

**VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY**  
**Blue Ridge Regional Office**

INTRA-AGENCY MEMORANDUM

|                                      |                                |   |   |                            |
|--------------------------------------|--------------------------------|---|---|----------------------------|
| <b>Permit Writer</b>                 | Paul R. Jenkins                |   |   |                            |
| <b>Memo To</b>                       | Air Permit File                | <b>Date</b>   | 10/2/2015 (Date of public notice - Permit issued 1/19/2016) |                            |
| <b>Facility Name</b>                 | Volvo Group North America, LLC |   |   |                            |
| <b>Registration Number</b>           | <b>20765 #26</b>               |   |   |                            |
| <b>County-Plant I.D.</b>             | 155-0041                       |   |   |                            |
| <b>Decimal Coordinates</b>           | 37.076                         | <b>Latitude</b>                                       | -80.7093  | <b>Longitude</b>           |
| <b>Elevation (feet)</b>              | 2,078                          |   |   |                            |
| <b>Distance to Class I Areas</b>     | 195.9                          | <b>SNP (km)</b>                                       | 121.5   | <b>JRF (km)</b>            |
| <b>FLM Notification (Y/N)</b>        | Y                              | Required if less than 10K (minor), 100K (state major) |   |                            |
| <b>NET Classification (A, SM, B)</b> | A                              | <b>Before permit action</b>                           | A   | <b>After permit action</b> |
| <b>Title V Major Pollutants</b>      | VOC and HAP                    | <b>Before permit action</b>                           | VOC, HAP, PM10 & PM2.5                                      | <b>After permit action</b> |
| <b>PSD Major Source (Y/N)</b>        | Y                              | <b>Before permit action</b>                           | Y   | <b>After permit action</b> |
| <b>PSD Major Pollutants</b>          | VOC                            | <b>Before permit action</b>                           | VOC, PM10 & PM2.5   | <b>After permit action</b> |

**I. Introduction**

Volvo Group North America, LLC (Volvo) owns and operates the New River Valley Plant, a heavy-duty truck production facility, in Dublin, Pulaski County, Virginia. The Volvo plant has been in operation since 1975.

Volvo currently has three minor NSR permits (4/21/2010; 4/6/2012; and 9/28/2012) and one Title V permit.

On August 29, 2014 DEQ received a permit application dated August 28, 2014 for a modification that is planned at the facility that would be subject to the Prevention of Significant Deterioration (PSD) regulations. Volvo submitted revisions to the original permit application dated October 21, 2014; December 19, 2014; February 12, 2015; March 2, 2015; April 23, 2015; June 19, 2015 and September 22, 2015. The final modeling report was received on July 13, 2015. The application was deemed complete on September 22, 2015.

The proposed expansion project will involve modification of the existing integrated cab and plastics paint line (April 6, 2012 minor NSR permit). The expansion will result in separate prime, basecoat, and clearcoat lines for metal cabs and plastic parts, separate from the multitone process.

## II. Emission Units / Process Description

Volvo trucks are produced on site in two major production areas 1) assembly including chassis<sup>1</sup> painting and 2) cab manufacturing in Body in White and cab painting (SIC 3713 and NAICS 336211). The first area assembles and paints the truck chassis and trims the cab from the paint shop, and the second area manufactures the cab with stamped steel parts from off-site locations, pretreats the steel cab in a 10 stage pretreatment system, then electrocoats the cab before painting the cab with prime, basecoat and clearcoat. See Attachment A for a list of equipment that is included in this project. See the application submittal dated August 29, 2014 for a complete description of the process and emission units.

The application states that the following are new units: 2PE-002, 7PE-002, 8PE-003 and 9PE-002 and that the following units are modified: 2PE-001, 3PE-001, 5PE-001, 6PE-001, 7PE-001, 8PE-001, 8PE-002, 9PE-001 and 10PE-001/002. The equipment that is included in each emissions unit is listed in Attachment A.

Under the April 21, 2010 minor NSR permit 8PE-001 is listed as a Multi-Tone spray booth and under this action that booth will become a basecoat spray booth and 8PE-002 is listed as a basecoat spray booth and under this action that booth will become a Multi-tone/Basecoat/Clearcoat (MT/BC/CC) spray booth. The P-C Building was renamed the Customer Care Center and the Final Inspection/Repair (11PE-001) was renamed the Cavity Wax; starting with this permit those are the names that will be used for those emission units. Flow diagrams showing the previous and post expansion facility configurations are in Attachment B.

## III. Regulatory Review

### A. 9 VAC 5 Chapter 80, Part II, Article 6 – Minor New Source Review

The provisions of Article 6<sup>2</sup> apply throughout Virginia to (i) the construction of any new stationary source, (ii) the construction of any project (which includes the affected emissions units), and (iii) the reduction of any stack outlet elevation at any stationary source.

Article 6 permitting is not applicable for VOC, PM10, and PM2.5 emissions because the project is subject to major new source review (See Section III.B) for those pollutants<sup>3</sup>.

The project has no affected emissions units listed in 9VAC 5-80-1105 B. In determining if a project is exempt under 9VAC5-80-1105 D, a calculation of the uncontrolled emission rate (UER) increase from the project is required. The project's increase is the sum of the UER increases from each affected emissions unit not listed in 9VAC5-80-1105 B. An emissions

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<sup>1</sup> Previously the facility had two chassis lines (North and South Chassis); they shutdown the North Chassis Line on April 12, 2010. The April 2010 minor NSR permit refers to remaining chassis line as the "South" chassis line. Starting with this permit the remaining chassis line will be called the "Chassis Line".

<sup>2</sup> Language is paraphrased from 9VAC5-80-1100.

<sup>3</sup> 9VAC5-80-1100H.1

unit's increase is the difference between the new UER after the project (NUE) and the current UER (CUE) for that emissions unit and cannot be less than zero.

Calculations are shown in Attachment D of this document and in Table 7 of the amended permit application submittal dated February 12, 2015.

As shown in the summary table below the project's increase for NO<sub>x</sub> exceeds the respective permitting threshold; therefore, the project is subject to the permitting requirements of Article 6 for NO<sub>x</sub>.

|                       | Sum of Uncontrolled Emission Rate Increases (TPY) <sup>4</sup> | Exemption (TPY) | Exempt (Y/N) |
|-----------------------|--|-----------------|--------------|
| SO <sub>2</sub>       | 0.08   | 10              | Yes          |
| CO                    | 12.88  | 100             | Yes          |
| PM                    | 7.45   | 15              | Yes          |
| <b>NO<sub>x</sub></b> | <b>15.33</b>   | <b>10</b>       | <b>No</b>    |
| Lead                  | 6.46E-05   | 6.00E-01        | Yes          |

As described in Section III.E, the affected emissions units are in source categories subject to a standard promulgated pursuant to 40 CFR 63 (Subpart M MMM, P PPP and D D D D D). Therefore, the project is exempt from the state toxics rule (9VAC 5-60 Article 5).

The facility is a state major source<sup>5</sup> with a potential to emit (PTE) of several pollutants greater than 100 tons per year. State major modifications occur if the change in PTE (i.e., the difference between the allowables after permit issuance and allowables prior to the project) is greater than the "significant" values in 9VAC5-80-1615 C. The PTE of the facility is going down for each pollutant not otherwise subject to major NSR<sup>6</sup> (see Section VI). Therefore, the project is not a state major modification.

Additional discussion of permitting requirements can be found in Sections IV and VII.

**B. 9 VAC 5 Chapter 80, Part II, Article 8 and Article 9 – PSD Major New Source Review and Non-Attainment Major New Source Review**

Pulaski County is a PSD area for all pollutants as designated in 9VAC 5-20-205. Volvo is a PSD major source with a PTE for at least one regulated NSR pollutant greater than 250 tons per year (VOC). A project is a major modification if it causes two types of emission increases: a significant emissions increase (SEI) and a significant net emission increase (SNEI). The procedure for calculating whether a SEI will occur depends on the type of emissions units being

<sup>4</sup> See Attachment C.

<sup>5</sup> "State Major" is the common terminology to indicate the source is major under the definition contained in 9VAC5-80-1100 et seq.

<sup>6</sup> In accordance with 9VAC5-80-1100 H 1, any pollutant subject to major NSR is exempt from Article 6.

modified. This project includes new and existing emission units; therefore the facility has utilized the emissions test (hybrid test) contained in 9VAC 5-1605 G. 5.

The hybrid test allows for both the actual-to-projected-actual applicability test for existing emissions units (9VAC5-80-1605G Subdivision 3) and the actual-to-potential test for new emission units (9VAC5-80-1605G Subdivision 4). The projected actual emissions (PAE) in Subdivision 3 may exclude, in calculating any increase in emissions that results from the particular project, that portion of the unit’s emissions following the project that an existing unit could have emitted during the baseline period and are unrelated to the change, which the unit must have been able to emit during the baseline period<sup>7</sup>.

