August 6, 2013

Manny Patel
VOC Unit Manager
Stationary Source Permitting Program
Georgia EPD - Air Protection Branch
4244 International Parkway, Suite 120
Atlanta, Georgia 30354

Re: Blue Bird Body Company - Fort Valley (Peach County), Georgia
40 CFR 52.21(r)(4) PSD Permit Application

Dear Mr. Patel:

Please find enclosed the PSD application submittal for the operation of the Blue Bird Body Company located in Fort Valley, Georgia. The facility currently operates under Georgia Title V Permit No. 3713-225-0001-V-05-0, issued December 21, 2012. The current permit limits facility-wide VOC emissions to 249 tpy to be considered a minor source with respect to PSD.

The facility is requesting the relaxation of the facility-wide VOC PSD avoidance limit in Condition No. 2.1.1. The requested change is considered a relaxation per 40 CFR 52.21(r)(4), thus, the facility is considered to be a new source and the requirements of 40 CFR 52.21(j) through (s) apply to the entire source as though construction has not yet commenced. This submittal demonstrates that the potential emissions from Blue Bird Body Company - Fort Valley facility will not cause or contribute to a violation of any ambient air standard or allowable PSD increment. Additionally, the operation of the facility as outlined in this application should not cause an impairment of visibility or detrimental effects to soils, vegetation or any Class I areas.

Blue Bird Corporation respectfully requests that an Air Quality Permit be issued for the operation of the Fort Valley, Georgia facility as specified in this submittal. To facilitate GAEPD's review, a reference table is attached with GAEPD's recommended PSD application elements and their referenced location in our application submittal (see Application narrative section 4.1).

If you have any questions or need any further information, please do not hesitate to contact Matthew Page at (404)-295-0928 ext. 115 or via email at mpage@smithaldridge.com. We genuinely look forward to working with GAEPD on this project.

Sincerely,

Robert Watts
Director of Environmental, Health & Safety

cc: Susan Jenkins – GAEPD
Greg Worley – EPA Region IV
Matthew Page – Smith Aldridge, Inc.
Craig Smith – Smith Aldridge, Inc.

Encl: PSD Application

Blue Bird Body Company
PSD Application
(40 CFR §52.21(r)(4) Relaxation)

Fort Valley, Georgia
(Peach County)

August 2013

Prepared by

SMITH ALDRIDGE, INC.

Environmental Consultants

Atlanta, Georgia

Blue Bird Body Company - Fort Valley, Georgia
PSD Review Application - Narrative

Table of Contents:

1.0 INTRODUCTION

The Blue Bird Body Company (AIRS No. 04-13-225-00001), located at 402 Blue Bird Boulevard Fort Valley (Peach County), Georgia, operates a custom assembly plant for large body vehicles. The facility specializes in the fabrication and assembly of busses, shuttles, and other custom ordered vehicles. The Blue Bird Body Company is a Title V major source for Hazardous Air Pollutants (HAPs) and Volatile Organic Compounds (VOC) and currently operates under Part 70 Operating Permit No. 3713-225-0001-V-05-0.

Permit No. 3713-225-0001-V-05-0 currently limits VOC emissions from the facility to below 250 tpy, however, the facility is proposing to relax this emission limitation in order to increase production. As a result, the facility will be considered a new major source with respect to the Prevention of Significant Deterioration (PSD) permitting requirements per 40 CFR 52.21(r)(4). Therefore, the facility is submitting this PSD application for the operation of the entire facility.

As PSD review is triggered, the facility has conducted a BACT analysis for each emission unit at the facility with the potential to emit NSR pollutants in significant amounts (§52.21(j)(2)). In this regard, the only NSR pollutant emitted from the facility in significant amounts is VOC (See Attachment B for supporting calculations). Therefore, the VOC BACT determinations for each emission unit with the potential to emit VOC are as follows:

- VOC BACT for each spray booth (Emission Unit IDs: PB10, PB11, PB27, PB28, PB29, PB30, and PB31) is determined to be the implementation of work practice standards used to reduce excess VOC emissions. Emissions are limited to no more than the following:

Table 1.1-1: Proposed Federally Enforceable Limits to Implement Requirements of §52.21(j)(2)

Emission Point ID	Emission Unit Description	Pollutant	Emission Limit
PB10	All American Touchup Booth	VOC	22.0
PB11	Overflow Paint Booth	VOC	35.7
PB27	Undercoat Booth	VOC	101.0
PB28	Black and Primer Paint Booth	VOC	200.0
PB29	Yellow Paint Booth	VOC	150.0
PB30	BBCV Touchup Booth	VOC	49.0
PB31	White Paint booth	VOC	95.0

- VOC BACT for each oven and the hanging furnaces (Emission Unit IDs: BO06, BO07, BO08, BO09, and HF01-HF03) is determined to be the use of a good combustion practices and the exclusive use of natural gas as fuel.

Also included in this application is an air toxics compliance demonstration. As detailed in Attachment D, the facility does not have the potential to emit toxic air pollutants (TAP) in quantities which would result in an exceedance of the allowable ambient concentration (AAC) for each TAP.

Additionally, per the Georgia EPD PSD Permit Application Guidance Document, Table 1.1-2, below, addresses the completeness of this PSD application using the checklists found in Appendix A and Appendix B of the document.

Table 1.1-2: PSD Application Checklist

PSD Application Checklist			
1.0 Introduction	Y	Y	Section 1.0
1.1 Scope of Stationary Source	Y	Y	Section 1.0
1.2 Project Emission Summary	Y	Y	Table 3.1-1
2.0 Process Description	Y	Y	Section 2.0
3.0 Emission Calculation Methodology	Y	Y	Section 3.1
3.1 Emissions for new units	NA	NA	NA
3.2 Baseline Actual Emissions	NA	NA	NA
3.3 Table of Projected Actual Emissions	NA	NA	NA
3.4 Table of Project's Significant Emissions Increase	Y	Y	Table 3.1-1
3.5 Contemporaneous Period Project Net Emissions Summary	NA	NA	NA
3.6 Modeled Emission rates and active-formula Excel spreadsheet with emission calculations	Y	Y	Attachment B
4.0 Regulatory Review	Y	Y	Section 4.0
4.1 PSD Applicability	Y	Y	Section 4.1.1
4.2 NSPS	NA	NA	NA
4.3 MACT	Y	Y	Section 4.1.3
4.4 State Rules	Y	Y	Section 4.2
4.5 Other, as applicable	Y	Y	Section 4.0
5.0 BACT Analysis	Y	Y	Attachment C
5.1 Identify Alternative Emission Control Technologies (Step 1)	Y	Y	Att. C Table 1.1-2
5.2 Technical Feasibility Analysis (Step 2)	Y	Y	Att. C Sect. 4.0
5.3 Ranking the Technically Feasible Alternatives to Establish a Control Hierarchy (Step 3)	Y	Y	Att. C Sect. 5.0
5.4 Evaluating Remaining Control Technologies (Step 4)	Y	Y	Att. C Sect. 6.0
5.5 Select BACT (Step 5)	Y	Y	Att. C Sect. 6.4
6.0 Modeling Analysis	Y	Y	Attachment D
6.1 Approved Modeling Protocol	NA	NA	NA
6.2 Building Downwash Analysis	Y	Y	Att. D Sect. 3.0
6.3 Receptor Grids Analysis	Y	Y	Att. D Sect. 3.0
6.4 Meteorological Representativeness Analysis	Y	Y	Att. D Sect. 3.0
6.5 Excel spreadsheet with emissions calculations and basis for modeled emission rates	Y	Y	Attachment B
6.6 Significance Modeling Analysis - Definition of SIA's	NA	NA	NA
6.7 Off-site Emission Inventory spreadsheet	NA	NA	NA
6.8 20D Calculations - Screening of off-site sources	NA	NA	NA
6.9 NAAQS Modeling Analysis	NA	NA	NA
6.10 PSD Increment Modeling Analysis	NA	NA	NA
6.11 Preconstruction Monitoring Requirement Analysis	NA	NA	NA

