04	7.73E-04	93.69	410
Body Shop - Rooftop Unit 33	BS-RTU33	0.80	5.93E-03	2.60E-02	4.68E-04	2.05E-03	8.80E-03	3.85E-02	6.55E-02	2.87E-01	4.29E-03	1.88E-02	93.60	410	1.76E-03	7.73E-03	1.76E-04	7.73E-04	93.69	410
Body Shop - Rooftop Unit 35	BS-RTU35	0.80	5.93E-03	2.60E-02	4.68E-04	2.05E-03	8.80E-03	3.85E-02	6.55E-02	2.87E-01	4.29E-03	1.88E-02	93.60	410	1.76E-03	7.73E-03	1.76E-04	7.73E-04	93.69	410
RTU Total		18.40	1.36E-01	5.97E-01	1.08E-02	4.71E-02	2.02E-01	8.87E-01	1.51E+00	6.60E+00	9.86E-02	4.32E-01	2,152.75	9,429	4.06E-02	1.78E-01	4.06E-03	1.78E-02	2,154.97	9,439
ASU + RTU Total		**123.04**	**7.50E-01**	**3.29E+00**	**7.20E-02**	**3.15E-01**	**8.41E+00**	**3.68E+01**	**1.01E+01**	**4.41E+01**	**6.60E-01**	**2.89E+00**	**14,395**	**63,052**	**2.71E-01**	**1.19E+00**	**2.71E-02**	**1.19E-01**	**14,410**	**63,117**

[g] Hours of operation for unrestricted emission calculations are 8,760.

Hours of Operation [a]	8,760	hrs
Total Rated Capacity	123.04	MMBtu/hr

Air Supply and Rooftop Units HAP/TAP Emissions

Pollutants	NG Emission Factor [a] lb/10^6 scf	HAP/TAP	
		lb/hr	tpy
2-Methylnaphthalene	2.40E-05	2.88E-06	1.26E-05
3-Methylchloranthrene	1.80E-06	2.16E-07	9.45E-07
7,12-Dimethylbenz(a)anthracene	1.60E-05	1.92E-06	8.40E-06
Acenaphthene	1.80E-06	2.16E-07	9.45E-07
Acenaphthylene	1.80E-06	2.16E-07	9.45E-07
Anthracene	2.40E-06	2.88E-07	1.26E-06
Benz(a)anthracene	1.80E-06	2.16E-07	9.45E-07
Benzene	2.10E-03	2.52E-04	1.10E-03
Benzo(a)pyrene	1.20E-06	1.44E-07	6.30E-07
Benzo(b)fluoranthene	1.80E-06	2.16E-07	9.45E-07
Benzo(g,h,i)perylene	1.20E-06	1.44E-07	6.30E-07
Benzo(k)fluoranthene	1.80E-06	2.16E-07	9.45E-07
Chrysene	1.80E-06	2.16E-07	9.45E-07
Dibenzo(a,h)anthracene	1.20E-06	1.44E-07	6.30E-07
Dichlorobenzene	1.20E-03	1.44E-04	6.30E-04
Fluoranthene	3.00E-06	3.60E-07	1.58E-06
Fluorene	2.80E-06	3.36E-07	1.47E-06
Formaldehyde	7.50E-02	8.99E-03	3.94E-02
Hexane	1.80E+00	2.16E-01	9.45E-01
Indeno(1,2,3-cd)pyrene	1.80E-06	2.16E-07	9.45E-07
Naphthalene	6.10E-04	7.32E-05	3.20E-04
Phenanathrene	1.70E-05	2.04E-06	8.93E-06
Pyrene	5.00E-06	6.00E-07	2.63E-06
Toluene	3.40E-03	4.08E-04	1.79E-03
Arsenic	2.00E-04	2.40E-05	1.05E-04
Beryllium	1.20E-05	1.44E-06	6.30E-06
Cadmium	1.10E-03	1.32E-04	5.78E-04
Chromium	1.40E-03	1.68E-04	7.35E-04
Cobalt	8.40E-05	1.01E-05	4.41E-05
Lead	5.00E-04	6.00E-05	2.63E-04
Manganese	3.80E-04	4.56E-05	2.00E-04
Mercury	2.60E-04	3.12E-05	1.37E-04
Nickel	2.10E-03	2.52E-04	1.10E-03
Selenium	2.40E-05	2.88E-06	1.26E-05

[a] Unrestricted hours of operation (8,760 hr/yr).

[b] Natural Gas Emission Factors are from AP-42 Section 1.4, Tables 1.4-2, 1.4-3, and 1.4-4.

Appendix B.2.4 - Paint Shop
Mercedes-Benz Vans, LLC

Coating Throughput Information

	# of Units	Notes
Paint Shop Bodies per Year	**146,000**	Based on maximum daily throughput and days of operation per year
Major Repair Equivalent Bodies per Year	**14,600**	Major repair area assumed to be equivalent to 10% of the total vehicle throughput.
Total Paint Shop Equivalent Bodies per Year	**160,600**	Major repair area assumed to be equivalent to 10% of the total vehicle throughput.
Total Parts per Year	**4,380**	Parts painted area assumed to be equivalent to 3% of the total vehicle throughput.
Assembly Bodies per Year	**164,250**	Based on maximum daily throughput and days of operation per year
Operating Hours per year	**8,760**	Based on facility operating 24 hours/day and days of operation per year.

Coating Emission Calculations

	Parts		Bodies	Material Data		VOC													PM/PM10/PM2.5								lb/GACS	
								Capture & Control						Emissions														
Process	Application Rate	Split	Application Rate	Coating Density	Coating Usage	VOC In		% Lost Booth and Oven	Booth Split	ADW Capture	RTO Eff.	Oven Split	RTO Eff.	Emissions from Booth	Emissions from Oven	Controlled VOC Emissions			Weight Solids	Volume Solids	Transfer Eff.	Uncontrolled PM Emissions		Control Eff.	Controlled PM Emissions		GACS per year	lbs VOC/ GACS
	A_1		A_2	B	C [a]	D	E=C x D	F	G	H	I	J	K	L [b]	M [c]	N [d]	O = L + M	P	Q	R	S	T [d]	U [e]	V	W [d]	X [f]	Y [g]	Z [h]
	gal/unit		gal/unit	lb/gal	gal/yr	lb/gal	tpy	%	%	%	%	%	%	lb/yr	lb/yr	lb/hr	lb/yr	tpy	%	%	%	lb/hr	tpy	%	lb/hr	tpy		
E-Coat (Emulsion) [i]	2.91		2.91	8.84	480,092	0.11	25.22	0.0%	20%	0.0%	0.0%	80%	95%	10,087	2,017	1.38	12,104	6.05	36.3%	32.1%	100%	0.00	0.00	0.0%	0.00	0.00	154,109	
E-Coat (Pigment Paste) [i]	0.78		0.78	10.59	128,684	1.27	81.63	0.0%	20%	0.0%	0.0%	80%	95%	32,651	6,530	4.47	39,181	19.59	47.2%	31.1%	100%	0.00	0.00	0.0%	0.00	0.00	40,059	
E-Coat Total							**106.84**							**42,737**	**8,547**	**5.85**	**51,285**	**25.64**				**0.00**	**0.00**		**0.00**	**0.00**	**194,169**	**0.26**
HVLP Robots Interior [i]	0.00	40%	0.73	11.684	117,096	4.24	248.31	20%	90%	90%	95%	10%	95%	151,171	1,986	17.48	153,157	76.58	67%	50.9%	60%	41.74	182.83	See Dry X PM Emissions Table			35,761	
Manual Cut-Ins & Underhood [i]	0.00	20%	0.36	11.684	58,548	4.24	124.15	20%	90%	90%	95%	10%	95%	75,586	993	8.74	76,579	38.29	67%	50.9%	40%	31.31	137.12				11,920	
ESTA Robot Exterior [i]	1.82	40%	0.73	11.684	125,080	4.24	265.24	20%	90%	90%	95%	10%	95%	161,478	2,122	18.68	163,600	81.80	67%	50.9%	75%	27.87	122.06				47,749	
Primer-Surfacer Totals	**1.82**		**1.82**				**637.70**							**388,235**	**5,102**	**44.90**	**393,336**	**196.67**				**100.92**	**442.02**		**0.13**	**0.58**	**95,431**	**4.12**
UB-PVC	0.00		4.33	8.304	695,022	0.00	0.00	0.0%	100%	0.0%	0.0%	0.0%	0.0%	0.0	0.0	0.00	0.0	0.00	100%	100%	95%	32.94	144.28	98.5%	0.49	2.16	660,270	0.00
Seam Sealer	0.00		0.64	10.68	102,751	0.00	0.00	0.0%	100%	0.0%	0.0%	0.0%	0.0%	0.0	0.0	0.00	0.0	0.00	100%	100%	100%	0.00	0.00	0.0%	0.00	0.00	102,751	0.00
Sika Sealing	0.00		0.04	10.85	6,201	0.29	0.90	0.0%	100%	0.0%	0.0%	0.0%	0.0%	1,803	0.0	0.21	1,803	0.90	97%	97%	100%	0.00	0.00	0.0%	0.00	0.00	6,035	0.30
(SAM) Sound Deadener Adhesive	0.00		0.961	13.77	154,277	0.14	10.62	0.0%	100%	0.0%	0.0%	0.0%	0.0%	21,244	0.0	2.43	21,244	10.62	99%	99%	100%	0.00	0.00	0.0%	0.00	0.00	152,734	0.14
Sealers and Adhesives Totals	**5.97**		**5.97**				**11.52**							**23,047**	**0**	**2.63**	**23,047**	**11.52**				**32.94**	**144.28**		**0.49**	**2.16**	**921,790**	**0.03**
						Total	**756.07**									**53.39**	**467,668**	**233.83**				**133.86**	**586.30**		**0.63**	**2.74**	**1,211,390**	

Process	Parts		Bodies	Material Data		VOC													PM/PM$_{10}$/PM$_{2.5}$								lb/GACS	
								Capture & Control						Emissions														
	Application Rate	Split	Application Rate	Coating Density	Coating Usage	VOC In		% Lost Booth and Oven	Booth Split	ADW Capture	RTO Eff.	Oven Split	RTO Eff.	Emissions from Booth	Emissions from Oven	Controlled VOC Emissions			Weight Solids	Volume Solids	Transfer Eff.	Uncontrolled PM Emissions		Control Eff.	Controlled PM Emissions		GACS per year	lbs VOC/ GACS
	A_1		A_2	B	C [a]	D	E=C x D	F	G	H	I	J	K	L [b]	M [c]	N [d]	O = L + M	P	Q	R	S	T [d]	U [e]	V	W [d]	X [f]	Y [g]	Z [h]
	gal/unit		gal/unit	lb/gal	gal/yr	lb/gal	tpy	%	%	%	%	%	%	lb/yr	lb/yr	lb/hr	lb/yr	tpy	%	%	%	lb/hr	tpy	%	lb/hr	tpy		
HVLP Robots Interior [i]	0.00	40%	1.32		212,131	3.84	407.2	20%	90%	90%	95%	10%	95%	247,897	3,258	28.67	251,155	125.58	62%	43.7%	60%	61.65	270.01				55,621	
Manual Cut-Ins & Underhood [i]	0.00	20%	0.66		106,065	3.84	203.6	20%	90%	90%	95%	10%	95%	123,949	1,629	14.34	125,577	62.79	62%	43.7%	40%	46.23	202.51	See Dry X PM Emissions Table			18,540	
ESTA Robot Exterior [i]	3.30	40%	1.32		226,594	3.84	435.0	20%	90%	90%	95%	10%	95%	264,799	3,480	30.63	268,279	134.14	62%	43.7%	75%	41.16	180.26				74,266	
Topcoat (Monocoat) Totals	**3.30**		**3.30**	10.26	**544,791**		**1,045.7**							**636,645**	**8,366**	**73.63**	**645,011**	**322.51**				**149.04**	**652.78**				**148,427**	**4.35**
													Topcoat Scenario 1	**636,645**	**8,366**	**73.63**	**645,011**	**322.51**									**148,427**	**4.35**
HVLP Robots Interior [i]	0.00	40%	0.94		151,037	5.94	448.4	20%	90%	90%	95%	10%	95%	272,984	3,587	31.57	276,571	138.29	37%	26.4%	60%	20.87	91.41				23,924	
Manual Cut-Ins & Underhood [i]	0.00	20%	0.47		75,519	5.94	224.2	20%	90%	90%	95%	10%	95%	136,492	1,794	15.79	138,286	69.14	37%	26.4%	40%	15.65	68.56				7,975	
ESTA Robot Exterior [i]	2.35	40%	0.94		161,335	5.94	479.0	20%	90%	90%	95%	10%	95%	291,597	3,832	33.72	295,429	147.71	37%	26.4%	75%	13.93	61.03				31,944	
Basecoat Totals	**2.35**		**2.35**	8.18	**387,891**		**1,151.6**							**701,073**	**9,213**	**81.08**	**710,286**	**355.14**				**50.45**	**220.99**	See Dry X PM Emissions Table			**63,843**	
HVLP Robots Interior [i]	0.00	40%	1.26		202,967	4.13	419.2	20%	90%	90%	95%	10%	95%	255,224	3,354	29.52	258,578	129.29	50%	42.0%	60%	38.67	169.38				51,148	
Manual Cut-Ins & Underhood [i]	0.00	20%	0.63		101,483	4.13	209.6	20%	90%	90%	95%	10%	95%	127,612	1,677	14.76	129,289	64.64	50%	42.0%	40%	29.00	127.04				17,049	
ESTA Robot Exterior [i]	3.16	40%	1.26		216,805	4.13	447.8	20%	90%	90%	95%	10%	95%	272,625	3,582	31.53	276,208	138.10	50%	42.0%	75%	25.82	113.08				68,294	
Clearcoat Totals	**3.16**		**3.16**	8.35	**521,256**		**1,076.6**							**655,461**	**8,613**	**75.81**	**664,074**	**332.04**				**93.49**	**409.50**				**136,491**	
													Topcoat Scenario 2	**1,356,534**	**17,826**	**156.89**	**1,374,360**	**687.18**									**200,334**	**6.86**
(Maximum Scenario 1 or 2) Total							**2,228.21**									**156.89**	**1,374,360**	**687.18**				**149.04**	**652.78**		**0.27**	**1.19**	**200,334**	**6.86**
Spot Repair - Topcoat [j]	0.00		0.03	10.26	663	3.84	1.27	0.0%	100%	0.0%	0.0%	0%	0.0%	2,545	0.00	0.29	2,545	1.27	62%	43.7%	40%	0.29	1.27	98.5%	0.004	0.019	115.88	
Spot Repair - Basecoat [j]	0.00		0.02	8.18	472	5.94	1.40	0.0%	100%	0.0%	0.0%	0%	0.0%	2,802	0.00	0.32	2,802	1.40	37%	26.4%	40%	0.10	0.43	98.5%	0.001	0.006	49.84	
Spot Repair - Clearcoat [j]	0.00		0.03	8.35	634	4.13	1.31	0.0%	100%	0.0%	0.0%	0%	0.0%	2,620	0.00	0.30	2,620	1.31	50%	42.0%	40%	0.18	0.79	98.5%	0.003	0.012	106.56	
Worst Case Spot Repair [k]							**2.71**							**5,423**	**0.00**	**0.62**	**5,423**	**2.71**				**0.289**	**1.266**		**0.004**	**0.019**	**156.40**	
Assembly Spot Repair - Topcoat [j]	0.00		0.10	10.26	1,644	3.84	3.16	0.0%	100%	0.0%	0.0%	0%	0.0%	6,311	0.00	0.72	6,311	3.16	62%	43.7%	40%	0.72	3.14	98.5%	0.011	0.047	287.37	
Assembly Spot Repair - Basecoat [j]	0.00		0.07	8.18	1,171	5.94	3.48	0.0%	100%	0.0%	0.0%	0%	0.0%	6,950	0.00	0.79	6,950	3.48	37%	26.4%	40%	0.24	1.06	98.5%	0.004	0.016	123.61	
Assembly Spot Repair - Clearcoat [j]	0.00		0.10	8.35	1,573	4.13	3.25	0.0%	100%	0.0%	0.0%	0%	0.0%	6,498	0.00	0.74	6,498	3.25	50%	42.0%	40%	0.45	1.97	98.5%	0.007	0.030	264.26	
Worst Case Assembly Repair [k]							**6.72**							**13,448**	**0.00**	**1.54**	**13,448**	**6.72**				**0.717**	**3.139**		**0.011**	**0.047**	**387.87**	
Cavity Wax	0.00		0.72	9.83	115,249	1.67	96.31	20%	100%	90.0%	95%	0%	0.0%	60,865	0.00	6.95	192,610	30.43	85%	74.0%	96%	4.40	19.26	98.5%	0.066	0.289	81,873	
Worst Case Repair and Cavity Wax Totals							**105.74**							**79,736**	**0.00**	**9.10**	**211,481**	**39.87**				**5.40**	**23.67**		**0.08**	**0.35**	**82,417**	
Coating Total (tpy)							**3,090.02**									**219.38**	**2,053,508**	**960.88**				**288.30**	**1,262.74**		**0.98**	**4.29**	**1,494,141**	

[a] Coating usage is calculated as follows: C = (A_1 * total parts per year) + (A_2 * total bodies per year)
[b] VOC emissions from the booth are calculated as follows: L = C *D * (F + (1-F) * G * (H * (1 - I) + (1-H))
[c] VOC emissions from the oven are calculated as follows: M = C * D * (1 - F) * (J * (1 - K))
[d] Hourly emissions are calculated by dividing the annual emissions in tons/yr by the operating hours/yr, and multiplying by 2000 lb/ton.
[e] Annual Uncontrolled PM emissions are calculated as follows: U = (B * Q * C / 2000) * (1 - S)
[f] Annual Controlled PM emissions are calculated as follows: X = (B * Q * C / 2000) * (1 - V) * (1 - S)
[g] GACS per year is calculated as follows: Y = C * R * S
[h] Lb VOC/GACS is calculated as follows: Z = O / Y
[i] A safety factor of 10% was added to the VOC content of the material.
[j] Spot repair application rates are assumed to be equal to 1% of the application rate of the corresponding coating for a full vehicle body for every eighth vehicle. Assembly repair rates are assumed to be equal to 3.1% of the application rate of the corresponding coating for a full vehicle body for every tenth vehicle.
[k] Worst case spot repair and assembly repair for VOC emissions comes from basecoat and clearcoat application. Worst case spot repair and assembly repair for PM emissions comes from topcoat (monocoat) application.

gal/year = gal/unit x units/year
Before Controls (tpy) = gal/year x voc lbs/gal
After Controls (tpy) = Before Controls (tpy) x (1-(capture x destruction efficiency))
gacs/year = gal/year x volume solids x te
lbs voc/gacs =(lbs voc/year) / (gacs/year)

tpy = tons/year
te = (paint solids) transfer efficiency
cap -capture efficiency
gacs - gallon applied coating solids

Paint Shop Coating HAP Emissions - Excluding E-Coat Spot Repair

Total VOC Entering Process [a] (lb/yr)	Solids Application [a] (GACS/yr)	Controlled VOC Emissions [a] (lb/yr)	Lbs HAP per GACS [b]	Uncont. HAP Emissions (lb/yr)	Annual Rate, Uncont. HAP [c] (tpy)	Controlled HAP Emissions (lb/yr)	Annual Rate, HAP Out [c] (tpy)
6,180,043	1,494,141	2,053,508	0.50	2,248,313	1,124.16	747,071	373.54

[a] Calculated in Paint Shop Coating Tab.

[b] Combined HAP emission limit for Paint Shop Primecoat (E-coat), Guidecoat, Topcoat, and Purge Solvent Operations per 40 CFR 63 Subpart IIII because emissions are routed to a control device with greater than a 95% destruction efficiency.

[c] Potential hours are based on operation 24 hrs/day, 365 days/yr.

Underbody Coating VOC Emissions

Area/Process	Material Usage per Vehicle [a] (gal/veh)	Material Density [b] (lb/gal)	Material VOC Content [b] %	Application Area Emissions [d] %	Oven Emissions [d] %	Oven RTO Control Efficiency %	Maximum Annual Production Phase 1 (veh/yr)	Maximum Annual Production Phase 2 (veh/yr)	Maximum Annual Production Phase 3 (veh/yr)	Application Area VOC Emission Rates Phase 1 (tpy)	Application Area VOC Emission Rates Phase 2 (tpy)	Application Area VOC Emission Rates Phase 3 (tpy)	Oven VOC Emission Rates Phase 1 (tpy)	Oven VOC Emission Rates Phase 2 (tpy)	Oven VOC Emission Rates Phase 3 (tpy)	Total Uncontrolled VOC Emission Rates Phase 1 (tpy)	Total Uncontrolled VOC Emission Rates Phase 2 (tpy)	Total Uncontrolled VOC Emission Rates Phase 3 (tpy)	Total Controlled VOC Emission Rates Phase 1 (tpy)	Total Controlled VOC Emission Rates Phase 2 (tpy)	Total Controlled VOC Emission Rates Phase 3 (tpy)
Underbody Coating	0.185	11.684	36%	40%	60%	95%	50,544	74,880	146,000	7.93	11.75	22.90	0.59	0.88	1.72	19.82	29.36	57.25	8.52	12.63	24.62
Total										**7.93**	**11.75**	**22.90**	**0.59**	**0.88**	**1.72**	**19.82**	**29.36**	**57.25**	**8.52**	**12.63**	**24.62**

Underbody Coating PM Emissions

Process	Material Usage per Vehicle [a] (gal/veh)	Material Density [b] (lb/gal)	Weight % Solids [b] %	Transfer Efficiency [c] %	Maximum Annual Production Phase 1 (veh/yr)	Maximum Annual Production Phase 2 (veh/yr)	Maximum Annual Production Phase 3 (veh/yr)	Filter Efficiency (%)	Uncontrolled $PM/PM_{10}/PM_{2.5}$ Emissions Phase 1 (tpy)	Uncontrolled $PM/PM_{10}/PM_{2.5}$ Emissions Phase 2 (tpy)	Uncontrolled $PM/PM_{10}/PM_{2.5}$ Emissions Phase 3 (tpy)	Controlled $PM/PM_{10}/PM_{2.5}$ Emissions[4] Phase 1 (tpy)	Controlled $PM/PM_{10}/PM_{2.5}$ Emissions[4] Phase 2 (tpy)	Controlled $PM/PM_{10}/PM_{2.5}$ Emissions[4] Phase 3 (tpy)
Underbody Coating	0.185	11.684	67%	50%	50,544	74,880	146,000	98.5%	18.24	27.03	52.69	0.27	0.41	0.79
Total									**18.24**	**27.03**	**52.69**	**0.27**	**0.41**	**0.79**

[a] Material usage per vehicle estimate was provided by Mercedes on 2/4/2017 as 0.7 L/vehicle. Value was convetered to gallons per vehicle using a conversion factor of 0.264172 gal/L.
[b] Based on BASF Primer UniBloc Solventborne primer.
[c] Transfer efficiency is assumed based on industry knowledge of underbody coating.
[d] BASF provided the application area/oven emission breakdown to Mercedes which was relayed on 1/4/2017 to Trinity Consultants as 37.5% of VOC emitted during application, and 62.5% emitted in the oven. Mercedes conservatively estimates that 40% is emitted during application.
[e] Annual operating hours assumed to be 8,760 hours per year.

Underbody Coating HAP/TAP Emissions

Material Usage per vehicle [a]	Material Density [b]	Application Area Emissions [c]	Oven Emissions [c]	Oven RTO Control Efficiency	Maximum Annual Production		
					Phase 1	Phase 2	Phase 3
(gal/veh)	(lb/gal)	%	%	%	(veh/yr)	(veh/yr)	(veh/yr)
0.185	11.684	40%	60%	95%	50,544	74,880	146,000

Underbody Coating HAP/TAP Emissions

Pollutant	CAS Number	Emission Factor [d] (%)	HAP?	TAP?	Application Area HAP Emissions (tpy)			Controlled Oven HAP Emissions (tpy)			Controlled HAP Emissions (tpy)		
			(Y/N)	(Y/N)	Phase 1	Phase 2	Phase 3	Phase 1	Phase 2	Phase 3	Phase 1	Phase 2	Phase 3
Naphtha	64742956	10%	N	N	-	-	-	-	-	-	-	-	-
Xylene	1330207	7%	Y	Y	1.53	2.26	4.42	0.11	0.17	0.33	1.64	2.43	4.75
1,2,4-trimethylbenzene	95636	5%	N	N	-	-	-	-	-	-	-	-	-
n-Butylacetate	123864	5%	N	N	-	-	-	-	-	-	-	-	-
2-Butoxyethyl Acetate	112072	3%	Y	N	0.66	0.97	1.89	0.05	0.07	0.14	0.70	1.04	2.03
n-Butanol	71363	2.5%	N	N	-	-	-	-	-	-	-	-	-
Mesitylene	108678	2%	N	N	-	-	-	-	-	-	-	-	-
n-Propylbenzene	103651	2%	N	N	-	-	-	-	-	-	-	-	-
Ethyl Benzene	100414	2%	Y	Y	0.44	0.65	1.26	0.03	0.05	0.09	0.47	0.70	1.36
Isopropylbenzene (Cumene)	98828	1%	Y	Y	0.22	0.32	0.63	0.02	0.02	0.05	0.23	0.35	0.68
Cyclohexane	110827	0.3%	N	N	-	-	-	-	-	-	-	-	-
Total Underbody Coating HAP Emissions					**2.84**	**4.21**	**8.20**	**0.21**	**0.32**	**0.62**	**3.05**	**4.52**	**8.82**

[a] Material usage per vehicle estimate was provided by Mercedes on 2/4/2017 as 0.7 L/vehicle. Value was convetered to gallons per vehicle using a conversion factor of 0.264172 gal/L.
[b] Based on BASF Primer UniBloc Solventborne primer.
[c] BASF provided the application area/oven emission breakdown to Mercedes which was relayed on 1/4/2017 to Trinity Consultants as 37.5% of VOC emitted during application, and 62.5% emitted in the oven. Mercedes conservatively estimates that 40% is emitted during application.
[d] Emission factors are from Section 3 Composition/Information on Ingredients on BASF UniBloc MB7746 silvergrey SDS (Revised 02/23/2015). HAP/TAP emissions assume that the maximum amount of each component is emitted.

E-Coat Spot Repair VOC Emissions

Area/Process	Material Usage per Vehicle[a] (gal/veh)	Material Density[b] (lb/gal)	Material VOC Content[b] (lb/gal)	Application Area Emissions %	Maximum Annual Production Phase 1 (veh/yr)	Phase 2 (veh/yr)	Phase 3 (veh/yr)	Application Area VOC Emission Rates Phase 1 (tpy)	Phase 2 (tpy)	Phase 3 (tpy)
E-Coat Spot Repair	3.71E-04	11.684	6.00	100%	50,544	74,880	146,000	0.66	0.08	0.16
Total								**0.66**	**0.08**	**0.16**

E-Coat Spot Repair PM Emissions

Process	Material Usage per Vehicle[a] (gal/veh)	Material Density[b] (lb/gal)	Weight % Solids[b] %	Volume % Solids %	Transfer Efficiency[c] %	Maximum Annual Production Phase 1 (veh/yr)	Phase 2 (veh/yr)	Phase 3 (veh/yr)	Uncontrolled $PM/PM_{10}/PM_{2.5}$ Emissions Phase 1 (tpy)	Phase 2 (tpy)	Phase 3 (tpy)	GACS per Year Phase 1 (tpy)	Phase 2 (tpy)	Phase 3 (tpy)
E-Coat Spot Repair	3.71E-04	11.684	67%	50.9%	40%	50,544	74,880	146,000	0.04	0.07	0.13	3.81	5.65	11.02
Total									**0.04**	**0.07**	**0.13**	**3.81**	**5.65**	**11.02**

[a] The material usage per vehicle was provided by Jae Park (Plant Engineer) via e-mail on 1/30/2017. The material usage per vehicle includes a 10% safety factor.

[b] Material density, VOC and solids content are based on BASF Primer UniBloc Solventborne primer.

[c] Transfer efficiency is assumed based on industry knowledge.

[d] Annual operating hours is assumed to be 8,760 hours per year.

Paint Shop Coating HAP Emissions - E-Coat Spot Repair HAP/TAP

Total VOC Entering Process [a] (lb/yr)	Solids Application [a] (GACS/yr)	Controlled VOC Emissions [a] (lb/yr)	Lbs HAP per GACS [b]	Uncont. HAP Emissions (lb/yr)	Annual Rate, Uncont. HAP [c] (tpy)	Controlled HAP Emissions (lb/yr)	Annual Rate, HAP Out [c] (tpy)
325	11	325	0.50	6	0.00	6	2.75E-03

[a] Calculated in Paint Shop Coating Tab.

[b] Combined HAP emission limit for Paint Shop Primecoat (E-coat), Guidecoat, Topcoat, and Purge Solvent Operations per 40 CFR 63 Subpart IIII because emissions are routed to a control device with greater than a 95% destruction efficiency.

[c] Potential hours are based on operation 24 hrs/day, 365 days/yr.

Paint Shop Adhesive Application Emissions

Welding area	Material Usage per vehicle	Uncontrolled VOC Emission Factor [a]	Hourly Production Rate	Maximum Annual production	Uncontrolled VOC Emissions [b]		
	(lb/veh)	(%)	(veh/hr)	(veh/yr)	(lb/hr)	(lb/yr)	(tpy)
Anti-flutter adhesive	6.61	1%	17	146,000	1.10	9,656.15	4.83
Structure adhesive	4.41	1%	17	146,000	0.73	6,437.43	3.22
Total					**1.84**	**16,093.58**	**8.05**

[a] From manufacturer's SDS, all body shop adhesives have >99% solids content. Mercedes-Benz Vans conservatively assumes VOC content of 1% for all adhesives.

[b] Mercedes-Benz Vans assumes that adhesive applied following the topcoat oven will be performed on an open workdeck (i.e. without control).