The actual-to-projected-actual (BAE to PAE) test was used for the Chassis and Customer Care Center. Volvo states in the amended permit application submittal dated February 12, 2015 that the entire projected increase in utilization of the Chassis Line (1PE-001) and the Customer Care Center (13-PE-001, -002 & -004) is due to demand growth and that there will not be any emission increase of VOC or particulate from these units due to the proposed project (excluded emissions). The calculations for that equipment are included on pages 1-4 of the amended permit application submittal dated February 12, 2015.

Volvo is using the actual-to-potential test in Subdivision 4 for the new emission units involved in this project. 9VAC5-80-1615C “Projected actual emissions” (d) allows for using the emission unit’s potential to emit in lieu of using the actual-to-projected-actual applicability test in Subdivision 3. Volvo chose to use the emission unit’s potential to emit for the existing emission units in this project.

Step 1 of determining if a major modification will occur is to sum all of the emission increases associated with the project for each pollutant. If the result for a pollutant is less than the significant emissions rate, then there is not a significant increase and a major modification has not occurred for that pollutant. For pollutants that exceed the significant emissions rate, another step is required to determine if a significant net emissions increase has occurred.

The potential emissions and baseline actual emissions for each emissions unit is calculated in Table 1 of the amended permit application submittal dated June 22, 2015 (See Attachment D for an amended copy of the table from the permit application) and are summarized below. The BAE for each new unit is zero. Considering the proposed permit limitations, the PTE for the project is greater than the significant rate for several pollutants.

| <b>Pollutant</b> | <b>Total Project Increase</b> | <b>PSD Significance Threshold</b> | <b>PSD Netting Required?</b> |
|------------------|-------------------------------|-----------------------------------|------------------------------|
|                  | <b>tons/yr</b>                | <b>tons/yr</b>                    | <b>tons/yr</b>               |
| CO               | 33.25                         | 100                               | No                           |
| NO <sub>x</sub>  | 39.59                         | 40                                | No                           |
| PM               | 22.45                         | 25                                | No                           |

<sup>7</sup> See 9VAC5-80-1605G.3 and .5 and 9VAC5-80-1615.

|                   |          |        |     |
|-------------------|----------|--------|-----|
| PM10              | 22.45    | 15     | Yes |
| PM2.5             | 22.45    | 10     | Yes |
| SO <sub>2</sub>   | 0.24     | 40     | No  |
| VOC               | 460.85   | 40     | Yes |
| Lead              | 1.98E-04 | 0.6    | No  |
| CO <sub>2</sub> e | 34,773   | 75,000 | No  |

Step 2 involves summing all of the emission increases associated with the project, and summing all of the other creditable increases and decreases in actual emissions made at the facility during the contemporaneous time period. If the result is greater than the significant emission rate, then a major modification would occur and the project is subject to PSD permitting. Volvo did not identify any decreases during the contemporaneous period; therefore, the NEI is the same as the Project Increases. As seen in the summary table below, the project is subject to PSD review as a major modification for PM10, PM2.5 and VOC.

| <b>Pollutant</b> | <b>Project Increases</b> | <b>NEI</b>     | <b>Significant Value</b> | <b>PSD Permitting Required?</b> |
|------------------|--------------------------|----------------|--------------------------|---------------------------------|
|                  | <b>tons/yr</b>           | <b>tons/yr</b> | <b>tons/yr</b>           | <b>tons/yr</b>                  |
| VOC              | 460.85                   | 460.85         | 40                       | Yes                             |
| PM10             | 22.45                    | 22.45          | 15                       | Yes                             |
| PM2.5            | 22.45                    | 22.45          | 10                       | Yes                             |

Greenhouse Gases (9 VAC 5 Chapters 80 and 85)

According to APG-311<sup>8</sup>, for modifications, the significant emissions increase and net emissions increase of a non-GHG pollutant must be triggered before evaluating GHGs. As discussed previously, the project is a major modification subject to PSD permitting due to a significant emissions increase and net emissions increase of PM10, PM2.5 and VOC. Since the source has triggered PSD review for a non-GHG pollutant the project must be evaluated for a significant emissions increase of GHG. The project does not have a significant emissions increase of at least 75,000 tpy of CO<sub>2</sub>e; therefore, it is not necessary to evaluate whether a significant net emissions increase has occurred. Since the project does not have a significant increase in GHG emissions at or above the 75,000 tpy threshold, the project is not subject to PSD permitting for GHG and a BACT review is not required.<sup>9</sup>

C. 9 VAC 5 Chapter 50, Part II, Article 5 – NSPS

NSPS Dc is applicable to the Phosphate solution/ Washer natural gas boiler - 2FBE-001/6FBE-001. This boiler is shared by both the Assembly/Washing (2PE-001) and Prep/Sand Booth (6PE-001). See Attachment A for the list of Emission Units and the equipment included in each.

<sup>8</sup> APG-311 Interim Guidance on the Prevention of Significant Deterioration (PSD) – 8/25/2014

<sup>9</sup> Attachment D summarizes the GHG emissions (34,773.04 tpy) that were submitted in the Revised Table 1 contained in the June 22, 2015 application submittal.

D. 9 VAC 5 Chapter 60, Part II, Article 1 – NESHAPS

The equipment in this permit action is not subject to any Part 61 rule.

E. 9 VAC 5 Chapter 60, Part II, Article 2 – MACT

The coating equipment is subject to MACT MMMM (Surface Coating of Miscellaneous Metal Parts and Products) and/or MACT PPPP (Surface Coating of Plastic Parts and Products). The following list of fuel burning equipment is subject to MACT DDDDD (National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers and Process Heaters): 2FBE-001/6FBE-001, 5FBE-002, 8FBE-005, 9FBE-002 and 14FBE-001. The applicable requirements from these MACTs will be included in the Title V permit that is currently being renewed.

F. State Only Enforceable (SOE) Requirements (9VAC5-80-1120 F)

State Only Enforceable (SOE) requirements are included in the SOE section of the permit. These requirements address odor management for the E-Coat (3PE-001) process.

**IV. Best Available Control Technology Review (BACT)**

**Minor NSR**

BACT applicability is pollutant-by-pollutant based on the permitting applicability thresholds. Each affected emissions unit emitting a pollutant that is subject to permitting shall apply BACT for that pollutant. BACT is applicable for NO<sub>x</sub>. The BACT review indicated low NO<sub>x</sub> burners as BACT for the affected emission units that were new and for modified units that have a rated capacity of at least 12 MMBtu/hr<sup>10</sup>.

Modified Units: Primer/Repair ASH Heating (12FBE-001), Cab BC Recirc Air Supply House (RASH) (8FBE-009 and -010), and the Cab Basecoat/Clearcoat RTO (9FBE-011) will use low NO<sub>x</sub> burners. For the remaining modified units in this project retrofitting with low NO<sub>x</sub> burners was not shown to be cost effective. Due to the special costs associated with retrofitting the Phosphate solution/Washer Boiler retrofitting that unit was not cost effective.<sup>10</sup>

New Units: Plastics Washer Boiler (2FBE-002), Repair/Touchup painter heater – air make up unit (7FBE-001), Central Process ASH (9FBE-009), Plastics Basecoat/Clearcoat RTO (9FBE-010), Recirc Air Supply House (9FBE-004 & -005), Plastics Clear Coat Oven (9FBE-006 & -007) and the Dry Off Oven (9FBE-008) will use low NO<sub>x</sub> burners.

**Prevention of Significant Deterioration**

The Article 8 control technology review regulations require a PSD major modification to apply

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<sup>10</sup> See application submittal dated March 5, 2015 for an explanation of the minor NSR BACT review for NO<sub>x</sub> and the application submittal dated June 22, 2015 for the updated minor NSR BACT review table.

BACT for each regulated NSR pollutant for which a project would result in a major modification at the source, and this requirement applies to each emissions unit at which an emission increase in that pollutant would occur as a result of this project. As shown in section III.B above, for this project BACT review is required for PM10, PM2.5 and VOC.

#### PM10 and PM2.5

##### Step 1: Identify Available Control Options:

The permit application identified fabric filtration, electrostatic precipitators (dry and wet) and wet scrubbers as available control options for PM10 and PM2.5. DEQ's independent review of the RACT/BACT/LAER Clearinghouse (RBLC) concurs that these are available options.

##### Step 2: Eliminate Technically Infeasible Options:

The permit application identified dry electrostatic precipitators (ESPs) as technically infeasible due to their difficulty in controlling sticky particles from spray booths. The permit application identified wet ESPs as technically infeasible due to their inability to control variable operations. The applicant could not find the use of ESPs for spraying operations. DEQ concurs that ESPs are technically infeasible for controlling PM10 and PM2.5 for the spraying operations.