PSD Application Checklist			
6.12 Air Toxics Modeling	Y	Y	Attachment B
6.13 Class I Area AQRV Analysis	Y	Y	Sect. 6.0; Att.D
6.14 Class I Area Increment Analysis	Y	Y	Sect. 6.0; Att.D
7.0 Additional Impacts Analysis (Class II Visibility Impacts, Vegetation/Soils, Construction, Demographics)	Y	Y	Section 7.0
8.0 Proposed Permit Conditions for BACT Pollutants	Y	Y	Attachment F
9.0 Georgia EPD SIP Construction Forms	NA	NA	NA
10.0 Title V Signature Page & Title V Application Disc(s)	NA	NA	NA
11.0 Phase II Acid Rain Permit Application, where applicable	NA	NA	NA
Exhibits:			
i. Emission Calculations	Y	Y	Attachment B
ii. Site Layout including	Y	Y	Attachment E
- Point Source Locations	Y	Y	Attachment E
- Fugitive Sources	NA	NA	NA
- Receptor Grids in UTM Coordinate System	Y	Y	Attachment D
- Site Buildings dimensions and coordinates for the BPIP analysis	Y	Y	Attachment D
- Fenceline/Ambient Air Boundary	Y	Y	Attachment D
iii. Off-site Emission Inventory	NA	NA	NA
iv. FLM Correspondence	NA	NA	NA
v. Electronic Copy of			
- Chapters 1 through 6.1.6	Y	Y	Attachment G
- SIP Construction Permit Application	NA	NA	NA
- Title V Permit Application (where applicable)	NA	NA	NA
- Phase II Acid Rain Permit Application (where applicable)	NA	NA	NA
- Off-site Emission Inventory in the form of a live-formulas Excel spreadsheet	NA	NA	NA
- Emission Calculations in the form of live-formulas Excel spreadsheet	Y	Y	Attachment G
- Site Layout (Exhibit ii material)	Y	Y	Attachment G
- Modeling input and output files (AERMAP, AERMOD, AERSURFACE, BPIP, SCREEN, or ISCST for Toxics)	Y	Y	Attachment G

1.1 PSD Requirement

1.1.1 Attainment Status of Each Criteria Pollutant

Blue Bird Body Company is located in Peach County, which is in attainment of the PM_{10}, $PM_{2.5}$, SO_2, NO_x, CO and Ozone (as VOCs) national ambient air quality standards.

1.1.2 Best Available Control Technology (BACT)

The PSD regulation requires that BACT be applied to all regulated air pollutants emitted in significant amounts. Section 169 of the Clean Air Act defines BACT as an emission limitation reflecting the maximum degree of reduction that the permitting authority (in this case Georgia Environmental Protection Division), on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, in order to determine what is achievable for such a facility through application of production processes and available methods, systems, and techniques. In all cases, BACT must establish emission limitations or specific design characteristics that are at least as stringent as applicable New Source Performance Standards (NSPS). In addition, if there are no economically reasonable or technologically feasible ways to measure the emissions, and hence to impose an enforceable emissions standard, the source may use a design, equipment, work practice, operations standard, or combination thereof, to reduce emissions of the pollutant to the maximum extent practicable.

EPA's Draft New Source Review Workshop Manual, dated October 1990, suggests the following five step top-down BACT review procedure:

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

The BACT analysis is discussed in further detail in Section 5.0, with the full determination provided in Attachment C.

1.2 Applicability Analysis

1.2.1 <u>NSR Pollutants Emitted</u>

Table 1.2-1 provides a list of all NSR pollutants emitted as a result of the proposed permit modification, as well as the corresponding PSD major source thresholds. As the facility is considered a new source with regard to this review, there are no contemporaneous or facility baseline emissions to be considered in this review as the facility-wide potential to emit of each pollutant is considered an increase associated with this project.

Table 1.2-1: PSD Applicability Analysis

Regulated NSR Pollutants	Facility-wide Potential Emissions (tpy)	PSD Significant Level (tpy)	PSD Triggered?	PSD Significance Threshold (tpy)	PSD Triggered for Modification?
Nitrogen Oxide	23.6	250	No	40	No
Carbon Monoxide	19.8	250	No	100	No
Sulfur Dioxide	0.14	250	No	40	No
Particulate Matter (PM)	1.98	250	No	25	No
Particulate Matter (PM_{10})	1.98	250	No	15	No
Particulate Matter ($PM_{2.5}$)	1.98	250	No	10	No

Regulated NSR Pollutants	Facility-wide Potential Emissions (tpy)	PSD Significant Level (tpy)	PSD Triggered?	PSD Significance Threshold (tpy)	PSD Triggered for Modification?
Ozone (VOCs)	654	250	**Yes**	40	**Yes**
Greenhouse Gases[1] (tpy CO_2e)	28,436	100,000 [1]	No	75,000	No

[1]Threshold emissions rate for greenhouse gases reported as CO_2e (includes emissions of CO_2, CH_4, and N_2O)

Based on these results, PSD review has been triggered for VOC as potential emissions exceed the 250 major source threshold.

2.0 PROCESS DESCRIPTION

Blue Bird Body Company receives engine and chassis parts from outside vendors. The body of each vehicle is assembled prior to the application of primers, cleaning solvents, and paints. Once assembled, vehicles are transferred to the Undercoating Paint Booth (PB27) where they are washed clean with solvents, and an undercoating is applied to the chassis.

Vehicles are then transferred to the White Paint Booth (PB31) where the roof is first wiped clean with a solvent, primed with an undercoat, and then painted white. It should be noted that a different paint is used to coat the exterior and interior portions of the vehicle roof. Once coated, the vehicle is sent through White Booth Bake Oven Nos. 1 and 2 (BO08 and BO09) where the paint is baked on.