Paint Shop Combustion - Natural Gas Emission Factors

Hours of Operation [e] 8,760 hrs

Pollutant		NG Emission Factors [a,b,c] (lb/MMBtu)
$PM/PM_{10}/PM_{2.5}$		0.0074
SO_2		0.0006
NO_X (low-NO_X)		0.0487
NO_X		0.0975
CO		0.0819
VOC		0.0054
CO_2e [d]		
	CO_2	117.00
	CH_4	2.21E-03
	N_2O	2.21E-04

[a] PM, SO_2, and VOC natural gas emission factors are from AP-42, Table 1.4-2, 07/98.
[b] NO_X and CO natural gas emission factors are from AP-42, Table 1.4-1, 07/98.
[c] The heating value of natural gas is assumed to be 1,026 Btu/scf.
[d] Emission factors from 40 CFR 98, Subpart C, Tables C-1 and C-2. Factors were converted to lb/MMBtu.

Paint Shop Combustion Non-HAP Emissions

			Emission Rates [e]																	
		Rated Capacity	$PM/PM_{10}/PM_{2.5}$		SO_2		NO_X		CO		VOC		CO_2		CH_4		N_2O		CO_2e	
Description	Equipment	(MMBtu/hr)	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
RTO #1 [f]	RTO1	8.00	0.06	0.26	0.005	0.020	0.78	3.42	0.65	2.87	0.04	0.19	935.98	4,100	0.018	0.077	0.002	0.008	936.95	4,104
RTO #1 (add) [f,g]	RTO1	8.00	0.06	0.26	0.005	0.020	0.78	3.42	0.65	2.87	0.04	0.19	935.98	4,100	0.018	0.077	0.002	0.008	936.95	4,104
ADW Desorption Heater #1	ADH1	3.50	0.03	0.11	0.002	0.009	0.17	0.75	0.29	1.26	0.02	0.08	409.49	1,794	0.008	0.034	0.001	0.003	409.91	1,795
ADW Desorption Heater #2	ADH2	2.13	0.02	0.07	0.001	0.005	0.10	0.45	0.17	0.76	0.01	0.05	249.20	1,092	0.005	0.021	0.000	0.002	249.46	1,093
E-Coat Oven	OV01	4.85	0.04	0.16	0.003	0.012	0.24	1.04	0.40	1.74	0.03	0.11	567.44	2,485	0.011	0.047	0.001	0.005	568.02	2,488
Primer (Guidecoat) Oven #1	OV02	4.30	0.03	0.14	0.003	0.011	0.21	0.92	0.35	1.54	0.02	0.10	503.09	2,204	0.009	0.042	0.001	0.004	503.61	2,206
Topcoat Oven #1	OV03	4.27	0.03	0.14	0.002	0.011	0.21	0.91	0.35	1.53	0.02	0.10	499.58	2,188	0.009	0.041	0.001	0.004	500.09	2,190
Primer (Guidecoat) Oven #2	OV22	5.12	0.04	0.17	0.003	0.013	0.25	1.09	0.42	1.84	0.03	0.12	599.03	2,624	0.011	0.049	0.001	0.005	599.64	2,626
Topcoat Oven #2	OV23	5.73	0.04	0.19	0.003	0.015	0.28	1.22	0.47	2.05	0.03	0.13	670.39	2,936	0.013	0.055	0.001	0.006	671.09	2,939
Total		**45.90**	**0.34**	**1.49**	**0.03**	**0.12**	**3.02**	**13.21**	**3.76**	**16.46**	**0.25**	**1.08**	**5,370.18**	**23,521**	**0.10**	**0.44**	**0.01**	**0.04**	**5,375.72**	**23,546**

[e] Annual emissions are based on paint shop hours of operation.
[f] NO_X emissions for RTOs calculated using the natural gas emission factors from AP-42, Table 1.4-1, 07/98, Small Boilers (uncontrolled). NO_X emissions from the remaining combustion units are calculated using the AP-42, Table 1.4-1 factor for small boilers (controlled - Low NOx burners).
[g] Phase II or III RTO will replace Phase I RTO (RTO #1 @ 8 MMBtu/hr), with a new unit that has 8 MMBtu/hr additional heat input, for a total of 16 MMBtu/hr. Emissions include combustion emissions from both RTO #1 and RTO #1 (add).

Hours of Operation [a]	8,760	hrs
Total Rated Capacity	45.90	MMBtu/hr

Paint Shop Combustion HAP/TAP Emissions

Pollutants	NG Emission Factor [b] lb/10^6 scf	HAP/TAP	
		lb/hr	tpy
2-Methylnaphthalene	2.40E-05	1.07E-06	4.70E-06
3-Methylchloranthrene	1.80E-06	8.05E-08	3.53E-07
7,12-Dimethylbenz(a)anthracene	1.60E-05	7.16E-07	3.14E-06
Acenaphthene	1.80E-06	8.05E-08	3.53E-07
Acenaphthylene	1.80E-06	8.05E-08	3.53E-07
Anthracene	2.40E-06	1.07E-07	4.70E-07
Benz(a)anthracene	1.80E-06	8.05E-08	3.53E-07
Benzene	2.10E-03	9.39E-05	4.11E-04
Benzo(a)pyrene	1.20E-06	5.37E-08	2.35E-07
Benzo(b)fluoranthene	1.80E-06	8.05E-08	3.53E-07
Benzo(g,h,i)perylene	1.20E-06	5.37E-08	2.35E-07
Benzo(k)fluoranthene	1.80E-06	8.05E-08	3.53E-07
Chrysene	1.80E-06	8.05E-08	3.53E-07
Dibenzo(a,h)anthracene	1.20E-06	5.37E-08	2.35E-07
Dichlorobenzene	1.20E-03	5.37E-05	2.35E-04
Fluoranthene	3.00E-06	1.34E-07	5.88E-07
Fluorene	2.80E-06	1.25E-07	5.49E-07
Formaldehyde	7.50E-02	3.36E-03	1.47E-02
Hexane	1.80E+00	8.05E-02	3.53E-01
Indeno(1,2,3-cd)pyrene	1.80E-06	8.05E-08	3.53E-07
Naphthalene	6.10E-04	2.73E-05	1.20E-04
Phenanathrene	1.70E-05	7.61E-07	3.33E-06
Pyrene	5.00E-06	2.24E-07	9.80E-07
Toluene	3.40E-03	1.52E-04	6.66E-04
Arsenic	2.00E-04	8.95E-06	3.92E-05
Beryllium	1.20E-05	5.37E-07	2.35E-06
Cadmium	1.10E-03	4.92E-05	2.16E-04
Chromium	1.40E-03	6.26E-05	2.74E-04
Cobalt	8.40E-05	3.76E-06	1.65E-05
Lead	5.00E-04	2.24E-05	9.80E-05
Manganese	3.80E-04	1.70E-05	7.45E-05
Mercury	2.60E-04	1.16E-05	5.09E-05
Nickel	2.10E-03	9.39E-05	4.11E-04
Selenium	2.40E-05	1.07E-06	4.70E-06

[a] Annual emissions are based on paint shop hours of operation.

[b] Natural Gas Emission Factors are from AP-42 Section 1.4, Tables 1.4-2, 1.4-3, and 1.4-4.

Controlled Particulate Emissions from Sources Routed to Dry X

Description	Exhaust Flow Rate (m^3/hr)	Hours of Operation (hr/yr)	Outlet PM Loading [a] (mg/m^3)	Percent Recycled (%)	Potential $PM/PM_{10}/PM_{2.5}$ Emissions [b] (lb/hr)	(tpy)
Primer-Surfacer	157,352	8,760	1	73%	0.09	0.41
Primer-Surfacer 2	64,721	8,760	1	73%	0.04	0.17
Basecoat/Clearcoat	324,643	8,760	1	73%	0.19	0.85
Basecoat/Clearcoat 2	133,529	8,760	1	73%	0.08	0.35

[a] Manufacturer specification for outlet of PM separation system (Dry X).

[b] All PM is assumed to be equal to PM_{10} and $PM_{2.5}$. Annual emissions are based on paint shop hours of operation.

[c] Emissions (lb/hr) = Exhaust Flow (m^3/hr) * Outlet Loading (mg/m^3) * Conversion Factor (1 lb/453,592 mg) * (1-Percent Recycled (%))

Purge Solvent Emissions

Process	Usage Rate	Number of Units [a]	Hours of Operation	Annual Usage [b]	Recovery Rate	Non-Recovered Solvent	Solvent Density [c]	VOC Content [c]	HAP Content [c]	Capture & Control: Percent Lost	Capture & Control: Booth Capture	Capture & Control: ADW Capture	Capture & Control: Booth Control Eff.	Uncontrolled Total VOC		Controlled Total VOC		Total HAP	
	(gal/unit)	(units/yr)	(hrs/yr)	(gal/yr)	%	(gal/yr)	(lb/gal)	(lb/gal)	(lb/gal)	%	%		%	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
Primer	0.34	160,600	8,760	55,154	65%	19,304	7.26	7.26	0.76	20%	80%	90%	95%	16.00	70.08	5.06	22.14	0.53	2.33
Basecoat	0.40	160,600	8,760	63,639	65%	22,274	7.26	7.26	0.76	20%	80%	90%	95%	18.46	80.86	5.83	25.55	0.61	2.69
Clearcoat	0.40	160,600	8,760	63,639	65%	22,274	7.26	7.26	0.76	20%	80%	90%	95%	18.46	80.86	5.83	25.55	0.61	2.69
Repair	0.11	160,600	8,760	16,970	65%	5,940	7.26	7.26	0.76	0%	100%	0%	0%	4.92	21.56	4.92	21.56	0.52	2.27
Total														**57.84**	**253.36**	**21.65**	**94.81**	**2.28**	**9.97**

[a] The number of units for primer, basecoat, and clearcoat includes major repairs sent back through the paint shop equivalent to 10% of the maximum production per year.

[b] The annual usage conservatively assumes that the lines are purged after each unit in each booth.

[c] Information provided in purge solvent SDS.

Paint Shop Phosphate Cleaner Calculation Information [a]

Supply (Inlet) Air		
Temperature	75	°F
Humidity	50	% RH
Moisture Content	0.0092	lb H_2O/lb air
Exhaust (Outlet) Air		
Temperature	63	°F
Humidity	95	% RH
Moisture Content	0.012	lb H_2O/lb air
Flow Rate	21,761	ft^3/min
Density of Air at 63 °F	0.0757	lb/ft^3
Phosphate Cleaner		
Dissolved Solids	0.5	%
Hours of Operation [b]	8,760	hr/yr
Control Efficiency [c]	55	%

[a] Reduction in PM emissions through use of mist eliminators.
[b] Paint shop annual hours of operation.
[c] Mist eliminator control efficiency.

Paint Shop Phosphate Cleaner Emissions

Phosphate Cleaner Emissions	$PM/PM_{10}/PM_{2.5}$	
	Uncontrolled	**Controlled**
Hourly (lb/hr)	1.38	0.62
Annual (tpy)	6.06	2.73

Sample Calculation:

Uncontrolled PM Emissions = $\frac{(0.012 - 0.0092)\ \text{lb}\ H_2O}{\text{lb air}} \times \frac{0.5\ \text{lb solids}}{100\ \text{lb}\ H_2O} \times \frac{12{,}000\ \text{ft}^3\ \text{air}}{\text{min}} \times \frac{0.0757\ \text{lb air}}{\text{scf air}} \times \frac{60\ \text{min}}{\text{hour}}$

Uncontrolled PM Emissions = 1.38 lb/hr

Controlled PM Emissions = $\frac{(0.76\ \text{lb PM})}{\text{hr}} \times \frac{(100 - 55)}{100}$ = 0.62 lb/hr

Appendix B.2.4 - Paint Shop
Mercedes-Benz Vans, LLC

Paint Mix Room Emissions

Paint Shop Material Usage Rates

Process/Material	Usage (gal/yr)
E-coat	608,776
Seam Sealer	102,751
Underbody PVC	695,022
Sika Sealing	6,201
(SAM) Sound Deadener Adhesive	154,277
Primer-Surfacer	300,724
Basecoat	387,891
Clearcoat	521,256
Spot Repair	6,157
Cavity Wax	115,249
Purge Solvent	199,403
Facility Total	2,488,930

vapor (I.e. partial) pressure of toluene	0.468	psia	P_{atm}
molecular weight of toluene	92.130	lb/lb-mole	MW
atmosphereic vapor pressure	14.700	psia	$P_{toluene}$
ideal gas constant - R	10.730	ft^3-psia/lb-mole-°R	
absolute temperature	532	°R	T
vapor density = MW*n/V = MW*P/R*T	0.237	lb/ft^3	n = 1
volume of displaced toluene-saturated air	2,488,930	gallons	
volume of displaced toluene-saturated air	332,745	ft^3	vol. displaced air
volume of displaced toluene	10,594	ft^3	vol. displaced air * $P_{toluene}/P_{atm}$
vapor density = MW*n/V = MW*P/R*T	0.2373	lb/ft^3	

Paint Shop Hours of Operation	8,760	hr/yr
Total VOC Emissions	0.29	lb/hr
Total VOC Emissions	**1.26**	**tpy**

Workdecks - Insignificant Activity Emissions

	Potential $PM/PM_{10}/PM_{2.5}$ Emissions				
Booth/Zone	Exhaust Volume (scfm) [a,b]	PM Loading (gr/10^3 dscf) [c]	Hours of Operation (hr/yr)	Hourly (lb/hr)	Annual (ton/yr) [c]
E-coat Sand	62,978	0.1	8,760	0.05	0.24
Primer Sand	62,978	0.1	8,760	0.05	0.24
Metal/Body Repair #1	6,474	0.1	8,760	0.01	0.02
Metal/Body Repair #2	6,474	0.1	8,760	0.01	0.02
E-coat Touch-up	21,189	0.1	8,760	0.02	0.08
Primer Touch-up	21,189	0.1	8,760	0.02	0.08
Basecoat Touch-up	21,189	0.1	8,760	0.02	0.08
Inspect/Polish	84,167	0.1	8,760	0.07	0.32
Total				**0.25**	**1.08**

[a] Calculation assumes exhaust volume is on a dry basis.

[b] Exhaust volumes provided by equipment manufacturer.

[c] Estimated outlet PM loading for workdeck operations.

[d] Based on paint shop annual hours of operation: 8,760 hrs/yr

Sample Calculations (for E-Coat Sand)

PM Emissions (lb/hr) = $\frac{62{,}978 \text{ scf}}{\text{min}} \times \frac{0.1 \text{ grains}}{1000 \text{ dscf}} \times \frac{60 \text{ min}}{\text{hr}} \times \frac{1 \text{ lb}}{7000 \text{ gr.}}$ = **0.05 lb/hr**

PM Emissions (tons/yr) = $\frac{0.05398104 \text{ lb}}{\text{hr}} \times \frac{8{,}760 \text{ hr}}{\text{yr}} \times \frac{\text{ton}}{2000 \text{ lb}}$ = **0.24 ton/yr**

Mercedes-Benz Vans, LLC

Body Shop Welding Emissions

Area/Process	Welding Material Usage per Vehicle		Material Usage per vehicle (lb/veh)	Uncontrolled PM Emission Factor [a] (lb/1000 lb)	Hourly Production Rate (veh/hr)	Maximum Annual Production (veh/yr)	Control Efficiency [b] %	Building Capture Efficiency %	Uncontrolled $PM/PM_{10}/PM_{2.5}$ Emissions [c] (lb/hr)	(lb/yr)	(tpy)	Controlled $PM/PM_{10}/PM_{2.5}$ Emission [c] (lb/hr)	(lb/yr)	(tpy)
MAG Welding	8,000	mm	0.30	20	17	146,000	95%	90%	1.00E-02	8.80E+01	4.40E-02	5.02E-04	4.40E+00	2.20E-03
Spot Welding	9,000	spots	0.34	20	17	146,000	0%	90%	1.13E-02	9.90E+01	4.95E-02	1.13E-02	9.90E+01	4.95E-02
Laser Welding	28,000	mm	1.05	20	17	146,000	0%	90%	3.52E-02	3.08E+02	1.54E-01	3.52E-02	3.08E+02	1.54E-01
Laser Soldering	9,000	mm	0.34	20	17	146,000	0%	90%	1.13E-02	9.90E+01	4.95E-02	1.13E-02	9.90E+01	4.95E-02
Total									**6.78E-02**	**5.94E+02**	**2.97E-01**	**5.83E-02**	**5.10E+02**	**2.55E-01**

[a] Average emission factor for welding and soldering at the facility is conservatively assumed to be 20 lb/1000 lb.

[b] Based on ESP control for MAG welding processes.

[c] A building capture efficiency of 90% is assumed for the body shop for both uncontrolled and controlled emissions based on building enclosure capture efficiency provided in Texas Commission on Environmental Quality, Rock Crushing Plants, Table 7, February, 2002. All welding and soldering operations are done inside the building.

Body Shop Welding HAP Emissions

Area/Process	Manganese Content %	lb/hr	tpy
MAG Welding	1.45	7.28E-06	3.19E-05
Spot Welding	0.0	0.00E+00	0.00E+00
Laser Welding	1.2	4.22E-04	1.85E-03
Laser Soldering	1.2	1.36E-04	5.94E-04
	Total	5.65E-04	2.47E-03

Welding Shield Gas CO_2 Emissions

Usage per Vehicle (kg)	Hourly Production Rate (veh/hr)	Maximum Annual Production (veh/yr)	CO_2 Content [a] %	CO_2 Emissions (lb/hr)	(tpy)
2.00	17	146,000	15%	1.10E+01	4.83E+01

[a] Based on Mercedes-Benz Vans shield gas specification.

Body Shop Adhesive Bonding Emissions

Welding area		Material Usage per vehicle (lb/veh)	Uncontrolled VOC Emission Factor [a] (%)	Hourly Production Rate (veh/hr)	Maximum Annual production (veh/yr)	Uncontrolled VOC Emissions (lb/hr)	(lb/yr)	(tpy)	Controlled VOC Emissions [b] (lb/hr)	(lb/yr)	(tpy)
Anti-flutter adhesive		6.61	1%	17	146,000	1.10	9,656.15	4.83	0.06	482.81	0.24
Structure adhesive		4.41	1%	17	146,000	0.73	6,437.43	3.22	0.04	321.87	0.16
Total						**1.84**	**16,093.58**	**8.05**	**0.09**	**804.68**	**0.40**

[a] From manufacturer's SDS, all body shop adhesives have >99% solids content. Mercedes-Benz Vans conservatively assumes VOC content of 1% for all adhesives.

[b] Mercedes-Benz Vans assumes 95% reduction in VOC emissions when body shop adhesives volatilize in the E-Coat oven.

Sample Calculations (for MAG Welding)

Material Usage (lb/veh) = $\pi \times r^2 \times$ Weld Length (mm) ÷ 10^3 × Material Specific Gravity (g/cm^3) ÷ 453.59 g/lb

Material Usage (lb/veh) = $\pi \times (0.8\text{ mm})^2 \times 8{,}000\text{ mm} \div 10^3 \times (8.5\text{ g/cm}^3) \div 453.59$ g/lb = **0.30** **lb/veh**

PM Emissions (lb/yr) = $\frac{0.30\text{ lb}}{\text{veh}} \times \frac{20\text{ lb}}{1000\text{ lb}} \times \frac{146{,}000\text{ veh}}{\text{yr}} \times (1-95\%) \times (1-90\%)$ = **4.401** **lb/yr**

PM Emissions (tons/yr) = $\frac{4.401\text{ lb}}{\text{yr}} \times \frac{1\text{ ton}}{2000\text{ lb}}$ = **0.002** **ton/yr**

Assembly Combustion - Natural Gas Emission Factors

Hours of Operation [e] 8,760 hrs

Pollutant		NG Emission Factors [a,b,c]	Units
$PM/PM_{10}/PM_{2.5}$		0.0074	lb/MMBtu
SO_2		0.0006	lb/MMBtu
NO_X		0.097	lb/MMBtu
CO		0.082	lb/MMBtu
VOC		0.0054	lb/MMBtu
CO_2e [d]			
	CO_2	117.00	lb/MMBtu
	CH_4	2.21E-03	lb/MMBtu
	N_2O	2.21E-04	lb/MMBtu

[a] PM, SO_2, and VOC natural gas emission factors are from AP-42, Table 1.4-2, 07/98.
[b] NO_X and CO natural gas emission factors are from AP-42, Table 1.4-1, 07/98, Small Boilers (uncontrolled).
[c] The heating value of natural gas is assumed to be 1,026 Btu/scf.
[d] Emission factors from 40 CFR 98, Subpart C, Tables C-1 and C-2. Factors were converted to lb/MMBtu.

Assembly Combustion Non-HAP Emissions

Description	Equipment	Rated Capacity (MMBtu/hr)	Emission Rates [e]																	
			$PM/PM_{10}/PM_{2.5}$		SO_2		NO_X		CO		VOC		CO_2		CH_4		N_2O		CO_2e	
			lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
Assembly Oven	OV04	4.30	0.03	0.14	0.003	0.011	0.42	1.84	0.35	1.54	0.02	0.10	503.09	2,203.53	0.009	0.042	0.0009	0.004	503.61	2,205.80
Total		**4.30**	**0.03**	**0.14**	**0.003**	**0.011**	**0.42**	**1.84**	**0.35**	**1.54**	**0.02**	**0.10**	**503.09**	**2,203.53**	**0.009**	**0.042**	**0.0009**	**0.004**	**503.61**	**2,205.80**

[e] Hours of operation for unrestricted emission calculations are 8,760.

Assembly Combustion HAP/TAP Emissions

Pollutants	NG Emission Factor[a] lb/10^6 scf	Total Emissions[b] lb/hr	tpy
2-Methylnaphthalene	2.40E-05	1.01E-07	4.41E-07
3-Methylchloranthrene	1.80E-06	7.54E-09	3.30E-08
7,12-Dimethylbenz(a)anthracene	1.60E-05	6.71E-08	2.94E-07
Acenaphthene	1.80E-06	7.54E-09	3.30E-08
Acenaphthylene	1.80E-06	7.54E-09	3.30E-08
Anthracene	2.40E-06	1.01E-08	4.41E-08
Benz(a)anthracene	1.80E-06	7.54E-09	3.30E-08
Benzene	2.10E-03	8.80E-06	3.85E-05
Benzo(a)pyrene	1.20E-06	5.03E-09	2.20E-08
Benzo(b)fluoranthene	1.80E-06	7.54E-09	3.30E-08
Benzo(g,h,i)perylene	1.20E-06	5.03E-09	2.20E-08
Benzo(k)fluoranthene	1.80E-06	7.54E-09	3.30E-08
Chrysene	1.80E-06	7.54E-09	3.30E-08
Dibenzo(a,h)anthracene	1.20E-06	5.03E-09	2.20E-08
Dichlorobenzene	1.20E-03	5.03E-06	2.20E-05
Fluoranthene	3.00E-06	1.26E-08	5.51E-08
Fluorene	2.80E-06	1.17E-08	5.14E-08
Formaldehyde	7.50E-02	3.14E-04	1.38E-03
Hexane	1.80E+00	7.54E-03	3.30E-02
Indeno(1,2,3-cd)pyrene	1.80E-06	7.54E-09	3.30E-08
Naphthalene	6.10E-04	2.56E-06	1.12E-05
Phenanathrene	1.70E-05	7.12E-08	3.12E-07
Pyrene	5.00E-06	2.10E-08	9.18E-08
Toluene	3.40E-03	1.42E-05	6.24E-05
Arsenic	2.00E-04	8.38E-07	3.67E-06
Beryllium	1.20E-05	5.03E-08	2.20E-07
Cadmium	1.10E-03	4.61E-06	2.02E-05
Chromium	1.40E-03	5.87E-06	2.57E-05
Cobalt	8.40E-05	3.52E-07	1.54E-06
Lead	5.00E-04	2.10E-06	9.18E-06
Manganese	3.80E-04	1.59E-06	6.98E-06
Mercury	2.60E-04	1.09E-06	4.77E-06
Nickel	2.10E-03	8.80E-06	3.85E-05
Selenium	2.40E-05	1.01E-07	4.41E-07

[a] Natural Gas Emission Factors are from AP-42 Section 1.4, Tables 1.4-2, 1.4-3, and 1.4-4.
[b] Hours of operation for unrestricted emission calculations are 8,760.

Hours of Operation[b]	8,760	hrs
Total Rated Capacity	4.30	MMBtu/hr

Assembly Glazing VOC Emissions

Area/Process	Material Usage per vehicle		Uncontrolled VOC Emission Factor [a]	Hourly Production Rate	Maximum Annual Production	Product Usage	Potential VOC Emissions		
	(kg/veh)	(lb/veh)	(%)	(veh/hr)	(veh/yr)	(lb/yr)	(lb/hr)	(lb/yr)	(tpy)
Primer 1	0.04	0.09	65%	19	164,250	14,595	1.08	9,486.75	4.74
Primer 2	0.08	0.19	64%	19	164,250	30,510	2.23	19,526.34	9.76
Adhesive	2.75	6.06	0%	19	164,250	995,971	0.00	0.00	0.00
Total							**3.31**	**29,013.09**	**14.51**

HAP/TAP Potential Emissions

Area/Process	Material Usage per vehicle		Constituent Chemical Name	CAS#	Uncontrolled Component Emission Factor [a]	Hourly Production Rate	Maximum Annual Production	Potential Emission Rates		
Area/Process	(kg/veh)	(lb/veh)			(%)	(veh/hr)	(veh/yr)	(lb/hr)	(lb/yr)	(tpy)
Primer 1	0.04	0.09	MEK	78-93-3	60%	19	164,250	1.00	8,757.00	4.38
	0.04	0.09	MDI	101-68-8	1%	19	164,250	0.02	145.95	0.07
Primer 2	0.08	0.19	MEK	78-93-3	60%	19	164,250	2.09	18,305.94	9.15
			Acrylic acid	79-10-7	1%	19	164,250	0.03	305.10	0.15
Adhesive	2.75	6.06	N/A					0.00	0.00	0.00
Total								**3.14**	**27,513.99**	**13.76**

[a] Information provided in SDS for each material.

Assembly Under Body Wax Emissions

Area/Process	Material Usage per vehicle (lb/veh)	Uncontrolled VOC Emission Factor (%)	Hourly Production Rate (veh/hr)	Maximum Annual Production (veh/yr)	Product Usage (lb/year)	Potential VOC Emission Rates (lb/hr)	(lb/yr)	(tpy)
Under body wax	1.94	0.0%	19	164,250	318,656	0.00	0.00	0.00
Total						**0.00**	**0.00**	**0.00**

Spray Deck PM Emissions

Process	Material Usage per vehicle (lb/veh)	Weight % Volatiles (%)	Weight % Solids (%)	%Transfer Efficiency (%)	Production Rates (units/hr)	Filter Efficiency (%)	Uncontrolled $PM/PM_{10}/PM_{2.5}$ Emissions (lb/hr)	(lb/yr)	(tpy)	Controlled $PM/PM_{10}/PM_{2.5}$ Emissions (lb/hr)	(lb/yr)	(tpy)
Under body wax	1.94	0.0%	100.0%	90%	19	98.0%	3.64	31,865.64	15.93	0.07	637.31	0.32
Total							**3.64**	**31,865.64**	**15.93**	**0.07**	**637.31**	**0.32**

Appendix B.2.6 - Assembly Operations
Mercedes-Benz Vans, LLC

Assembly Filling Emissions

Product	Material Usage per Vehicle (liter/veh)	True Vapor Pressure, VP (psia)	Molecular Weight (g/mol)	Vehicle Throughput (veh/hr)	Vehicle Throughput (veh/yr)	Uncontrolled VOC Emission Rates (lb/hr)	Uncontrolled VOC Emission Rates (lb/yr)	Uncontrolled VOC Emission Rates (tpy)	Controlled VOC Emission Rates [a] (lb/hr)	Controlled VOC Emission Rates [a] (lb/yr)	Controlled VOC Emission Rates [a] (tpy)
Gasoline	18.9	7.4	66	19	164,250	1.08E+00	9.49E+03	4.74E+00	5.42E-02	4.74E+02	2.37E-01
Diesel fuel	18.9	0.01	130	19	164,250	2.88E-03	2.53E+01	1.26E-02	2.88E-03	2.53E+01	1.26E-02
Brake fluid	1.2	0.02	75	19	164,250	2.13E-04	1.86E+00	9.32E-04	2.13E-04	1.86E+00	9.32E-04
Antifreeze	9.0	0.02	62	19	164,250	1.31E-03	1.15E+01	5.73E-03	1.31E-03	1.15E+01	5.73E-03
Windshield Cleaner [b]	4.0	0.77	28.14	19	164,250	1.02E-02	8.89E+01	4.45E-02	1.02E-02	8.89E+01	4.45E-02
Differential Gear Oil	0.5	0.02	75	19	164,250	8.79E-05	7.70E-01	3.85E-04	8.79E-05	7.70E-01	3.85E-04
Auto Transmission Fluid	0.7	0.02	150	19	164,250	2.40E-04	2.10E+00	1.05E-03	2.40E-04	2.10E+00	1.05E-03
Power Steering Fluid	0.8	0.02	76	19	164,250	1.42E-04	1.24E+00	6.20E-04	1.42E-04	1.24E+00	6.20E-04
Total						**1.10E+00**	**9.62E+03**	**4.81E+00**	**6.92E-02**	**6.06E+02**	**3.03E-01**

[a] Assumes 95% control from onboard refueling vapor recovery (ORVR) for gasoline.

[b] From windshield cleaner MSDS, material contains 23% volatiles (methanol and ethylene glycol). VOC emissions calculated based on vapor pressure provided in the MSDS and molecular weight calculated as the weighted average of 23% ethylene glycol and 77% water.

HAP/TAP Emissions from Assembly Filling

Pollutant	Material Usage per Vehicle (liter/veh)	Component Emission Factor [a] (liter/veh)	True Vapor Pressure, VP (psia)	Molecular Weight (g/mol)	Vehicle Throughput (veh/hr)	Vehicle Throughput (veh/yr)	Uncontrolled HAP/TAP Emission Rates (lb/hr)	Uncontrolled HAP/TAP Emission Rates (lb/yr)	Uncontrolled HAP/TAP Emission Rates (tpy)	Controlled HAP/TAP Emission Rates (lb/hr)	Controlled HAP/TAP Emission Rates (lb/yr)	Controlled HAP/TAP Emission Rates (tpy)
Windshield Cleaner	4.0											
Methanol		1.12	1.888	32.04	19	164,250	7.92E-03	6.94E+01	3.47E-02	7.92E-03	6.94E+01	3.47E-02
Ethylene Glycol		0.80	0.0725	62.07	19	164,250	4.19E-04	3.67E+00	1.84E-03	4.19E-04	3.67E+00	1.84E-03
Total							**8.34E-03**	**7.30E+01**	**3.65E-02**	**8.34E-03**	**7.30E+01**	**3.65E-02**

[a] From windshield cleaner MSDS, material is 23% volatile by mass. Windshield cleaner fluid was conservatively assumed to contain 23% methanol and 23% ethylene glycol.