##### Step 3: Rank Remaining Control Options by Control Effectiveness:

Dry filters can achieve outlet concentrations of 0.005 gr/dscf from spray booths. Venturi scrubbers can achieve outlet concentrations of 0.003 gr/dscf from spray booths. Wet ESPs are able to control emissions at the same control efficiency.

##### Step 4: Evaluate Economic, Environmental, and Energy Impacts:

Wet scrubbers (Venturi) are currently used at the source for controlling particulate emissions and are also common in this industry. The installation and operation of wet scrubbers are economically feasible for 5PE-001, 7PE-001, 7PE-002, 8PE-001, 8PE-002, 8PE-003, 9PE-001 and 9PE-002. They are not economically feasible for 6PE-001, 10PE-001 and 10PE-002 due to the low level of emissions (each has potential PM10 and PM2.5 emissions of less than 2.2 tons per year).

Dry filters are economically feasible for 6PE-001, 10PE-001 and 10PE-002. HEPA filters would provide higher control, however, their use would require physical changes to these spray booths which would make their installation economically infeasible.

##### Step 5: Select BACT

For spray booths 6PE-001, 10PE-001 and 10PE-002 (with low particulate pollutant emissions) dry filters rated at 0.005 gr/dscf are considered BACT. For spray booths 5PE-001, 7PE-001, 7PE-002, 8PE-001, 8PE-002, 8PE-003, 9PE-001 and 9PE-002 venturi scrubbers rated at 0.003 gr/dscf are considered BACT.

## VOC

### Step 1: Identify Available Control Options:

The permit application identified thermal oxidation (RTO), catalytic oxidation, carbon absorption, liquid absorption, rotary concentrator with thermal oxidation, specific formulation coatings (e.g. low VOC formulations), high capture efficiency and high transfer efficiencies as available control options for VOC. DEQ's independent review of the RBLC concurs that these are available options.

### Step 2: Eliminate Technically Infeasible Options:

The permit application did not identify any of the control options as technically infeasible.

### Step 3: Rank Remaining Control Options by Control Effectiveness:

A review of the RACT/BACT/LAER Clearinghouse (RBLC) shows thermal oxidizers (95-97% DRE) coupled with high capture efficiency (96-100%) to be the top choice for the automotive industry. Six automotive industry entries are listed in the RBLC and all but one used an RTO; the remaining entry used low VOC coatings (2.1 – 6.5 lb VOC/gal). Regenerative Thermal Oxidizers have high energy recovery and are able to handle variable flows and potentially sticky air streams. Based on a 100% capture efficiency, use of low VOC coatings (3.5 lbs/gal as applied) and a destruction efficiency of 95% the expected emissions reduction is 1,230.8 tons of VOC.

High capture efficiency coupled with an RTO is identified as the top control technologies for VOC emissions for this process.

The applicant calculated the cost effectiveness of installing and using an RTO. The calculations were based on the EPA OAQPS Control Cost Manual and were reviewed by the DEQ. The cost per ton VOC removed for 8PE-001/9PE-001 (share an RTO) was \$1,147; for 8PE-002 it was \$3,317 and for 8PE-003/9PE-002 (share an RTO) it was \$765. The cost per ton VOC removed for 5PE-001 was \$15,700 per ton based on a VOC removed amount of 29.36 tons.

### Step 4: Evaluate Economic, Environmental, and Energy Impacts:

High capture efficiency coupled with an RTO was identified as the top control technologies for VOC emissions for this process in Step 3. The impacts of unregulated air pollutants or impacts in other media do not justify selection of an alternative control option. RTO have high energy recovery and do not transfer the pollutant to a liquid or solid waste stream that would need to be treated or handled as hazardous waste.

### Step 5: Select BACT

100% capture efficiency, low VOC coatings (3.5 lbs/gal as applied) and regenerative thermal oxidizers (RTO) is considered BACT for 8PE-001, 8PE-002, 8PE-003, 9PE-001 and 9PE-002.

Due to the low level of VOC emissions and the high cost of add on controls (\$15,700 per ton VOC removed for the unit with the highest VOC emissions) for the following emission units, the use of low VOC coatings (3.5 lbs/gal as applied) is considered BACT for 5PE-001, 7PE-001, 7PE-002, 10PE-001 and 10PE-002. Electro-deposition of waterborne coatings is considered BACT for 3PE-001.

For those units (8PE-001, 8PE-002, 8PE-003, 9PE-001 and 9PE-002) that have both VOC and PM control the equipment will be constructed in the following manner: Exhaust from the spray booth will go to the venturi scrubber then 20% of the exhaust will go directly to the RTO. The other 80% of the exhaust will go through a fabric filter and then back to the spray booth to be used as a vertical downdraft flow. The VOC is concentrated 4:1 using this configuration.

#### Greenhouse Gases (9 VAC 5 Chapters 80 and 85)

Since the project does not have an increase in GHG emissions of at least 75,000 tpy of CO<sub>2</sub>e BACT review is not required.<sup>11</sup>

## **V. Combination of Permit Program Requirements**

The permit is a combined permit that includes the following approvals:

- New PSD permit and minor NSR permit (modification of the existing integrated cab and plastics paint line and new equipment) approved on DRAFT.
- Minor NSR permit approval date April 21, 2010
- Amendment to the Minor NSR permit approval date April 21, 2010 amended on DRAFT.

This combined permit document has the implementing program regulatory citation for each condition, has the most recent effective date of each condition, and notes that each condition is state and federally enforceable unless marked SOE (9VAC5-80-1255D.1-3).

The following conditions of the April 21, 2010 minor NSR permit were amended during this permit action: 19, 21 - 23, 26 - 29, 33 - 35, 39, 41, 43, 46, 51 and 57. The conditions were amended to remove equipment that was part of the PSD project and were covered in separate conditions.

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<sup>11</sup> See the Revised Table 1 in the June 22, 2015 application submittal for the GHG emissions (34,773.04 tpy).

**VI. Summary of Actual Emissions Increase**

The Past PTE and Future PTE values are summations of the facility’s current and post project completion emission limits. The facility’s increase in PTE is shown in the table below.

| Pollutant       | Past PTE (TPY) | Future PTE (TPY) | Increase PTE (TPY) |
|-----------------|----------------|------------------|--------------------|
| VOC             | 493.5          | 799.2            | 305.7              |
| PM              | 64.1           | 48.4             | -15.7              |
| NO <sub>x</sub> | 91.6           | 39.6             | -52.0              |
| CO              | 77.0           | 33.3             | -26.3              |

**VII. Dispersion Modeling**

The project is subject to PSD review for VOC, PM10 and PM2.5 and a modeling analysis is a required portion of that review process. The emission rates modeled correlate to the emission rates allowed in this permit. The following is a brief summary of the findings of the full modeling report dated July 31, 2015 by DEQ’s Office of Air Quality Assessments (OAQA).

PSD regulations require an air quality analysis be performed that demonstrates that the projected air emissions from the proposed modified facility will neither cause or significantly contribute to a violation of any applicable National Ambient Air Quality Standard (NAAQS) or PSD increment. The United States Forest Service (USFS), the United States Fish and Wildlife Service (FWS) and the National Park Service (NPS) each stated in emails that an air quality related values (AQRV) analysis was not required since the project is not expected to show any significant additional impacts to AQRVs. Therefore, only a Class I area analysis to assess compliance with the Class I PSD increments was required.

The air quality modeling analysis submitted by Volvo conforms to the required modeling methodology.<sup>12</sup>

NAAQS Analysis: A full impact analysis for PM10 (24-hour and annual averaging periods) was conducted because the preliminary modeling analysis results exceeded the applicable SILs. A full impact analysis was conducted for PM2.5 (24-hour and annual averaging periods) because the provisions of the PM2.5 SILs in 40 CFR 51.166(k)(2) and 52.21(k)(2) were vacated in January 2013 and the VADEQ does not currently have state-specific SILs for the purpose of excluding a project from performing a full impact analysis.

The NAAQS analysis included emissions from the proposed modified facility, emissions from existing sources from Virginia, and representative ambient background concentrations of PM10 and PM2.5. The PSD increment analysis included emissions from the proposed modified facility and emissions from increment-consuming source from Virginia.

<sup>12</sup> The final modeling report was submitted by Volvo on July 13, 2015.

NAAQS Conclusion: Based on the OAQA's review of the NAAQS and PSD increment analysis the project does not cause or significantly contribute to a predicted violation of any applicable NAAQS or Class II area PSD increment.

Toxics Analysis: The painting operations of at the facility are not subject to the state toxics regulations at 9VAD5-60-300 et al. These emission sources of toxic pollutants are regulated by MACT standards. Therefore, a toxic pollutant modeling analysis was not conducted.

Additional Impact Analysis: Based on the soil types and quantity of emissions from the proposed project, no adverse impact on local soils is anticipated.

Growth: No new significant emissions from growth during construction and operation phases of the modified NRV plant are anticipated.