The vehicles are then moved to the Black and Primer Paint Booth (PB28) where they are wiped clean with solvents, primed, and painted. This booth applies all black paint as on each vehicle. Once finished, the vehicles are transferred to the Black and Primer Bake Oven (BO06) where the applied coatings are cured.

The vehicles are then transferred to the Yellow Paint Booth (PB29) where they are cleaned, primed, and painted with yellow paint. Once the coatings have been applied, the vehicle is baked in the Yellow Booth Bake Oven (BO07) and then sent to the finishing area of the plant where it is inspected for defects.

It should be noted that the cleaning solvents are applied prior to the vehicles entering each paint booth. The emissions from these cleaning activities are associated with each paint booth, however, the fraction of emissions resulting from cleaning activities have been accounted for as a volume source with regard to toxic emissions dispersion modeling.

If the vehicles require additional painting, they are sent to either the All American Touchup Booth (PB10) or the BBCV Touchup Booth (PB31) for larger touchup work, or to the Overflow Paint Booth (PB11) for detailed touchup work, all of which utilize air assisted applicators to apply paint. At this point in the production process, it is not necessary to prime, and all cleaning is done within the booth prior to the application of paint. After the application of the paint is compete, each vehicle is transported through a dryer tunnel (one for each touchup booth) to bake the final coating of paint. Vehicles are then transported to the parking lot located on the facility's property for storage.

A detailed process flow diagram can be found in Attachment E of this application. It should be noted that the undercoat and touchup booths utilize conventional air assisted paint spray guns, while PB28, PB29, and PB31 utilize high volume, low pressure (HVLP) paint applicators.

3.0 EMISSIONS

3.1 Emission Source Types

As the facility utilizes several VOC containing coatings, the primary NSR pollutant of concern is VOC. The facility also has the potential to emit significant amounts of HAPs and TAPs. However, potential emissions of $PM/PM_{10}/PM_{2.5}$, NO_x, SO_2, and GHGs are below the PSD significance thresholds. The seven paint booths are the primary sources of VOC emissions at the facility; combustion contributes only a minor fraction of the facility-wide VOC emissions.

Paint Booths

VOC emissions are generated primarily from the application of primers and paints to the vehicles, which occur in each paint booth. Additionally, each vehicle is wiped down with cleaning solvents prior to entering the four paint booths where the majority of paints and coatings are applied (Emission Unit ID's PB27, PB28, PB29, and PB31). While all emissions from cleaning, priming, and painting are associated with each paint booth, emissions from cleaning activities are not considered to be vented through the exhaust stacks of each paint booth. Therefore, with regard to dispersion modeling, emissions from primers and paints are modeled as point sources while emissions from cleaners are treated as volume sources.

As the facility primarily produces fleets of school busses, the paints used to color these busses are considered for emissions from these booths. While other colors may be used in the touchup booths, an overwhelming majority of the paints used are that of the traditional color scheme for school busses (yellow, black, and white).

Per EPA's document "Protocol for Determining the Daily Volatile Organic Compound Emission Rate of Automobile and Light-Duty Truck Primer-Surfacer and Top Coat Operations", VOC emissions from coating applications are considered to be entirely emitted from the coating booths. As such, VOC emissions from these booths were calculated assuming that each booth continually operates at maximum capacity for the entire year. It is conservatively assumed that all VOC fractions of the paints are emitted from the stacks of these booths. However, cleaning activities using solvent wipes occur outside of paint booths PB27, PB28, PB29, and PB31, therefore, emissions from these cleaning operations are considered to be emitted as a volume source encompassing the coating application area of the facility. Emissions from cleaning activities have been attributed to each booth, however, have been modeled as a volume source, rather than as a point source, in the toxics dispersion model (see Attachment D for details).

Additionally, potential calculations consider the maximum quantity of each coating type that would be used for a standard school bus to ensure emission calculations represent the true potential to emit VOC of each paint booth. Details regarding the VOC emission calculations can be seen in Table 4 of Attachment B.

TAC emissions from the paint booths are calculated using the same methodology as used for the VOC emission calculations. Due to the composition of the coatings applied, the largest TAP emitted is acetone. Details regarding the TAP emission calculations for the paint booths are provided in Tables 6 through 27 of Attachment B.

Particulate matter emissions were calculated based on the solids content of each coating, the transfer efficiency of the paint applicators, and a fall out factor for each coating type. The fallout factor is based on the principle that particles sprayed from a paint applicator that are greater than 30 microns in diameter will fallout of the airstream prior to entering the control device or exhaust stack. It is estimated that 90% of particles from HVLP applicators, and 80% of particles from conventional air assisted applicators are greater than 30 microns in diameter and will thus not be emitted through the stack[1]. Detailed calculations are provided in Table 3 Attachment B.

Paint Bake Ovens and Hanging Furnaces

Emissions from the paint bake ovens and hanging furnaces were calculated by utilizing emission factors for the external combustion of natural gas (AP-42 Chapter 1, Tables 1.4-2 and 1.4-3). Each paint bake oven has a maximum rated heat input of 10 MMBtu/hr and each hanging furnace has a maximum heat input capacity of 4.95 MMBtu/hr. Calculations detailing the potential to emit of all fuel burning sources are provided in Table 2 of Attachment B.

Table 3.1-1 provides a summary of potential emissions from each unit, as well as a total facility-wide potential to emit for each regulated pollutant. It should be noted that per §52.21(r)(4), the facility is considered a new facility in which construction has not commenced. As such, the facility does not have any baseline emissions or contemporaneous emissions increases as the facility-wide potential to emit for each pollutant is considered as an emissions increase associated with this project.

1 Texas Commission on Environmental Quality " painting basics and emission calculations for tceq air quality permit applications" October 11, 2006.