Assembly Roll and Brake Testing Capacities

Hourly Production Rate	19	units/hr
Annual Production Rate	164,250	units/yr
Simulated Distance	3.0	miles/unit
Hours of Operation [a]	8,760	hr/yr

[a] Potential operating hours are based on operation 24 hours/day, 365 days/yr.

Assembly Roll and Brake Testing Emission Factors

Pollutant	Diesel g/mile [a]	Gasoline g/mile	Worst Case Fuel g/mile
PM	0.08	0.0	0.08
NO_X	0.3	0.3	0.3
CO	4.2	4.2	4.2
VOC	0.09	0.09	0.09
Formaldehyde	0.018	0.018	0.018
CO_2e [b,c]			
CO_2 [b]	417	417	417
CH_4 [d]	0.73	0.73	0.73
N_2O [d]	0.01	0.01	0.01

[a] Emission rates are based on 40 CFR 88 Subpart A Table A Table A104-2—Full Useful Life Standards (g/mi) for Light-Duty Vehicles, diesel vehicles.

[b] The CO_2 emission factor is from "Light-Duty Automotive Technology, Carbon Dioxide Emissions, and Fuel Economy Trends: 1975 Through 2010"

[c] When accounting for global warming potential, CO_2 is 95% of CO_2e. EPA Emission Facts: Greenhouse Gas Emissions from a Typical Passenger Vehicle, http://www.epa.gov/OMS/climate/420f05004.htm.

[d] 5% of CO_2e is assumed to be CH_4 and N_2O, when accounting for global warming potential. Emission factors for these pollutants are based on a ratio of CH_4 and N_2O emission factors for petroleum fuels from the GHG Mandatory Reporting Rule Subpart C, Table C-2.

Assembly Roll and Brake Testing Potential Emissions

Process	Potential Emissions																	
	$PM/PM_{10}/PM_{2.5}$		NO_X		CO		VOC		Formaldehyde		CO_2		CH_4		N_2O		CO_2e	
	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr	(tpy)	(lb/hr	(tpy)	(lb/hr	(tpy)	(lb/hr)	(tpy)
Assembly Roll and Brake	0.010	0.043	0.037	0.163	0.521	2.281	0.011	0.049	0.002	0.010	51.71	226.50	0.091	0.40	0.002	0.01	54.43	238.42

Assembly Washer System Testing Compound Usage Data

Washer System Test [a]	mL/unit	% Ethylene Glycol [b]	Density Ethylene Glycol (lb/gal)	lb Ethylene Glycol/unit
Maximum Tested Windshield Cleaner Usage	100	23%	9.26	0.056

[a] Represents the maximum testing fluid usage per unit.
[b] From windshield cleaner MSDS, material contains 23% volatiles (methanol and ethylene glycol). Emissions from washer system testing calculated based on ethylene glycol density which represents the worst-case VOC emissions for the material.

Assembly Washer System Testing Emissions

	Production		VOC Emissions [a]			Maximum Ethylene Glycol Emissions [b]			Maximum Methanol Emissions [b]		
	(units/hr)	(units/yr)	(lb/hr)	(lb/yr)	(tpy)	(lb/hr)	(lb/yr)	(tpy)	(lb/hr)	(lb/yr)	(tpy)
Washer System Testing	19	164,250	1.06	9,244.66	4.62	1.06	9,244.66	4.62	0.75	6,579.53	3.29

[a] VOC emissions from washer system testing calculated based on ethylene glycol density which represents the worst-case VOC emissions for the material.
[b] Maximum HAP emissions are calculated assuming the maximum volatile content for both ethylene glycol and methanol. Therefore, the calculated VOC emissions are not equivalent to the sum of the HAP emissions.

Storage Tank Volumes

Tank ID	Consumption per Vehicle (gal/veh)	Max. Consumption per year[a] (gal/yr)	Fuel Type
TK-01	5.00	821,250	Gasoline
TK-02	5.00	821,250	Diesel
TK-03	----	100,000	Diesel

Storage Tank Emissions

Tank ID	Description[a]	Controls	Tank Size		Capacity	Throughput	Uncontrolled Emissions[b] (lb/yr)			Total VOC Emissions[b]	
			Shell Length (ft)	Diameter (ft)	(gal)	(gal/yr)	Working Loss	Breathing Loss	Total	Total (lb/hr)	Total (tpy)
TK-01	Gasoline	N/A	10.00	9.67	5,000	821,250	3,553.34	1,718.84	5,272.18	0.60	2.64
TK-02	Diesel fuel	N/A	15.08	11.00	10,000	821,250	10.79	2.27	13.06	0.001	0.01
TK-03	Diesel fuel	N/A	7.58	2.92	1,240	100,000	1.39	1.08	2.47	0.000	0.00
Tanks Total									**5,287.71**	**0.60**	**2.64**

[a] Max throughput for TK-01 and TK-02 based on the max. consumption per vehicle. TK-03 will be used to fuel sources in the Marshalling yard.

[b] All the storage tanks are horizontal tanks.

[c] Storage Tank emissions taken from TANKS 4.09d output based on tank parameters and geographical information.

Emergency Generators and Fire Pumps Emission Factors [a,b]

Pollutant	Emergency Engines 19 ≤ kW < 37	Emergency Engines 37 ≤ kW < 75	Emergency Engines 225 ≤ kW < 450	Emergency Engines kW > 560	Fire Pumps 225 < kW < 450	Units
$PM/PM_{10}/PM_{2.5}$	0.45	0.30	0.15	0.15	0.15	g/hp-hr
SO_2 [c]	0.93	0.93	0.93	5.5E-03	0.93	g/hp-hr
NO_X	5.59	3.5	3.0	4.8	3.0	g/hp-hr
CO	4.10	3.7	2.6	2.6	2.6	g/hp-hr
VOC	5.6	3.5	3.0	4.8	3.0	g/hp-hr
CO_2e [d]						
CO_2	163.08	163.08	163.08	163.08	163.08	lb/MMBtu
CH_4	6.62E-03	6.62E-03	6.62E-03	6.62E-03	6.62E-03	lb/MMBtu
N_2O	1.32E-03	1.32E-03	1.32E-03	1.32E-03	1.32E-03	lb/MMBtu

[a] The emission factors are from 40 CFR 89.112(a), Table 1. VOC and NO_X emission factors are each assumed to be equivalent to NO_X + NMHC emission limit. The SO_2 emission factor is from AP-42, Table 3.4-1 for large diesel engines.
[b] The emission factors are from 40 CFR 89.112(a), Table 1. VOC and NO_X emission factors are each assumed to be equivalent to NO_X + NMHC emission limit. The SO_2 emission factor is from AP-42, Table 3.3-1.
[c] Sulfur content of diesel fuel equals the maximum sulfur content of 15 ppm, per 40 CFR 80.510(b).
[d] Emission factors from 40 CFR 98, Subpart C, Tables C-1 and C-2. Factors were converted to lb/MMBtu.

Emergency Generators and Fire Pumps Criteria Pollutant Emissions

Equipment ID	Fuel	Horsepower	Max. Rated Capacity	Max. hours per year [a]	$PM/PM_{10}/PM_{2.5}$		SO_2		NO_X		CO		VOC		CO_2		CH_4		N_2O		CO_2e	
		(hp)	(MMBtu/hr)	(hr)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
EG01	Diesel	398	1.01	500	0.13	0.03	0.82	0.204	2.62	0.65	2.29	0.57	2.62	0.65	143.09	35.77	0.006	0.001	0.001	0.0003	143.59	35.90
EG02	Diesel	65	0.17	500	0.04	0.01	0.13	0.03	0.50	0.13	0.53	0.13	0.50	0.13	23.37	5.84	0.001	2E-04	0.0002	5E-05	23.45	5.86
EG03	Diesel	40	0.10	500	0.04	0.01	0.08	0.021	0.50	0.12	0.36	0.09	0.50	0.12	14.46	3.62	0.001	0.00	0.000	0.000	14.51	3.63
EG04	Diesel	1,500	3.82	500	0.49	0.12	0.02	0.005	15.78	3.95	8.63	2.16	15.78	3.95	539.30	134.83	0.022	0.01	0.004	0.001	541.15	135.29
FP01	Diesel	305	0.78	500	0.10	0.03	0.63	0.16	2.02	0.50	1.75	0.44	2.02	0.50	109.66	27.41	0.004	0.001	0.0009	0.0002	110.03	27.51
Total					**0.81**	**0.20**	**1.68**	**0.42**	**21.42**	**5.35**	**13.57**	**3.39**	**21.42**	**5.35**	**829.9**	**207.47**	**0.03**	**0.01**	**0.01**	**0.002**	**832.7**	**208.18**

[a] Hours based on maximum allowable hours for maintenance and readiness testing under NSPS Subpart IIII.

Emergency Generators and Fire Pumps Combined Heat Input Capacities

	Capacity (MMBtu/hr)
Total Large Diesel Heat Input	3.82
Total Diesel Heat Input	2.06

[a] Large diesel engines are those larger than 600 hp.

Emergency Generators and Fire Pumps HAP/TAP Emissions

Pollutant	Emission Factors (lb/MMBtu) Large Diesel [a]	Emission Factors (lb/MMBtu) Diesel [b]	Emergency Equipment Emissions (lb/hr)	(tpy)
Benzene	7.76E-04	9.33E-04	4.88E-03	1.22E-03
Toluene	2.81E-04	4.09E-04	1.91E-03	4.79E-04
Xylene	1.93E-04	2.85E-04	1.32E-03	3.31E-04
Formaldehyde	7.89E-05	1.18E-03	2.73E-03	6.82E-04
Acetaldehyde	2.52E-05	7.67E-05	2.54E-04	6.35E-05
Acrolein	7.88E-06	9.25E-05	2.20E-04	5.51E-05
Napthalene	1.30E-04	8.48E-05	6.71E-04	1.68E-04
Total PAH	2.12E-04	1.68E-04	1.15E-03	2.89E-04

[a] Emission factors from AP-42 Section 3.4 Large Stationary Diesel and All Stationary Duel-fuel Engines, Table 3.4-3 - 3.4-4.
[b] Emission factors from AP-42 Section 3.3 Gasoline and Diesel Industrial Engines, Table 3.3-2.

Appendix B.2.9 - Cooling Towers
Mercedes-Benz Vans, LLC

Cooling Tower Potential Emissions

Description	Circulating Water Flowrate	Water Density	Total Dissolved Solids [a]	Drift Rate [b]	Hours of Operation	Potential Emissions [c]					
						PM		PM_{10}		$PM_{2.5}$	
	(gal/hr)	(lb/gal)	(ppm)	(%)	(hrs/yr)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
Cooling Tower 1	412,500	8.34	650	0.001	8,760	2.24E-02	9.79E-02	3.33E-03	1.46E-02	2.00E-03	8.76E-03
Cooling Tower 2	412,500	8.34	650	0.001	8,760	2.24E-02	9.79E-02	3.33E-03	1.46E-02	2.00E-03	8.76E-03
Cooling Tower 3	412,500	8.34	650	0.001	8,760	2.24E-02	9.79E-02	3.33E-03	1.46E-02	2.00E-03	8.76E-03
Cooling Tower 4	73,800	8.34	650	0.001	8,760	4.00E-03	1.75E-02	5.96E-04	2.61E-03	3.58E-04	1.57E-03
Cooling Tower 5	484,900	8.34	650	0.001	8,760	2.63E-02	1.15E-01	3.92E-03	1.72E-02	2.35E-03	1.03E-02
Cooling Tower 6	484,900	8.34	650	0.001	8,760	2.63E-02	1.15E-01	3.92E-03	1.72E-02	2.35E-03	1.03E-02
Cooling Tower 7	484,900	8.34	650	0.001	8,760	2.63E-02	1.15E-01	3.92E-03	1.72E-02	2.35E-03	1.03E-02
Total						1.50E-01	6.57E-01	2.23E-02	9.79E-02	1.34E-02	5.87E-02

[a] TDS provided by Charleston Water System.

[b] Drift rate value supplied based on vendor guaranteed drift rate.

[c] PM emissions calculated using equation from AP-42 Chapter 13.4 - Wet Cooling Towers. PM_{10} emissions are 14.9% of PM emissions based on *Calculating Realistic PM $_{10}$ Emissions from Cooling Towers* by Joel Reisman and Gordon Frisbie. $PM_{2.5}$ assumed to be 60% of PM_{10} based on California Emissions Inventory Development and Reporting System (CEIDARS).

Paved Roads - Emission Factor Equation[1]

$$E = [k\,(sL)^{0.91} * W^{1.02}] * (1 - 1.2*P/N)$$

where:	Value	Units	Data Source
k = particle size multiplier for PM	0.011	lb/VMT	AP-42, Table 13.2.1-1 [2]
k = particle size multiplier for PM_{10}	0.0022	lb/VMT	AP-42, Table 13.2.1-1 [2]
k = particle size multiplier for $PM_{2.5}$	0.00054	lb/VMT	AP-42, Table 13.2.1-1 [2]
sL = road surface silt loading	0.6	g/m^2	AP-42, Table 13.2.1-2 [3]
W_a = average weight of vehicles traveling the road	40.0	tons	SC DOT [4]
N = number of days in averaging period	365	days	AP-42, pg. 13.2.1-6
P = number of days in a year with at least 0.01 in of precipitation	120	days	AP-42, Fig. 13.2.1-2
E_a = PM emission factor	**0.18**	**lb/VMT**	**Calculation**
E_a = PM_{10} emission factor	**0.04**	**lb/VMT**	**Calculation**
E_a = $PM_{2.5}$ emission factor	**0.01**	**lb/VMT**	**Calculation**

[1] AP-42, Section 13.2.1.3, Equation 3.
[2] K value selected is for PM_{30}, PM_{10} and $PM_{2.5}$. The PM_{30} factor is used to calculate PM emissions.
[3] AP-42 Section 13.2.1, Table 13.2.1-2, Ubiquitous Silt Loading Default Values for sites with average daily traffic (ADT) for low volume roads, ADT category < 500 vehicles.
[4] Average weight conservatively set to maximum allowable gross vehicle weight rating is 80,000 lbs (40 tons), per SC §56-5-4140.

Paved Roads - Loads and Distance Inputs

Parameter	Value	Units
Distance traveled per load	1.71	VMT/load
Loads traveled	6	loads/hr
	150	loads/day
	54,750	loads/yr
Paved Vehicle Miles Traveled per Year [1]	93,349	VMT/yr
Paved Vehicle Miles Traveled per Hour [2]	10.66	VMT/hr

[1] Calculation: Paved Vehicle Miles Traveled per Year (VMT/yr) = (Potential Vehicle Production (tpy)) / Weight of Truck Load (tons/load) * Distance Traveled per Load (VMT/load).
[2] Calculation: Paved Vehicle Miles Traveled per Hour (VMT/hr) = (Potential Vehicle Production (tons/hr)) / Weight of Truck Load (tons/load) * Distance Traveled per Load (VMT/load).

Paved Roads - Potential Emissions

	PM		PM_{10}		$PM_{2.5}$	
	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
Paved Roads [1,2]	1.92	8.41	0.38	1.68	0.09	0.41

[1] Calculation: Potential Emissions (tpy) = Paved Vehicle Miles Traveled per Year (VMT/yr) * Emission Factor (lb/VMT) / (2,000 lb/ton).
[2] Calculation: Potential Emissions (lb/hr) = Paved Vehicle Miles Traveled per Year (VMT/hr) * Emission Factor (lb/VMT).

APPENDIX B: E-COAT SPOT REPAIR BACT COST ANALYSIS

Appendix B - BACT Supporting Documentation - Cost Analysis

Annualized RTO Cost Analysis to Control VOC from E-Coat Spot Repair
Based on 124,800 Units/Yr & 95% RTO Control

Annualized Costs for RTO to Control VOC: E-Coat Spot Repair		
Standard Temperature	68	°F
Density of Air	0.0026	lb-mole/scf
Specific Heat of Air	6.85	Btu/lb-mole F
Exhaust Gas Temperature	72	°F
Minimum RTO Temp	1,500	°F
Heat Input	25.24	Btu/acf
Fuel Cost Summary		
Exhaust Gas Flow Rate	12,939	acfm
Natural Gas Usage	171,657	MMBtu/yr
	168,292	1,000 cf/yr
Natural Gas Cost[1]	$6.11	dollars/1,000 cf
Heat Loss Rate	5.00%	
Total Natural Gas Cost	**$51,413**	**dollars/yr**
Electricity Cost Summary		
Cost of Electricity[2]	$0.05207	$/kWh
Electricity Required	12	kW/h
Hours of Operation	8,760	h/yr
Total Electricity Cost	**$5,256.39**	**dollars/yr**
Pollutant Removal Cost Summary		
Total Annual Cost - Fuel & Electricity	**$56,669.49**	**dollars/yr**
Pollutant to be Removed [VOC] (90% capture, 95% control, 124,800 bodies/yr)	**0.12**	**tpy**
Cost Control Effectiveness	**$477,557**	**dollars/ton**

1. Natural gas rates are based U.S. Energy Information Administration Industrial natural gas prices for 2014. *http://www.eia.gov/dnav/ng/ng_pri_sum_dcu_SSC_a.htm.*

2. Cost of Electricity is based on *https://www.sceg.com/docs/librariesprovider5/electric-gas-rates/rate23.pdf.*

Annualized RTO Cost Analysis to Control VOC from E-Coat Spot Repair
Based on 146,000 Units/Yr & 95% RTO Control

Annualized Costs for RTO to Control VOC: E-Coat Spot Repair		
Standard Temperature	68	°F
Density of Air	0.0026	lb-mole/scf
Specific Heat of Air	6.85	Btu/lb-mole F
Exhaust Gas Temperature	72	°F
Minimum RTO Temp	1,500	°F
Heat Input	25.24	Btu/acf
Fuel Cost Summary		
Exhaust Gas Flow Rate	12,939	acfm
Natural Gas Usage	171,657	MMBtu/yr
	168,292	1,000 cf/yr
Natural Gas Cost [1]	$6.11	dollars/1,000 cf
Heat Loss Rate	5.00%	
Total Natural Gas Cost	**$51,413**	**dollars/yr**
Electricity Cost Summary		
Cost of Electricity [2]	$0.05207	$/kWh
Electricity Required	12	kW/h
Hours of Operation	8,760	h/yr
Total Electricity Cost	**$5,256.39**	**dollars/yr**
Pollutant Removal Cost Summary		
Total Annual Cost - Fuel & Electricity	**$56,669.49**	**dollars/yr**
Pollutant to be Removed [VOC] **(90% capture, 95% control, 146,000 bodies/yr)**	**0.14**	**tpy**
Cost Control Effectiveness	**$408,213**	**dollars/ton**

1. Natural gas rates are based U.S. Energy Information Administration Industrial natural gas prices for 2014. *http://www.eia.gov/dnav/ng/ng_pri_sum_dcu_SSC_a.htm.*
2. Cost of Electricity is based on *https://www.sceg.com/docs/librariesprovider5/electric-gas-rates/rate23.pdf.*

APPENDIX C: DHEC PERMIT APPLICATION FORMS

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Bureau of Air Quality
Construction Permit Application
Application Revision Request

CONSTRUCTION PERMIT IDENTIFICATION			
SC Air Permit Number *(8-digits only)* *(Leave blank if unknown or has never been assigned)*	Construction Permit ID	Date Construction Permit Issued	Revision Request Date
0560 - 0385	0560-0385-CA-R2	January 26, 2018	April 2018
Facility Name *(This should be the name used to identify the facility)*			
Mercedes-Benz Vans, LLC			

CONSTRUCTION PERMIT APPLICATION FORMS BEING REVISED *(Amended construction permit forms must be filled out completely and attached to this modification request.)*		
Form #	**Date of Original Submittal**	**Brief Description of Revision**
D-2566	February 2016	No change
D-2567	February 2016	No change
D-2569	February 2016	Revised facility-wide emission estimate as described in the application addendum. Calculations are provided in Appendix A.
D-2570	February 2016	No change
D-2573	February 2016	No change

OWNER OR OPERATOR			
Title/Position: President/CEO	Salutation: Mr	First Name: Michael	Last Name: Balke
Mailing Address: 8501 Palmetto Commerce Parkway			
City: Ladson		State: SC	Zip Code: 29546
E-mail Address: Michael.balke@daimler.com		Phone No.: (843) 695-5142	Cell No.:

OWNER OR OPERATOR SIGNATURE

I certify, to the best of my knowledge and belief, that no applicable standards and/or regulations will be contravened or violated. I certify that any application form, report, or compliance certification submitted in this permit application is true, accurate, and complete based on information and belief formed after reasonable inquiry. I understand that any statements and/or descriptions, which are found to be incorrect, may result in the immediate revocation of any permit issued for this application.

[signature] 04-10-2018

Signature of Owner or Operator Date

Bureau of Air Quality
Construction Permit Application
Application Revision Request

AIR PERMIT CONSULTANT (If not the same person as the Professional Engineer.)			
Consulting Firm Name: Same as P.E. (see below)			
Title/Position:	Salutation:	First Name:	Last Name:
Mailing Address:			
City:		State:	Zip Code:
E-mail Address:		Phone No.:	Cell No.:
PROFESSIONAL ENGINEER INFORMATION			
Consulting Firm Name: Trinity Consultants, Inc.			
Title/Position: Managing Consultant	Salutation: Ms.	First Name: Nicole	Last Name: Saniti
Mailing Address: 325 Arlington Ave. Suite 500			
City: Charlotte		State: NC	Zip Code: 28203
E-mail Address: nsaniti@trinityconsultants.com		Phone No.: (704) 553-7747	Cell No.:
SC License/Registration No.: 30237			
PROFESSIONAL ENGINEER SIGNATURE			
I have placed my signature and seal on the engineering documents submitted, signifying that I have reviewed this construction permit application as it pertains to *South Carolina Regulation 61-62, Air Pollution Control Regulations and Standards.*			

Nicole Saniti 4/12/18

Signature of Professional Engineer Date

SOUTH CAROLINA LICENSED PROFESSIONAL ENGINEER No. 30237 NICOLE L. SANITI

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Construction Permit Application
Facility Information

FACILITY IDENTIFICATION	
SC Air Permit Number (8-digits only) *(Leave blank if one has never been assigned)* 0560 - 0385	Application Date April 2018
Facility Name *(This should be the name used to identify the facility at the physical address listed below)* Mercedes-Benz Vans, LLC	Facility Federal Tax Identification Number *(Established by the U.S. Internal Revenue Service to identify a business entity)*

FACILITY PHYSICAL ADDRESS		
Physical Address: 8501 Palmetto Commerce Parkway		County: Charleston
City: Ladson	State: SC	Zip Code: 29456
Facility Coordinates *(Facility coordinates should be based at the front door or main entrance of the facility.)*		
Latitude: 32° 57' 50.25"	Longitude: 80° 06' 27.27"	☐ NAD27 *(North American Datum of 1927)* Or ☒ NAD83 *(North American Datum of 1983)*

CO-LOCATION DETERMINATION
Are there other facilities in close proximity that could be considered co-located? ☒ No ☐ Yes*
List potential co-located facilities, including air permit numbers if applicable: Not Applicable

**If yes, please submit co-location applicability determination details in an attachment to this application.*

COMMUNITY OUTREACH
What are the potential air issues and community concerns? Please provide a brief description of potential air issues and community concerns about the entire facility and/or specific project. Include how these issues and concerns are being addressed, if the community has been informed of the proposed construction project, and if so, how they have been informed.

FACILITY'S PRODUCTS / SERVICES	
Primary Products / Services *(List the primary product and/or service)* Automobile Manufacturing, Light Truck and Utility Vehicle Manufacturing	
Primary SIC Code *(Standard Industrial Classification Codes)* 3711	Primary NAICS Code *(North American Industry Classification System)* 336111
Other Products / Services *(List any other products and/or services)*	
Other SIC Code(s): 3713	Other NAICS Code(s): 336112

AIR PERMIT FACILITY CONTACT *(Person at the facility who can answer technical questions about the facility and permit application.)*			
Title/Position: Paint Engineer	Salutation: Mr.	First Name: Jae	Last Name: Park
Mailing Address: 8501 Palmetto Commerce Parkway			
City: Ladson		State: SC	Zip Code: 29456
E-mail Address: jae.park@daimler.com		Phone No.: (843) 695-5095	Cell No.:

The signed permit will be e-mailed to the designated Air Permit Contact.
If additional individuals need copies of the permit, please provide their names and e-mail addresses.

Name	**E-mail Address**
Russell Revell	russell.revell@daimler.com

CONFIDENTIAL INFORMATION / DATA
Does this application contain confidential information or data? ☒ No ☐ Yes*

If yes, include a sanitized version of the application for public review and* ***ONLY ONE COPY OF CONFIDENTIAL INFORMATION SHOULD BE SUBMITTED*

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Construction Permit Application
Facility Information

LIST OF FORMS INCLUDED *(Identify all forms included in the application package)*	
Form Name	**Included (Y/N)**
Expedited Review Request (DHEC Form 2212)	☒ Yes ☐ No * This submittal is an addendum to the application submitted for expedited review in February 2018.
Equipment/Processes (DHEC Form 2567)	☒ Yes
Emissions (DHEC Form 2569)	☒ Yes
Regulatory Review (DHEC Form 2570)	☒ Yes
Emissions Point Information (DHEC Form 2573)	☒ Yes ☐ No (If No, Explain:)

OWNER OR OPERATOR			
Title/Position: President/CEO	Salutation: Mr.	First Name: Michael	Last Name: Balke
Mailing Address: 8501 Palmetto Commerce Parkway			
City: Ladson		State: SC	Zip Code: 29546
E-mail Address: Michael.balke@daimler.com		Phone No.: (843) 695-5142	Cell No.:

OWNER OR OPERATOR SIGNATURE

I certify, to the best of my knowledge and belief, that no applicable standards and/or regulations will be contravened or violated. I certify that any application form, report, or compliance certification submitted in this permit application is true, accurate, and complete based on information and belief formed after reasonable inquiry. I understand that any statements and/or descriptions, which are found to be incorrect, may result in the immediate revocation of any permit issued for this application.

[signature] 04-10-2018

Signature of Owner or Operator Date

PERSON AND/OR FIRM THAT PREPARED THIS APPLICATION *(If not the same person as the Professional Engineer who has reviewed and signed this application.)*			
Consulting Firm Name: Same as P.E - see below			
Title/Position:	Salutation:	First Name:	Last Name:
Mailing Address:			
City:		State:	Zip Code:
E-mail Address:		Phone No.:	Cell No.:
SC Professional Engineer License/Registration No. (if applicable):			

Bureau of Air Quality
Construction Permit Application
Facility Information

PROFESSIONAL ENGINEER INFORMATION			
Consulting Firm Name: Trinity Consultants, Inc.			
Title/Position: Managing Consultant	Salutation: Ms.	First Name: Nicole	Last Name: Saniti
Mailing Address: 325 Arlington Ave. Suite 500			
City: Charlotte		State: NC	Zip Code: 28203
E-mail Address: nsaniti@trinityconsultants.com		Phone No.: (704) 553-7747	Cell No.:
SC License/Registration No.: 30237			
PROFESSIONAL ENGINEER SIGNATURE			
I have placed my signature and seal on the engineering documents submitted, signifying that I have reviewed this construction permit application as it pertains to the requirements of *South Carolina Regulation 61-62, Air Pollution Control Regulations and Standards.*			

Nicole Saniti 4/12/18

Signature of Professional Engineer Date

SOUTH CAROLINA LICENSED PROFESSIONAL ENGINEER No. 30237 NICOLE L. SANITI

dhec

APPLICATION IDENTIFICATION *(Please ensure that the information list in this table is the same on all of the forms and required information submitted in this construction permit application package.)*		
Facility Name *(This should be the name used to identify the facility)* Mercedes-Benz Vans, LLC	SC Air Permit Number (8-digits only) *(Leave blank if one has never been assigned)* 0560 - 0385	Application Date April 2018

PROJECT DESCRIPTION
Brief Project Description (What, why, how, etc.): Daimler Vans is proposing to expand current assembly operations at the Ladson plant to include a paint shop, body shop, and additional assembly areas, including all associated combustion equipment. This application revises information submitted to the Department for Construction Permit No. 0560-0385, 0560-0385-R1, and 0560-0385-R2.

ATTACHMENTS	
☒ Process Flow Diagram	Location in Application: Appendix A of the application submitted in February 2018
☒ Detailed Project Description	Location in Application: Application addendum, section 1.2

EQUIPMENT / PROCESS INFORMATION

Equipment ID Process ID	Action	Equipment / Process Description	Maximum Design Capacity (Units)	Control Device ID(s)	Pollutants Controlled (Include CAS#)	Capture System Efficiency and Description	Emission Point ID(s)
OV04	☐ Add ☐ Remove ☒ Modify ☐ Other	Assembly Oven Burners (natural gas fired)	4.30 MMBtu/hr	N/A	N/A	N/A	EP-AO01

CONTROL DEVICE INFORMATION

Control Device ID	Action	Control Device Description	Maximum Design Capacity (Units)	Inherent/Required/Voluntary (Explain)	Destruction/Removal Efficiency Determination
	☐ Add ☐ Remove ☐ Modify ☐ Other				

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RAW MATERIAL AND PRODUCT INFORMATION			
Equipment ID Process ID Control Device ID	Raw Material(s)	Product(s)	Fuels Combusted
OV04	N/A	Process Heat	Natural Gas

MONITORING AND REORTING INFORMATION					
Equipment ID Process ID Control Device ID	Pollutant(s)/Parameter(s) Monitored	Monitoring Frequency	Reporting Frequency	Monitoring/Reporting Basis	Averaging Period(s)
OV04	N/A	N/A	N/A	N/A	N/A

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Bureau of Air Quality
Construction Permit Application
Emissions

APPLICATION IDENTIFICATION (*Please ensure that the information list in this table is the same on all of the forms and required information submitted in this construction permit application package.*)		
Facility Name (*This should be the name used to identify the facility*)	SC Air Permit Number (8-digits only) (*Leave blank if one has never been assigned*)	Application Date
Mercedes-Benz Vans, LLC	0560 - 0385	April 2018

ATTACHMENTS (*Check all the appropriate checkboxes if included as an attachment*)	
☒ Sample Calculations, Emission Factors Used, etc.	☒ Detailed Explanation of Assumptions, Bottlenecks, etc.
☒ Supporting Information: Manufacturer's Data, etc.	☐ Source Test Information
☒ Details on Limits Being Taken for Limited Emissions	☒ NSR Analysis

SUMMARY OF PROJECTED CHANGE IN FACILITY WIDE POTENTIAL EMISSIONS
(Calculated at maximum design capacity.)