### **VIII. Boilerplate Deviations**

The Generic NSR Boilerplate (last modified 10/9/2012) and Skeleton NSR Boilerplate (last modified 12/4/2012) were used to develop this permit. No deviations to the boilerplates were made.

### **IX. Compliance Demonstration**

Periodic monitoring (pressure drop, RTO chamber temperature) of the control equipment is required.

Initial performance tests are required for visible emissions and VOC destruction efficiency of the RTOs. Initial demonstrations of capture efficiency are required. In addition, the source is subject to routine testing upon notification from DEQ.

Records of throughput and emissions are required to be maintained in addition to monitoring and maintenance records.

### **X. Title V Review – 9 VAC 5 Chapter 80 Part II Article 1**

The facility is a Title V major source due to a potential to emit (PTE) greater than 100 tons per year for at least one regulated pollutant. A complete application for a significant modification to the Title V permit is due no later than 12 months after beginning operation of the modified source. The source has submitted an application to renew their current Title V permit.

Emission limits in the current Title V permit (date) must be met until the Title V permit has been modified to include the NSR approved increase in VOC and particulate emissions.

### **XI. Other Considerations**

The VOC throughput limit in Condition 39 was derived by summing the controlled (these units do not have VOC controls) emissions from the units (1PE-001, 13PE-001, 13PE-002 and 13PE-003)

that are not included in this project (Table 2 – Permit application submittal received August 29, 2014). The VOC throughput limits in Condition 40 were derived by summing the controlled (some of these do not have VOC controls) emissions from the units listed in the condition (Table 2 – Permit application submittal received June 22, 2015)

The E-Coat Oven 3FBE-001 incinerator demonstrated acceptable emissions at 1400 °F chamber temperature in 1997 testing because there were so little emissions. The main purpose of the E-Coat Oven 3FBE-001 incinerator is for odor control.

The CO and NO<sub>x</sub> emission limits in Condition 45 were calculated using the rated capacity of the units and the emission factors supplied in the application See Table 3 – Permit application submittal received June 22, 2015).

As discussed in Section III.B, the project is subject to PSD review as a major modification and must meet other requirements, mainly concerned with public participation:

- On July 10 and 17, 2015 the Federal Land Managers declined review of this project.
- As a currently operating industrial facility, the site is deemed suitable for this project.
- The Local Governing Body Certification, required under §10.1-1321.1, was signed on October 7, 2014.
- Publication by the source of a notice of application and source information session was completed on October 25, 2014. The notice was published in *The Roanoke Times* and the required informational session was held on December 2, 2014. Three Volvo employees, one member of the local government and two DEQ employees were in attendance. No questions were asked.
- The following public participation information was published in *The Roanoke Times* on October 2, 2015:
  - The public comment period began on October 2, 2015
  - The public hearing was held at the Pulaski County Administration Building in Pulaski, Virginia and began at 6 p.m. on November 2, 2015; ENTER NUMBER of speakers spoke at the hearing. The hearing report is Attachment ENTER LETTER to this analysis. ENTER NUMBER comments were received during the comment period.
  - The comment period will end on November 17, 2015.
- Pulaski County, the Town of Dublin, the Town of Pulaski and the New River Valley Regional Commission were notified by letter dated ENTER DATE since they are “localities particularly affected”.
- Delegate Rush and Senator Chafin were notified by letter dated ENTER DATE since they are General Assembly members for districts that cover the facility’s location.
- EPA, Region III and West Virginia were notified by letter dated ENTER DATE.

## **XII. Recommendations**

Approval of the draft permit is recommended.

## **Attachments**

- Attachment A – Equipment List
- Attachment B – Flow Diagrams
- Attachment C – Article 6 (Minor NSR) Applicability Summary
- Attachment D – Article 8 (PSD) Applicability Summary
- Attachment E – Engineering Analysis Addendum

## Attachment A - Equipment List

The following emission units and associated equipment are included in this project:

### **2PE-001 Assembly/Washing** (*Existing*)

Phosphate solution/Washer Boiler (2FBE-001/6FBE-001) – shared with 6PE-001

### **2PE-002 Plastics 5-Stage Washing Process** (*New*)

Plastics Washer Boiler (2FBE-002)

### **3PE-001 E-Coat Oven** (*Existing*)

E-Coat Dip Tank

E-Coat Tunnel

E-Coat Oven Heater/TO (3FBE-001)

E-Coat Oven Cooler

E-Coat Scuff Booth

### **5PE-001 Cab Prime** (*Existing*)

Primer - Oven Zone heater (5FBE-001)

Primer - Oven Zone heater (5FBE-002)

Primer Flash

Primer Oven Exhaust heater (5FBE-003)

Primer Oven Exhaust Cooler

Primer/Repair ASH heating (12FBE-001) - shared with 7PE-001

[Venturi Scrubber]

### **6PE-001 Prep/Sand Booth** (*Existing*)

Prep booth/sand booth

Washing heater/phosphate System Boiler – shared with 2PE-001

[Dry Filter]

### **7PE-001 Specialty Painting/Touchup** (*Existing*)

Specialty/Touch-Up Painting

Primer/Repair ASH heating (12FBE-001) - shared with 5PE-001

[Venturi Scrubber]

### **8PE-001 Cab BC** (*Existing*)

BC Spray Booth

BC Flash Zone

Oven – no burners

Wet-On-Wet with exhaust to CC curing oven.

Cab Basecoat/Clearcoat RTO (9FBE-011) – shared with 9PE-001

Recirc Air Supply House (RASH) (8FBE-009 and 8FBE-010)

[Venturi Scrubber & RTO – shared with 9PE-001]

### **8PE-002 MT/BC/CC** (*Existing*)

Multitone/Basecoat Spray Booth

Multitone/Basecoat Flash Zone

MT/BC/CC RTO (8FBE-008)

Multitone/Clearcoat Flash Zone

Multitone/Clearcoat Curing Oven Zones (8FBE-004, -005, -006 and -007)

Boiler for humidity control (14FBE-001)

Air supply house (16FBE-001)

[Venturi Scrubber & RTO]

### **8PE-003 Plastics BC** (*New*)

BC Spray Booth

BC Flash Zone

Wet-On-Wet with exhaust to CC curing oven.

Central Process ASH (9FBE-009) – shared with 9PE-002

Plastics RTO (9FBE-010) – shared with 9PE-002  
[Precoated Dry Filter System & RTO – shared with 9PE-002]

### **9PE-001 Cab CC** (*Existing*)

CC Spray Booth

CC Flash Zone

CC Oven (9FBE-001, -002 & -003)

Cab Basecoat/Clearcoat RTO (9FBE-011) – shared with 8PE-001

Recirc Air Supply House (RASH) (9FBE-004 & 9FBE-005)

[Venturi Scrubber & RTO – shared with 8PE-001]

### **9PE-002 Plastics CC** (*New*)

CC Spray Booth

CC Heated Flash

CC Oven (9FBE-006 & -007)

Dry off oven (9FBE-008)

Central Process ASH (9FBE-009) – shared with 8PE-003

Plastics Basecoat/Clearcoat RTO (9FBE-010) – shared with 8PE-003

[Precoated Dry Filter System & RTO – shared with 8PE-003]

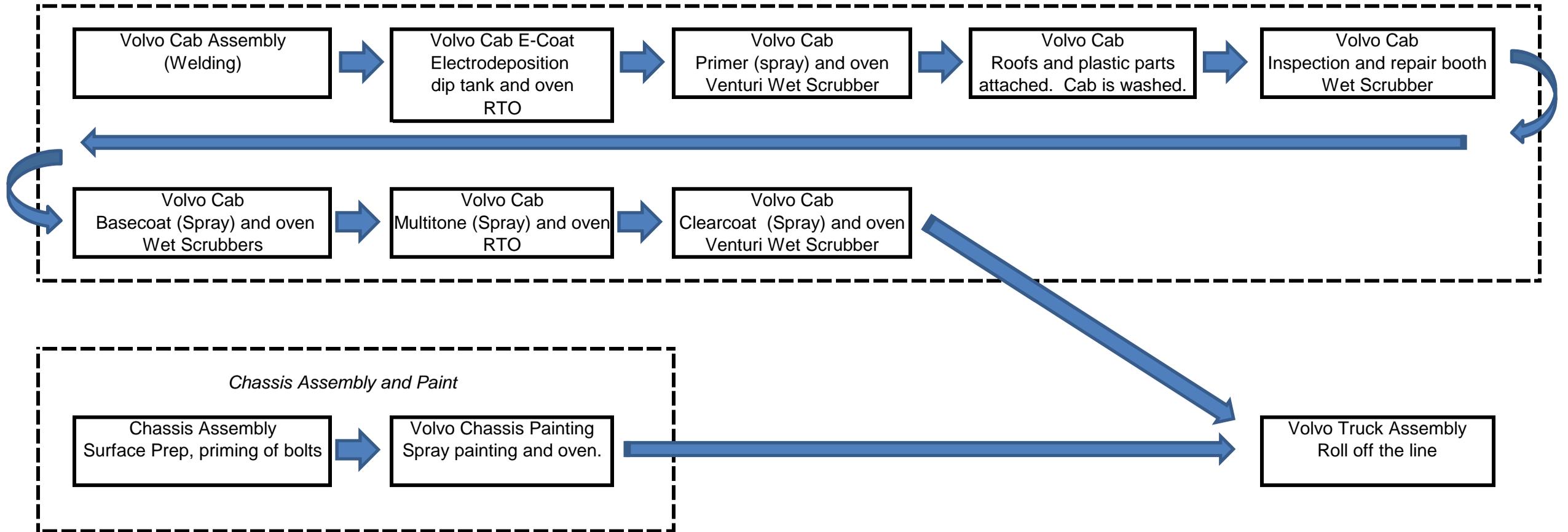
### **10PE-001/002 Spot Repair** (*Existing*)