Table 3.1-1: Potential Emissions, NSR Pollutants, HAPs and TAPs

Emission Unit ID	Emission Unit Descriptions	NOx (tpy)	CO (tpy)	SO_2 (tpy)	$PM/PM_{10}/PM_{2.5}$[1] (tpy)	VOC (tpy)	Total TAP (tpy)	Largest TAP[3] (Acetone) (tpy)	Largest HAP[3] (Xylene) (tpy)	Total HAP (tpy)	GHG (tpy CO_2e)
PB10	All American Touchup Booth	0.0	0.0	0.0	0.02	22.0	35.2	0.1	20.8	24.7	0.0
PB11	Overflow Paint Booth	0.0	0.0	0.0	0.012	35.7	19.3	1.1	12.4	14.7	0.0
PB27	Undercoat Booth	0.0	0.0	0.0	0.0	101.0	210.5	196.3	0.0	0.0	0.0
PB28	Black and Primer Paint Booth	0.0	0.0	0.0	0.047	200.0	228.1	0.2	1.2	2.0	0.0
PB29	Yellow Paint Booth	0.0	0.0	0.0	0.041	150.4	76.5	8.8	0.4	0.6	0.0
PB30	BBCV Touchup Booth	0.0	0.0	0.0	0.02	49.0	35.2	0.1	20.8	24.7	0.0
PB31	White Paint booth	0.0	0.0	0.0	0.051	95.0	248.0	130.9	55.3	82.4	0.0
OV06	Black and Primer Bake Oven	4.29	3.61	0.03	0.33	0.24	0.08	0.0	0.08	0.08	5,184
OV07	Yellow Booth Bake Oven	4.29	3.61	0.03	0.33	0.24	0.08	0.0	0.08	0.08	5,184
OV08	White Booth Bake Oven 1	4.29	3.61	0.03	0.33	0.24	0.08	0.0	0.08	0.08	5,184
OV09	White Booth Bake Oven 2	4.29	3.61	0.03	0.33	0.24	0.08	0.0	0.08	0.08	5,184
HF01-HF03	Hanging Furnaces	6.38	5.36	0.04	0.485	0.35	0.12	0.0	0.12	0.12	7,699
Facility-wide PTE		**23.6**	**19.8**	**0.14**	**1.98**	**654**	**853.2**	**337.5**	**111.3**	**149.5**	**28,436**
PSD Major Source Thresholds		**250**	**250**	**250**	**250**	**250**	**NA**	**NA**	**NA**	**NA**	**100,000**
PSD Triggered?[2] (Y/N)		**N**	**N**	**N**	**N/N/N**	**Y**	**NA**	**NA**	**NA**	**NA**	**No**
PSD Significance Threshold		**40**	**100**	**40**	**25/15/10**	**40**	**NA**	**NA**	**NA**	**NA**	**75,000**
PSD Triggered? (Y/N)		**N**	**N**	**N**	**N/N/N**	**Y**	**NA**	**NA**	**NA**	**NA**	**No**

[1] All PM assumed to be $PM_{2.5}$
[2] As the facility is a major source for a single pollutant, all other pollutants are subject to PSD review if they exceed the applicable significance threshold
[3] Largest HAP and TAP is analyzed on a facility-wide potential to emit basis

4.0 REGULATORY REVIEW

4.1 Review of Federal Rules

4.1.1 40 CFR 52.21 - Prevention of Significant Air Quality Deterioration (PSD)

PSD review requirements are applicable to any new source which belongs to one of 28 specific source categories having potential emissions of 100 tons per year or more of any regulated pollutant, or all other sources having potential emissions of 250 tons per year or more of any regulated pollutant; or a modification of a major stationary source which results in a significant net emission increase of any regulated pollutant. As the facility is proposing to relax the VOC emission limit of 250 tpy, the facility will become a PSD Major Source of VOC emissions per 40 CFR 52.21(r)(4). Georgia is a SIP approved state with regard to the PSD program, as such, §52.21 is implemented per Georgia Rule 391-3-1-.02(7) (see Section 4.2).

Table 4.1.1-1, below, provides a summary of the PSD review regulations applicable to this project and where each requirement is addressed within this application.

Table 4.1.1-1: PSD Requirements Reference

PSD Requirement Citation	PSD Review Requirement Description	Location in Application
40 CFR §52.21(j)	Application of best available control technology (BACT) for each regulated pollutant that would be emitted in significant amounts.	Attachment C
40 CFR §52.21(k)	Analysis of the source's ambient air impact.	Section 6.2 of this narrative
40 CFR §52.21(m)	Analysis of existing ambient air quality.	Section 6.2 of this narrative
40 CFR §52.21(o)	Analysis of the impact on soils, vegetation, and visibility.	Section 7.0 of this narrative
40 CFR §52.21(p)	Analysis of the impact on Class I areas.	Section 7.0 of this narrative

4.1.2 40 CFR Part 70 – Title V Permitting

The requirements of 40 CFR Part 70 are adopted by reference into Georgia Rule 391-3-1-.03(10). The Blue Bird facility is considered a Major Source with regard to the Title V Permitting program and currently operates under Georgia Part 70 Operating Permit No. 3713-225-0001-V-05-0. As VOC emission limits are being relaxed, this PSD application will be processed as a significant modification without construction.

4.1.3 40 CFR Part 64 – Compliance Assurance Monitoring

Part 64 addresses compliance assurance monitoring (CAM) for emission units with the potential to emit Part 70 regulated pollutants in quantities that exceed the respective major source threshold. The facility does not currently implement any VOC control devices; therefore, CAM requirements are not applicable to any VOC emitting source at the facility. Additionally, while the facility utilizes fabric filters to control particulate matter emissions, CAM requirements are not applicable at this time as facility-wide controlled potential PM emissions are below the Title V Major Source Threshold.

4.1.4 40 CFR 63 Subpart MMMM—National Emission Standards for Hazardous Air Pollutants for Surface Coating of Miscellaneous Metal Parts and Products

Blue Bird Body Company is subject to NESHAP Subpart MMMM as it fabricates and assembles large specialty vehicles. The facility utilizes several solvents, paints, and coatings that are subject to restrictions in this subpart. This subpart limits the HAP content of coatings, solvents, and paints used on miscellaneous metal part to below 2.6 lb of HAP/gal of coating. Compliance with this performance standard is achieved through the use of low HAP coatings and detailed recordkeeping of material use. The relaxation of the facility-wide VOC emission limit will not change the facility's compliance status with respect to NESHAP Subpart MMMM.

4.1.5 Clean Air Act Section 112(g)(2)(B)

Section 112(g) of the Clean Air Act regulates major modifications to facilities that are a major source of HAPs. A major source of HAPs cannot commence with a modification until the Administrator (or State) has determined that the maximum achievable control technology emission limitation for HAPs has been met. As the facility is subject to NESHAP Subpart MMMM, the facility is considered to implement MACT with regard to HAP emissions.

4.2 Review of State Rules

4.2.1 State Rules – Air Permitting

Georgia Rule for Air Quality Control (Georgia Rule) 391-3-1-.03(1) requires that a permit be obtained prior to beginning the construction or modification of any facility which may result in pollution. Georgia Rules 391-3-1-.03(8)(b) continues that no permit to construct a new stationary source or modify an existing stationary source shall be issued unless such proposed source meets all the requirements for review and for obtaining a permit prescribed in Title I, Part C of the Federal Act [i.e., Prevention of Significant Deterioration of Air Quality (PSD)], and Section 391-3-1-.02(7) of the Georgia Rules (i.e., PSD).