Pollutants	Emission Rates Prior to Construction / Modification (tons/year)			Emission Rates After Construction / Modification (tons/year)		
	Uncontrolled	Controlled	Limited	Uncontrolled	Controlled	Limited
Particulate Matter (PM)	1,353.39	29.51	26.97	1,354.08	24.74	21.32
Particulate Matter <10 Microns (PM_{10})	1,346.10	22.23	19.77	1,346.79	17.45	14.11
Particulate Matter <2.5 Microns ($PM_{2.5}$)	1,344.79	20.92	18.46	1,345.49	16.15	12.81
Sulfur Dioxide (SO_2)	0.72	0.72	0.59	0.94	0.94	0.73
Nitrogen Oxides (NO_x)	48.94	48.94	38.55	61.91	61.91	39.90
Carbon Monoxide (CO)	77.43	77.43	59.16	78.03	78.03	49.63
Volatile Organic Compounds (VOC)	3,442.84	1,110.37	952.04	3,446.82	1,114.35	955.36
Lead (Pb)	4.18E-04	4.18E-04	3.09E-04	4.31E-04	4.31E-04	2.62E-04
Highest HAP Prior to Construction (CAS #:)	Multiple >10	Multiple >10		Multiple >10	Multiple >10	
Highest HAP After Construction (CAS #:)						
Total HAP Emissions*	415.56	415.56	358.18	415.61	415.61	358.00
Carbon Dioxide Equivalent (CO_2e)	101,146	101,146	74,999	104,003	104,003	63,367

Include emissions from exempt equipment and emission increases from process changes that were exempt from construction permits.
(*All HAP emitted from the various equipment or processes must be listed in the appropriate "Potential Emission Rates at Maximum Design Capacity" Table)

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Emissions

POTENTIAL EMISSION RATES AT MAXIMUM DESIGN CAPACITY

Equipment ID / Process ID	Emission Point ID	Pollutants (Include CAS #)	Calculation Methods / Limits Taken / Other Comments	Uncontrolled		Controlled		Limited	
				lbs/hr	tons/yr	lbs/hr	tons/yr	lbs/hr	tons/yr
See Appendix A of the Application Addendum									

APPENDIX D: SUPPORTING DOCUMENTATION

Kimberly Teofilak

From:	Kimberly Teofilak
Sent:	Tuesday, April 10, 2018 12:55 PM
To:	Kimberly Teofilak
Subject:	FW: JDE_180404_DAI_SC_WG: GW_180404_DAI_ Documentation of Low NOx Burners - ASUs, RTUs, Ovens
Attachments:	totemomail_info.html

6 ppm for Durr ASUs (everything routed to DryX)

....

Nicole Saniti, P.E.
Managing Consultant

Trinity Consultants
325 Arlington Ave., Suite 500 | Charlotte, North Carolina 28203

Office: **704-553-7747 x104** | Mobile: 518-461-8135
Email: nsaniti@trinityconsultants.com | LinkedIn: www.linkedin.com/in/nsanititrinityconsultants

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Trinity Consultants

From: jae.park@daimler.com [mailto:jae.park@daimler.com]
Sent: Wednesday, April 04, 2018 10:50 AM
To: Nicole Saniti <NSaniti@trinityconsultants.com>
Cc: Tony Jabon <TJabon@trinityconsultants.com>
Subject: FW: JDE_180404_DAI_SC_WG: GW_180404_DAI_ Documentation of Low NOx Burners - ASUs, RTUs, Ovens

Hi Nicole,

Info on ASU burners from Durr on the NOx emission.

Kind Regards / Mit freundlichen Grüßen

Jae Park
Paint Engineer, VAN/OEC

Merecedes-Benz Vans,LLC
8501 Palmetto Commerce Parkway
Ladson, SC 29456

Phone +1 843 695 5095
Mobile +1 843 697 9478

Fax +1 843 695 5031
E-Mail jae.park@daimler.com

From: Denzinger, Joachim [mailto:Joachim.Denzinger@durr.com]
Sent: Wednesday, April 04, 2018 10:38 AM
To: Park, Jae (566) <jae.park@daimler.com>
Cc: Fein, Ronald <ronald.fein@durr.com>; Revell, Russell (566) <russell.revell@daimler.com>; Fleissner, Thomas (065) <thomas.fleissner@daimler.com>
Subject: JDE_180404_DAI_SC_WG: GW_180404_DAI_ Documentation of Low NOx Burners - ASUs, RTUs, Ovens

Hello Jae,

regarding ASU burners, according to burner supplier with proper commissioning following is possible:

NO max. 5 ppm
NO2 max. 1 ppm

Emissions are subject to the process conditions

Mit freundlichen Grüßen/Best regards

Joachim Denzinger
Senior Project Manager

Dürr Systems AG
Paint and Final Assembly Systems
Project Management
Carl-Benz-Str. 34
74321 Bietigheim-Bissingen
Germany

Phone +49 7142 78 1472
Mobile +49 172 751 0602
Fax +49 7142 78 55 1472
E-mail joachim.denzinger@durr.com
Internet www.durr-paint.com
Internet www.durr.com

Vorsitzender des Aufsichtsrats: Ralf Dieter
Vorstand: Dr. Jochen Weyrauch (Vors.), Dr. Hans Schumacher, Jaroslaw Baginski, Rainer Gausepohl
Sitz der Gesellschaft: Stuttgart; eingetragen im Amtsgericht Stuttgart HRB 757705

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DÜRR NEWS

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Kimberly Teofilak

From: Kimberly Teofilak
Sent: Thursday, April 12, 2018 2:54 PM
To: Kimberly Teofilak
Subject: FW: MBV - Burners

80 ppm on other ASUs.

So we have:

- 6 ppm on ASUs to DryX
- 80 ppm on all other ASUs
- AP-42 low NOx factors on oven burners
- AP-42 low NOx factors on ADW heaters
- California low NOx factors for all RTUs
- AP-42 conventional NOx factors on RTO
- AP-42 conventional NOx factor on assembly oven

....

Nicole Saniti, P.E.
Managing Consultant

Trinity Consultants
325 Arlington Ave., Suite 500 | Charlotte, North Carolina 28203

Office: 704-553-7747 x104 | Mobile: 518-461-8135
Email: nsaniti@trinityconsultants.com | LinkedIn: www.linkedin.com/in/nsanititrinityconsultants

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From: jae.park@daimler.com [mailto:jae.park@daimler.com]
Sent: Tuesday, April 03, 2018 10:18 AM
To: Tony Jabon <TJabon@trinityconsultants.com>; Nicole Saniti <NSaniti@trinityconsultants.com>
Cc: paul.hayes@daimler.com; russell.revell@daimler.com
Subject: FW: MBV - Burners

Hi Tony and Nicole,

NOx info on Paint Shop ASU burners for ASU 2.1, 2.2, and 2.3.

Kind Regards / Mit freundlichen Grüßen

Jae Park

Paint Engineer, VAN/OEC

Merecedes-Benz Vans,LLC
8501 Palmetto Commerce Parkway
Ladson, SC 29456

Phone +1 843 695 5095
Mobile +1 843 697 9478
Fax +1 843 695 5031
E-Mail jae.park@daimler.com

From: Brian Grundmeyer [mailto:bgrundmeyer@idom.com]
Sent: Tuesday, April 03, 2018 8:45 AM
To: Park, Jae (566) <jae.park@daimler.com>
Cc: Shah, Pranav (566) <pranav.shah@daimler.com>
Subject: FW: MBV - Burners

Hi Jae,

See below for the Paint shop ASU 2.1, 2.2, and 2.3 emissions.

Regards,
Brian

From: Andy.Stegner@bargedesign.com [mailto:Andy.Stegner@bargedesign.com]
Sent: Thursday, March 29, 2018 11:45 AM
To: Brian Grundmeyer <bgrundmeyer@idom.com>
Cc: Juan Luis Geijo Angulo <juan.geijo@idom.com>
Subject: FW: MBV - Burners

Brian,

See below from ClimateCraft regarding the NOx emissions from the ASU burners.

Best Regards,

Andy Stegner PE*
LEED AP
*TN, NC, SC, AK
MECHANICAL ENGINEER
andy.stegner@bargedesign.com

D 865-934-4197
O 865-637-2810
F 865-637-8554

520 West Summit Hill Drive, Suite 1202
Knoxville, TN 37902

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From: Johnson Mathew [mailto:jmathew@climatecraft.com]
Sent: Thursday, March 29, 2018 8:51 AM
To: Andy Stegner <Andy.Stegner@bargedesign.com>
Cc: Scott Sandberg <SSandberg@climatecraft.com>
Subject: FW: MBV - Burners

Andy,

The direct gas-fired modules at the Mercedes Benz facility are constructed with Midco HMA 2A burners. These burners are not considered Low NOx.
Please see below the NOx emission chart from their literature.

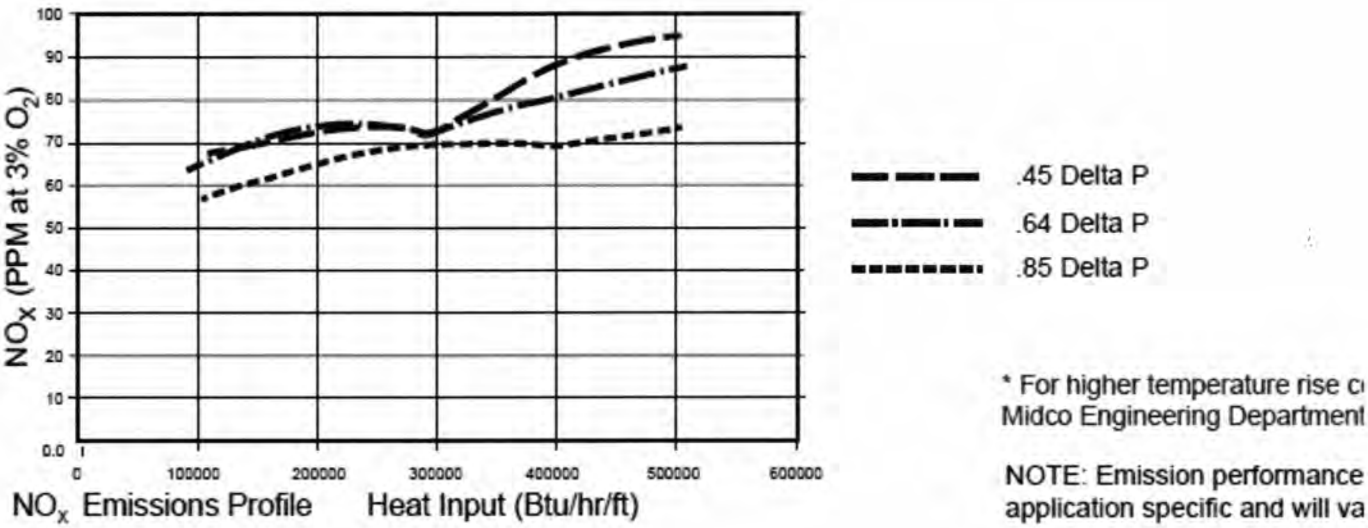

Chart 1 - CO and NO_2 Emissions Data

Based on the operating parameters of the Mercedes Benz job site:

505 Btu/hr/ft, 0.7" Delta P, you should expect around 80 ppm NOx.

Thanks
Johnson

If you are not the addressee, please inform us immediately that you have received this e-mail by mistake, and delete it.
We thank you for your support.

Kimberly Teofilak

From: Kimberly Teofilak
Sent: Tuesday, April 10, 2018 1:00 PM
To: Kimberly Teofilak
Subject: FW: Low NOx Burners - Ovens, ASUs, RTUs

From: Nicole Saniti
Sent: Monday, April 09, 2018 11:02 PM
To: Kimberly Teofilak <kteofilak@trinityconsultants.com>
Cc: Taylor Loftis <TLoftis@trinityconsultants.com>; Tony Jabon <TJabon@trinityconsultants.com>
Subject: FW: Low NOx Burners - Ovens, ASUs, RTUs

From: pranav.shah@daimler.com [mailto:pranav.shah@daimler.com]
Sent: Tuesday, March 27, 2018 7:47 AM
To: Nicole Saniti <NSaniti@trinityconsultants.com>
Cc: gregory.kunze@daimler.com
Subject: RE: Low NOx Burners - Ovens, ASUs, RTUs

Hi Nicole,

I found below statement from Trane RTU submittal (for AS & BS RTUs) regarding NOx emissions:

High/Low Modulating Gas Heat

The heating section shall have a drum and tube heat exchanger(s) design with primary and secondary surfaces of corrosion resistant aluminized steel or optional stainless steel (all modulating gas heat units shall have stainless steel). A forced combustion blower shall supply premixed fuel to a single burner ignited by a pilotless shot surface ignition system. In order to provide reliable operation, a regulated gas valve shall be used that requires blower operation to initiate gas flow. On an initial call for heat, the combustion blower shall purge the heat exchanger(s) 45 seconds before ignition. After three unsuccessful ignition attempts, the entire heating system shall be locked out until manually reset at the thermostat. Modulating gas turn down ratio on high fire units is accomplished by allowing the furnaces to act independently of one another. The modulating bank is activated first and is allowed to modulate itself to meet the heating needs. If the modulating bank is unable to meet the need at high fire, the second bank is turned on and then the first bank again modulates to the appropriate level.
This system creates a nearly seamless range of capacity from low fire on the modulating bank to high fire of both

FLD = Furnished by Trane U.S. Inc. dba Trane / Installed by Others **Equipment Submittal** *Page 7 of 22*

Mercedes Vans Manufacturing Facility December 06, 2016

furnaces together. Modulating gas heat units shall be suitable for use with natural gas only. All gas heat units comply with California requirements for low NOx emissions

I need to look over Paint shop ASUs submittal for NOx emission. Will look over it and confirm today.

Kind Regards/Mit Freundlichen Grüßen,

Pranav Shah

Utility Engineer, VAN/OECA

Mercedes-Benz Vans, LLC
8501 Palmetto Commerce Parkway
Ladson, SC, 29456

Office: +1 (854) 888-3220
Cell: +1 (843) 693-6226
Email: Pranav.Shah@Daimler.com
http://mbvcharleston.com/

From: Nicole Saniti [mailto:NSaniti@trinityconsultants.com]
Sent: Monday, March 26, 2018 8:37 PM
To: Shah, Pranav (566) <pranav.shah@daimler.com>
Subject: Low NOx Burners - Ovens, ASUs, RTUs

Pranav,

Is there any available documentation related to the NOx emissions from the oven burners, ASUs, or RTUs? I am wanting to verify whether these burners are low NOx burners.

Regards,

Nicole

Nicole Saniti, P.E.
Managing Consultant

Trinity Consultants
325 Arlington Ave., Suite 500 | Charlotte, North Carolina 28203

Office: 704-553-7747 x104 | Mobile: 518-461-8135
Email: nsaniti@trinityconsultants.com | LinkedIn: www.linkedin.com/in/nsanititrinityconsultants

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If you are not the addressee, please inform us immediately that you have received this e-mail by mistake, and delete it. We thank you for your support.

Healthy People. Healthy Communities.

April 17, 2018

Catherine Collins
USPHS
Bureau of Air & Water Resources
US Fish and Wildlife Service
7333 West Jefferson Ave.
Suite 375
Lakewood, CO 80235

Sarah Dawsey
Cape Romain Wilderness Area
5801 Highway 17 North
Awendaw, SC 29429

Re: Prevention of Significant Deterioration (PSD) Air Permit Application Revision Addendum
Mercedes Benz Vans, LLC
Permit No. 0560-0385-CA-R3, Charleston County

Dear Ms. Collins and Dawsey:

The Bureau of Air Quality (BAQ) received a PSD permit application revision from Mercedes Benz Vans, LLC, Ladson, SC on February 20, 2018. The application was for revisions/modifications to the new automobile manufacturing plant. The completeness review period for the application officially began on this date and the application has been deemed technically complete as of February 26, 2018. It will now undergo technical review for a preliminary determination under the requirements of SC Regulation 61-62.5, Standard No. 7 (PSD). An addendum to the application was received on April 13, 2018, to address questions and concerns during the review process.

An electronic copy of the PSD construction permit application addendum is available for review upon your request. Please direct all written comments to my attention at the address below. If I can be of further assistance, please contact me at (803) 898-4072 or by E-mail at clarkfaw@dhec.sc.gov.

Sincerely,

Fatina Ann Washburn Clark

Fatina Ann Washburn Clark
Air Permitting Division
Bureau of Air Quality

cc: Permit File: 0560-0385
ec: Wendy Boswell, BEHS

Clark, Fatina Ann Washburn

From:	Nicole Saniti <NSaniti@trinityconsultants.com>
Sent:	Tuesday, April 24, 2018 10:59 AM
To:	Clark, Fatina Ann Washburn; Humphries, Diane
Cc:	russell.revell@daimler.com; jae.park@daimler.com; McCaslin, Steven; Tony Jabon
Subject:	Mercedes-Benz Vans Permit Status

Fatina and Diane,

I wanted to check in on the status of the Mercedes-Benz Vans permit revision. I understand that Fatina was on leave and may still be on leave this week. With the start of production anticipated the first week of June, we are hopeful that the permit will be sent out for comment this week to ensure permit issuance prior to June 1st. As of last week, we had submitted an addendum to the application and provided clarifying information via email as requested by Fatina. My understanding was that modeling was reviewing the addendum and that Fatina had made the permit updates.

Please let us know the status of this revision, and whether any additional information is needed. We appreciate all of your effort on the Mercedes permit.

Regards,

Nicole

………………………………………………………………………………………………

Nicole Saniti, P.E.
Managing Consultant

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325 Arlington Ave., Suite 500 | Charlotte, North Carolina 28203

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Clark, Fatina Ann Washburn

From: Nicole Saniti <NSaniti@trinityconsultants.com>
Sent: Tuesday, April 17, 2018 2:27 PM
To: Clark, Fatina Ann Washburn
Cc: jae.park@daimler.com; russell.revell@daimler.com; Tony Jabon
Subject: Body Shop MAG Welding Filters - Requested Permit Update
Attachments: RoboVent_Filter_A15Filter_2017.pdf

Fatina,

As we discussed on the phone this morning, Mercedes-Benz Vans has confirmed that the filters they have selected for the MAG welding operation are not specifically "HEPA" filters. However, they achieve the level of control that we specified in the application. The specification sheet for the filters the facility is using is attached. Could we update the body shop MAG welding control to "cartridge filters" in place of "HEPA filters" in the permit?

Please feel free to reach out with any questions.

Regards,

Nicole

……………………………………………………………………………………………………

Nicole Saniti, P.E.
Managing Consultant

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Clark, Fatina Ann Washburn

From: Nicole Saniti <NSaniti@trinityconsultants.com>
Sent: Tuesday, April 17, 2018 2:19 PM
To: Clark, Fatina Ann Washburn
Cc: jae.park@daimler.com; russell.revell@daimler.com; Tony Jabon
Subject: Mercedes-Benz Vans Standard No. 5.2 Technical Infeasibility Information

Fatina,

As we discussed on the phone this morning, Standard No. 5.2 allows for Case-by-Case NO_X control if the facility has technical or economic limitations that make compliance with the requirements of Standard No. 5.2 infeasible. Mercedes-Benz Vans will be unable to track startup and shutdown periods as required in Standard No. 5.2 due to the design of the boilers and the manner in which they operate.

The boilers are natural gas fired hot water heaters that periodically turn on to heat water based on demand. This operation is similar to a hot water heater in a residence. The hot water heaters are maintained per manufacturer's recommendations to ensure clean and efficient burning of natural gas to minimize emissions. With the hot water demand constantly changing, the hot water heaters cycle off and on to meet the facility requirements, which makes it impossible to track startup and shutdown. The burners do not have a ramped startup like boilers, but only an "off" or "efficient full firing" operation.

Mercedes will track facility-wide natural gas usage and will use this information to determine boiler fuel usage on a monthly basis.

Based on this information, Mercedes-Benz Vans requests a Case-by-Case NO_X permit condition that excludes the startup and shutdown tracking requirement.

Please feel free to reach out with any questions.

Regards,

Nicole

…………………………………………………………………………………………

Nicole Saniti, P.E.
Managing Consultant

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Clark, Fatina Ann Washburn

From: Taylor Loftis <TLoftis@trinityconsultants.com>
Sent: Friday, April 06, 2018 4:41 PM
To: Allard, John R.
Cc: Tony Jabon; Nicole Saniti; McAvoy, Bryan P.; Clark, Fatina Ann Washburn
Subject: RE: Draft modeling summary and thoughts on RTO NOx emissions

John,

Yes, we are okay with that value. We expect the actual maximum value to be less than 2.11 lb/hr.

Best,
Taylor

....

Taylor Loftis, P.E.
Managing Consultant

Trinity Consultants
325 Arlington Ave., Suite 500 | Charlotte, North Carolina 28203

Office: 704-553-7747 x103
Email: tloftis@trinityconsultants.com

From: Allard, John R. [mailto:allardjr@dhec.sc.gov]
Sent: Friday, April 06, 2018 1:42 PM
To: Taylor Loftis <TLoftis@trinityconsultants.com>
Cc: Tony Jabon <TJabon@trinityconsultants.com>; Nicole Saniti <NSaniti@trinityconsultants.com>; McAvoy, Bryan P. <mcavoybp@dhec.sc.gov>; Clark, Fatina Ann Washburn <clarkfaw@dhec.sc.gov>
Subject: Re: Draft modeling summary and thoughts on RTO NOx emissions

Hey Taylor,

Thanks for providing the additional information. Are you okay with the NO_2 emission rate of 2.11 lb/hr that we have in our modeling summary for the RTO?

Thanks,
John

John R. Allard, Jr.
Meteorologist
Modeling Section/ Bureau of Air Quality
S.C. Dept. of Health & Environmental Control
2600 Bull Street, Columbia SC 29201
Office: (803) 898-4088
Connect: www.scdhec.gov Facebook Twitter

From: Taylor Loftis <TLoftis@trinityconsultants.com>
Sent: Friday, April 6, 2018 9:58:21 AM
To: McAvoy, Bryan P.; Allard, John R.; Clark, Fatina Ann Washburn
Cc: Tony Jabon; Nicole Saniti
Subject: RE: Draft modeling summary and thoughts on RTO NOx emissions

Bryan,

Thank you for getting back to us quickly regarding our question on the guidance. We've attached an "other information" demonstration for the facility in order to satisfy the requirements under Standard No. 2.

Please let me know if you have any questions or comments regarding the attached document.

Best,
Taylor

....
Taylor Loftis, P.E.
Managing Consultant

Trinity Consultants
325 Arlington Ave., Suite 500 | Charlotte, North Carolina 28203

Office: 704-553-7747 x103
Email: tloftis@trinityconsultants.com

From: McAvoy, Bryan P. [mailto:mcavoybp@dhec.sc.gov]
Sent: Monday, April 02, 2018 5:07 PM
To: Taylor Loftis <TLoftis@trinityconsultants.com>; Allard, John R. <allardjr@dhec.sc.gov>; Clark, Fatina Ann Washburn <clarkfaw@dhec.sc.gov>
Subject: Draft modeling summary and thoughts on RTO NOx emissions

Hi Taylor,

Concerning the RTO emissions, I talked this over with John Glass and his take on it is that the control device is essentially part of the source. In addition, the venting of multiple sources from one emission point creates a more concentrated plume than you would get from having each source vent separately (and even more so than when a single source's emissions are distributed across multiple stacks). Thus, in this case, the RTO emissions likely should trigger a Std 2 compliance demonstration if they do turn out to be over 1.14 lb/hr.

Here is how I got the values that I did for the RTO emissions.

As I said on the phone, I parsed the RTO NAAQS emissions using what was in Appendix B from the permit application. In particular, I got the emissions from pages "7 of 37" and "10 of 37" of Appendix B. For the sake of completeness, I've attached a screen capture of each page. Anything highlighted in cyan I added to the RTO output.

I've attached the draft of the modeling summary that I mentioned on the phone. It is a slightly sanitized version, but understand that as it is a draft there are plenty of things in there that are incomplete and some things that might be considered flat-out wrong as they have not undergone a complete internal review.

That said, the Std 2 emissions, by emission point, are listed in the table titled "Standard No. 2 - Ambient Air Quality Standards Emission Ratess" at the beginning of Section F (page 16). The RTO emissions are highlighted in cyan. They are not broken out (see the screen captures of Appdx B for that) as this table is listed by emission point.

If you have any questions, please give us a call and we can discuss this futher.

Thank you,

Bryan McAvoy
Meteorologist
S.C. Dept. of Health & Environmental Control
Office: (803) 898-1275
Email: mcavoybp@dhec.sc.gov
Connect: www.scdhec.gov

Clark, Fatina Ann Washburn

From:	Allard, John R.
Sent:	Friday, April 06, 2018 1:42 PM
To:	Taylor Loftis
Cc:	Tony Jabon; Nicole Saniti; McAvoy, Bryan P.; Clark, Fatina Ann Washburn
Subject:	Re: Draft modeling summary and thoughts on RTO NOx emissions

Hey Taylor,

Thanks for providing the additional information. Are you okay with the NO2 emission rate of 2.11 lb/hr that we have in our modeling summary for the RTO?

Thanks,
John

John R. Allard, Jr.
Meteorologist
Modeling Section/ Bureau of Air Quality
S.C. Dept. of Health & Environmental Control
2600 Bull Street, Columbia SC 29201
Office: (803) 898-4088
Connect: www.scdhec.gov Facebook Twitter

From: Taylor Loftis <TLoftis@trinityconsultants.com>
Sent: Friday, April 6, 2018 9:58:21 AM
To: McAvoy, Bryan P.; Allard, John R.; Clark, Fatina Ann Washburn
Cc: Tony Jabon; Nicole Saniti
Subject: RE: Draft modeling summary and thoughts on RTO NOx emissions

Bryan,

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Please let me know if you have any questions or comments regarding the attached document.

Best,
Taylor

Taylor Loftis, P.E.
Managing Consultant

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325 Arlington Ave., Suite 500 | Charlotte, North Carolina 28203
Office: 704-553-7747 x103
Email: tloftis@trinityconsultants.com

From: McAvoy, Bryan P. [mailto:mcavoybp@dhec.sc.gov]
Sent: Monday, April 02, 2018 5:07 PM
To: Taylor Loftis <TLoftis@trinityconsultants.com>; Allard, John R. <allardjr@dhec.sc.gov>; Clark, Fatina Ann Washburn <clarkfaw@dhec.sc.gov>
Subject: Draft modeling summary and thoughts on RTO NOx emissions

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That said, the Std 2 emissions, by emission point, are listed in the table titled "Standard No. 2 - Ambient Air Quality Standards Emission Ratess" at the beginning of Section F (page 16). The RTO emissions are highlighted in cyan. They are not broken out (see the screen captures of Appdx B for that) as this table is listed by emission point.

If you have any questions, please give us a call and we can discuss this futher.

Thank you,

Bryan McAvoy
Meteorologist
S.C. Dept. of Health & Environmental Control
Office: (803) 898-1275
Email: mcavoybp@dhec.sc.gov
Connect: www.scdhec.gov

Clark, Fatina Ann Washburn

From:	Clark, Fatina Ann Washburn
Sent:	Friday, April 06, 2018 12:38 PM
To:	Nicole Saniti; Kimberly Teofilak
Cc:	russell.revell@daimler.com; jae.park@daimler.com; Tony Jabon; Humphries, Diane
Subject:	RE: Mercedes-Benz Vans Permit Revision Comments

Hi Nicole.

I would go ahead and include the minor changes to the ASUs/RTUs while you are correcting things and any other small changes that may have come up. Please remember to do a full BACT analysis on the spot repair change in order for the process to continue moving forward smoothly. I will touch base with you on Monday when we are both back in the office and we can discuss anything else that comes up next week when we are at CAPCA (assuming you will be there as always ☺) Have a wonderful weekend.

Fatina A. W. Clark
Coastal Plains and Power Section
Bureau of Air Quality
S.C. Dept. of Health & Environmental Control
Office: (803) 898-4072
Connect: www.scdhec.gov Facebook Twitter

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From: Nicole Saniti [mailto:NSaniti@trinityconsultants.com]
Sent: Friday, April 6, 2018 10:16 AM
To: Clark, Fatina Ann Washburn <clarkfaw@dhec.sc.gov>; Kimberly Teofilak <kteofilak@trinityconsultants.com>
Cc: russell.revell@daimler.com; jae.park@daimler.com; Tony Jabon <TJabon@trinityconsultants.com>; Humphries, Diane <HUMPHRDM@dhec.sc.gov>
Subject: RE: Mercedes-Benz Vans Permit Revision Comments

Fatina,

We will submit this information in a letter addendum containing all of the requested information for the Standard No. 5.2 determination and E-coat spot repair BACT. We should be able to submit early next week. Assuming what we provide is acceptable to you, it seems that there would still be sufficient time for permit issuance by June 1 since the permit comments have already been provided. Do you agree?

Regards,

Nicole

....

Nicole Saniti, P.E.
Managing Consultant

Trinity Consultants
325 Arlington Ave., Suite 500 | Charlotte, North Carolina 28203

Office: **704-553-7747 x104** | Mobile: 518-461-8135
Email: nsaniti@trinityconsultants.com | LinkedIn: www.linkedin.com/in/nsanititrinityconsultants

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From: Clark, Fatina Ann Washburn [mailto:clarkfaw@dhec.sc.gov]
Sent: Friday, April 06, 2018 8:23 AM
To: Nicole Saniti <NSaniti@trinityconsultants.com>; Kimberly Teofilak <kteofilak@trinityconsultants.com>
Cc: russell.revell@daimler.com; jae.park@daimler.com; Tony Jabon <TJabon@trinityconsultants.com>; Humphries, Diane <HUMPHRDM@dhec.sc.gov>
Subject: RE: Mercedes-Benz Vans Permit Revision Comments

Hi Nicole.