Repair Booth

[Dry Filters]

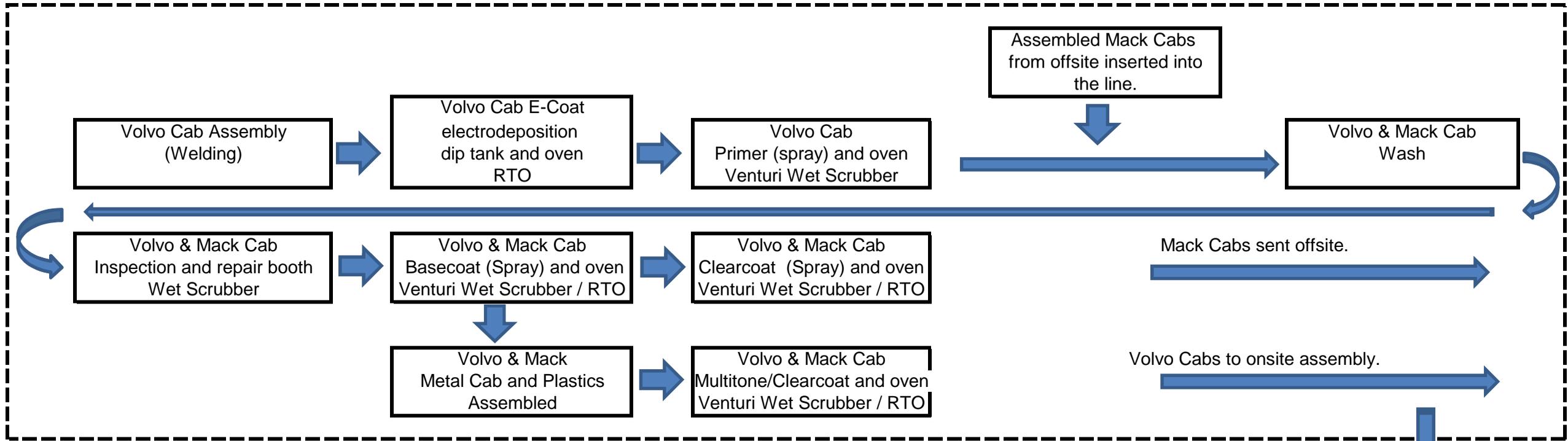
# ATTACHMENT B - FLOW DIAGRAMS - VOLVO CURRENT OPERATIONS

*Integrated cab (metal) and plastics paint line.*

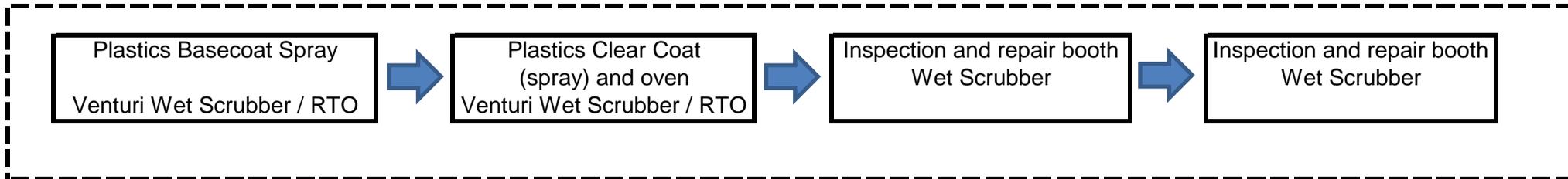


**ATTACHMENT B - FLOW DIAGRAMS - POST EXPANSION**

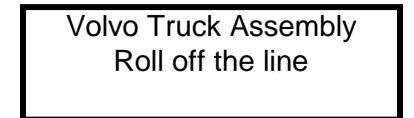
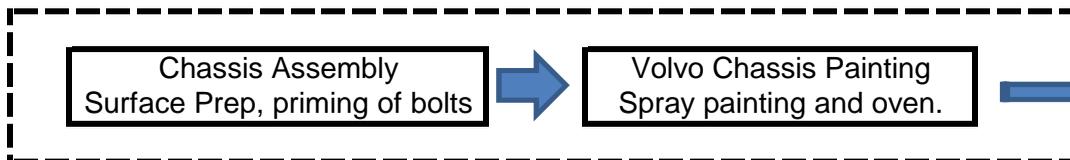
*Metal Assembly, Prime, Basecoat, Multitone/Clearcoat and Repair*



*Plastics Basecoat/Clearcoat/Repair Paint Line*



*Chassis Assembly and Paint*



Article 6 Applicability  
Uncontrolled Criteria Pollutant Emissions

| Emission Units  | Size/Rated Capacity |                    | Uncontrolled Criteria Pollutant Emissions (a) (b) (c) |              |              |                     |              |                 |
|---|---------------------|--------------------|---|--------------|--------------|---------------------|--------------|-----------------|
|   | MMBtu/hr            | MMcf/hr            | NOx TPY   | PM TPY       | CO TPY       | SO <sub>2</sub> TPY | Lead TPY     |                 |
| 2PE-001 Assembly/Washing (modified)                                 | 25.20               | 0.02520            | CUE   | 11.04        | 0.49         | 9.27                | 0.07         | 5.52E-05        |
|   |                     |                    | NUE   | 11.04        | 0.49         | 9.27                | 0.07         | 5.52E-05        |
|   |                     |                    | Increase  | 0.00         | 0.00         | 0.00                | 0.00         | 0.00E+00        |
| 3PE-001 E-Coat Oven (modified)                                      | 5.50                | 0.00550            | CUE   | 2.41         | 0.11         | 2.02                | 0.01         | 1.20E-05        |
|   |                     |                    | NUE   | 2.41         | 0.11         | 2.02                | 0.01         | 1.20E-05        |
|   |                     |                    | Increase  | 0.00         | 0.00         | 0.00                | 0.00         | 0.00E+00        |
| 5PE-001 Cab Prime (modified)  | 33.49               | 0.03349            | CUE   | 14.67        | 5.54         | 12.32               | 0.09         | 7.33E-05        |
|   |                     |                    | NUE   | 14.67        | 5.54         | 12.32               | 0.09         | 7.33E-05        |
|   |                     |                    | Increase  | 0.00         | 0.00         | 0.00                | 0.00         | 0.00E+00        |
| 7PE-001 Specialty Repair (modified)                                 | 8.20                | 0.00820            | CUE   | 3.59         | 3.38         | 3.02                | 0.02         | 1.80E-05        |
|   |                     |                    | NUE   | 3.59         | 3.38         | 3.02                | 0.02         | 1.80E-05        |
|   |                     |                    | Increase  | 0.00         | 0.00         | 0.00                | 0.000        | 0.00E+00        |
| 8PE-001 Cab BC (modified) (d)                                       | 29.56<br>10.20      | 0.02956<br>0.01020 | CUE   | 12.95        | 1.97         | 10.88               | 0.08         | 6.47E-05        |
|   |                     |                    | NUE   | 4.47         | 1.97         | 3.75                | 0.03         | 2.23E-05        |
|   |                     |                    | Increase  | 0.00         | 0.00         | 0.00                | 0.00         | 0.00E+00        |
| 9PE-001 Cab CC (modified) (d)                                       | 23.83<br>20.43      | 0.02383<br>0.02043 | CUE   | 10.44        | 2.53         | 8.77                | 0.06         | 5.22E-05        |
|   |                     |                    | NUE   | 8.95         | 2.17         | 7.52                | 0.05         | 4.47E-05        |
|   |                     |                    | Increase  | 0.00         | 0.00         | 0.00                | 0.00         | 0.00E+00        |
| 8PE-002 MT BC (modified) (e)  | 40.50<br>40.50      | 0.04050<br>0.04050 | CUE   | 17.74        | 4.34         | 14.90               | 0.11         | 8.87E-05        |
|   |                     |                    | NUE   | 17.74        | 4.34         | 14.90               | 0.11         | 8.87E-05        |
|   |                     |                    | Increase  | 0.00         | 0.00         | 0.00                | 0.00         | 0.00E+00        |
| 8PE-003 Plastics BC (new) (f)                                       | 8.75                | 0.00875            | CUE   | 0.00         | 0.00         | 0.00                | 0.00         | 0.00E+00        |
|   |                     |                    | NUE   | 3.83         | 1.94         | 3.22                | 0.02         | 1.92E-05        |
|   |                     |                    | Increase  | 3.83         | 1.94         | 3.22                | 0.02         | 1.92E-05        |
| 9PE-002 Plastics CC (new) (f)                                       | 16.25               | 0.01625            | CUE   | 0.00         | 0.00         | 0.00                | 0.00         | 0.00E+00        |
|   |                     |                    | NUE   | 7.12         | 2.09         | 5.98                | 0.04         | 3.56E-05        |
|   |                     |                    | Increase  | 7.12         | 2.09         | 5.98                | 0.04         | 3.56E-05        |
| 7PE-002 Plastics Repair (new)                                       | 4.50                | 0.00450            | CUE   |              |              |                     |              |                 |
|   |                     |                    | NUE   |              |              |                     |              |                 |
|   |                     |                    | Increase  |              |              |                     |              |                 |
| 2PE-002 Plastics Washer (new)                                       | 5.50                | 0.00550            | CUE   | 0.00         | 0.00         | 0.00                | 0.00         | 0.00E+00        |
|   |                     |                    | NUE   | 2.41         | 0.11         | 2.02                | 0.01         | 1.45E-02        |
|   |                     |                    | Increase  | 2.41         | 0.11         | 2.02                | 0.01         | 1.45E-02        |
| <b>Project Totals</b>   |                     |                    |   |              |              |                     |              |                 |
| <b>Sum of the uncontrolled emission rate increases <sup>1</sup></b> |                     |                    |   | <b>13.36</b> | <b>4.14</b>  | <b>11.23</b>        | <b>0.066</b> | <b>5.48E-05</b> |
| <b>Art 6 Applicability Threshold</b>                                |                     |                    |   | <b>10.00</b> | <b>15.00</b> | <b>100.00</b>       | <b>10.00</b> | <b>6.00E-01</b> |
| <b>Art 6 (Y,N)</b>  |                     |                    |   | <b>Y</b>     | <b>N</b>     | <b>N</b>            | <b>N</b>     | <b>N</b>        |