4.2.2 Rule 391-3-1-.02(a)3(ii): General Provisions

Under Georgia Rule 391-3-1-.02(2)(a)3(ii), the Director may require emissions limitations when necessary to safeguard the public health, safety, and welfare of the people of the State of Georgia. The Georgia Air Toxics Guideline is a guide for estimating the environmental impact of sources of toxic air pollutants. A toxic air pollutant is defined as any substance that may have an adverse effect on public health, excluding any specific substance that is covered by a State or Federal ambient air quality standard. Several types of toxic air pollutants are emitted during the facility's coating operations. As such, a complete toxics assessment was performed using the Georgia Air Toxics Guideline. The toxic impact assessment can be found in Attachment D. This assessment indicates that the facility is in full compliance with the Georgia Air Toxics Guidelines, dated June 1998.

4.2.3 Rule 391-3-1-.02(b): Visible Emissions

Georgia Rule b limits the opacity of air emissions from any source at the facility to no more than 40%. Compliance with this opacity limit is achieved through the exclusive use of natural gas as fuel for the bake ovens and the use of fabric filters for controlling the exhaust from each paint booth.

4.2.4 Rule 391-3-1-.02(e): Particulate Emission from Manufacturing Processes

Georgia Rule (e) limits particulate emissions from manufacturing processes to below the following

$$E=55P^{0.11}-40$$

For P > 30 tons/hr.

where:

E = PM emission rate in lbs/hr
P = Process weight per hour

This regulation is applicable to each paint spray booth, bake ovens, and hanging furnaces at the facility.

Table 4.2.4-1 provides a summary of the applicable emission units and their respective PM emission limits:

Table 4.2.4-1: PM/PM_{10}/$PM_{2.5}$ Emission Limit Summary

Emission Unit ID	Emission Unit Name	Throughput[1] (tph)	Georgia Rule (e) Limit (lb/hr)
PB10/HF01	All American Touchup Booth and Hanging Furnace 1	56	45.6
PB11/HF02	Overflow Paint Booth and Hanging Furnace 2	84	49.5
PB27	Undercoat Paint Booth	84	49.5
PB28/BO09	Black and Primer Paint Booths and Black and Primer Bake Oven	84	49.5

Emission Unit ID	Emission Unit Name	Throughput[1] (tph)	Georgia Rule (e) Limit (lb/hr)
PB29/ BO07	Yellow Paint Booth and Yellow Booth Bake Oven	84	49.5
PB30/HF03	BBCV Touchup Booth and Hanging Furnace 3	56	45.6
PB31/BO08/ BO09	White Paint Booth and White Booth Bake Ovens 1 and 2	84	49.5

1. Throughput is considered the maximum throughput of school busses per hour of each unit. Each school bus weighs approximately 14.0 tons

The facility will ensure compliance with the limits in Table 4.2.4-1 through the use of fabric filters controlling emissions from PB10, PB11, and PB28-31. PB27 is assumed to be inherently compliant with this limit as no activity with the potential to emit PM occurs in this paint booth. Additionally, the ovens and hanging furnaces are considered to be inherently compliant with Rule (e) through the exclusive use of natural gas as fuel. Facility-wide PM emissions are calculated to be 1.98 tpy, therefore, there are no compliance issues with this rule.

4.2.5 Rule 391-3-1-.02(g): Sulfur Dioxide

Georgia Rule (g) limits sulfur dioxide emissions from fuel burning equipment by limiting the sulfur content of fuel to be 2.5% sulfur by weight. Ovens BO06, BO07, BO08, BO09, and hanging furnaces HF01-HF03 are subject to this regulation. It is assumed that these ovens are inherently compliant with this regulation as only natural gas is combusted in these units.

4.2.6 Rule 391-3-1-.02(ii): VOC Emissions from Surface Coating of Miscellaneous Metal Parts and Produces

Georgia Rule (ii) sets performance standards for metal surface coating operations. As Blue Bird Body Company coats sheet metal during the fabrication of busses, this regulation is applicable. The rule limits the VOC content of any coating delivered to a coating applicator to no more than 3.0 lb/gal (or solids equivalence of 5.06 lb/gal). Compliance with this regulation can be demonstrated by only using compliant materials, daily averages of single line coating operations, daily averages of facility-wide coating operations, or control technology that reduces the emitted VOC to below the applicable material restrictions. The facility currently uses compliant coatings. The relaxation of the facility-wide VOC emissions limit is not affecting the facility’s compliance status with respect to Rule (ii).

4.2.7 Rule 391-3-1-.02(7): Prevention of Significant Deterioration

The requirements of this rule apply to any source with the potential to emit more than 250 tpy of an NSR pollutant (100 tpy for one of the 28 source categories). As the facility has the potential to emit VOC of more than 250 tpy, this regulation is applicable. This rule implements the federal PSD program (§52.21) by reference for portions applicable to the Blue Bird Body Company site.

4.2.8 Rule 391-3-1-.03(10)(e)5(iii): Title V Significant Modification

This rule incorporates the requirements of 40 CFR Part 70 with regard to major sources of Part 70 pollutants. The Blue Bird Body Company currently operates under Air Permit No. 3713-225-0001-V-05-0 as a Part 70 major source of VOC and HAPs. The relaxation of the VOC emission limit is considered to be a major modification without construction per Rule 391-3-1-.03(e)(5)(iii) as the proposed increase in VOC emissions requires a case-by-case determination of an emission limit.

5.0 CONTROL TECHNOLOGY REVIEW

5.1 BACT Applicability and Methodology

This Section offers a condensed summary of the BACT requirements applicable to the project, and the proposed BACT findings for each pollutant and emission unit combination subject to BACT. For detailed BACT analysis, including calculation and discussion of energy, environmental, and economic impacts, see Attachment C of this application.

The PSD regulation requires that the Best Available Control Technology (BACT) be applied to all regulated air pollutants emitted in significant amounts. Section 169 of the Clean Air Act defines BACT as an emission limitation reflecting the maximum degree of reduction that the permitting, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, in order to determine what is achievable for such a facility through application of production processes and available methods, systems, and techniques. In all cases, BACT must establish emission limitations or specific design characteristics at least as stringent as applicable New Source Performance Standards (NSPS). In addition, if there are no economically reasonable or technologically feasible ways to measure the emissions, and hence to impose an enforceable emissions standard, the source may use a design, equipment, work practice, operations standard, or combination thereof, to reduce emissions of the pollutant to the maximum extent practicable.

The BACT determination should, at a minimum, meet two core requirements.[2] The first core requirement is that the determination follows a "top-down" approach. The second core requirement is that the selection of a particular control system as BACT must be justified in terms of the statutory criteria, be supported by the permit record, and explain the basis for the rejection of other more stringent candidate control systems.

Suggested procedures for performing a top-down BACT analysis are set forth in EPA's Draft New Source Review Workshop Manual ("Manual"), dated October 1990. One critical step in the BACT analysis is to determine if a control option is technically feasible.[3] If a control is determined to be infeasible, it is eliminated from further

[2] The discussion of the core requirements is taken from the Preamble to the Proposed NSR Reform, 61 FR38272.