Thank you for your comments. I will review them and get back to you. As mentioned previously, changes to BACT are required to be addressed in the application. Please include your e-coat spot repair BACT limit change and basis/rationale for this change in the application. Once the application is revised and reviewed, we can include this change in this revision. Please let me know a timeframe for submittal along with the case by case NOx determination. Thanks!

Fatina A. W. Clark
Coastal Plains and Power Section
Bureau of Air Quality
S.C. Dept. of Health & Environmental Control
Office: (803) 898-4072
Connect: www.scdhec.gov Facebook Twitter

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From: Nicole Saniti [mailto:NSaniti@trinityconsultants.com]
Sent: Thursday, April 5, 2018 11:34 AM
To: Clark, Fatina Ann Washburn <clarkfaw@dhec.sc.gov>; Kimberly Teofilak <kteofilak@trinityconsultants.com>
Cc: russell.revell@daimler.com; jae.park@daimler.com; Tony Jabon <TJabon@trinityconsultants.com>
Subject: RE: Mercedes-Benz Vans Permit Revision Comments

Fatina,

I have attached the updated draft permit incorporating the comments I sent this morning, as well as a track change edited version of the PD.

Please note that we have included an additional request in the draft permit and PD. For simplicity in compliance tracking and to allow for flexibility, Mercedes-Benz Vans requests the same limit for E-coat spot repair as the other spot repair booths (6 lb VOC per gallon of material). This results in a trivial increase in Phase 3 emissions of 0.04 tpy, and total E-coat spot repair emissions are 0.14 tpy following this revision. Based on this very small increase in VOC emissions, there would be no change to any conclusions in BACT analysis or regulatory applicability. This change impacts conditions C.58 and C.59 (marked up accordingly).

Please feel free to reach out with any questions.

Regards,

Nicole

Nicole Saniti, P.E.
Managing Consultant

Trinity Consultants
325 Arlington Ave., Suite 500 | Charlotte, North Carolina 28203

Office: **704-553-7747 x104** | Mobile: 518-461-8135
Email: nsaniti@trinityconsultants.com | LinkedIn: www.linkedin.com/in/nsanititrinityconsultants

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From: Nicole Saniti
Sent: Thursday, April 05, 2018 10:31 AM
To: 'Clark, Fatina Ann Washburn' <clarkfaw@dhec.sc.gov>; Kimberly Teofilak <kteofilak@trinityconsultants.com>
Cc: russell.revell@daimler.com; jae.park@daimler.com; Tony Jabon <TJabon@trinityconsultants.com>
Subject: RE: Mercedes-Benz Vans Permit Revision Comments

Fatina,

As shown in the equipment table in the permit, the ovens are not routed to the filtration systems and have no PM emissions (no coating operations within the ovens). Therefore, we have a few additional comments on the draft permit:

- In Condition C.40, the permit lists GO01 and GO21 instead of GC01 and GC21. The ovens are not routed to the filtration system and do not have PM emissions (no spraying). Please update to list the booths (GC01 and GC21) instead of the ovens.
- Same comment applies to Condition C.66. The ovens are not routed to the filtration systems, so GO01, GO21, TO01, and TO21 should be removed. The spray booths routed to the filtration systems with pre-controlled PM emissions greater than 100 tons per year are as follows:
    - GC01

  - GC21
  - BC01
  - CC01
  - BC21
- Based on the comment above, Condition C.66 should include CD-FS1, CD-FS2, CD-FS3, CD-FS4, and CD-FS5.

Please feel free to call me with any questions. I am taking another look at the PD, and we are working on the BACT write up for the boilers regarding Standard No. 5.2.

Thanks,

Nicole

……………………………………………………………………………………………………….
Nicole Saniti, P.E.
Managing Consultant

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325 Arlington Ave., Suite 500 | Charlotte, North Carolina 28203

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From: Clark, Fatina Ann Washburn [mailto:clarkfaw@dhec.sc.gov]
Sent: Tuesday, April 03, 2018 10:44 AM
To: Nicole Saniti <NSaniti@trinityconsultants.com>; Kimberly Teofilak <kteofilak@trinityconsultants.com>
Cc: russell.revell@daimler.com; jae.park@daimler.com; Tony Jabon <TJabon@trinityconsultants.com>
Subject: RE: Mercedes-Benz Vans Permit Revision Comments

Hi Nicole/Kim.

I did not see any comments on the PD. Did you have any? Thanks!

Fatina A. W. Clark
Engineering Services Division
S.C. Dept. of Health & Environmental Control
Office: (803) 898-4072
Fax: (803) 898-4079
Connect: www.scdhec.gov Facebook Twitter

From: Nicole Saniti [mailto:NSaniti@trinityconsultants.com]
Sent: Thursday, March 29, 2018 1:12 PM
To: Clark, Fatina Ann Washburn <clarkfaw@dhec.sc.gov>
Cc: russell.revell@daimler.com; jae.park@daimler.com; Tony Jabon <TJabon@trinityconsultants.com>
Subject: Mercedes-Benz Vans Permit Revision Comments

Fatina,

I have attached a marked up version of the draft permit with Mercedes-Benz Vans comments, as well as minor changes to the PD. Please review the comments and let us know if you have any questions or would like to discuss any of these items further. I will be on vacation until Thursday of next week but available on my cell phone (518) 461-8135.

Thanks,

Nicole

Nicole Saniti, P.E.
Managing Consultant

Trinity Consultants
325 Arlington Ave., Suite 500 | Charlotte, North Carolina 28203

Office: **704-553-7747 x104** | Mobile: 518-461-8135
Email: nsaniti@trinityconsultants.com | LinkedIn: www.linkedin.com/in/nsanititrinityconsultants

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Clark, Fatina Ann Washburn

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Sent: Friday, April 06, 2018 10:16 AM
To: Clark, Fatina Ann Washburn; Kimberly Teofilak
Cc: russell.revell@daimler.com; jae.park@daimler.com; Tony Jabon; Humphries, Diane
Subject: RE: Mercedes-Benz Vans Permit Revision Comments

Fatina,

We will submit this information in a letter addendum containing all of the requested information for the Standard No. 5.2 determination and E-coat spot repair BACT. We should be able to submit early next week. Assuming what we provide is acceptable to you, it seems that there would still be sufficient time for permit issuance by June 1 since the permit comments have already been provided. Do you agree?

Regards,

Nicole

……………………………………………………………………………………………

Nicole Saniti, P.E.
Managing Consultant

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Cc: russell.revell@daimler.com; jae.park@daimler.com; Tony Jabon <TJabon@trinityconsultants.com>; Humphries, Diane <HUMPHRDM@dhec.sc.gov>
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Coastal Plains and Power Section
Bureau of Air Quality
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From: Nicole Saniti [mailto:NSaniti@trinityconsultants.com]
Sent: Thursday, April 5, 2018 11:34 AM
To: Clark, Fatina Ann Washburn <clarkfaw@dhec.sc.gov>; Kimberly Teofilak <kteofilak@trinityconsultants.com>
Cc: russell.revell@daimler.com; jae.park@daimler.com; Tony Jabon <TJabon@trinityconsultants.com>
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Managing Consultant

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Clark, Fatina Ann Washburn

From:	Taylor Loftis <TLoftis@trinityconsultants.com>
Sent:	Friday, April 06, 2018 9:58 AM
To:	McAvoy, Bryan P.; Allard, John R.; Clark, Fatina Ann Washburn
Cc:	Tony Jabon; Nicole Saniti
Subject:	RE: Draft modeling summary and thoughts on RTO NOx emissions
Attachments:	Other Information_NO2_2018-0406.pdf

Bryan,

Thank you for getting back to us quickly regarding our question on the guidance. We've attached an "other information" demonstration for the facility in order to satisfy the requirements under Standard No. 2.

Please let me know if you have any questions or comments regarding the attached document.

Best,
Taylor

....
Taylor Loftis, P.E.
Managing Consultant

Trinity Consultants
325 Arlington Ave., Suite 500 | Charlotte, North Carolina 28203

Office: 704-553-7747 x103
Email: tloftis@trinityconsultants.com

From: McAvoy, Bryan P. [mailto:mcavoybp@dhec.sc.gov]
Sent: Monday, April 02, 2018 5:07 PM
To: Taylor Loftis <TLoftis@trinityconsultants.com>; Allard, John R. <allardjr@dhec.sc.gov>; Clark, Fatina Ann Washburn <clarkfaw@dhec.sc.gov>
Subject: Draft modeling summary and thoughts on RTO NOx emissions

Hi Taylor,

Concerning the RTO emissions, I talked this over with John Glass and his take on it is that the control device is essentially part of the source. In addition, the venting of multiple sources from one emission point creates a more concentrated plume than you would get from having each source vent separately (and even more so than when a single source's emissions are distributed across multiple stacks). Thus, in this case, the RTO emissions likely should trigger a Std 2 compliance demonstration if they do turn out to be over 1.14 lb/hr.

Here is how I got the values that I did for the RTO emissions.

As I said on the phone, I parsed the RTO NAAQS emissions using what was in Appendix B from the permit application. In particular, I got the emissions from pages "7 of 37" and "10 of 37" of Appendix B. For the sake of completeness, I've attached a screen capture of each page. Anything highlighted in cyan I added to the RTO output.

I've attached the draft of the modeling summary that I mentioned on the phone. It is a slightly sanitized version, but understand that as it is a draft there are plenty of things in there that are incomplete and some things that might be considered flat-out wrong as they have not undergone a complete internal review.

That said, the Std 2 emissions, by emission point, are listed in the table titled "Standard No. 2 - Ambient Air Quality Standards Emission Ratess" at the beginning of Section F (page 16). The RTO emissions are highlighted in cyan. They are not broken out (see the screen captures of Appdx B for that) as this table is listed by emission point.

If you have any questions, please give us a call and we can discuss this futher.

Thank you,

Bryan McAvoy
Meteorologist
S.C. Dept. of Health & Environmental Control
Office: (803) 898-1275
Email: mcavoybp@dhec.sc.gov
Connect: www.scdhec.gov

Clark, Fatina Ann Washburn

From: Clark, Fatina Ann Washburn
Sent: Friday, April 06, 2018 8:23 AM
To: Nicole Saniti; Kimberly Teofilak
Cc: russell.revell@daimler.com; jae.park@daimler.com; Tony Jabon; Humphries, Diane
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Subject:	RE: Mercedes-Benz Vans Permit Revision Comments
Attachments:	0560-0385ca.r3 (002) ns edits 4.5.18.docx; 0560-0385ca.r3.pd ns edits.docx

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Subject: RE: Mercedes-Benz Vans Permit Revision Comments

Hi Nicole.

Thank you for the comments. Most of the comments can be incorporated without further discussion. When you return, we will need to discuss the Case by Case for the boilers. It can be performed in that manner. Our requirements are basically a mini NOx BACT to establish the case-by-case. Since this will take some time to put together, I wanted to get this to you so folks can be working on it in your absence if that is the path the facility would like to take. I will work through your comments and email you if I have any additional questions. Should I email Kim as well? Thanks!

Fatina A. W. Clark
Engineering Services Division
S.C. Dept. of Health & Environmental Control
Office: (803) 898-4072
Fax: (803) 898-4079
Connect: www.scdhec.gov Facebook Twitter

From: Nicole Saniti [mailto:NSaniti@trinityconsultants.com]
Sent: Thursday, March 29, 2018 1:12 PM
To: Clark, Fatina Ann Washburn <clarkfaw@dhec.sc.gov>
Cc: russell.revell@daimler.com; jae.park@daimler.com; Tony Jabon <TJabon@trinityconsultants.com>
Subject: Mercedes-Benz Vans Permit Revision Comments

Fatina,

I have attached a marked up version of the draft permit with Mercedes-Benz Vans comments, as well as minor changes to the PD. Please review the comments and let us know if you have any questions or would like to discuss any of these items further. I will be on vacation until Thursday of next week but available on my cell phone (518) 461-8135.

Thanks,

Nicole

Nicole Saniti, P.E.
Managing Consultant

Trinity Consultants
325 Arlington Ave., Suite 500 | Charlotte, North Carolina 28203

Office: **704-553-7747 x104** | Mobile: 518-461-8135
Email: nsaniti@trinityconsultants.com | LinkedIn: www.linkedin.com/in/nsanititrinityconsultants

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Clark, Fatina Ann Washburn

From: Nicole Saniti <NSaniti@trinityconsultants.com>
Sent: Thursday, March 29, 2018 1:12 PM
To: Clark, Fatina Ann Washburn
Cc: russell.revell@daimler.com; jae.park@daimler.com; Tony Jabon
Subject: Mercedes-Benz Vans Permit Revision Comments
Attachments: 0560-0385ca.r3 (002) ns edits 3.26.18.docx; 0560-0385ca.r3.pd ns edits.docx

Fatina,

I have attached a marked up version of the draft permit with Mercedes-Benz Vans comments, as well as minor changes to the PD. Please review the comments and let us know if you have any questions or would like to discuss any of these items further. I will be on vacation until Thursday of next week but available on my cell phone (518) 461-8135.

Thanks,

Nicole

Nicole Saniti, P.E.
Managing Consultant

Trinity Consultants
325 Arlington Ave., Suite 500 | Charlotte, North Carolina 28203

Office: **704-553-7747 x104** | Mobile: 518-461-8135
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Learn about Trinity's courses for environmental professionals.

Clark, Fatina Ann Washburn

From: McAvoy, Bryan P.
Sent: Tuesday, March 27, 2018 4:11 PM
To: Taylor Loftis
Cc: Clark, Fatina Ann Washburn; Glass, John; jae.park@daimler.com
Subject: Std 2 (NAAQS) pollutant emissions question

Hi Taylor,

I have another question for you. I've been putting together a table of the Std 2 emissions, by emission point, for the facility. This is part of the modeling summary that we create here at DHEC.

It appears that the NOx emissions from the RTO exceed the Std 2 state modeling threshold of 1.14 lb/hr from a single emission point. Here's the details...

On page 97 of facility's permit application (the PDF file) there is a table named "Air Supply Units Non-HAP Emissions". If I'm reading it correctly, the emissions from "ASU P/BC/CC", "ASU31" and "ASU32" all vent to "Dry X" which then vents out the RTO. The total NOx emissions from these three sources is 1.06 lb/hr.

Further down, on page 100, there is a table named "Paint Shop Combustion Non-HAP Emissions". In this table, the combined emissions from the "RTO", "RTO (add)", "ADH1" and "ADH2" equal 1.05 lb/hr.

Do you know if the 1.06 lb/hr and 1.05 lb/hr emissions are somehow from the same process? They don't appear to be, but I'm not sure. If not, then the RTO emissions exceed the Std 2 state modeling threshold for NOx.

If you have a spreadsheet with all these emissions I could look at, that would be helpful, though the question above still stands.

Thank you,

Bryan McAvoy
Meteorologist
S.C. Dept. of Health & Environmental Control
Office: (803) 898-1275
Email: mcavoybp@dhec.sc.gov
Connect: www.scdhec.gov

Clark, Fatina Ann Washburn

From: Clark, Fatina Ann Washburn
Sent: Tuesday, March 27, 2018 10:27 AM
To: NSaniti@trinityconsultants.com
Subject: Revision 3

Hi Nicole.

Just following up to see if the facility has any comments on the last permit revision. Please let me know. Thanks!

Fatina A. W. Clark
Engineering Services Division
S.C. Dept. of Health & Environmental Control
Office: (803) 898-4072
Fax: (803) 898-4079
Connect: www.scdhec.gov Facebook Twitter

dhec
Healthy People. Healthy Communities.

Clark, Fatina Ann Washburn

From:	Taylor Loftis <TLoftis@trinityconsultants.com>
Sent:	Friday, March 23, 2018 11:12 AM
To:	McAvoy, Bryan P.
Cc:	Clark, Fatina Ann Washburn; Allard, John R.; jae.park@daimler.com
Subject:	RE: Question concerning Q/D values in the Mercedes modeling report

Bryan,

I'm sorry I forgot to answer your burner emission point question. Yes, there is actually only one stack for these sources. Since the original submittal, a different firm was hired to design the plant and they completely changed the design in several areas, including the number of stacks and their locations. As a result, there were less stacks per oven and also only a single RTO (I believe originally there were multiple).

Best,
Taylor

....

Taylor Loftis, P.E.
Managing Consultant

Trinity Consultants
325 Arlington Ave., Suite 500 | Charlotte, North Carolina 28203

Office: 704-553-7747 x103
Email: tloftis@trinityconsultants.com

From: McAvoy, Bryan P. [mailto:mcavoybp@dhec.sc.gov]
Sent: Friday, March 23, 2018 10:49 AM
To: Taylor Loftis <TLoftis@trinityconsultants.com>
Cc: Clark, Fatina Ann Washburn <clarkfaw@dhec.sc.gov>; Allard, John R. <allardjr@dhec.sc.gov>; jae.park@daimler.com
Subject: Re: Question concerning Q/D values in the Mercedes modeling report

Hi Taylor,

Thank you for the clarification on Q/D and the followup on VISCREEN.

The only other open question that I have concerns the oven/burner emission point ID's. I asked that question in a separate email. You may be working on a reply already. But, just as a reminder, this was the situation where previous modeling reports listed 4 or 5 emission points for each oven, while the most recent reports lists just one emission point per oven.

-Bryan @ BAQ

From: Taylor Loftis <TLoftis@trinityconsultants.com>
Sent: Friday, March 23, 2018 9:59 AM
To: McAvoy, Bryan P.
Subject: RE: Question concerning Q/D values in the Mercedes modeling report

Bryan,

Sorry for the delay in my reply. I had to dig a bit to find the answer to this question. It turns out I pulled the Q/D table from a spreadsheet that had been setup to calculate unrestricted emissions that also included emergency equipment. I pulled the wrong one when updating the report, but have fixed it in the attached page. The higher values were in a table that included emergency equipment, operating continuously. My apologies for the confusion.

For NO_X, the value shown is 9.36, which is the sum of the boilers (1.03), air supply units (6.00), Paint Shop Ovens, RTO, etc. (2.24), Assembly oven (0.07), and Roll & Break (0.04). There are some rounding up in the individual values that affects the sum when they're split out, but the main difference in the values I put in initially was that it assumed everything (including the emergency equipment) was operating. The emergency equipment accounts for 20 something pounds per hour of NO_X.

Also, with respect to your other email about VISCREEN. If the conservative values pose a problem, we can circle back and sharpen the pencil, but for now I don't think we have any issues with your approach to the VISCREEN analysis.

Best,
Taylor

....
Taylor Loftis, P.E.
Managing Consultant

Trinity Consultants
325 Arlington Ave., Suite 500 | Charlotte, North Carolina 28203

Office: 704-553-7747 x103
Email: tloftis@trinityconsultants.com

From: McAvoy, Bryan P. [mailto:mcavoybp@dhec.sc.gov]
Sent: Thursday, March 15, 2018 4:30 PM
To: Taylor Loftis <TLoftis@trinityconsultants.com>
Subject: Question concerning Q/D values in the Mercedes modeling report

Hi Taylor,

Table 4-2 in the Mercedes modeling report has some odd looking pollutant values. This is the table for the Q/D calculation.

In TPY, NOx is listed as 185.84, SO2 is 27.55 and PM10 is 25.01

But in DHEC form 2569 they are listed as (under "limited"):

NOx = 35.42. SO2 = 0.79 and PM10 = 14.73

Fatina is off for a couple days, so I thought I'd just run this by you first. Either way they screen out, so it's fine from a big picture perspective, but the values in that table appear to be way off. Please let me know what's up.

Thanks,

Bryan McAvoy
Meteorologist
S.C. Dept. of Health & Environmental Control
Office: (803) 898-1275
Email: mcavoybp@dhec.sc.gov
Connect: www.scdhec.gov

Clark, Fatina Ann Washburn

From: McAvoy, Bryan P.
Sent: Friday, March 23, 2018 10:49 AM
To: Taylor Loftis
Cc: Clark, Fatina Ann Washburn; Allard, John R.; jae.park@daimler.com
Subject: Re: Question concerning Q/D values in the Mercedes modeling report

Hi Taylor,

Thank you for the clarification on Q/D and the followup on VISCREEN.

The only other open question that I have concerns the oven/burner emission point ID's. I asked that question in a separate email. You may be working on a reply already. But, just as a reminder, this was the situation where previous modeling reports listed 4 or 5 emission points for each oven, while the most recent reports lists just one emission point per oven.

-Bryan @ BAQ

From: Taylor Loftis <TLoftis@trinityconsultants.com>
Sent: Friday, March 23, 2018 9:59 AM
To: McAvoy, Bryan P.
Subject: RE: Question concerning Q/D values in the Mercedes modeling report

Bryan,

Sorry for the delay in my reply. I had to dig a bit to find the answer to this question. It turns out I pulled the Q/D table from a spreadsheet that had been setup to calculate unrestricted emissions that also included emergency equipment. I pulled the wrong one when updating the report, but have fixed it in the attached page. The higher values were in a table that included emergency equipment, operating continuously. My apologies for the confusion.

For NO_X, the value shown is 9.36, which is the sum of the boilers (1.03), air supply units (6.00), Paint Shop Ovens, RTO, etc. (2.24), Assembly oven (0.07), and Roll & Break (0.04). There are some rounding up in the individual values that affects the sum when they're split out, but the main difference in the values I put in initially was that it assumed everything (including the emergency equipment) was operating. The emergency equipment accounts for 20 something pounds per hour of NO_X.

Also, with respect to your other email about VISCREEN. If the conservative values pose a problem, we can circle back and sharpen the pencil, but for now I don't think we have any issues with your approach to the VISCREEN analysis.

Best,
Taylor

Taylor Loftis, P.E.
Managing Consultant

Trinity Consultants
325 Arlington Ave., Suite 500 | Charlotte, North Carolina 28203

Office: 704-553-7747 x103
Email: tloftis@trinityconsultants.com

From: McAvoy, Bryan P. [mailto:mcavoybp@dhec.sc.gov]
Sent: Thursday, March 15, 2018 4:30 PM
To: Taylor Loftis <TLoftis@trinityconsultants.com>
Subject: Question concerning Q/D values in the Mercedes modeling report

Hi Taylor,

Table 4-2 in the Mercedes modeling report has some odd looking pollutant values. This is the table for the Q/D calculation.

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Fatina is off for a couple days, so I thought I'd just run this by you first. Either way they screen out, so it's fine from a big picture perspective, but the values in that table appear to be way off. Please let me know what's up.

Thanks,

Bryan McAvoy
Meteorologist
S.C. Dept. of Health & Environmental Control
Office: (803) 898-1275
Email: mcavoybp@dhec.sc.gov
Connect: www.scdhec.gov

Clark, Fatina Ann Washburn

From: McAvoy, Bryan P.
Sent: Wednesday, March 21, 2018 4:02 PM
To: Taylor Loftis
Cc: Clark, Fatina Ann Washburn; Allard, John R.
Subject: Re: Question concerning Q/D values in the Mercedes modeling report

Hi Taylor,

I've got another one to add to the list. The submitted VISCREEN analysis was run (per the SUM file) with input values of 4.59 lb/hr for PM10 and 8.91 lb/hr for NOx.

The most recent facility PTE submission for PM10 is 14.73 tpy limited, and 17.36 tpy controlled. And for NOx the values are 35.42 limited and 46.37 controlled.

As VISCREEN uses the 24 hour avg max emissions, in this case, it is probably best to go with the higher controlled emissions (just to be conservative). Converted to lb/hr to match the ".SUM" file, this gives an input value of 3.96 lb/hr for PM10. and 10.59 lb/hr for NOx.

The difference isn't great, and the facility still easily passes the screening analysis. Still, I want to be sure that we are using the same data for the compliance demonstration. If you have different numbers in mind, please explain how they were derived and we'll go with that.

Thank you,

-Bryan at BAQ

From: Taylor Loftis <TLoftis@trinityconsultants.com>
Sent: Wednesday, March 21, 2018 7:54:18 AM
To: McAvoy, Bryan P.
Subject: RE: Question concerning Q/D values in the Mercedes modeling report

Bryan,

I'm travelling, but I should be back in the office this afternoon. I'll check on the items you've sent me and get back to you later today.

Best,
Taylor

Taylor Loftis, P.E.
Managing Consultant

Trinity Consultants
325 Arlington Ave., Suite 500 | Charlotte, North Carolina 28203

Office: 704-553-7747 x103
Email: tloftis@trinityconsultants.com

From: McAvoy, Bryan P. [mailto:mcavoybp@dhec.sc.gov]
Sent: Thursday, March 15, 2018 4:30 PM
To: Taylor Loftis <TLoftis@trinityconsultants.com>
Subject: Question concerning Q/D values in the Mercedes modeling report

Hi Taylor,

Table 4-2 in the Mercedes modeling report has some odd looking pollutant values. This is the table for the Q/D calculation.

In TPY, NOx is listed as 185.84, SO2 is 27.55 and PM10 is 25.01

But in DHEC form 2569 they are listed as (under "limited"):

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Fatina is off for a couple days, so I thought I'd just run this by you first. Either way they screen out, so it's fine from a big picture perspective, but the values in that table appear to be way off. Please let me know what's up.

Thanks,

Bryan McAvoy
Meteorologist
S.C. Dept. of Health & Environmental Control
Office: (803) 898-1275
Email: mcavoybp@dhec.sc.gov
Connect: www.scdhec.gov

Clark, Fatina Ann Washburn

From: Nicole Saniti <NSaniti@trinityconsultants.com>
Sent: Wednesday, March 21, 2018 2:10 PM
To: Clark, Fatina Ann Washburn; jae.park@daimler.com
Cc: Humphries, Diane
Subject: RE: Permit for Review - 0560-0385-CA-R3 - EXPEDITED

Hi Fatina,

We are working through comments on this draft permit. We have a meeting with Mercedes at the plant tomorrow, and will discuss some of the comments during the meeting. Would it be possible to have a little bit more time to provide a response since we will be at the site tomorrow?

Regards,

Nicole

Nicole Saniti, P.E.
Managing Consultant

Trinity Consultants
325 Arlington Ave., Suite 500 | Charlotte, North Carolina 28203
Office: **704-553-7747 x104** | Mobile: 518-461-8135
Email: nsaniti@trinityconsultants.com | LinkedIn: www.linkedin.com/in/nsanititrinityconsultants

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From: Clark, Fatina Ann Washburn [mailto:clarkfaw@dhec.sc.gov]
Sent: Thursday, March 15, 2018 7:19 AM
To: jae.park@daimler.com; Nicole Saniti <NSaniti@trinityconsultants.com>
Cc: Humphries, Diane <HUMPHRDM@dhec.sc.gov>
Subject: Permit for Review - 0560-0385-CA-R3 - EXPEDITED

Hello there.

Attached please find a draft preliminary determination, permit and statement of basis for your review. The preliminary determination and permit are redlined for ease of review. Modeling is being revised and in order to keep the project moving forward, is not included in this draft. Please take a moment to review and provide comments by Thursday, March 22, 2018. Please feel free to call or email with any questions or concerns. Thanks!

Fatina A. W. Clark

Engineering Services Division
S.C. Dept. of Health & Environmental Control
Office: (803) 898-4072
Fax: (803) 898-4079
Connect: www.scdhec.gov Facebook Twitter

Clark, Fatina Ann Washburn

From: McAvoy, Bryan P.
Sent: Tuesday, March 20, 2018 11:49 AM
To: Taylor Loftis
Cc: Allard, John R.; Clark, Fatina Ann Washburn; jae.park@daimler.com
Subject: Question about various oven burner emission points at Mercedes

Hi Taylor,

I have a question for you concerning some of the emission points associated with the ovens/burners at the facility.

Previously, Primer Ovens 1 and 2, Topcoat Ovens 1 and 2 and the E-Coat Oven each had several modeled emissions points (corresponding to each burner, I believe). For example, Primer Oven No 1 was previously modeled with emission points R022, R023, R024, R024A and R025.

The modeling report in the current application has combined all of these into one emission point, OV02A. The same general idea applies to the other ovens as well.

Do the OV01A, OV02A, OV03A, OV22 and OV23 stacks now represent the only emission points from each oven/process? Or do they represent a virtual stack with the various ROXXX stacks remaining the actual emission points for permitting purposes?

The permit writer was unaware of these changes in the stack IDs, so please let us know which is correct.

Thank you,

Bryan McAvoy
Meteorologist
S.C. Dept. of Health & Environmental Control
Office: (803) 898-1275
Email: mcavoybp@dhec.sc.gov
Connect: www.scdhec.gov

Clark, Fatina Ann Washburn

From: McAvoy, Bryan P.
Sent: Monday, March 19, 2018 1:22 PM
To: Clark, Fatina Ann Washburn
Cc: Allard, John R.
Subject: Question about various oven burner emission points at Mercedes

Hi Fatina,

Thank you for the permit and SOB documents. They have been a big help. I do have a question concerning some the emission points associated with the oven burners at the facility.

Previously, Trinity modeled four separate emission points for the Primer Oven No 2 burners (RO322, RO323, RO324, RO325) and five for the Topcoat Oven No 2 burners (RO332, RO333, RO334, RO335, RO336). They did the same kind of thing for the Primer Oven No 1 and Topcoat Oven No 1 burners and for the E-Coat oven burners.

However, with this submission, they modeled one emission point for each group of burners. For example, Primer Oven No 2 burners were simply modeled with the emission point OV22.

In the draft permit, each burner is still listed as a separate emission point (RO322, RO323 etc).

Do you know which method is correct? I figured it would be best to ask you before hitting up the consultant.

Thanks,

-Bryan

Clark, Fatina Ann Washburn

From:	Clark, Fatina Ann Washburn
Sent:	Monday, March 19, 2018 7:20 AM
To:	McAvoy, Bryan P.
Cc:	Allard, John R.
Subject:	RE: A question about the Mercedes permit application
Attachments:	0560-0385ca.r3.docx; 0560-0385ca.r3.pd.docx; 0560-0385ca.r3.sob.docx

Hi Bryan.