| Criteria Pollutant | 9VAC5-80-1105.D.1 Exemption Rates (TPY) |  |
|--------------------|---|--|
| NOx                | 10                                      |  |
| CO                 | 100                                     |  |
| VOC                | 10                                      |  |
| PM                 | 15                                      |  |
| PM10               | 10                                      |  |
| PM2.5              | 6                                       |  |
| SO <sub>2</sub>    | 10                                      |  |
| Pb                 | 6.0E-01                                 |  |

Table taken from permit application (6/22/2015) - modified to reflect the "sum of the uncontrolled emission rate increases of the affected emission units." <sup>1</sup> Per 9VAC5-80-1105D uncontrolled emissions rate decreases are not considered as part of this calculation.

Notes:

(a) AP-42 Section 1.4 Natural Gas Emission Factors, Tables 1.4-1 & 1.4-2

|                             |                  |                   |
|-----------------------------|------------------|-------------------|
| NOx                         | 100 lb/MMCF      | 9.80E-02 lb/MMBtu |
| Low Nox burners             | 50 lb/MMCF       | 4.90E-02 lb/MMBtu |
| CO                          | 84 lb/MMCF       | 8.24E-02 lb/MMBtu |
| VOC                         | 5.5 lb/MMCF      | 5.39E-03 lb/MMBtu |
| PM/ PM10/ PM <sub>2.5</sub> | 7.6 lb/MMCF      | 7.45E-03 lb/MMBtu |
| SO <sub>2</sub>             | 0.6 lb/MMCF      | 5.88E-04 lb/MMBtu |
| Lead (Pb)                   | 5.00E-04 lb/MMCF | 4.90E-07 lb/MMBtu |

(b) Emissions based on 8760 hr/yr.

(c) VOC, PM10 and PM2.5 emissions reviewed under Article 8 BACT.

(d) Cab BC and CC operations: pre-project existing RTO and post-project new RTO rated capacities split between BC and CC.

(e) MT: pre-project no RTO; post-project ducted to existing RTO now serving Cab BC & CC.

(f) Plastics BC and CC operations: RTO rated capacity split between BC and CC.

**Attachment D - PSD Applicability Analysis by Emissions Unit**  
**Paint Booth Paint Process Emissions plus FBE Emissions**

| <b>Emission Units</b>                     | <b>VOC<br/>(TPY)</b> | <b>PM<br/>(TPY)</b> | <b>PM10<br/>(TPY)</b> | <b>PM2.5<br/>(TPY)</b> | <b>NOx<br/>(TPY)</b> | <b>CO<br/>(TPY)</b> | <b>SO<sub>2</sub><br/>(TPY)</b> | <b>Lead (Pb)<br/>(TPY)</b> |
|---|----------------------|---------------------|-----------------------|------------------------|----------------------|---------------------|---------------------------------|----------------------------|
| <b>2PE-001 Assembly/Washing</b>           |                      |                     |                       |                        |                      |                     |                                 |                            |
| Future potential emissions                | 0.36                 | 0.49                | 0.49                  | 0.49                   | 6.49                 | 5.45                | 0.04                            | 3.25E-05                   |
| Baseline actual emissions                 | 0.07                 | 0.08                | 0.08                  | 0.08                   | 1.00                 | 0.84                | 0.01                            | 4.99E-06                   |
| Increase                                  | 0.29                 | 0.42                | 0.42                  | 0.42                   | 5.50                 | 4.62                | 0.03                            | 2.75E-05                   |
| <b>3PE-001 E-Coat Oven</b>                |                      |                     |                       |                        |                      |                     |                                 |                            |
| Future potential emissions                | 8.25                 | 0.11                | 0.11                  | 0.11                   | 1.42                 | 1.19                | 0.01                            | 7.09E-06                   |
| Baseline actual emissions                 | 4.76                 | 0.02                | 0.02                  | 0.02                   | 0.22                 | 0.18                | 0.001                           | 1.09E-06                   |
| Increase                                  | 3.49                 | 0.09                | 0.09                  | 0.09                   | 1.20                 | 1.01                | 0.01                            | 6.00E-06                   |
| <b>5PE-001 Cab Prime</b>                  |                      |                     |                       |                        |                      |                     |                                 |                            |
| Future potential emissions                | 31.39                | 5.54                | 5.54                  | 5.54                   | 8.63                 | 7.25                | 0.05                            | 4.31E-05                   |
| Baseline actual emissions                 | 9.22                 | 2.13                | 2.13                  | 2.13                   | 1.20                 | 1.01                | 0.01                            | 6.00E-06                   |
| Increase                                  | 22.17                | 3.41                | 3.41                  | 3.41                   | 7.43                 | 6.24                | 0.04                            | 3.71E-05                   |
| <b>6PE-001 Prep/Sand Booth</b>            |                      |                     |                       |                        |                      |                     |                                 |                            |
| Future potential emissions                | 0.00                 | 1.23                | 1.23                  | 1.23                   | 0.00                 | 0.00                | 0.00                            | 0.00                       |
| Baseline actual emissions (Note 3)        | 0.00                 | 0.00                | 0.00                  | 0.00                   | 0.00                 | 0.00                | 0.00                            | 0.00                       |
| Increase                                  | 0.00                 | 1.23                | 1.23                  | 1.23                   | 0.00                 | 0.00                | 0.00                            | 0.00E+00                   |
| <b>7PE-001 Specialty Painting/Touchup</b> |                      |                     |                       |                        |                      |                     |                                 |                            |
| Future potential emissions                | 2.11                 | 3.38                | 3.38                  | 3.38                   | 2.11                 | 1.77                | 0.01                            | 1.06E-05                   |
| Baseline actual emissions                 | 1.23                 | 0.66                | 0.66                  | 0.66                   | 0.28                 | 0.24                | 1.69E-03                        | 1.41E-06                   |
| Increase                                  | 0.89                 | 2.72                | 2.72                  | 2.72                   | 1.83                 | 1.54                | 0.01                            | 9.16E-06                   |
| <b>8PE-001 Cab BC</b>                     |                      |                     |                       |                        |                      |                     |                                 |                            |
| Future potential emissions                | 11.77                | 1.97                | 1.97                  | 1.97                   | 2.63                 | 2.21                | 0.02                            | 1.31E-05                   |
| Baseline actual emissions                 | 32.75                | 0.96                | 0.96                  | 0.96                   | 1.17                 | 0.98                | 0.01                            | 5.85E-06                   |
| Increase                                  | 0.00 A               | 1.01                | 1.01                  | 1.01                   | 1.46                 | 1.22                | 0.01                            | 7.29E-06                   |
| <b>9PE-001 Cab CC</b>                     |                      |                     |                       |                        |                      |                     |                                 |                            |
| Future potential emissions                | 16.46                | 2.17                | 2.17                  | 2.17                   | 5.26                 | 4.42                | 0.03                            | 2.63E-05                   |
| Baseline actual emissions                 | 89.60                | 3.05                | 3.05                  | 3.05                   | 0.94                 | 0.79                | 0.01                            | 4.72E-06                   |
| Increase                                  | 0.00 A               | 0.00 A              | 0.00 A                | 0.00 A                 | 4.32                 | 3.63                | 0.03                            | 2.16E-05                   |
| <b>8PE-002 MT BC CC</b>                   |                      |                     |                       |                        |                      |                     |                                 |                            |
| Future potential emissions                | 24.45                | 4.34                | 4.34                  | 4.34                   | 10.44                | 8.77                | 0.06                            | 5.22E-05                   |
| Baseline actual emissions                 | 16.87                | 0.34                | 0.34                  | 0.34                   | 1.60                 | 1.35                | 0.01                            | 8.02E-06                   |
| Increase                                  | 7.58                 | 3.99                | 3.99                  | 3.99                   | 8.83                 | 7.42                | 0.05                            | 4.42E-05                   |
| <b>8PE-003 Plastics BC</b>                |                      |                     |                       |                        |                      |                     |                                 |                            |
| Future potential emissions                | 13.32                | 1.94                | 1.94                  | 1.94                   | 2.25                 | 1.89                | 0.01                            | 1.13E-05                   |
| Baseline actual emissions                 | 0.00                 | 0.00                | 0.00                  | 0.00                   | 0.00                 | 0.00                | 0.00                            | 0.00                       |
| Increase                                  | 13.32                | 1.94                | 1.94                  | 1.94                   | 2.25                 | 1.89                | 0.01                            | 1.13E-05                   |
| <b>9PE-002 Plastics CC</b>                |                      |                     |                       |                        |                      |                     |                                 |                            |
| Future potential emissions                | 18.75                | 2.09                | 2.09                  | 2.09                   | 4.19                 | 3.52                | 0.03                            | 2.09E-05                   |
| Baseline actual emissions                 | 0.00                 | 0.00                | 0.00                  | 0.00                   | 0.00                 | 0.00                | 0.00                            | 0.00                       |
| Increase                                  | 18.75                | 2.09                | 2.09                  | 2.09                   | 4.19                 | 3.52                | 0.03                            | 2.09E-05                   |
| <b>7PE-002 Plastics Repair</b>            |                      |                     |                       |                        |                      |                     |                                 |                            |
| Future potential emissions                |                      |                     |                       |                        |                      |                     |                                 |                            |
| Baseline actual emissions                 |                      |                     |                       |                        |                      |                     |                                 |                            |
| Increase                                  |                      |                     |                       |                        |                      |                     |                                 |                            |
| <b>2PE-002 Plastics Washer</b>            |                      |                     |                       |                        |                      |                     |                                 |                            |
| Future potential emissions                | 0.08                 | 0.11                | 0.11                  | 0.11                   | 1.42                 | 1.19                | 0.01                            | 7.09E-06                   |
| Baseline actual emissions                 | 0.00                 | 0.00                | 0.00                  | 0.00                   | 0.00                 | 0.00                | 0.00                            | 0.00                       |
| Increase                                  | 0.08                 | 0.11                | 0.11                  | 0.11                   | 1.42                 | 1.19                | 0.01                            | 7.09E-06                   |
| <b>10PE-001/002 Spot Repair</b>           |                      |                     |                       |                        |                      |                     |                                 |                            |
| Future potential emissions                | 1.99                 | 2.15                | 2.15                  | 2.15                   | 0.00                 | 0.00                | 0.00                            | 0.00                       |
| Baseline actual emissions                 | 0.00                 | 0.02                | 0.02                  | 0.02                   | 0.00                 | 0.00                | 0.00                            | 0.00                       |
| Increase                                  | 1.99                 | 2.13                | 2.13                  | 2.13                   | 0.00                 | 0.00                | 0.00                            | 0.00E+00                   |