[3] Discussion on technical feasibility is taken from the PSD Final Determination for AES Londonderry, L.L. C., Rockingham County, New Hampshire. The PSD Final Determination was written by the U.S. EPA Region I, Air Permits Program.

consideration. The Manual applies several criteria for determining technical feasibility. The first is straightforward. If the control has been installed and operated by the type of source under review, it is demonstrated and technically feasible.

For controls not demonstrated using this straightforward approach, the Manual applies a more complex approach that involves two concepts for determining technical feasibility: availability and applicability. A technology is considered available if it can be obtained through commercial channels. An available control is applicable if it can be reasonably installed and operated on the source type under consideration. A technology that is available and applicable is considered technically feasible.

The Manual also requires available technologies to be applicable to the source type under consideration before a control is considered technically feasible. For example, deployment of the control technology on the existing source with similar gas stream characteristics is generally a sufficient basis for concluding technical feasibility. However, even in this instance, the Manual would allow an applicant to make a demonstration to the contrary. For example, the applicant could show that unresolved technical difficulties with applying a control to the source under consideration (e.g., because of size of the unit, location of the proposed site and operating problems related to the specific circumstances of the source) make a control technically infeasible.

5.2 Summary of Emission Units Subject to BACT

40 CFR Part 52.21(j) requires an application of BACT for each regulated NSR pollutant for which it would result in a significant net emissions increase at the source undergoing a major modification. This requirement applies to each proposed emissions unit at which a net emissions increase in the pollutant would occur as a result of a physical change or change in the method of operation in the unit. Table 5.2-1, below, displays the NSR pollutants for which a BACT analysis is required.

Table 5.2-1: BACT Applicability Summary

Regulated NSR Pollutants	Facility-wide Potential to Emit (tpy)	PSD Major Source Threshold (tpy)	PSD Significance Threshold (tpy)	BACT Applicable?
Nitrogen Oxide	23.6	250	40	No
Carbon Monoxide	19.8	250	100	No
Sulfur Dioxide	0.14	250	40	No
Particulate Matter (PM) / Particulate Matter (PM_{10}) / Particulate Matter ($PM_{2.5}$)	1.98/1.98/1.98	250	25 / 15 / 10	No / No / No
Ozone (VOCs)	654.0	250	40	Yes
Greenhouse gases (as CO_2e)	28,436	100,000	75,000	No

As seen in Table 5.2-1, a VOC BACT analysis is necessary for all emission units with the potential to emit VOC.

5.3 Summary of Top-Down BACT Analysis: Paint Booths (PB10, PB11, PB27-31)

Table 5.3-1 summarizes the BACT analysis conducted, and proposed BACT findings for the paint booths at the facility. The conclusions presented in the table below take into account the use of each control device with and without the use of a rotor concentrator.

Table 5.3-1: Summary of BACT Analysis and Findings- Paint Booths (PB10, PB11, PB27-31)

Pollutant	Technologies Evaluated	Proposed BACT	Reference
VOC	Carbon Adsorption	Work Practice Standards in addition to annual VOC emission limits for each booth (See Table 5.3-2)	Attachment C
	Regenerative Thermal Oxidation		
	Catalytic Oxidation		
	Biofiltration		
	Low-VOC Materials		

Table 5.3-2, below, summarizes VOC emission limits determined as BACT for each paint booth.

Table 5.3-2: Proposed Federally Enforceable Limits to Implement Requirements of §52.21(j)(2)

Emission Point ID	Emission Unit Description	Pollutant	Emission Limit
PB10	All American Touchup Booth	VOC	22.0
PB11	Overflow Paint Booth	VOC	35.7
PB27	Undercoat Booth	VOC	101.0
PB28	Black and Primer Paint Booth	VOC	200.0
PB29	Yellow Paint Booth	VOC	150.0
PB30	BBCV Touchup Booth	VOC	49.0
PB31	White Paint booth	VOC	95.0

5.4 Summary of Top-Down BACT Analysis: Paint Baking Ovens (BO06 - BO09)

Table 5.4-1, summarizes the BACT analysis conducted, and proposed BACT findings for paint bake ovens at the facility.

Table 5.4-1: Summary of BACT Analysis and Findings- Combustion Units (BO06-BO09 and HF01-HF03)

Pollutant	Technologies Evaluated	Proposed BACT	Reference
VOC	Carbon Adsorption	Good Combustion practices and exclusive use of natural gas	Attachment C
	Regenerative Thermal Oxidation		
	Catalytic Oxidation		
	Biofiltration		
	Good Combustion Practices		

6.0 AIR QUALITY ANALYSIS

Blue Bird Body Company located in a Class II Air Quality area that is in attainment for all National Ambient Air Quality Standards (NAAQS) as demonstrated by Georgia EPD's ambient air quality monitoring program. The proposed relaxation of the PSD avoidance limits will result in potential emissions greater than 250 tpy, therefore, per

§52.21(k), an analysis must be performed that demonstrates that the facility will not violate the NAAQS for ground level ozone (8-hour standard).

6.1 Requirements

Under certain atmospheric conditions in the presence of elevated concentrations of VOC, tropospheric ozone can be generated. Therefore, VOC is treated as an ozone precursor and is regulated as a criteria pollutant. The potential emissions increase from the proposed relaxation of the PSD avoidance limits at Blue Bird Body Company is approximately 654 tpy of VOCs, and thus triggers the need to conduct an analysis on the potential impacts of these emissions. The main purpose of the air quality analysis is to demonstrate that the VOC emissions from Blue Bird Body Company, in conjunction with other applicable emissions from existing sources, will not cause or contribute to a violation of any applicable National Ambient Air Quality Standard (NAAQS) or PSD increment in a Class II or Class I area. NAAQS exist for NO_2, CO, PM_{10}, $PM_{2.5}$, SO_2, Ozone (O_3), and lead (Pb).

Ozone is unique relative to other criteria pollutants (e.g CO, NO_2, SO_2, and PM) in that the USEPA has not established a modeling protocol or significance level (e.g ppm or ug/m^3), but has set a 100 tpy de minimis level as a trigger for an impact analysis. However, the photochemistry underlying the generation of ground-level ozone is complex and not always well defined. Consequently, USEPA has not established a dispersion model which is capable of accurately predicting ozone concentrations resulting from VOC emissions. Thus, it has been Georgia EPD's policy (as well as other states) not to require PSD air dispersion modeling for VOCs. In lieu of this, an analysis of VOCs on ground level ozone concentrations has been assessed based upon existing ambient ozone monitoring data in relation to the relative increases of VOC emissions that have occurred from the major sources in the area. An air quality analysis has been performed for the facility-wide toxic air pollutant (TAP) emissions.