Attached are the drafts I sent to the facility for review. Please let me know if you have any questions. Thanks!

Fatina A. W. Clark
Coastal Plains and Power Section
Bureau of Air Quality
S.C. Dept. of Health & Environmental Control
Office: (803) 898-4072
Connect: www.scdhec.gov Facebook Twitter

From: McAvoy, Bryan P.
Sent: Friday, March 16, 2018 4:09 PM
To: Clark, Fatina Ann Washburn <clarkfaw@dhec.sc.gov>
Cc: Allard, John R. <allardjr@dhec.sc.gov>
Subject: A question about the Mercedes permit application

Hi Fatina,

I'm working up the "emission point descriptive information" table for the Mercedes modeling summary. We are done with the modeling and it shouldn't be much longer until the modeling summary is finished.

On to my question. Do you have a preliminary permit and SOB that I could look at? There were quite a few changes in the names of emission points since the last revision, and those documents would help me with the current descriptive table.

Thank you,

Bryan McAvoy
Meteorologist
S.C. Dept. of Health & Environmental Control
Office: (803) 898-1275
Email: mcavoybp@dhec.sc.gov
Connect: www.scdhec.gov

Clark, Fatina Ann Washburn

From: McAvoy, Bryan P.
Sent: Friday, March 16, 2018 4:09 PM
To: Clark, Fatina Ann Washburn
Cc: Allard, John R.
Subject: A question about the Mercedes permit application

Hi Fatina,

I'm working up the "emission point descriptive information" table for the Mercedes modeling summary. We are done with the modeling and it shouldn't be much longer until the modeling summary is finished.

On to my question. Do you have a preliminary permit and SOB that I could look at? There were quite a few changes in the names of emission points since the last revision, and those documents would help me with the current descriptive table.

Thank you,

Bryan McAvoy
Meteorologist
S.C. Dept. of Health & Environmental Control
Office: (803) 898-1275
Email: mcavoybp@dhec.sc.gov
Connect: www.scdhec.gov

Clark, Fatina Ann Washburn

From: Taylor Loftis <TLoftis@trinityconsultants.com>
Sent: Friday, March 09, 2018 4:04 PM
To: McAvoy, Bryan P.
Cc: Allard, John R.; Clark, Fatina Ann Washburn
Subject: RE: Question concerning Century Aluminum emissions data in the Mercedes Vans modeling
Attachments: Daimler Vans PSD Modeling Report 2018 0309_Table 3-5.pdf

Bryan,

I've attached the updated table we discussed. As I mentioned, the modeling files were based directly on some design drawings that we were given and I built the tables in the report from the modeling files, but when we made our last few updates to the source locations, I missed updating this table in the report. My apologies for the error. Please let me know if you have any other questions for us.

Best,
Taylor

....

Taylor Loftis, P.E.
Managing Consultant

Trinity Consultants
325 Arlington Ave., Suite 500 | Charlotte, North Carolina 28203

Office: 704-553-7747 x103
Email: tloftis@trinityconsultants.com

From: McAvoy, Bryan P. [mailto:mcavoybp@dhec.sc.gov]
Sent: Tuesday, March 06, 2018 1:46 PM
To: Taylor Loftis <TLoftis@trinityconsultants.com>
Cc: Allard, John R. <allardjr@dhec.sc.gov>; Clark, Fatina Ann Washburn <clarkfaw@dhec.sc.gov>
Subject: Question concerning Century Aluminum emissions data in the Mercedes Vans modeling

Hi Taylor,

In looking over the emissions data from other facilities included in the full modeling, I ran across a stack parameter that I'd like to ask you about. It concerns the data from the Century Aluminum facility that was modeled as a pseudo-point source. For source ID's ALCM3 through ALCM6, a stack temperature of -40 Kelvin was used. Please explain your reasoning for using this temperature.

Thank you,

Bryan McAvoy
Meteorologist
S.C. Dept. of Health & Environmental Control
Office: (803) 898-1275

Email: mcavoybp@dhec.sc.gov
Connect: www.scdhec.gov

Clark, Fatina Ann Washburn

From:	Clark, Fatina Ann Washburn
Sent:	Friday, March 09, 2018 7:10 AM
To:	jae.park@daimler.com
Cc:	NSaniti@trinityconsultants.com; TJabon@trinityconsultants.com; joshua.fawley@daimler.com
Subject:	RE: BAQ in receipt of an Expedited Prevention of Significant Deterioration (PSD) Air Permit Application Revision for Mercedes Benz Vans. LLC (0560-0385-CA-R3)

Thanks Jae. I will have them be on the lookout for it. Have a great weekend!!

Fatina A. W. Clark
Coastal Plains and Power Section
Bureau of Air Quality
S.C. Dept. of Health & Environmental Control
Office: (803) 898-4072
Connect: www.scdhec.gov Facebook Twitter

dhec
Healthy People. Healthy Communities.

From: jae.park@daimler.com [mailto:jae.park@daimler.com]
Sent: Friday, March 9, 2018 6:46 AM
To: Clark, Fatina Ann Washburn <clarkfaw@dhec.sc.gov>
Cc: NSaniti@trinityconsultants.com; TJabon@trinityconsultants.com; joshua.fawley@daimler.com
Subject: FW: BAQ in receipt of an Expedited Prevention of Significant Deterioration (PSD) Air Permit Application Revision for Mercedes Benz Vans. LLC (0560-0385-CA-R3)

Hi Fatina,

Here is email from our accounting manager that the $10,000 expedite fee payment was processed.
DHEC should receive the ACH payment by Monday at the latest.
Please contact me if the payment is not received.

Kind Regards / Mit freundlichen Grüßen

Jae Park
Paint Engineer, VAN/OEC

Merecedes-Benz Vans,LLC
8501 Palmetto Commerce Parkway
Ladson, SC 29456

Phone +1 843 695 5095
Mobile +1 843 697 9478
Fax +1 843 695 5031

E-Mail   jae.park@daimler.com

From: Fawley, Joshua (566)
Sent: Thursday, March 08, 2018 6:11 PM
To: Park, Jae (566) <jae.park@daimler.com>
Cc: Revell, Russell (566) <russell.revell@daimler.com>
Subject: RE: BAQ in receipt of an Expedited Prevention of Significant Deterioration (PSD) Air Permit Application Revision for Mercedes Benz Vans. LLC (0560-0385-CA-R3)

Jae,

Payment was just processed. I would expect them to receive the payment tomorrow or Monday at the latest. It was sent via ACH.

Please contact them to make sure that the funds were successfully transferred.

Kind regards

Joshua Fawley
Accounting Manager, FMV/O-C

Mercedes-Benz Vans, LLC
8501 Palmetto Commerce Parkway
Ladson, SC 29456

Phone +1 843 695 5038
Fax   +1 843 695 5031
E-Mail   joshua.fawley@daimler.com

From: Park, Jae (566)
Sent: Thursday, March 08, 2018 1:04 PM
To: Fawley, Joshua (566) <joshua.fawley@daimler.com>
Subject: Re: BAQ in receipt of an Expedited Prevention of Significant Deterioration (PSD) Air Permit Application Revision for Mercedes Benz Vans. LLC (0560-0385-CA-R3)

Hi Josh,

Can you let me know if the $10,000 was paid to SCDHEC so that I can let DHEC know?
Thanks,
Jae Park

Sent from my iPhone

On Mar 8, 2018, at 9:56 AM, Bouhlou, Mustapha (566) <mustapha.bouhlou@daimler.com> wrote:

> Approved!
>
> Mustapha Bouhlou

Daimler AG
Mercedes-Benz VANS, LLC

Manager Paint
Manufacturing Engineering
Ladson Plant

Plant/HPC: 566 / PExx – VAN/OEC
8501 Palmetto Commerce Parkway, Ladson, SC 29456

Mobil +1 843 408 8222
mailto Mustapha.Bouhlou@daimler.com
Visitors 8501 Palmetto Commerce Parkway, Ladson, SC 29456

From: Park, Jae (566)
Sent: Thursday, March 08, 2018 9:32 AM
To: Bouhlou, Mustapha (566) <mustapha.bouhlou@daimler.com>
Subject: FW: BAQ in receipt of an Expedited Prevention of Significant Deterioration (PSD) Air Permit Application Revision for Mercedes Benz Vans. LLC (0560-0385-CA-R3)
Importance: High

Hi Musti,

Can you please reply to Joshua to pay the $10,000 to DHEC for our air permit revision expedite review? We need to pay today.
Thanks,

Kind Regards / Mit freundlichen Grüßen

Jae Park
Paint Engineer, VAN/OEC

Merecedes-Benz Vans,LLC
8501 Palmetto Commerce Parkway
Ladson, SC 29456

Phone +1 843 695 5095
Mobile +1 843 697 9478
Fax +1 843 695 5031
E-Mail jae.park@daimler.com

From: Fawley, Joshua (566)
Sent: Thursday, March 08, 2018 8:40 AM
To: Park, Jae (566) <jae.park@daimler.com>
Cc: Revell, Russell (566) <russell.revell@daimler.com>; Bouhlou, Mustapha (566) <mustapha.bouhlou@daimler.com>
Subject: RE: BAQ in receipt of an Expedited Prevention of Significant Deterioration (PSD) Air Permit Application Revision for Mercedes Benz Vans. LLC (0560-0385-CA-R3)

Musti, please reply to this email that you approve the attached invoice YU00591-8 in the amount of $10,000 for the expedited air permit, PO 1566001099.

Kind regards

Joshua Fawley
Accounting Manager, FMV/O-C

Mercedes-Benz Vans, LLC
8501 Palmetto Commerce Parkway
Ladson, SC 29456

Phone +1 843 695 5038
Fax +1 843 695 5031
E-Mail joshua.fawley@daimler.com

From: Park, Jae (566)
Sent: Thursday, March 08, 2018 7:20 AM
To: Fawley, Joshua (566) <joshua.fawley@daimler.com>
Cc: Revell, Russell (566) <russell.revell@daimler.com>; Bouhlou, Mustapha (566) <mustapha.bouhlou@daimler.com>
Subject: FW: BAQ in receipt of an Expedited Prevention of Significant Deterioration (PSD) Air Permit Application Revision for Mercedes Benz Vans. LLC (0560-0385-CA-R3)
Importance: High

Hi Joshua,

Can you please pay the $10,000 fee to SCDHEC today for our expedite review of our air permit revision? SCDHEC sent you the invoice# last Wednesday and should have been paid then.
Please let me know when the payment has been submitted so that I can let SCDHEC know that it has been paid.
Thanks,

Kind Regards / Mit freundlichen Grüßen

Jae Park
Paint Engineer, VAN/OEC

Merecedes-Benz Vans,LLC
8501 Palmetto Commerce Parkway
Ladson, SC 29456

Phone +1 843 695 5095
Mobile +1 843 697 9478
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E-Mail jae.park@daimler.com

From: Clark, Fatina Ann Washburn [mailto:clarkfaw@dhec.sc.gov]
Sent: Thursday, March 08, 2018 7:13 AM
To: Park, Jae (566) <jae.park@daimler.com>; Fawley, Joshua (566) <joshua.fawley@daimler.com>
Cc: Nicole Saniti <NSaniti@trinityconsultants.com>
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Hi Jae.

This was sent to Joshua. Can you please let me know when payment has been submitted. If the invoice for the expedited fee is no longer valid, please let me know. Thank you!

Fatina A. W. Clark
Engineering Services Division
S.C. Dept. of Health & Environmental Control
Office: (803) 898-4072
Fax: (803) 898-4079
Connect: www.scdhec.gov Facebook Twitter

From: Whiteside, Pamela
Sent: Wednesday, February 28, 2018 8:51 AM
To: Watkins, Terri <WatkinT@dhec.sc.gov>; joshua.fawley@daimler.com
Cc: Clark, Fatina Ann Washburn <clarkfaw@dhec.sc.gov>
Subject: RE: BAQ in receipt of an Expedited Prevention of Significant Deterioration (PSD) Air Permit Application Revision for Mercedes Benz Vans. LLC (0560-0385-CA-R3)

There is an invoice for QF29693-9 for $636.38 that is due by 3-23-18 and the expedited fee of $10,000 for YU00591-8. Thanks.

From: Watkins, Terri
Sent: Wednesday, February 28, 2018 8:47 AM
To: joshua.fawley@daimler.com
Cc: Whiteside, Pamela <whitespw@dhec.sc.gov>
Subject: Re: BAQ in receipt of an Expedited Prevention of Significant Deterioration (PSD) Air Permit Application Revision for Mercedes Benz Vans. LLC (0560-0385-CA-R3)

Jashua,

OK, I'll copy this to our Bureau of Air folks you've been talking with (below) and they can verify the fees since their emails to me only mentioned the $10,000.

Plus as information. Our online system they gave you the link for will take credit card, e-check (called ACH in that program) as long as you have an invoice number. That system will add a transaction fee of $1.00 per transaction at the end and give you the the confirmation number which is the TPE number on the receipt.

Pamela, can you check on Mr. Fawley's email below about the fee to pay. $10,000 or the just the $636.38...or both. Please review and get back with him and copy me too please so I can help him with the payment.

Kind Regards,

Terri Watkins

Financial Management
watkint@dhec.sc.gov
S.C . Dept. of Health & Environmental Control

From: joshua.fawley@daimler.com <joshua.fawley@daimler.com>
Sent: Tuesday, February 27, 2018 6:34 PM
To: Watkins, Terri
Subject: RE: BAQ in receipt of an Expedited Prevention of Significant Deterioration (PSD) Air Permit Application Revision for Mercedes Benz Vans. LLC (0560-0385-CA-R3)

Hi Terri,

Thanks for your support. I see that the invoice you sent me is for $10,000.00 for the air permit. The one I was inquiring about is invoice number QF29693-9 in the amount of $636.38. If we owe the $10,000.00 invoice as well, then I'll get in touch with my colleagues about that one and try to pay both at once.

If you could go ahead and email me the banking information and contact for remittance, I can have you set up in our system so we can make payment to you.

Thanks!

Kind regards

Joshua Fawley
Accounting Manager, FMV/O-C

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8501 Palmetto Commerce Parkway
Ladson, SC 29456

Phone +1 843 695 5038

Fax +1 843 695 5031
E-Mail joshua.fawley@daimler.com

From: Watkins, Terri [mailto:WatkinT@dhec.sc.gov]
Sent: Tuesday, February 27, 2018 11:57 AM
To: Fawley, Joshua (566) <joshua.fawley@daimler.com>
Cc: Ramsey, Hope V. <RAMSEYHV@dhec.sc.gov>
Subject: Fw: BAQ in receipt of an Expedited Prevention of Significant Deterioration (PSD) Air Permit Application Revision for Mercedes Benz Vans. LLC (0560-0385-CA-R3)

Mr. Fawley,

I am the person in our agency (DHEC) that can give you the banking information and contact for the remittance for this invoice attached. Please email me back and I will separate the other emails from our conversation. I am attaching a copy of our W-9 here as well in case you need it.

Kind Regards,
Terri Watkins

Financial Management
watkint@dhec.sc.gov
S.C . Dept. of Health & Environmental Control
Mailing: 2600 Bull Street / Columbia, SC / 29201
Physical Loc: 301 Gervais Street / Columbia, SC / 29201
Office: 803-898-3423 / Fax: 803-253-7637

Connect: www.scdhec.gov Facebook Twitter

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From: Whiteside, Pamela
Sent: Tuesday, February 27, 2018 11:09 AM
To: Watkins, Terri
Subject: RE: BAQ in receipt of an Expedited Prevention of Significant Deterioration (PSD) Air Permit Application Revision for Mercedes Benz Vans. LLC (0560-0385-CA-R3)

Yes. Please contact Joshua Fawley at 1-843-695-5038 or Joshua.fawley@daimler.com. Attached is the invoice. Thanks.

From: Watkins, Terri
Sent: Tuesday, February 27, 2018 10:47 AM
To: Whiteside, Pamela <whitespw@dhec.sc.gov>
Cc: Graham, Kevin <GRAHAMKB@dhec.sc.gov>
Subject: Re: BAQ in receipt of an Expedited Prevention of Significant Deterioration (PSD) Air Permit Application Revision for Mercedes Benz Vans. LLC (0560-0385-CA-R3)

Pamela,

Either I contact the company on the ACH issue or they contact me. They can provide the remittance information as soon as the money is sent. (Hope would have to then search the daily reports generated by our State Treasurer's Office then apply the payment to us.)

I need an invoice number from you. The amount is $10,000?

If you do not have the invoice number, you could provide the complete funding stream you want A/R to deposit it in. Of course, an invoice number is much preferred.

Is it the Joshua Fawley (below) that needs to contact me or me contact him? --I have an errand to run and will return shortly.

Kind Regards,
Terri Watkins
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watkint@dhec.sc.gov
S.C . Dept. of Health & Environmental Control
Mailing: 2600 Bull Street / Columbia, SC / 29201
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From: Graham, Kevin
Sent: Tuesday, February 27, 2018 9:40 AM
To: Watkins, Terri
Subject: Fw: BAQ in receipt of an Expedited Prevention of Significant Deterioration (PSD) Air Permit Application Revision for Mercedes Benz Vans. LLC (0560-0385-CA-R3)

Terri, can you see below please and see what they need to do in order to be set up for ACH payments? Thanks!

Kevin Graham
Accountant / Fiscal Analyst II
Bureau of Financial Management
S.C. Dept. of Health & Environmental Control
Office: (803) 898-1272
Fax: (803) 253-7637
Connect: www.scdhec.gov Facebook Twitter

S.C. Department of Health & Environmental Control

www.scdhec.gov

SC DHEC promotes and protects the health of the public and the environment.

dhec

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From: Whiteside, Pamela
Sent: Tuesday, February 27, 2018 9:32 AM
To: Graham, Kevin
Cc: Clark, Fatina Ann Washburn
Subject: FW: BAQ in receipt of an Expedited Prevention of Significant Deterioration (PSD) Air Permit Application Revision for Mercedes Benz Vans. LLC (0560-0385-CA-R3)

Can they contact you to do this ACH payment?

From: Hayes, Alyson
Sent: Tuesday, February 27, 2018 7:25 AM
To: Clark, Fatina Ann Washburn <clarkfaw@dhec.sc.gov>; AIR_ENG_ADMIN <AIR_ENG_ADMIN@dhec.sc.gov>
Cc: Humphries, Diane <HUMPHRDM@dhec.sc.gov>
Subject: RE: BAQ in receipt of an Expedited Prevention of Significant Deterioration (PSD) Air Permit Application Revision for Mercedes Benz Vans. LLC (0560-0385-CA-R3)

No we can't

From: Clark, Fatina Ann Washburn
Sent: Tuesday, February 27, 2018 7:04 AM
To: AIR_ENG_ADMIN <AIR_ENG_ADMIN@dhec.sc.gov>
Cc: Humphries, Diane <HUMPHRDM@dhec.sc.gov>
Subject: FW: BAQ in receipt of an Expedited Prevention of Significant Deterioration (PSD) Air Permit Application Revision for Mercedes Benz Vans. LLC (0560-0385-CA-R3)

Anyone know the answer to the this? I'm guessing no. Just want to confirm. Thanks!

Fatina A. W. Clark
Engineering Services Division
S.C. Dept. of Health & Environmental Control
Office: (803) 898-4072
Fax: (803) 898-4079
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S.C. Department of Health & Environmental Control

www.scdhec.gov

SC DHEC promotes and protects the health of the public and the environment.

From: joshua.fawley@daimler.com [mailto:joshua.fawley@daimler.com]
Sent: Monday, February 26, 2018 4:43 PM
To: Clark, Fatina Ann Washburn <clarkfaw@dhec.sc.gov>
Subject: FW: BAQ in receipt of an Expedited Prevention of Significant Deterioration (PSD) Air Permit Application Revision for Mercedes Benz Vans. LLC (0560-0385-CA-R3)

Hi Fatina,

Regarding this topic, would it be possible for us to make payment to you via ACH? Could you please provide us with your banking information so ACH payment could be made this week?

Kind regards

Joshua Fawley
Accounting Manager, FMV/O-C

Mercedes-Benz Vans, LLC
8501 Palmetto Commerce Parkway
Ladson, SC 29456

Phone +1 843 695 5038
Fax +1 843 695 5031
E-Mail joshua.fawley@daimler.com

From: Clark, Fatina Ann Washburn [mailto:clarkfaw@dhec.sc.gov]
Sent: Monday, February 26, 2018 8:06 AM
To: Park, Jae (566) <jae.park@daimler.com>
Cc: Boswell, Wendy <BOSWELWM@dhec.sc.gov>; Humphries, Diane <HUMPHRDM@dhec.sc.gov>; AIR_ENG_ADMIN <AIR_ENG_ADMIN@dhec.sc.gov>; Boyce, Lawra <boycelc@dhec.sc.gov>; Glass, John <glassjp@dhec.sc.gov>; Nicole Saniti <NSaniti@trinityconsultants.com>
Subject: BAQ in receipt of an Expedited Prevention of Significant Deterioration (PSD) Air Permit Application Revision for Mercedes Benz Vans. LLC (0560-0385-CA-R3)

The Bureau of Air Quality (BAQ) received an expedited PSD application from Mercedes Benz Vans. LLC, Ladson, SC on February 20, 2018. The application was for revisions and updates to the automobile manufacturing plant. The completeness review period for the application officially began on this date and the application has been deemed technically complete as of February 26, 2018.

We need your assistance in meeting the time frame goals. We ask that you commit to assisting us with public participation activities, such as participating in answering questions from the public about the proposed project during any public meeting and/or public hearings that may be requested and held and helping us respond to any comments that may be received during the public comment period. We also ask that you commit to providing timely answers to any additional information that may be requested during the review. If you still wish to enter the expedited program and agree to the above conditions, please respond to this email and submit payment in the amount of $10,000.

If paying the expedited fee by check, make the check out to "SC DHEC." The check should be received within 5 business days of this notification and should be sent to the attention of the "Director of Air Permitting Division – BAQ".

If you wish to pay by electronic check, let us know who to email an invoice to. Once the invoice is created and emailed you will have one business day to pay. You will need the invoice number and then you may log on to the website at the address below to pay the expedited fee.

https://web.sc.gov/dheconlineinvoicepaymentsystem/invoicegroupselection.aspx

SC DHEC Invoice Payments - South Carolina

web.sc.gov

sc dhec invoice payments please note that a total payment amount greater than $3,000 can be paid online only by electronic check.

If you have questions, please contact me at (803) 898-4072 or by e-mail.

Fatina A. W. Clark
Engineering Services Division
S.C. Dept. of Health & Environmental Control
Office: (803) 898-4072
Fax: (803) 898-4079
Connect: www.scdhec.gov

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If you are not the addressee, please inform us immediately that you have received this e-mail by mistake, and delete it. We thank you for your support.

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<mime-attachment>

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Clark, Fatina Ann Washburn

From:	jae.park@daimler.com
Sent:	Thursday, March 08, 2018 4:53 PM
To:	Clark, Fatina Ann Washburn
Cc:	NSaniti@trinityconsultants.com; TJabon@trinityconsultants.com; russell.revell@daimler.com
Subject:	RE: BAQ in receipt of an Expedited Prevention of Significant Deterioration (PSD) Air Permit Application Revision for Mercedes Benz Vans. LLC (0560-0385-CA-R3)

Hi Fatina,

Sorry to get back to you late.
Our finance department has setup to pay the $10,000 expedite fee to be paid by ACH tomorrow. They told me tha ACH process will take a couple of days for the funds to be transferred to DHEC's account.
If you have any questions, please contact me.
I apologize for our confusion.

Kind Regards / Mit freundlichen Grüßen

Jae Park
Paint Engineer, VAN/OEC

Merecedes-Benz Vans,LLC
8501 Palmetto Commerce Parkway
Ladson, SC 29456

Phone +1 843 695 5095
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Cc: Clark, Fatina Ann Washburn <clarkfaw@dhec.sc.gov>
Subject: RE: BAQ in receipt of an Expedited Prevention of Significant Deterioration (PSD) Air Permit Application Revision for Mercedes Benz Vans. LLC (0560-0385-CA-R3)

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From: Watkins, Terri
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Jashua,

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Pamela, can you check on Mr. Fawley's email below about the fee to pay. $10,000 or the just the $636.38...or both. Please review and get back with him and copy me too please so I can help him with the payment.

Kind Regards,
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Thanks!

Kind regards

Joshua Fawley
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E-Mail joshua.fawley@daimler.com

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Financial Management

watkint@dhec.sc.gov

S.C . Dept. of Health & Environmental Control

Mailing: 2600 Bull Street / Columbia, SC / 29201

Physical Loc: 301 Gervais Street / Columbia, SC / 29201

Office: 803-898-3423 / Fax: 803-253-7637

Connect: www.scdhec.gov Facebook Twitter

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Cc: Graham, Kevin <GRAHAMKB@dhec.sc.gov>
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Terri, can you see below please and see what they need to do in order to be set up for ACH payments? Thanks!

Kevin Graham
Accountant / Fiscal Analyst II
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S.C. Dept. of Health & Environmental Control
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Fax: (803) 253-7637
Connect: www.scdhec.gov Facebook Twitter

S.C. Department of Health & Environmental Control

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From: Whiteside, Pamela
Sent: Tuesday, February 27, 2018 9:32 AM
To: Graham, Kevin
Cc: Clark, Fatina Ann Washburn
Subject: FW: BAQ in receipt of an Expedited Prevention of Significant Deterioration (PSD) Air Permit Application Revision for Mercedes Benz Vans. LLC (0560-0385-CA-R3)

Can they contact you to do this ACH payment?

From: Hayes, Alyson
Sent: Tuesday, February 27, 2018 7:25 AM
To: Clark, Fatina Ann Washburn <clarkfaw@dhec.sc.gov>; AIR_ENG_ADMIN <AIR_ENG_ADMIN@dhec.sc.gov>
Cc: Humphries, Diane <HUMPHRDM@dhec.sc.gov>
Subject: RE: BAQ in receipt of an Expedited Prevention of Significant Deterioration (PSD) Air Permit Application Revision for Mercedes Benz Vans. LLC (0560-0385-CA-R3)

No we can't

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Sent: Tuesday, February 27, 2018 7:04 AM
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Cc: Humphries, Diane <HUMPHRDM@dhec.sc.gov>
Subject: FW: BAQ in receipt of an Expedited Prevention of Significant Deterioration (PSD) Air Permit Application Revision for Mercedes Benz Vans. LLC (0560-0385-CA-R3)

Anyone know the answer to the this? I'm guessing no. Just want to confirm. Thanks!

Fatina A. W. Clark
Engineering Services Division
S.C. Dept. of Health & Environmental Control
Office: (803) 898-4072
Fax: (803) 898-4079
Connect: www.scdhec.gov Facebook Twitter

S.C. Department of Health & Environmental Control

www.scdhec.gov

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From: joshua.fawley@daimler.com [mailto:joshua.fawley@daimler.com]
Sent: Monday, February 26, 2018 4:43 PM
To: Clark, Fatina Ann Washburn <clarkfaw@dhec.sc.gov>
Subject: FW: BAQ in receipt of an Expedited Prevention of Significant Deterioration (PSD) Air Permit Application Revision for Mercedes Benz Vans. LLC (0560-0385-CA-R3)

Hi Fatina,

Regarding this topic, would it be possible for us to make payment to you via ACH? Could you please provide us with your banking information so ACH payment could be made this week?

Kind regards

Joshua Fawley
Accounting Manager, FMV/O-C

Mercedes-Benz Vans, LLC
8501 Palmetto Commerce Parkway
Ladson, SC 29456

Phone +1 843 695 5038
Fax +1 843 695 5031
E-Mail joshua.fawley@daimler.com

From: Clark, Fatina Ann Washburn [mailto:clarkfaw@dhec.sc.gov]
Sent: Monday, February 26, 2018 8:06 AM
To: Park, Jae (566) <jae.park@daimler.com>
Cc: Boswell, Wendy <BOSWELWM@dhec.sc.gov>; Humphries, Diane <HUMPHRDM@dhec.sc.gov>; AIR_ENG_ADMIN <AIR_ENG_ADMIN@dhec.sc.gov>; Boyce, Lawra <boycelc@dhec.sc.gov>; Glass, John <glassjp@dhec.sc.gov>; Nicole Saniti <NSaniti@trinityconsultants.com>
Subject: BAQ in receipt of an Expedited Prevention of Significant Deterioration (PSD) Air Permit Application Revision for Mercedes Benz Vans. LLC (0560-0385-CA-R3)

The Bureau of Air Quality (BAQ) received an expedited PSD application from Mercedes Benz Vans. LLC, Ladson, SC on February 20, 2018. The application was for revisions and updates to the automobile manufacturing plant. The completeness review period for the application officially began on this date and the application has been deemed technically complete as of February 26, 2018.

We need your assistance in meeting the time frame goals. We ask that you commit to assisting us with public participation activities, such as participating in answering questions from the public about the proposed project during any public meeting and/or public hearings that may be requested and held and helping us respond to any comments that may be received during the public comment period. We also ask that you commit to providing timely answers to any additional information that may be requested during the review. If you still wish to enter the expedited program and agree to the above conditions, please respond to this email and submit payment in the amount of $10,000.

If paying the expedited fee by check, make the check out to “SC DHEC.” The check should be received within 5 business days of this notification and should be sent to the attention of the “Director of Air Permitting Division – BAQ”.

If you wish to pay by electronic check, let us know who to email an invoice to. Once the invoice is created and emailed you will have one business day to pay. You will need the invoice number and then you may log on to the website at the address below to pay the expedited fee.

https://web.sc.gov/dheconlineinvoicepaymentsystem/invoicegroupselection.aspx

SC DHEC Invoice Payments - South Carolina

web.sc.gov

sc dhec invoice payments please note that a total payment amount greater than $3,000 can be paid online only by electronic check.

If you have questions, please contact me at (803) 898-4072 or by e-mail.

Fatina A. W. Clark
Engineering Services Division
S.C. Dept. of Health & Environmental Control
Office: (803) 898-4072
Fax: (803) 898-4079
Connect: www.scdhec.gov

S.C. Department of Health & Environmental Control

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If you are not the addressee, please inform us immediately that you have received this e-mail by mistake, and delete it. We thank you for your support.