**Attachment D - PSD Applicability Analysis by Emissions Unit**  
**Paint Booth Paint Process Emissions plus FBE Emissions**

| <b>Emission Units</b>                      | <b>VOC (TPY)</b> | <b>PM (TPY)</b> | <b>PM10 (TPY)</b> | <b>PM2.5 (TPY)</b> | <b>NOx (TPY)</b> | <b>CO (TPY)</b> | <b>SO<sub>2</sub> (TPY)</b> | <b>Lead (Pb) (TPY)</b> |
|--|------------------|-----------------|-------------------|--------------------|------------------|-----------------|-----------------------------|------------------------|
| <b>Facility-wide Purge losses</b>          |                  |                 |                   |                    |                  |                 |                             |                        |
| Future potential emissions                 | 424.29           | 0.00            | 0.00              | 0.00               | 0.00             | 0.00            | 0.00                        | 0.00                   |
| Baseline actual emissions                  | 126.04           | 0.00            | 0.00              | 0.00               | 0.00             | 0.00            | 0.00                        | 0.00                   |
| Increase                                   | 298.25           | 0.00            | 0.00              | 0.00               | 0.00             | 0.00            | 0.00                        | 0.00E+00               |
| <b>Facility-wide Paint Mix Room losses</b> |                  |                 |                   |                    |                  |                 |                             |                        |
| Future potential emissions                 | 93.73            | 0.00            | 0.00              | 0.00               | 0.00             | 0.00            | 0.00                        | 0.00                   |
| Baseline actual emissions                  | 14.98            | 0.00            | 0.00              | 0.00               | 0.00             | 0.00            | 0.00                        | 0.00                   |
| Increase                                   | 78.75            | 0.00            | 0.00              | 0.00               | 0.00             | 0.00            | 0.00                        | 0.00E+00               |
| <b>Facility-wide Misc losses</b>           |                  |                 |                   |                    |                  |                 |                             |                        |
| Future potential emissions                 | 42.38            | 0.00            | 0.00              | 0.00               | 0.00             | 0.00            | 0.00                        | 0.00                   |
| Baseline actual emissions                  | 31.13            | 0.00            | 0.00              | 0.00               | 0.00             | 0.00            | 0.00                        | 0.00                   |
| Increase                                   | 11.25            | 0.00            | 0.00              | 0.00               | 0.00             | 0.00            | 0.00                        | 0.00E+00               |
| <b>Project Totals</b>                      |                  |                 |                   |                    |                  |                 |                             |                        |
| <b>Total Project Emissions Increase</b>    | 456.80           | 19.14           | 19.14             | 19.14              | 38.43            | 32.28           | 0.23                        | 1.92E-04               |
| <b>PSD Applicability Threshold</b>         | <b>40</b>        | <b>25</b>       | <b>15</b>         | <b>10</b>          | <b>40</b>        | <b>100</b>      | <b>40</b>                   | <b>0.6</b>             |
| <b>PSD (Y,N)</b>                           | <b>Y</b>         | <b>N</b>        | <b>Y</b>          | <b>Y</b>           | <b>N</b>         | <b>N</b>        | <b>N</b>                    | <b>N</b>               |

Netting<sup>C</sup>

**GHG Emissions**

|   | <b>NG Throughput</b> | <b>GHG EF<sup>B</sup></b> | <b>GHG Emissions (TPY)</b> | <b>BACT</b> |
|---|----------------------|---------------------------|----------------------------|-------------|
| <b>Future Potential Emissions</b>         | 920 MMcf/Yr          | 120730.3 lb/MMcf          | 55,535.94                  | <b>No</b>   |
| <b>Baseline Actuals 11/2012 - 10/2014</b> | 343.96 MMcf/Yr       | 120730.3 lb/MMcf          | 20,762.90                  |             |
|   |                      | <b>Increase</b>           | <b>34,773.04</b>           |             |

A - Per 9VAC5-80-1605.G5 A significant emissions increase of a regulated pollutant is projected to occur if the sum of the emissions increases for each emissions unit, using the method specified in subdivisions 3 and 4 of this subdivision [9VAC5-80-1605.G] as applicable with respect to each emissions unit, for each type of emissions unit is significant for that pollutant.

B - CO<sub>2</sub> factor of 120,000 lb/MMscf, CH<sub>4</sub> factor of 2.3 lb/MMscf and N<sub>2</sub>O factor of 2.2 lb/MMscf from AP-42 Table 1.4-2, with Global Warming Potential for CH<sub>4</sub> of 21, for N<sub>2</sub>O of 310, for a total CO<sub>2</sub>e factor of 120,730.3 lb/MMscf.

C - Netting - Volvo did not identify any decreases during the contemporaneous period.