6.2 Ozone (as VOC) Analysis (40 CFR 52.21(k) and 52.21(m))

As a part of PSD review, the facility must analyze the existing ambient air quality as well as the potential impacts the modifications included in this application present to regional air quality with regard to VOC per §52.21(k) and §52.21(m). Georgia EPD has operated continuous ozone monitoring equipment in Macon, Georgia for several years. The monitoring site is located in Bibb County and is the primary ozone monitor for the surrounding area. Table 6.2 -1 shows the fourth highest eight-hour ozone concentrations for the past three years as compiled from Georgia EPD records. The NAAQS for ozone is 0.075 ppmv as averaged over an eight-hour period. The air quality design value for the 8-hour ozone NAAQS is the three-year average of the annual fourth highest daily maximum 8-hour average ozone concentration. The 8-hour ozone NAAQS is not met when the 8-hour ozone design value is greater than 0.075 ppmv.

Table 6.2-1: Georgia EPD Monitored Eight-Hour Averaged Ozone Concentrations

Calendar Year	Three Year Average of Fourth Highest Daily Maximum Ozone Concentration (ppm$_v$)
2009	0.070
2010	0.071

Calendar Year	Three Year Average of Fourth Highest Daily Maximum Ozone Concentration (ppm_v)
2011	0.078
2011 Design Value	0.073

As shown, one of the fourth highest daily maximum 8-hour monitored ozone concentrations was in excess of 0.075 ppmv. However, the 2011 design value is 0.073, therefore, the potential for detrimental concentrations of ozone are minimal. Additionally Bibb County and its surrounding area (including Peach County) is considered to be an attainment area with regard to the 8-hr NAAQS for VOC.

The next step of the Ozone Impact Analysis involved an evaluation of the potential increase in ozone as a result of the emissions from the Blue Bird Body Company. For the purposes of this PSD submittal, the entire VOC emissions from the facility are evaluated.

It is generally accepted that NO_x is the limiting precursor in the formation of ground level ozone in the southeastern United States. The facility-wide potential to emit NO_x is 23.6 tpy, which is below the PSD significant threshold of 40 tpy, therefore, it is assumed that the effects of NO_x emissions on ground level ozone are minimal.

The facility-wide potential to emit VOC is 654 tpy. Biogenic sources such as forests and vegetation are known as substantial contributors of VOC emissions in the southeast. As the facility is located in Fort Valley, Georgia, which is surrounded with heavy vegetation, the background VOCs emissions resulting from biogenic emissions will be substantial. The biogenic precursors play a major role in the organic aerosol in the Southeastern United States[4]. Moreover, biogenic VOC in Georgia consist mainly of highly photochemically reactive species, such as turpenes, pinenes, and isoprenes.

Sensitivity analyses conducted for the Macon area as part of the Georgia Fall Line Air Quality Study indicates that VOC increases on the order of 50 to 70 tons per day would result in a 0.001 ppm increase of ozone (per the 8-hour standard). As the entire facility only has the potential to emit 2.68 tons per day of VOC, the increase in VOC emissions from the proposed relaxation of the PSD avoidance limits on the Blue Bird Body Company will not cause a violation of the NAAQS for ground level ozone or contribute to the deterioration of the ambient air in the vicinity of the facility (a $5.36*10^{-5}$ ppm increase in ozone).

Additionally, per page 3-11 of the Macon 8-hr Ozone Maintenance Plan, NO_x is considered to be the primary pollutant of concern with regard to ozone levels in the ambient air. Since the facility is a minor source of NO_x emissions, and potential impacts from facility-wide VOC emissions are not considered to significantly impact ambient ozone concentrations, facility-wide emissions are not expected to contravene any portion of the Macon 8-hr Ozone Maintenance Plan.

[4] Rodney J. Weber, Amy P. Sullivan, Richard E. Peltier, Armistead Russell, Bo Yan, Mei Zheng, Joost de Gouw, Carsten Warneke, Charles Brock, John S. Holloway, Elliot L. Atlas, and Eric Edgerton "A study of secondary organic aerosol formation in the anthropogenic-influenced southeastern United States" JOURNAL OF GEOPHYSICAL RESEARCH, VOL. 112. 2007

As Bibb County and the surrounding areas considered attainment with regard to the 8-hr VOC NAAQS, and facility-wide emissions will not contravene the Macon 8-hr Ozone Maintenance Plan, and potential facility-wide VOC emissions are not expected to increase ambient ozone concentrations, the proposed operating conditions contained in this permit application are considered to not be contribute to the deterioration of ambient air quality with regard to ozone.

6.3 Georgia Toxic Guidelines (Georgia Rule 391-3-1-.02(a)3(ii)

There are no applicable NAAQS or specific Georgia ambient air standards for the individual toxics emitted by the facility. The facility has the potential to emit a wide variety of TAPs due to the coatings used. Tables 1 and 2 of Attachment D provide a complete list of all TAPs with the potential to be emitted from facility operations. Impacts from each pollutant listed are analyzed using the EPD Guidance for Ambient Impact Assessment of Toxic Air Pollutant Emissions (referred to as the Georgia Air Toxics Guideline; Version June 21, 1998). The Georgia Air Toxics Guideline is a guide for estimating the environmental impact of sources of toxic air pollutants. A toxic air pollutant is defined as any substance which may have an adverse effect on public health, excluding any specific substance that is covered by a State or Federal ambient air quality standard. ISCST3 computer dispersion modeling was used to conservatively predict the maximum 15-minute, 24-hour average, or annual ground level concentration (referred to as MGLC) for each pollutant in question. Each MGLC is compared to its respective acceptable ambient concentration (referred to as AAC), the basis of which comes from the pollutant toxicity rating systems described in the Georgia Air Toxics Guideline.

As shown in Table 1.4-1 of Attachment D, the predicted MGLC for each applicable pollutant is below the Georgia EPD AACs, and the facility is considered to have passed Georgia's Toxic Guidelines. An in-depth discussion concerning assumptions and considerations made during the toxic impact assessment is also provided in Attachment D.

7.0 ADDITIONAL IMPACT ANALYSIS

Per §52.21(o), PSD applicants are required to conduct an analysis of the adverse impacts to visibility, soils and vegetation that would occur as a result of the project and from associated growth. The analysis need not address impacts to receptors sensitive to visibility impairment not located within the largest of the annual Ozone significant impact area (SIA), soils and vegetation having no significant commercial or recreational value, or growth associated with mobile source or temporary emissions.

7.1 Soils and Vegetation

In order to determine if any adverse impacts to soils or vegetation would occur as a result of the project, a screening procedure was used based on guidance provided by US EPA in *A Screening Procedure for the Impacts of Air Pollution Sources on Plants, Soils and Animals*, December 1980 (the Guidance). The Guidance lists pollutants which have both direct and indirect impacts on soils and vegetation. VOC, considered as Ozone, is considered to have a significant impact on sensitive vegetation at concentrations of 0.2

ppm (hourly average), 0.1 ppm (4-hr average), and 0.06 ppm (8-hr average). These thresholds represent the concentration at which 20% of sensitive species are injured. It should be noted that the 8-hr NAAQS for Ozone is 0.075 ppm.