Clark, Fatina Ann Washburn

From: Clark, Fatina Ann Washburn
Sent: Thursday, March 08, 2018 7:13 AM
To: jae.park@daimler.com; joshua.fawley@daimler.com
Cc: Nicole Saniti
Subject: FW: BAQ in receipt of an Expedited Prevention of Significant Deterioration (PSD) Air Permit Application Revision for Mercedes Benz Vans. LLC (0560-0385-CA-R3)

Hi Jae.

This was sent to Joshua. Can you please let me know when payment has been submitted. If the invoice for the expedited fee is no longer valid, please let me know. Thank you!

Fatina A. W. Clark
Engineering Services Division
S.C. Dept. of Health & Environmental Control
Office: (803) 898-4072
Fax: (803) 898-4079
Connect: www.scdhec.gov Facebook Twitter

From: Whiteside, Pamela
Sent: Wednesday, February 28, 2018 8:51 AM
To: Watkins, Terri <WatkinT@dhec.sc.gov>; joshua.fawley@daimler.com
Cc: Clark, Fatina Ann Washburn <clarkfaw@dhec.sc.gov>
Subject: RE: BAQ in receipt of an Expedited Prevention of Significant Deterioration (PSD) Air Permit Application Revision for Mercedes Benz Vans. LLC (0560-0385-CA-R3)

There is an invoice for QF29693-9 for $636.38 that is due by 3-23-18 and the expedited fee of $10,000 for YU00591-8. Thanks.

From: Watkins, Terri
Sent: Wednesday, February 28, 2018 8:47 AM
To: joshua.fawley@daimler.com
Cc: Whiteside, Pamela <whitespw@dhec.sc.gov>
Subject: Re: BAQ in receipt of an Expedited Prevention of Significant Deterioration (PSD) Air Permit Application Revision for Mercedes Benz Vans. LLC (0560-0385-CA-R3)

Jashua,

OK, I'll copy this to our Bureau of Air folks you've been talking with (below) and they can verify the fees since their emails to me only mentioned the $10,000.

Plus as information. Our online system they gave you the link for will take credit card, e-check (called ACH in that program) as long as you have an invoice number. That system will add a transaction fee of $1.00 per transaction at the end and give you the the confirmation number which is the TPE number on the receipt.

Pamela, can you check on Mr. Fawley's email below about the fee to pay. $10,000 or the just the $636.38...or both. Please review and get back with him and copy me too please so I can help him with the payment.

Kind Regards,

Terri Watkins

Financial Management

watkint@dhec.sc.gov

S.C . Dept. of Health & Environmental Control

From: joshua.fawley@daimler.com <joshua.fawley@daimler.com>
Sent: Tuesday, February 27, 2018 6:34 PM
To: Watkins, Terri
Subject: RE: BAQ in receipt of an Expedited Prevention of Significant Deterioration (PSD) Air Permit Application Revision for Mercedes Benz Vans. LLC (0560-0385-CA-R3)

Hi Terri,

Thanks for your support. I see that the invoice you sent me is for $10,000.00 for the air permit. The one I was inquiring about is invoice number QF29693-9 in the amount of $636.38. If we owe the $10,000.00 invoice as well, then I'll get in touch with my colleagues about that one and try to pay both at once.

If you could go ahead and email me the banking information and contact for remittance, I can have you set up in our system so we can make payment to you.

Thanks!

Kind regards

Joshua Fawley
Accounting Manager, FMV/O-C

Mercedes-Benz Vans, LLC
8501 Palmetto Commerce Parkway

Ladson, SC 29456

Phone +1 843 695 5038
Fax +1 843 695 5031
E-Mail joshua.fawley@daimler.com

From: Watkins, Terri [mailto:WatkinT@dhec.sc.gov]
Sent: Tuesday, February 27, 2018 11:57 AM
To: Fawley, Joshua (566) <joshua.fawley@daimler.com>
Cc: Ramsey, Hope V. <RAMSEYHV@dhec.sc.gov>
Subject: Fw: BAQ in receipt of an Expedited Prevention of Significant Deterioration (PSD) Air Permit Application Revision for Mercedes Benz Vans. LLC (0560-0385-CA-R3)

Mr. Fawley,

I am the person in our agency (DHEC) that can give you the banking information and contact for the remittance for this invoice attached. Please email me back and I will separate the other emails from our conversation. I am attaching a copy of our W-9 here as well in case you need it.

Kind Regards,

Terri Watkins
Financial Management
watkint@dhec.sc.gov
S.C . Dept. of Health & Environmental Control
Mailing: 2600 Bull Street / Columbia, SC / 29201
Physical Loc: 301 Gervais Street / Columbia, SC / 29201
Office: 803-898-3423 / Fax: 803-253-7637

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From: Whiteside, Pamela
Sent: Tuesday, February 27, 2018 11:09 AM
To: Watkins, Terri

Subject: RE: BAQ in receipt of an Expedited Prevention of Significant Deterioration (PSD) Air Permit Application Revision for Mercedes Benz Vans. LLC (0560-0385-CA-R3)

Yes. Please contact Joshua Fawley at 1-843-695-5038 or Joshua.fawley@daimler.com. Attached is the invoice. Thanks.

From: Watkins, Terri
Sent: Tuesday, February 27, 2018 10:47 AM
To: Whiteside, Pamela <whitespw@dhec.sc.gov>
Cc: Graham, Kevin <GRAHAMKB@dhec.sc.gov>
Subject: Re: BAQ in receipt of an Expedited Prevention of Significant Deterioration (PSD) Air Permit Application Revision for Mercedes Benz Vans. LLC (0560-0385-CA-R3)

Pamela,

Either I contact the company on the ACH issue or they contact me. They can provide the remittance information as soon as the money is sent. (Hope would have to then search the daily reports generated by our State Treasurer's Office then apply the payment to us.)

I need an invoice number from you. The amount is $10,000?

If you do not have the invoice number, you could provide the complete funding stream you want A/R to deposit it in. Of course, an invoice number is much preferred.

Is it the Joshua Fawley (below) that needs to contact me or me contact him? --I have an errand to run and will return shortly.

Kind Regards,

Terri Watkins
Financial Management
watkint@dhec.sc.gov
S.C . Dept. of Health & Environmental Control
Mailing: 2600 Bull Street / Columbia, SC / 29201
Physical Loc: 301 Gervais Street / Columbia, SC / 29201
Office: 803-898-3423 / Fax: 803-253-7637

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From: Graham, Kevin
Sent: Tuesday, February 27, 2018 9:40 AM
To: Watkins, Terri
Subject: Fw: BAQ in receipt of an Expedited Prevention of Significant Deterioration (PSD) Air Permit Application Revision for Mercedes Benz Vans. LLC (0560-0385-CA-R3)

Terri, can you see below please and see what they need to do in order to be set up for ACH payments? Thanks!

Kevin Graham
Accountant / Fiscal Analyst II
Bureau of Financial Management
S.C. Dept. of Health & Environmental Control
Office: (803) 898-1272
Fax: (803) 253-7637
Connect: www.scdhec.gov Facebook Twitter

S.C. Department of Health & Environmental Control

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Connect: www.scdhec.gov Facebook Twitter

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From: joshua.fawley@daimler.com [mailto:joshua.fawley@daimler.com]
Sent: Monday, February 26, 2018 4:43 PM
To: Clark, Fatina Ann Washburn <clarkfaw@dhec.sc.gov>
Subject: FW: BAQ in receipt of an Expedited Prevention of Significant Deterioration (PSD) Air Permit Application Revision for Mercedes Benz Vans. LLC (0560-0385-CA-R3)

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Kind regards

Joshua Fawley
Accounting Manager, FMV/O-C

Mercedes-Benz Vans, LLC
8501 Palmetto Commerce Parkway
Ladson, SC 29456

Phone +1 843 695 5038
Fax +1 843 695 5031
E-Mail joshua.fawley@daimler.com

From: Clark, Fatina Ann Washburn [mailto:clarkfaw@dhec.sc.gov]
Sent: Monday, February 26, 2018 8:06 AM
To: Park, Jae (566) <jae.park@daimler.com>

Cc: Boswell, Wendy <BOSWELWM@dhec.sc.gov>; Humphries, Diane <HUMPHRDM@dhec.sc.gov>; AIR_ENG_ADMIN <AIR_ENG_ADMIN@dhec.sc.gov>; Boyce, Lawra <boycelc@dhec.sc.gov>; Glass, John <glassjp@dhec.sc.gov>; Nicole Saniti <NSaniti@trinityconsultants.com>
Subject: BAQ in receipt of an Expedited Prevention of Significant Deterioration (PSD) Air Permit Application Revision for Mercedes Benz Vans. LLC (0560-0385-CA-R3)

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sc dhec invoice payments please note that a total payment amount greater than $3,000 can be paid online only by electronic check.

If you have questions, please contact me at (803) 898-4072 or by e-mail.

Fatina A. W. Clark
Engineering Services Division
S.C. Dept. of Health & Environmental Control
Office: (803) 898-4072
Fax: (803) 898-4079
Connect: www.scdhec.gov

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If you are not the addressee, please inform us immediately that you have received this e-mail by mistake, and delete it. We thank you for your support.

Clark, Fatina Ann Washburn

From:	Taylor Loftis <TLoftis@trinityconsultants.com>
Sent:	Tuesday, March 06, 2018 10:04 PM
To:	McAvoy, Bryan P.
Cc:	Allard, John R.; Clark, Fatina Ann Washburn
Subject:	RE: Question concerning Century Aluminum emissions data in the Mercedes Vans modeling

Bryan,

We didn't make any updates to the inventory sources as part of this analysis, and I didn't set up the initial modeling in 2015, so I'm going to check with the person that set up the original model tomorrow and will get back to you about this. My initial guess is they're set to model a temperature relative to ambient, but I'd have to check to see why the temperature gradient was set to 40K.

Best,
Taylor

....

Taylor Loftis, P.E.
Managing Consultant

Trinity Consultants
325 Arlington Ave., Suite 500 | Charlotte, North Carolina 28203

Office: 704-553-7747 x103
Email: tloftis@trinityconsultants.com

From: McAvoy, Bryan P. [mailto:mcavoybp@dhec.sc.gov]
Sent: Tuesday, March 06, 2018 1:46 PM
To: Taylor Loftis <TLoftis@trinityconsultants.com>
Cc: Allard, John R. <allardjr@dhec.sc.gov>; Clark, Fatina Ann Washburn <clarkfaw@dhec.sc.gov>
Subject: Question concerning Century Aluminum emissions data in the Mercedes Vans modeling

Hi Taylor,

In looking over the emissions data from other facilities included in the full modeling, I ran across a stack parameter that I'd like to ask you about. It concerns the data from the Century Aluminum facility that was modeled as a pseudo-point source. For source ID's ALCM3 through ALCM6, a stack temperature of -40 Kelvin was used. Please explain your reasoning for using this temperature.

Thank you,

Bryan McAvoy
Meteorologist
S.C. Dept. of Health & Environmental Control
Office: (803) 898-1275
Email: mcavoybp@dhec.sc.gov

Connect: www.scdhec.gov

Clark, Fatina Ann Washburn

From:	McAvoy, Bryan P.
Sent:	Tuesday, March 06, 2018 1:46 PM
To:	Taylor Loftis
Cc:	Allard, John R.; Clark, Fatina Ann Washburn
Subject:	Question concerning Century Aluminum emissions data in the Mercedes Vans modeling

Hi Taylor,

In looking over the emissions data from other facilities included in the full modeling, I ran across a stack parameter that I'd like to ask you about. It concerns the data from the Century Aluminum facility that was modeled as a pseudo-point source. For source ID's ALCM3 through ALCM6, a stack temperature of -40 Kelvin was used. Please explain your reasoning for using this temperature.

Thank you,

Bryan McAvoy
Meteorologist
S.C. Dept. of Health & Environmental Control
Office: (803) 898-1275
Email: mcavoybp@dhec.sc.gov
Connect: www.scdhec.gov

Clark, Fatina Ann Washburn

From:	Humphries, Diane
Sent:	Tuesday, March 06, 2018 1:06 PM
To:	Myers, James; Watts, Sheila G.; Clark, Fatina Ann Washburn
Subject:	RE: Permit for Review - Winyah

Definitely need to put new logo on and use new letter/email (get rid of letter that is at the beginning of permit). No other comments that haven't already been made.

I still have this showing draft – so I guess I didn't send before I left – Sorry!

Diane Humphries
Coastal Plains and Power Section
Bureau of Air Quality – Air Permitting Division
Office: (803) 898-0048
humphrdm@dhec.sc.gov

S.C. Dept. of Health & Environmental Control
2600 Bull Street
Columbia, SC 29201

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From: Myers, James
Sent: Tuesday, February 27, 2018 1:18 PM
To: Watts, Sheila G. <wattssg@dhec.sc.gov>; Clark, Fatina Ann Washburn <clarkfaw@dhec.sc.gov>; Humphries, Diane <HUMPHRDM@dhec.sc.gov>
Subject: Re: Permit for Review - Winyah

Just a few minor comments on SOB. I deleted some extra spaces on the permit.

James M. Myers
Coastal Plains and Power Section
Bureau of Air Quality - Air Permitting Division

S.C. Dept. of Health & Environmental Control
2600 Bull Street, Columbia, SC 29201
Office: (803) 898-4621
myersjm@dhec.sc.gov
Connect: www.scdhec.gov Facebook Twitter

From: Watts, Sheila G.
Sent: Tuesday, February 27, 2018 10:22:32 AM
To: Clark, Fatina Ann Washburn; Myers, James; Humphries, Diane
Subject: RE: Permit for Review - Winyah

Looks good! Only a few minor comments on the TV and one minor comment on SOB.

From: Clark, Fatina Ann Washburn
Sent: Tuesday, February 27, 2018 9:04 AM
To: Watts, Sheila G. <wattssg@dhec.sc.gov>; Myers, James <myersjm@dhec.sc.gov>; Humphries, Diane <HUMPHRDM@dhec.sc.gov>
Subject: Permit for Review - Winyah

Attached is a minor mod incorporating construction permit CS into the TV. Please review and comment by March 6, 2018. I will forward for internal and external review after that. Thanks!

Fatina A. W. Clark
Engineering Services Division
S.C. Dept. of Health & Environmental Control
Office: (803) 898-4072
Fax: (803) 898-4079
Connect: www.scdhec.gov Facebook Twitter

Clark, Fatina Ann Washburn

From: Clark, Fatina Ann Washburn
Sent: Tuesday, March 06, 2018 9:57 AM
To: Kimberly Teofilak
Subject: Re: Emissions ==> Paint Shop/Assembly Adhesives

I will try to call you shortly after 10:30 - thanks!

On Mar 6, 2018, at 9:27 AM, Kimberly Teofilak <kteofilak@trinityconsultants.com> wrote:

Fatina,

Do you have any availability for a call this morning? I would like more clarification on the information needed regarding the paint shop/assembly adhesives. Please let me know if you are available today to discuss. I have a 9:30-10:30 AM meeting, but am otherwise available.

Thanks,

Kim

Kim Teofilak | Senior Consultant
Trinity Consultants | (704) 553-7747 x 111
325 Arlington Ave., Suite 500 | Charlotte, NC 28203
http://trinityconsultants.com/

From: Clark, Fatina Ann Washburn [mailto:clarkfaw@dhec.sc.gov]
Sent: Tuesday, March 06, 2018 8:19 AM
To: Kimberly Teofilak <kteofilak@trinityconsultants.com>
Cc: Nicole Saniti <NSaniti@trinityconsultants.com>
Subject: RE: Emissions ==> Paint Shop/Assembly Adhesives

Hi again.

So I have figured out that the Body Shop/Paint Shop adhesives is an either/or emission. We revised to add the flexibility of two different locations for the side panel adhesives. That would make sense why they were the same in the application. I think I've clarified that for myself. I could still use your help clarifying the paint shop/assembly adhesives. Thanks!

Fatina A. W. Clark
Engineering Services Division
S.C. Dept. of Health & Environmental Control
Office: (803) 898-4072
Fax: (803) 898-4079
Connect: www.scdhec.gov Facebook Twitter
<image001.jpg>

From: Clark, Fatina Ann Washburn
Sent: Tuesday, March 06, 2018 7:52 AM

To: 'Kimberly Teofilak' <kteofilak@trinityconsultants.com>
Cc: Nicole Saniti <NSaniti@trinityconsultants.com>
Subject: RE: Emissions ==> Paint Shop/Assembly Adhesives

Hi Kim.

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Fatina A. W. Clark
Coastal Plains and Power Section
Bureau of Air Quality
S.C. Dept. of Health & Environmental Control
Office: (803) 898-4072
Connect: www.scdhec.gov Facebook Twitter

<image002.png>

From: Kimberly Teofilak [mailto:kteofilak@trinityconsultants.com]
Sent: Monday, March 5, 2018 11:03 AM
To: Clark, Fatina Ann Washburn <clarkfaw@dhec.sc.gov>
Cc: Nicole Saniti <NSaniti@trinityconsultants.com>
Subject: RE: Emissions ==> Paint Shop/Assembly Adhesives

Fatina,

Thank you for the clarification! Appendix B.3.4, page 20 of 37 represents the emissions from PSA (Paint Shop Adhesive Application). Appendix B.3.5, page 25 of 37 (4th table) represents the emissions from BS02 (Body Shop/Paint Shop Adhesives Application).

Thanks,

Kim

Kim Teofilak | Senior Consultant
Trinity Consultants | (704) 553-7747 x 111
325 Arlington Ave., Suite 500 | Charlotte, NC 28203
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<image001.jpg>

Clark, Fatina Ann Washburn

From: Kimberly Teofilak <kteofilak@trinityconsultants.com>
Sent: Tuesday, March 06, 2018 9:27 AM
To: Clark, Fatina Ann Washburn
Cc: Nicole Saniti
Subject: RE: Emissions ==> Paint Shop/Assembly Adhesives

Fatina,

Do you have any availability for a call this morning? I would like more clarification on the information needed regarding the paint shop/assembly adhesives. Please let me know if you are available today to discuss. I have a 9:30-10:30 AM meeting, but am otherwise available.

Thanks,

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Attachments:	2016-03-14_0560-0385ca.pd.complete.pdf

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Clark, Fatina Ann Washburn

From:	McAvoy, Bryan P.
Sent:	Monday, March 05, 2018 11:32 AM
To:	Taylor Loftis
Cc:	Allard, John R.; Clark, Fatina Ann Washburn
Subject:	Re: Further question concerning Mercedes emission point parameters

Thanks, Taylor.

-Bryan @ BAQ

From: Taylor Loftis <TLoftis@trinityconsultants.com>
Sent: Monday, March 5, 2018 11:18:44 AM
To: McAvoy, Bryan P.
Cc: Allard, John R.; Clark, Fatina Ann Washburn
Subject: RE: Further question concerning Mercedes emission point parameters

Bryan,

I'll double check these today or tomorrow and get back to you.

ASU11 is the correct ID, I've attached an updated page for Table 3-4.

Best,
Taylor

Taylor Loftis, P.E.
Managing Consultant

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325 Arlington Ave., Suite 500 | Charlotte, North Carolina 28203
Office: 704-553-7747 x103
Email: tloftis@trinityconsultants.com

From: McAvoy, Bryan P. [mailto:mcavoybp@dhec.sc.gov]
Sent: Monday, March 05, 2018 11:08 AM
To: Taylor Loftis <TLoftis@trinityconsultants.com>
Cc: Allard, John R. <allardjr@dhec.sc.gov>; Clark, Fatina Ann Washburn <clarkfaw@dhec.sc.gov>
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In the case of the UTM differences, here is a list of emission points that are different in the modeling report vs the AERMOD run:

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CT4B
WD03TU
UBS01
UBC01
SR01
ASU08
ASU33
ASU34
ASU37
ASU38
UBS21

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Bryan McAvoy
Meteorologist
S.C. Dept. of Health & Environmental Control
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Sent: Monday, March 05, 2018 9:33 AM
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Cc: Nicole Saniti <NSaniti@trinityconsultants.com>
Subject: RE: Emissions ==> Paint Shop/Assembly Adhesives

Good morning Fatina. Are you referring to the paint shop adhesive application emissions? If so, they are contained in Appendix B.3.4, page 20 of 37 in the submitted application. if this is not what you were looking for, please let me know and we will locate the proper records.

Regards.

Kim

Kim Teofilak | Senior Consultant
Trinity Consultants | (704) 553-7747 x 111
325 Arlington Ave., Suite 500 | Charlotte, NC 28203
http://trinityconsultants.com/

From: Clark, Fatina Ann Washburn [mailto:clarkfaw@dhec.sc.gov]
Sent: Monday, March 05, 2018 9:03 AM
To: Kimberly Teofilak <kteofilak@trinityconsultants.com>
Subject: Emissions

Hi Kim.

I was updating the preliminary determination and cannot locate the emissions for the Paint Shop/Assembly Adhesives. I may just be missing them. Can you please help me locate them or provide if they were omitted. Thanks!

Fatina A. W. Clark
Engineering Services Division
S.C. Dept. of Health & Environmental Control
Office: (803) 898-4072
Fax: (803) 898-4079
Connect: www.scdhec.gov Facebook Twitter

dhec
Healthy People. Healthy Communities.

Clark, Fatina Ann Washburn

From:	Kimberly Teofilak <kteofilak@trinityconsultants.com>
Sent:	Monday, March 05, 2018 9:33 AM
To:	Clark, Fatina Ann Washburn
Cc:	Nicole Saniti
Subject:	RE: Emissions ==> Paint Shop/Assembly Adhesives

Good morning Fatina. Are you referring to the paint shop adhesive application emissions? If so, they are contained in Appendix B.3.4, page 20 of 37 in the submitted application. if this is not what you were looking for, please let me know and we will locate the proper records.

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Clark, Fatina Ann Washburn

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Clark, Fatina Ann Washburn

From:	McAvoy, Bryan P.
Sent:	Friday, March 02, 2018 2:58 PM
To:	tjabon@trinityconsultants.com
Cc:	Clark, Fatina Ann Washburn; Allard, John R.; Kingston, Andrew; jae.park@daimler.com
Subject:	Follow-up on emission and stack parameter inconsistencies in the Mercedes permit application (no 0560-0385)

Good afternoon,

I'm following up on an email I sent yesterday concerning differences in the emission rates and stack parameters between the AERMOD modeling and the PSD Air Quality Modeling Report submitted with the latest construction permit from the Cercedes-Benz Vans facility in Ladson.

I received a call yesterday from from Taylor Loftis and we chatted over the differences I noted in my previous email. He mentioned that the SIL modeling was not updated as most of the changes in the new application would yield lower concentrations than the previous modeling (not to speak for him, this is simply a paraphrasing of my recollection of the conversation). He said that updated NAAQS modeling had been submitted with the application.

In reviewing the NAAQS (aka full) modeling that we were sent, the input data for PM10 - including stack parameters and emission rates - also does not appear to have been updated, while the PM25 data has been updated.

The modeling report indicates that the PM10 NAAQS (full impact) modeling should have been updated as well. Please explain.

Bryan McAvoy
Meteorologist
S.C. Dept. of Health & Environmental Control
Office: (803) 898-1275
Email: mcavoybp@dhec.sc.gov
Connect: www.scdhec.gov

Clark, Fatina Ann Washburn

From:	Clark, Fatina Ann Washburn
Sent:	Thursday, March 01, 2018 4:48 PM
To:	NSaniti@trinityconsultants.com
Subject:	Fwd: Emission and stack parameter inconsistencies in the Mercedes permit application (no 0560-0385)

Begin forwarded message:

From: "McAvoy, Bryan P." <mcavoybp@dhec.sc.gov>
Date: March 1, 2018 at 4:27:45 PM EST
To: "tjabon@trinityconsultants.com" <tjabon@trinityconsultants.com>
Cc: "Clark, Fatina Ann Washburn" <clarkfaw@dhec.sc.gov>, "Allard, John R." <allardjr@dhec.sc.gov>, "Kingston, Andrew" <kingstap@dhec.sc.gov>
Subject: Emission and stack parameter inconsistencies in the Mercedes permit application (no 0560-0385)

Hello,

In reviewing the PSD Air Quality Modeling Report submitted as part of the Mercedes-Benz Vans application, I've noticed apparent inconsistencies between what is in the report and the contents of the submitted AERMOD modeling.

In particular, in comparing Table 3-5 "Modeled Source Locations and Parameters" in the report to the AERMOD source ID's, the stack parameters and emissions are different between IDs "01", "B01" and "CT1". This is not an inclusive list as I stopped checking after observing the initial differences between the stacks in table 3-5.

Please let us know which data is correct and if this will have an effect on the modeling analysis. A reply by Wednesday, March 8th would be appreciated.

Bryan McAvoy

Meteorologist

S.C. Dept. of Health & Environmental Control

Office: (803) 898-1275

Email: mcavoybp@dhec.sc.gov

Connect: www.scdhec.gov

Clark, Fatina Ann Washburn

From:	McAvoy, Bryan P.
Sent:	Thursday, March 01, 2018 4:28 PM
To:	tjabon@trinityconsultants.com
Cc:	Clark, Fatina Ann Washburn; Allard, John R.; Kingston, Andrew
Subject:	Emission and stack parameter inconsistencies in the Mercedes permit application (no 0560-0385)

Hello,

In reviewing the PSD Air Quality Modeling Report submitted as part of the Mercedes-Benz Vans application, I've noticed apparent inconsistencies between what is in the report and the contents of the submitted AERMOD modeling.

In particular, in comparing Table 3-5 "Modeled Source Locations and Parameters" in the report to the AERMOD source ID's, the stack parameters and emissions are different between IDs "01", "B01" and "CT1". This is not an inclusive list as I stopped checking after observing the initial differences between the stacks in table 3-5.

Please let us know which data is correct and if this will have an effect on the modeling analysis. A reply by Wednesday, March 8th would be appreciated.

Bryan McAvoy
Meteorologist
S.C. Dept. of Health & Environmental Control
Office: (803) 898-1275
Email: mcavoybp@dhec.sc.gov
Connect: www.scdhec.gov

Clark, Fatina Ann Washburn

From:	Kimberly Teofilak <kteofilak@trinityconsultants.com>
Sent:	Thursday, March 01, 2018 2:13 PM
To:	Clark, Fatina Ann Washburn
Cc:	Nicole Saniti
Subject:	RE: Uncontrolled Emissions
Attachments:	Mercedes-Benz Facility-wide Potential Emissions (UNRESTRICTED)_2018-0301.pdf

Fatina,

I have attached a pdf copy of the unrestricted emission calculations. Please let us know if you have any questions or need any additional documentation.

Regards,

Kim

Kim Teofilak | Senior Consultant
Trinity Consultants | (704) 553-7747 x 111
325 Arlington Ave., Suite 500 | Charlotte, NC 28203
http://trinityconsultants.com/

From: Clark, Fatina Ann Washburn [mailto:clarkfaw@dhec.sc.gov]
Sent: Thursday, March 01, 2018 10:42 AM
To: Kimberly Teofilak <kteofilak@trinityconsultants.com>
Subject: Uncontrolled Emissions

Hi Kim.

Can you please send me the emission calculations for the unrestricted case? Thanks!

Fatina A. W. Clark
Engineering Services Division
S.C. Dept. of Health & Environmental Control
Office: (803) 898-4072
Fax: (803) 898-4079
Connect: www.scdhec.gov Facebook Twitter

Clark, Fatina Ann Washburn

From: Lofton, Anthony
Sent: Thursday, March 01, 2018 2:01 PM
To: Clark, Fatina Ann Washburn
Subject: Re: EGUs Using Coal

Thanks!

Anthony T. Lofton
Environmental Health Manager III
Bureau of Air Quality
S.C. Dept. of Health & Environmental Control
Office: (803) 898-7217
Fax: (803) 898-4487
Connect: www.scdhec.gov Facebook Twitter LinkedIn

Whoever pursues righteousness and love finds life, prosperity and honor.
Proverbs 21:21

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From: Clark, Fatina Ann Washburn
Sent: Thursday, March 1, 2018 1:01:34 PM
To: Lofton, Anthony
Subject: Re: EGUs Using Coal

Cross and Winyah are burning coal. Don't know if any plans of shutting them down. Jeffries and grainger have shutdown.

On Mar 1, 2018, at 11:49 AM, Lofton, Anthony <loftonat@dhec.sc.gov> wrote:

> Hello Fatina,
>
> I wanted to know if you can tell me what Santee Cooper electric generating plants are still burning coal and any that have stopped burning coal since 2016/17.
>
> Also, of those still burning coal, do you know if any are scheduled to shutdown/switch to natural gas in the near future.
>
> Any info you can provide would be very much appreciated.
>
> Tony.

Anthony T. Lofton
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Clark, Fatina Ann Washburn

From: Clark, Fatina Ann Washburn
Sent: Thursday, March 01, 2018 1:02 PM
To: Lofton, Anthony
Subject: Re: EGUs Using Coal

Cross and Winyah are burning coal. Don't know if any plans of shutting them down. Jeffries and grainger have shutdown.

On Mar 1, 2018, at 11:49 AM, Lofton, Anthony <loftonat@dhec.sc.gov> wrote:

Hello Fatina,

I wanted to know if you can tell me what Santee Cooper electric generating plants are still burning coal and any that have stopped burning coal since 2016/17.

Also, of those still burning coal, do you know if any are scheduled to shutdown/switch to natural gas in the near future.

Any info you can provide would be very much appreciated.

Tony.

Anthony T. Lofton
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Clark, Fatina Ann Washburn

From: Lofton, Anthony
Sent: Thursday, March 01, 2018 11:49 AM
To: Clark, Fatina Ann Washburn
Subject: EGUs Using Coal

Hello Fatina,

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Clark, Fatina Ann Washburn

From: Clark, Fatina Ann Washburn
Sent: Thursday, March 01, 2018 10:42 AM
To: 'Kimberly Teofilak'
Subject: Uncontrolled Emissions

Hi Kim.

Can you please send me the emission calculations for the unrestricted case? Thanks!

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Clark, Fatina Ann Washburn

From:	Kimberly Teofilak <kteofilak@trinityconsultants.com>
Sent:	Thursday, March 01, 2018 8:56 AM
To:	Clark, Fatina Ann Washburn
Cc:	Nicole Saniti
Subject:	RE: Emissions table - Updated
Attachments:	D-2569 Emissions-UPDATED_2018-0301.pdf

Fatina,

I have added a row to the DHEC Form 2569 template and have attached a copy of the updated form for your review. Please let us know if you need any additional information.