**Notes:**

1. Future potential emissions are the sum of process and fuel burning equipment associated with the emissions units. See Tables 2 and 3 in the permit application for data.
2. Baseline actual emissions are 11/2012 - 10/2014 2-year averages. The data show the sum of process and fuel burning equipment associated with the emissions units. See Tables 4, 5, and 6 of the permit application.
3. Volvo does not have actual PM data for this small emissions unit. No paint is applied; operations include light sanding of parts and some "scuff" removal

**Table taken from Permit Application Update dated June 22, 2015; modified to reflect changes listed in A and C above. See the June 22, 2015 submittal for background calculations.**

## Engineering Analysis Addendum

**Permit Writer:** Paul R. Jenkins

**Date:** January 5, 2016 (Permit issued January 19, 2016)

**Facility Name:** Volvo Group North America, LLC

**Registration Number:** 20765 #26

This is an addendum to the engineering analysis (dated October 2, 2015) written for Volvo Group North America, LLC (Volvo). The following information is in addition or a replacement of the information in the engineering analysis:

### I. Introduction

*The following information was added to the Introduction section due to Volvo's submission of additional updates to the permit application:*

December 9, 2015; December 15, 2015; January 4, 2016 and January 11, 2016.

*The following language replaces the language in the Introduction section regarding the final modeling report and application completion date due to Volvo's submission of an updated modeling report (superseding the July 13, 2015 modeling report) and submission of additional updates to the permit application discussed above.*

The final modeling report was received on December 9, 2015.

The application was deemed complete on January 11, 2016.

### II. Emission Units/Process Description

*Volvo requested that the Plastics Repair Booth (7PE-002) that would have been a new emissions unit be removed from the permit. Volvo has decided not to install this booth. The following language replaces the second paragraph in Section II of the engineering analysis:*

The application states that the following are new units: 2PE-002, 8PE-003 and 9PE-002 and that the following units are modified: 2PE-001, 3PE-001, 5PE-001, 6PE-001, 7PE-001, 8PE-001, 8PE-002, 9PE-001 and 10PE-001/002. The equipment that is included in each emissions unit is listed in Attachment A.

*Attachment A was updated due to removal of this emission unit from the project and that updated attachment is attached to this addendum.*

### III. Regulatory Review

*This section was also amended to reflect the removal of 7PE-002 from this project. The following language replaces the language in the engineering analysis:*

A. 9 VAC 5 Chapter 80, Part II, Article 6 – Minor New Source Review

|                       | Sum of Uncontrolled Emission Rate Increases (TPY) <sup>4</sup> | Exemption (TPY) | Exempt (Y/N) |
|-----------------------|--|-----------------|--------------|
| SO <sub>2</sub>       | 0.07   | 10              | Yes          |
| CO                    | 11.23  | 100             | Yes          |
| PM                    | 4.14   | 15              | Yes          |
| <b>NO<sub>x</sub></b> | <b>13.36</b>   | <b>10</b>       | <b>No</b>    |
| Lead                  | 5.48E-05   | 6.00E-01        | Yes          |

B. 9 VAC 5 Chapter 80, Part II, Article 8 and Article 9 – PSD Major New Source Review and Non-Attainment Major New Source Review

| <b>Pollutant</b>  | <b>Total Project Increase</b> | <b>PSD Significance Threshold</b> | <b>PSD Netting Required?</b> |
|-------------------|-------------------------------|-----------------------------------|------------------------------|
|                   | <b>tons/yr</b>                | <b>tons/yr</b>                    | <b>tons/yr</b>               |
| CO                | 33.28                         | 100                               | No                           |
| NO <sub>x</sub>   | 38.43                         | 40                                | No                           |
| PM                | 19.14                         | 25                                | No                           |
| PM10              | 19.14                         | 15                                | Yes                          |
| PM2.5             | 19.14                         | 10                                | Yes                          |
| SO <sub>2</sub>   | 0.23                          | 40                                | No                           |
| VOC               | 456.80                        | 40                                | Yes                          |
| Lead              | 1.92E-04                      | 0.6                               | No                           |
| CO <sub>2</sub> e | 34,773                        | 75,000                            | No                           |

| <b>Pollutant</b> | <b>Project Increases</b> | <b>NEI</b>     | <b>Significant Value</b> | <b>PSD Permitting Required?</b> |
|------------------|--------------------------|----------------|--------------------------|---------------------------------|
|                  | <b>tons/yr</b>           | <b>tons/yr</b> | <b>tons/yr</b>           | <b>tons/yr</b>                  |
| VOC              | 456.80                   | 456.80         | 40                       | Yes                             |
| PM10             | 19.14                    | 19.14          | 15                       | Yes                             |
| PM2.5            | 19.14                    | 19.14          | 10                       | Yes                             |

**IV. Best Available Control Technology Review (BACT)**

*Attached to this addendum is a revised BACT analysis for particulate matter that was submitted by Volvo on January 11, 2016. This revised BACT analysis replaces the BACT analysis for particulate matter in the engineering analysis. This section was also amended to reflect the removal of 7PE-002 from this project. The following language replaces the language in the engineering analysis:*

## **Prevention of Significant Deterioration**

### **PM10 and PM2.5**

#### **Step 4: Evaluate Economic, Environmental, and Energy Impacts:**

Wet scrubbers (Venturi) are currently used at the source for controlling particulate emissions and are also common in this industry. The installation and operation of wet scrubbers are economically feasible for 5PE-001, 7PE-001, 8PE-001, 8PE-002, 8PE-003, 9PE-001 and 9PE-002. They are not economically feasible for 6PE-001, 10PE-001 and 10PE-002 due to the low level of emissions (each has potential PM10 and PM2.5 emissions of less than 2.2 tons per year).

#### **Step 5: Select BACT**

For spray booths 6PE-001, 10PE-001 and 10PE-002 (with low particulate pollutant emissions) dry cartridge filters rated at 0.005 gr/dscf are considered BACT. For spray booths 5PE-001, 7PE-001, 8PE-001, 8PE-002, 9PE-001 venturi scrubbers rated at 0.003 gr/dscf are considered BACT.

For spray booths 8PE-003 and 9PE-002 dry precoated filter systems rated at 0.0001 gr/dscf are considered BACT.

*The following language was added to the VOC section:*

### **VOC**

#### **Step 5: Select BACT**

100% capture efficiency, low VOC coatings (3.5 lbs/gal as applied) and regenerative thermal oxidizers (RTO) is considered BACT for 8PE-001, 8PE-002, 8PE-003, 9PE-001 and 9PE-002. Due to the low level of VOC emissions and the high cost of add on controls (\$15,700 per ton VOC removed for the unit with the highest VOC emissions) for the following emission units, the use of low VOC coatings (3.5 lbs/gal as applied) is considered BACT for 5PE-001, 7PE-001, 10PE-001 and 10PE-002. Electro-deposition of waterborne coatings is considered BACT for 3PE-001.

The emission limitations in the permit that include Article 8 (Permits for Major Stationary Sources and Major Modifications Locating in Prevention of Significant Deterioration Areas) citations – 9VAC5-80-1605 et seq, are limits established to satisfy PSD requirements.

## **V. Combination of Permit Program Requirements**

*The following language replaces the language in the engineering analysis:*

The permit is a combined permit that includes the following approvals:

- New PSD permit and minor NSR permit (modification of the existing integrated cab and plastics paint line and new equipment) approved on January 19, 2016.
- Minor NSR permit approval date April 21, 2010
- Amendment to the Minor NSR permit approval date April 21, 2010 amended on January 19,

2016.

## **VII. Dispersion Modeling**

*The dispersion modeling was updated to correct for minor errors in the original modeling, however, the results of the modeling did not change and the modeling section of the engineering analysis is unchanged. The updated dispersion modeling will be filed with the permit files.*

## **XI. Other Considerations**

*The following language replaces the language in the engineering analysis:*

- The following public participation information was published in *The Roanoke Times* on October 2, 2015:
  - The public comment period began on October 2, 2015
  - The public hearing was held at the Pulaski County Administration Building in Pulaski, Virginia and began at 6 p.m. on November 2, 2015; No speakers spoke at the hearing. Comments from EPA Region III were received during the comment period; DEQ response to those comments are attached in the document titled “Response to Comments Memo”
  - The comment period ended on November 17, 2015.
- Pulaski County, the Town of Dublin, the Town of Pulaski and the New River Valley Regional Commission were notified by letter dated September 30, 2015 since they are “localities particularly affected”.
- Delegate Rush and Senator Chafin were notified by letter dated September 30, 2015 since they are General Assembly members for districts that cover the facility’s location.
- EPA, Region III and West Virginia were notified by letter dated September 30, 2015.

Attachments:

*Attachments A, C and D were updated to reflect the removal of 7PE-002 from the project.*

Response to Comments Memo  
Analysis Attachment A 01-11-2016  
Analysis Attachment C 01-11-2016  
Analysis Attachment D 01-11-2016