Regards,

Kim

Kim Teofilak | Senior Consultant
Trinity Consultants | (704) 553-7747 x 111
325 Arlington Ave., Suite 500 | Charlotte, NC 28203
http://trinityconsultants.com/

From: Nicole Saniti
Sent: Thursday, March 01, 2018 8:27 AM
To: Kimberly Teofilak <kteofilak@trinityconsultants.com>
Subject: FW: Emissions table

Kim – Could you get Fatina what she is requesting here?

Thanks,

Nicole

....
Nicole Saniti, P.E.
Managing Consultant

Trinity Consultants
325 Arlington Ave., Suite 500 | Charlotte, North Carolina 28203

Office: **704-553-7747 x104** | Mobile: 518-461-8135
Email: nsaniti@trinityconsultants.com | LinkedIn: www.linkedin.com/in/nsanititrinityconsultants

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Learn about Trinity's courses for environmental professionals.

From: Clark, Fatina Ann Washburn [mailto:clarkfaw@dhec.sc.gov]
Sent: Thursday, March 01, 2018 8:00 AM
To: Nicole Saniti <NSaniti@trinityconsultants.com>
Subject: Emissions table

Hi Nicole. I need the uncontrolled and controlled GHG emissions from this modification. This is the only pollutant that isn't on the form. Thanks in advance for your help.

FACILITY WIDE EMISSIONS			
Pollutant	Uncontrolled Emissions	Controlled Emissions	Limited Emissions
	TPY	TPY	TPY
PM	1,353.99	24.65	21.94
PM_{10}	1,346.70	17.36	14.73
$PM_{2.5}$	1,345.39	16.05	13.43
SO_2	0.93	0.93	0.79
NO_x	46.37	46.37	35.42
CO	76.98	76.98	57.76
VOC	3,446.70	1,114.23	955.85
CO_2e	101,145.76	101,145.76	74,999.00
Lead	4.24E-04	4.24E-04	3.10E-04
Total HAP	415.58	415.58	358.18

Fatina A. W. Clark
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S.C. Dept. of Health & Environmental Control
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	TPY	TPY	TPY
PM	1,353.99	24.65	21.94
PM_{10}	1,346.70	17.36	14.73
$PM_{2.5}$	1,345.39	16.05	13.43
SO_2	0.93	0.93	0.79
NO_x	46.37	46.37	35.42
CO	76.98	76.98	57.76
VOC	3,446.70	1,114.23	955.85
CO_2e	101,145.76	101,145.76	74,999.00
Lead	4.24E-04	4.24E-04	3.10E-04
Total HAP	415.58	415.58	358.18

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Healthy People. Healthy Communities.

Clark, Fatina Ann Washburn

From: Clark, Fatina Ann Washburn
Sent: Wednesday, February 28, 2018 8:56 AM
To: 'Nicole Saniti'
Subject: RE: Rooftop Units

Yes – sounds great! I will change per the table below. Thanks!

Fatina A. W. Clark
Engineering Services Division
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Office: (803) 898-4072
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From: Nicole Saniti [mailto:NSaniti@trinityconsultants.com]
Sent: Wednesday, February 28, 2018 8:52 AM
To: Clark, Fatina Ann Washburn <clarkfaw@dhec.sc.gov>
Subject: Rooftop Units

Hi Fatina,

After taking a closer look at the table in the application, I would suggest that we stay with the unit IDs proposed, exclude the Btu ratings from the description, and then describe as you proposed. See the table below. Is this what you were suggesting as well?

Current	Proposed	Proposed Change Note	Proposed Description
RTU01	AS-RTU01	1	Assembly Rooftop Unit 1
RTU02	N/A	2	N/A
RTU03	N/A	2	N/A
RTU04	AS-RTU04	1	Assembly Rooftop Unit 4
RTU05	N/A	2	N/A
RTU06	AS-RTU06	1	Assembly Rooftop Unit 6
RTU07	N/A	2	N/A
RTU08	AS-RTU08	1	Assembly Rooftop Unit 8
RTU09	N/A	2	N/A
RTU10	AS-RTU10	1	Assembly Rooftop Unit 10
RTU11	AS-RTU11	1	Assembly Rooftop Unit 11
RTU12	N/A	2	N/A
RTU13	AS-RTU13	1	Assembly Rooftop Unit 13
RTU14	BS-RTU01	3	Body Shop Rooftop Unit 1
RTU15	BS-RTU02	3	Body Shop Rooftop Unit 2

RTU16	N/A	2	N/A
RTU17	BS-RTU04	3	Body Shop Rooftop Unit 4
RTU18	BS-RTU05	3	Body Shop Rooftop Unit 5
RTU19	BS-RTU06	3	Body Shop Rooftop Unit 6
RTU20	BS-RTU07	3	Body Shop Rooftop Unit 7
RTU21	BS-RTU10	3	Body Shop Rooftop Unit 10
RTU22	BS-RTU17	3	Body Shop Rooftop Unit 17
RTU23	BS-RTU18	3	Body Shop Rooftop Unit 18
RTU24	BS-RTU23	3	Body Shop Rooftop Unit 23
RTU25	BS-RTU25	3	Body Shop Rooftop Unit 25
RTU26	BS-RTU26	3	Body Shop Rooftop Unit 26
RTU27	BS-RTU30	3	Body Shop Rooftop Unit 30
RTU28	BS-RTU32	3	Body Shop Rooftop Unit 32
RTU29	BS-RTU33	3	Body Shop Rooftop Unit 33
RTU30	BS-RTU35	3	Body Shop Rooftop Unit 35
RTU31	N/A	2	N/A
RTU32	N/A	2	N/A
RTU33	N/A	2	N/A
RTU34	N/A	2	N/A
RTU35	N/A	2	N/A

……………………………………………………………………………………………………..
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Managing Consultant

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Clark, Fatina Ann Washburn

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RTU05	N/A	2	N/A
RTU06	AS-RTU06	1	Assembly Rooftop Unit 6
RTU07	N/A	2	N/A
RTU08	AS-RTU08	1	Assembly Rooftop Unit 8
RTU09	N/A	2	N/A
RTU10	AS-RTU10	1	Assembly Rooftop Unit 10
RTU11	AS-RTU11	1	Assembly Rooftop Unit 11
RTU12	N/A	2	N/A
RTU13	AS-RTU13	1	Assembly Rooftop Unit 13
RTU14	BS-RTU01	3	Body Shop Rooftop Unit 1
RTU15	BS-RTU02	3	Body Shop Rooftop Unit 2
RTU16	N/A	2	N/A
RTU17	BS-RTU04	3	Body Shop Rooftop Unit 4
RTU18	BS-RTU05	3	Body Shop Rooftop Unit 5
RTU19	BS-RTU06	3	Body Shop Rooftop Unit 6
RTU20	BS-RTU07	3	Body Shop Rooftop Unit 7
RTU21	BS-RTU10	3	Body Shop Rooftop Unit 10
RTU22	BS-RTU17	3	Body Shop Rooftop Unit 17
RTU23	BS-RTU18	3	Body Shop Rooftop Unit 18
RTU24	BS-RTU23	3	Body Shop Rooftop Unit 23
RTU25	BS-RTU25	3	Body Shop Rooftop Unit 25
RTU26	BS-RTU26	3	Body Shop Rooftop Unit 26
RTU27	BS-RTU30	3	Body Shop Rooftop Unit 30
RTU28	BS-RTU32	3	Body Shop Rooftop Unit 32
RTU29	BS-RTU33	3	Body Shop Rooftop Unit 33
RTU30	BS-RTU35	3	Body Shop Rooftop Unit 35
RTU31	N/A	2	N/A
RTU32	N/A	2	N/A

RTU33	N/A	2	N/A
RTU34	N/A	2	N/A
RTU35	N/A	2	N/A

……………………………………………………………………………………………………

Nicole Saniti, P.E.
Managing Consultant

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Clark, Fatina Ann Washburn

From: Clark, Fatina Ann Washburn
Sent: Wednesday, February 28, 2018 7:10 AM
To: jae.park@daimler.com
Cc: NSaniti@trinityconsultants.com
Subject: RE: BAQ in receipt of an Expedited Prevention of Significant Deterioration (PSD) Air Permit Application Revision for Mercedes Benz Vans. LLC (0560-0385-CA-R3)

OK Thank you.

I have requested an invoice be created for you. I'm not sure who will contact you, but please feel free to contact me if you don't have an invoice number by tomorrow. Thanks!

Fatina A. W. Clark
Coastal Plains and Power Section
Bureau of Air Quality
S.C. Dept. of Health & Environmental Control
Office: (803) 898-4072
Connect: www.scdhec.gov Facebook Twitter

From: jae.park@daimler.com [mailto:jae.park@daimler.com]
Sent: Wednesday, February 28, 2018 6:56 AM
To: Clark, Fatina Ann Washburn <clarkfaw@dhec.sc.gov>
Cc: NSaniti@trinityconsultants.com
Subject: RE: BAQ in receipt of an Expedited Prevention of Significant Deterioration (PSD) Air Permit Application Revision for Mercedes Benz Vans. LLC (0560-0385-CA-R3)

Hi Fatina,

Attached is a copy of the PO for the Expedite review of the air permit revision for the Mercedes-Benz Vans facility.
I'm not sure if you need it but I am sending you a copy because the email we have listed in our system for PO's may not be the correct person for the expedite review.
I await the invoice so we can process a payment to SCDHEC for the expedite review.

Kind Regards / Mit freundlichen Grüßen

Jae Park
Paint Engineer, VAN/OEC

Merecedes-Benz Vans,LLC
8501 Palmetto Commerce Parkway
Ladson, SC 29456

Phone +1 843 695 5095
Mobile +1 843 697 9478
Fax +1 843 695 5031
E-Mail jae.park@daimler.com

From: Clark, Fatina Ann Washburn [mailto:clarkfaw@dhec.sc.gov]
Sent: Monday, February 26, 2018 8:06 AM
To: Park, Jae (566) <jae.park@daimler.com>
Cc: Boswell, Wendy <BOSWELWM@dhec.sc.gov>; Humphries, Diane <HUMPHRDM@dhec.sc.gov>; AIR_ENG_ADMIN <AIR_ENG_ADMIN@dhec.sc.gov>; Boyce, Lawra <boycelc@dhec.sc.gov>; Glass, John <glassjp@dhec.sc.gov>; Nicole Saniti <NSaniti@trinityconsultants.com>
Subject: BAQ in receipt of an Expedited Prevention of Significant Deterioration (PSD) Air Permit Application Revision for Mercedes Benz Vans. LLC (0560-0385-CA-R3)

The Bureau of Air Quality (BAQ) received an expedited PSD application from Mercedes Benz Vans. LLC, Ladson, SC on February 20, 2018. The application was for revisions and updates to the automobile manufacturing plant. The completeness review period for the application officially began on this date and the application has been deemed technically complete as of February 26, 2018.

We need your assistance in meeting the time frame goals. We ask that you commit to assisting us with public participation activities, such as participating in answering questions from the public about the proposed project during any public meeting and/or public hearings that may be requested and held and helping us respond to any comments that may be received during the public comment period. We also ask that you commit to providing timely answers to any additional information that may be requested during the review. If you still wish to enter the expedited program and agree to the above conditions, please respond to this email and submit payment in the amount of $10,000.

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https://web.sc.gov/dheconlineinvoicepaymentsystem/invoicegroupselection.aspx

If you have questions, please contact me at (803) 898-4072 or by e-mail.

Fatina A. W. Clark
Engineering Services Division
S.C. Dept. of Health & Environmental Control
Office: (803) 898-4072
Fax: (803) 898-4079
Connect: www.scdhec.gov Facebook Twitter

If you are not the addressee, please inform us immediately that you have received this e-mail by mistake, and delete it.
We thank you for your support.

Clark, Fatina Ann Washburn

From:	Clark, Fatina Ann Washburn
Sent:	Wednesday, February 28, 2018 7:04 AM
To:	AIR_ENG_ADMIN
Subject:	FW: BAQ in receipt of an Expedited Prevention of Significant Deterioration (PSD) Air Permit Application Revision for Mercedes Benz Vans. LLC (0560-0385-CA-R3)

Can you please create an invoice and send it to Jae Park? His email is below. Thank you!

Fatina A. W. Clark
Coastal Plains and Power Section
Bureau of Air Quality
S.C. Dept. of Health & Environmental Control
Office: (803) 898-4072
Connect: www.scdhec.gov Facebook Twitter

From: jae.park@daimler.com [mailto:jae.park@daimler.com]
Sent: Wednesday, February 28, 2018 6:17 AM
To: Clark, Fatina Ann Washburn <clarkfaw@dhec.sc.gov>
Cc: joshua.fawley@daimler.com; mustapha.bouhlou@daimler.com; russell.revell@daimler.com
Subject: RE: BAQ in receipt of an Expedited Prevention of Significant Deterioration (PSD) Air Permit Application Revision for Mercedes Benz Vans. LLC (0560-0385-CA-R3)

Hello Fatina,

Can you please email an invoice to me?

Kind Regards / Mit freundlichen Grüßen

Jae Park
Paint Engineer, VAN/OEC

Merecedes-Benz Vans,LLC
8501 Palmetto Commerce Parkway
Ladson, SC 29456

Phone +1 843 695 5095
Mobile +1 843 697 9478
Fax +1 843 695 5031
E-Mail jae.park@daimler.com

From: Clark, Fatina Ann Washburn [mailto:clarkfaw@dhec.sc.gov]
Sent: Monday, February 26, 2018 8:06 AM

To: Park, Jae (566) <jae.park@daimler.com>
Cc: Boswell, Wendy <BOSWELWM@dhec.sc.gov>; Humphries, Diane <HUMPHRDM@dhec.sc.gov>; AIR_ENG_ADMIN <AIR_ENG_ADMIN@dhec.sc.gov>; Boyce, Lawra <boycelc@dhec.sc.gov>; Glass, John <glassjp@dhec.sc.gov>; Nicole Saniti <NSaniti@trinityconsultants.com>
Subject: BAQ in receipt of an Expedited Prevention of Significant Deterioration (PSD) Air Permit Application Revision for Mercedes Benz Vans. LLC (0560-0385-CA-R3)

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Clark, Fatina Ann Washburn

From:	jae.park@daimler.com
Sent:	Wednesday, February 28, 2018 6:56 AM
To:	Clark, Fatina Ann Washburn
Cc:	NSaniti@trinityconsultants.com
Subject:	RE: BAQ in receipt of an Expedited Prevention of Significant Deterioration (PSD) Air Permit Application Revision for Mercedes Benz Vans. LLC (0560-0385-CA-R3)
Attachments:	FW: Purchase Order 1566001099 from Daimler Purchasing Coordination Corp.

Hi Fatina,

Attached is a copy of the PO for the Expedite review of the air permit revision for the Mercedes-Benz Vans facility.
I'm not sure if you need it but I am sending you a copy because the email we have listed in our system for PO's may not be the correct person for the expedite review.
I await the invoice so we can process a payment to SCDHEC for the expedite review.

Kind Regards / Mit freundlichen Grüßen

Jae Park
Paint Engineer, VAN/OEC

Merecedes-Benz Vans,LLC
8501 Palmetto Commerce Parkway
Ladson, SC 29456

Phone +1 843 695 5095
Mobile +1 843 697 9478
Fax +1 843 695 5031
E-Mail jae.park@daimler.com

From: Clark, Fatina Ann Washburn [mailto:clarkfaw@dhec.sc.gov]
Sent: Monday, February 26, 2018 8:06 AM
To: Park, Jae (566) <jae.park@daimler.com>
Cc: Boswell, Wendy <BOSWELWM@dhec.sc.gov>; Humphries, Diane <HUMPHRDM@dhec.sc.gov>; AIR_ENG_ADMIN <AIR_ENG_ADMIN@dhec.sc.gov>; Boyce, Lawra <boycelc@dhec.sc.gov>; Glass, John <glassjp@dhec.sc.gov>; Nicole Saniti <NSaniti@trinityconsultants.com>
Subject: BAQ in receipt of an Expedited Prevention of Significant Deterioration (PSD) Air Permit Application Revision for Mercedes Benz Vans. LLC (0560-0385-CA-R3)

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If you have questions, please contact me at (803) 898-4072 or by e-mail.

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S.C. Dept. of Health & Environmental Control
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Fax: (803) 898-4079
Connect: www.scdhec.gov Facebook Twitter

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We thank you for your support.

Clark, Fatina Ann Washburn

From: jae.park@daimler.com
Sent: Wednesday, February 28, 2018 6:17 AM
To: Clark, Fatina Ann Washburn
Cc: joshua.fawley@daimler.com; mustapha.bouhlou@daimler.com; russell.revell@daimler.com
Subject: RE: BAQ in receipt of an Expedited Prevention of Significant Deterioration (PSD) Air Permit Application Revision for Mercedes Benz Vans. LLC (0560-0385-CA-R3)

Hello Fatina,

Can you please email an invoice to me?

Kind Regards / Mit freundlichen Grüßen

Jae Park
Paint Engineer, VAN/OEC

Merecedes-Benz Vans,LLC
8501 Palmetto Commerce Parkway
Ladson, SC 29456

Phone +1 843 695 5095
Mobile +1 843 697 9478
Fax +1 843 695 5031
E-Mail jae.park@daimler.com

From: Clark, Fatina Ann Washburn [mailto:clarkfaw@dhec.sc.gov]
Sent: Monday, February 26, 2018 8:06 AM
To: Park, Jae (566) <jae.park@daimler.com>
Cc: Boswell, Wendy <BOSWELWM@dhec.sc.gov>; Humphries, Diane <HUMPHRDM@dhec.sc.gov>; AIR_ENG_ADMIN <AIR_ENG_ADMIN@dhec.sc.gov>; Boyce, Lawra <boycelc@dhec.sc.gov>; Glass, John <glassjp@dhec.sc.gov>; Nicole Saniti <NSaniti@trinityconsultants.com>
Subject: BAQ in receipt of an Expedited Prevention of Significant Deterioration (PSD) Air Permit Application Revision for Mercedes Benz Vans. LLC (0560-0385-CA-R3)

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If you have questions, please contact me at (803) 898-4072 or by e-mail.

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Fax: (803) 898-4079
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If you are not the addressee, please inform us immediately that you have received this e-mail by mistake, and delete it.
We thank you for your support.

Clark, Fatina Ann Washburn

From: Clark, Fatina Ann Washburn
Sent: Tuesday, February 27, 2018 8:12 AM
To: 'joshua.fawley@daimler.com'
Subject: RE: BAQ in receipt of an Expedited Prevention of Significant Deterioration (PSD) Air Permit Application Revision for Mercedes Benz Vans. LLC (0560-0385-CA-R3)

Hi Joshua.

I'm afraid we can't accept an ACH payment. You may request an invoice and pay online if you like. Thanks!

Fatina A. W. Clark
Engineering Services Division
S.C. Dept. of Health & Environmental Control
Office: (803) 898-4072
Fax: (803) 898-4079
Connect: www.scdhec.gov Facebook Twitter

From: joshua.fawley@daimler.com [mailto:joshua.fawley@daimler.com]
Sent: Monday, February 26, 2018 4:43 PM
To: Clark, Fatina Ann Washburn <clarkfaw@dhec.sc.gov>
Subject: FW: BAQ in receipt of an Expedited Prevention of Significant Deterioration (PSD) Air Permit Application Revision for Mercedes Benz Vans. LLC (0560-0385-CA-R3)

Hi Fatina,

Regarding this topic, would it be possible for us to make payment to you via ACH? Could you please provide us with your banking information so ACH payment could be made this week?

Kind regards

Joshua Fawley
Accounting Manager, FMV/O-C

Mercedes-Benz Vans, LLC
8501 Palmetto Commerce Parkway
Ladson, SC 29456

Phone +1 843 695 5038
Fax +1 843 695 5031
E-Mail joshua.fawley@daimler.com

From: Clark, Fatina Ann Washburn [mailto:clarkfaw@dhec.sc.gov]
Sent: Monday, February 26, 2018 8:06 AM
To: Park, Jae (566) <jae.park@daimler.com>
Cc: Boswell, Wendy <BOSWELWM@dhec.sc.gov>; Humphries, Diane <HUMPHRDM@dhec.sc.gov>; AIR_ENG_ADMIN <AIR_ENG_ADMIN@dhec.sc.gov>; Boyce, Lawra <boycelc@dhec.sc.gov>; Glass, John <glassjp@dhec.sc.gov>; Nicole Saniti <NSaniti@trinityconsultants.com>
Subject: BAQ in receipt of an Expedited Prevention of Significant Deterioration (PSD) Air Permit Application Revision for Mercedes Benz Vans. LLC (0560-0385-CA-R3)

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Connect: www.scdhec.gov Facebook Twitter

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Clark, Fatina Ann Washburn

From:	Clark, Fatina Ann Washburn
Sent:	Monday, February 26, 2018 8:04 AM
To:	'ceron.heather@epa.gov'; Shepherd, Lorinda; 'NSRsubmittals'
Cc:	Boswell, Wendy; Humphries, Diane
Subject:	Prevention of Significant Deterioration (PSD) Air Permit Application Revision for Mercedes Benz Vans, LLC (0560-0385-CA-R3)
Attachments:	2018-02-20_0560-0385.CP.pdf

The Bureau of Air Quality (BAQ) received a PSD permit application from Mercedes Benz Vans, LLC, Ladson, SC on February 20, 2018. The application was for revisions/modifications to the new automobile manufacturing plant. The completeness review period for the application officially began on this date and the application has been deemed technically complete as of February 26, 2018. It will now undergo technical review for a preliminary determination under the requirements of SC Regulation 61-62.5, Standard No. 7 (PSD).

An electronic copy of the PSD construction permit application is attached for your review. Please direct all written comments to my attention at the address below. If I can be of further assistance, please contact me at (803) 898-4072 or by E-mail.

Fatina A. W. Clark
Engineering Services Division
S.C. Dept. of Health & Environmental Control
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Clark, Fatina Ann Washburn

From:	Clark, Fatina Ann Washburn
Sent:	Monday, February 26, 2018 8:05 AM
To:	'jae.park@daimler.com'
Cc:	Boswell, Wendy; Humphries, Diane; AIR_ENG_ADMIN; Boyce, Lawra; Glass, John; 'Nicole Saniti'
Subject:	BAQ in receipt of an Expedited Prevention of Significant Deterioration (PSD) Air Permit Application Revision for Mercedes Benz Vans. LLC (0560-0385-CA-R3)
Attachments:	2018-02-20_0560-0385.CP.pdf

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Fax: (803) 898-4079
Connect: www.scdhec.gov Facebook Twitter

Clark, Fatina Ann Washburn

From: Kimberly Teofilak <kteofilak@trinityconsultants.com>
Sent: Monday, February 26, 2018 7:44 AM
To: Clark, Fatina Ann Washburn
Subject: RE: Coating PDF

Ah good, I was just about to try and dig it up. let me know if you have any other questions as you finish your review.

Thanks,

Kim

Kim Teofilak | Senior Consultant
Trinity Consultants | (704) 553-7747 x 111
325 Arlington Ave., Suite 500 | Charlotte, NC 28203
http://trinityconsultants.com/

From: Clark, Fatina Ann Washburn [mailto:clarkfaw@dhec.sc.gov]
Sent: Monday, February 26, 2018 7:20 AM
To: Kimberly Teofilak <kteofilak@trinityconsultants.com>
Subject: RE: Coating PDF

I think I figured it out. The bottom total includes the e-coat totals on page 10 which did change in Rev 2. Comparing page for page didn't catch two pages were added together. Thanks!

Fatina A. W. Clark
Engineering Services Division
S.C. Dept. of Health & Environmental Control
Office: (803) 898-4072
Fax: (803) 898-4079
Connect: www.scdhec.gov Facebook Twitter

From: Clark, Fatina Ann Washburn
Sent: Monday, February 26, 2018 7:14 AM
To: 'Kimberly Teofilak' <kteofilak@trinityconsultants.com>
Subject: Coating PDF

Page 236 is what I'm comparing. Thanks!

Fatina A. W. Clark

Engineering Services Division
S.C. Dept. of Health & Environmental Control
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Connect: www.scdhec.gov Facebook Twitter

Clark, Fatina Ann Washburn

From: Clark, Fatina Ann Washburn
Sent: Monday, February 26, 2018 7:14 AM
To: 'Kimberly Teofilak'
Subject: Coating PDF
Attachments: 2016-03-01-0560-0385.pdf

Page 236 is what I'm comparing. Thanks!

Fatina A. W. Clark
Engineering Services Division
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Fax: (803) 898-4079
Connect: www.scdhec.gov Facebook Twitter

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Clark, Fatina Ann Washburn

From: Glass, John
Sent: Friday, February 23, 2018 2:13 PM
To: Clark, Fatina Ann Washburn
Subject: Re: Mercedes Expedited

Fatina,

It looks OK to accept. Please let me know when you start the expedited task in efis.

Thanks,
John

John P. Glass, Jr.
Air Modeling Section Manager
Bureau of Air Quality
S.C. Dept. of Health & Environmental Control
Office: (803)898-4074
Connect: www.scdhec.gov Facebook Twitter

From: Clark, Fatina Ann Washburn
Sent: Friday, February 23, 2018 9:33:21 AM
To: Glass, John
Subject: Mercedes Expedited

Please let me know if you are okay with the application. I would like to send the acceptance email on Monday. Thanks.

Fatina

Clark, Fatina Ann Washburn

From: Clark, Fatina Ann Washburn
Sent: Friday, February 23, 2018 12:31 PM
To: Kimberly Teofilak
Subject: Re: Mercedes-Benz Vans Application Questions

Kim.

I'm out of the office for the rest of the day. I can send the pdf to you Monday. If you would please go ahead and forward the spreadsheet so I can look at it first thing Monday. I would like to approve on Monday so the sooner I get it, the better. Thanks.

Fatina

On Feb 23, 2018, at 11:28 AM, Kimberly Teofilak <kteofilak@trinityconsultants.com> wrote:

> Fatina,
>
> I can do that. Could you send me a pdf of the paint shop calcs you are calling Rev 0 and comparing to the current submittal? I want to make sure I'm not looking at something completely different than you.
>
> Thanks,
>
> Kim
>
> **Kim Teofilak | Senior Consultant**
> Trinity Consultants | (704) 553-7747 x 111
> 325 Arlington Ave., Suite 500 | Charlotte, NC 28203
> http://trinityconsultants.com/
>
> ---
>
> **From:** Clark, Fatina Ann Washburn [mailto:clarkfaw@dhec.sc.gov]
> **Sent:** Friday, February 23, 2018 10:28 AM
> **To:** Kimberly Teofilak <kteofilak@trinityconsultants.com>
> **Cc:** Nicole Saniti <NSaniti@trinityconsultants.com>
> **Subject:** RE: Mercedes-Benz Vans Application Questions
>
> Can you send me the spreadsheet? It may be easier for me to follow the calculation to see if that is the discrepancy. Thanks!
>
> **Fatina A. W. Clark**
> Coastal Plains and Power Section
> Bureau of Air Quality
> **S.C. Dept. of Health & Environmental Control**
> Office: (803) 898-4072
> Connect: www.scdhec.gov Facebook Twitter

<image001.png>

From: Kimberly Teofilak [mailto:kteofilak@trinityconsultants.com]
Sent: Friday, February 23, 2018 9:57 AM
To: Clark, Fatina Ann Washburn <clarkfaw@dhec.sc.gov>
Cc: Nicole Saniti <NSaniti@trinityconsultants.com>
Subject: RE: Mercedes-Benz Vans Application Questions

Fatina,

I've looked over the documentation regarding the paint shop VOC calculations and have noted the differences below. Since the submittal of the original application (Rev 0), Mercedes-Benz Vans changed E-Coat Suppliers and the associated BACT limit (Rev 2). This revision resulted in an increase in total VOC emissions from the shop.

Rev 0 – 10/2015 and subsequent updates – Original App
Rev 1 – 03/2017 – No changes to VOC calculations
Rev 2 – 09/2017 – Updated E-Coat calculations
Rev 3 – 02/2018 – No change to VOC, but the PM emissions have been updated due to Cavity Wax and Dry X

If you have any additional questions regarding the application, please feel free to give us a call.

Thanks,

Kim

Kim Teofilak | Senior Consultant
Trinity Consultants | (704) 553-7747 x 111
325 Arlington Ave., Suite 500 | Charlotte, NC 28203
http://trinityconsultants.com/

From: Kimberly Teofilak
Sent: Friday, February 23, 2018 8:54 AM
To: 'Clark, Fatina Ann Washburn' <clarkfaw@dhec.sc.gov>
Cc: Nicole Saniti <nsaniti@trinityconsultants.com>
Subject: RE: Mercedes-Benz Vans Application Questions

Fatina,

I know the changes to E-coat updated the overall numbers from the original application to this one, but I will take a closer look at the spreadsheets to see if I can identify what has changed.

Thanks,

Kim

Kim Teofilak | Senior Consultant
Trinity Consultants | (704) 553-7747 x 111
325 Arlington Ave., Suite 500 | Charlotte, NC 28203
http://trinityconsultants.com/

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Sent: Friday, February 23, 2018 7:32 AM
To: Kimberly Teofilak <kteofilak@trinityconsultants.com>
Cc: Nicole Saniti <NSaniti@trinityconsultants.com>
Subject: RE: Mercedes-Benz Vans Application Questions

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S.C. Dept. of Health & Environmental Control
Office: (803) 898-4072
Connect: www.scdhec.gov Facebook Twitter

<image001.png>

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Clark, Fatina Ann Washburn

From: Kimberly Teofilak <kteofilak@trinityconsultants.com>
Sent: Friday, February 23, 2018 11:28 AM
To: Clark, Fatina Ann Washburn
Subject: RE: Mercedes-Benz Vans Application Questions

Fatina,

I can do that. Could you send me a pdf of the paint shop calcs you are calling Rev 0 and comparing to the current submittal? I want to make sure I'm not looking at something completely different than you.

Thanks,

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Clark, Fatina Ann Washburn

From: Clark, Fatina Ann Washburn
Sent: Friday, February 23, 2018 9:33 AM
To: Glass, John
Subject: Mercedes Expedited

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