Additionally, NO_x and SO_2 emissions can have a synergistic effect on ozone, however, the potential emission rates of these pollutants are considerably lower than the potential to emit VOC of the facility, and are not considered in this analysis due to the perceived minimal effect.

The Bibb County weather station is the ambient air monitoring station closest to Fort Valley Georgia that measures ozone. Of the 236 days measured in 2012, only 6 days had concentrations of ozone exceeding the 0.075 ppm NAAQS threshold. Additionally, per the Georgia Fall Line Study done in 2006, an increase of 50-70 tons/day of VOC emissions results in an average 0.001 ppm increase in Ozone concentration. As the site has the potential to emit 2.68 tons-VOC/day, it is not expected that the emissions from the site will have a negative impact on any soil or vegetation.

7.2 Visibility Impairment

For long-range visibility, given the projected emissions rate and the distance from any Class I area (over 100 km to Wolf Island and Cohutta), long range visibility impairment modeling is not warranted and has not been performed. As PSD review for ozone is triggered due to VOC emissions, and NO_x and particulate emissions (PM_{10} and $PM_{2.5}$) are deemed to be not a significant increase with regard to the PSD program, it is not expected that the increase in emissions as proposed in this application will result in any local visibility impairment.

7.3 Class I Area Impact Analysis (40 CFR 52.21(p))

Per §52.21(p), the facility must analyze the potential impacts to Class I Areas as a result of the increase in emissions. The facility is located approximately 275 km from the Cohutta I area and 275 km from the Wolf Island Class I area (these are the closest Class I areas to the facility). As the nearest Class I areas are over 100 km away from the facility, it is not expected that the increase in emissions as presented in this application would negatively effect any of these Class I areas.

7.4 Growth

The impacts of growth associated with a PSD project are referred to as secondary emissions. Secondary emissions are not emitted directly by the proposed project, but are indirectly associated with the operation of the facility. The growth analysis, if warranted, is intended to quantify the amount of new growth that is likely to occur in support of the facility and to estimate emissions resulting from that growth. Associated growth includes residential and commercial/industrial growth resulting from the facility but excludes temporary and mobile source emissions.

Commercial, residential, and industrial growth will not result from the plant expansion as new jobs are expected to be filled by current residents of Fort Valley, Georgia. Therefore, the effects to ambient air quality due to growth associated with this source are expected to be insignificant.

8.0 Proposed Permit Language/Conclusion

Blue Bird Body Company respectfully requests that its current VOC PSD avoidance limits be relaxed. The facility believes it has demonstrated compliance with Georgia's Toxic Air Regulations, that the increase in VOC emissions will not contribute to the deterioration of the ambient air surrounding the facility, and that end of pipe pollution control devices are not feasible for controlling VOC emissions from this plant.

The facility has provided proposed permit language included as Attachment F of this application. Included in the language are VOC emission limits for each paint booth.

Attachment A

Georgia EPD Forms

State of Georgia
Department of Natural Resources
Environmental Protection Division
Air Protection Branch

Stationary Source Permitting Program
4244 International Parkway, Suite 120
Atlanta, Georgia 30354
404/363-7000
Fax: 404/363-7100

SIP AIR PERMIT APPLICATION

EPD Use Only

Date Received: ____________ Application No. ____________

FORM 1.00: GENERAL INFORMATION

1. Facility Information

Facility Name: Blue Bird Body Company

AIRS No. (if known): 04-13- 225 – 00001

Facility Location: Street: 402 Blue Bird Boulevard

City: Fort Valley Georgia Zip: 31030 County: Peach

Is this facility a "small business" as defined in the instructions? Yes: ☐ No: ☒

2. Facility Coordinates

Latitude: 32° 33' 38" **NORTH** Longitude: 83° 52' 45" **WEST**

UTM Coordinates: ________ **EAST** ________ **NORTH** **ZONE** ________

3. Facility Owner

Name of Owner: School Bus Holdings, Inc

Owner Address Street: 402 Blue Bird Boulevard

City: Fort Valley State: Georgia Zip: 31030

4. Permitting Contact and Mailing Address

Contact Person: Robert Watts Title: Director of Environmental, Health & Safety

Telephone No.: (478)-542-1158 Ext. ________ Fax No.: ________

Email Address: Robert.Watts@Blue-Bird.com

Mailing Address: Same as: Facility Location: ☒ Owner Address: ☐ Other: ☐

If Other: Street Address: ________

City: ________ State: ________ Zip: ________

5. Authorized Official

Name: Dave Whelan Title: Senior Vice President of Manufacturing and Quality

Address of Official Street: 402 Blue Bird Boulevard

City: Fort Valley State: Georgia Zip: 31030

This application is submitted in accordance with the provisions of the Georgia Rules for Air Quality Control and, to the best of my knowledge, is complete and correct.

Signature: ________ Date: 8-6-13

6. **Reason for Application: (Check all that apply)**

☐ New Facility (to be constructed)

☒ Existing Facility (initial or modification application)

☐ Permit to Construct

☐ Permit to Operate

☐ Change of Location

☐ Permit to Modify Existing Equipment: Affected Permit No.: ______

☐ Revision of Data Submitted in an Earlier Application

Application No.: ______

Date of Original Submittal: ______

7. **Permitting Exemption Activities (for permitted facilities only):**

Have any exempt modifications based on emission level per Georgia Rule 391-3-1-.03(6)(i)(3) been performed at the facility that have not been previously incorporated in a permit?

☒ **No** ☐ **Yes, please fill out the SIP Exemption Attachment** (See Instructions for the attachment download)

8. **Has assistance been provided to you for any part of this application?**

☐ **No** ☐ **Yes, SBAP** ☒ **Yes, a consultant has been employed or will be employed.**

If yes, please provide the following information:

Name of Consulting Company: Smith Aldridge, Inc.

Name of Contact: Matthew Page

Telephone No.: 404-255-0928 ext. 115 Fax No.: 404-255-0948

Email Address: mpage@smithaldridge.com

Mailing Address: Street: 6000 Lake Forrest Drive, Suite 385

City: Atlanta State: Georgia Zip: 30328

Describe the Consultant's Involvement:

Preparation of permit application

9. **Submitted Application Forms:** Select only the necessary forms for the facility application that will be submitted.

No. of Forms	Form
1	2.00 Emission Unit List
1	2.01 Boilers and Fuel Burning Equipment
	2.02 Storage Tank Physical Data
	2.03 Printing Operations
1	2.04 Surface Coating Operations
	2.05 Waste Incinerators (solid/liquid waste destruction)
1	2.06 Manufacturing and Operational Data
	3.00 Air Pollution Control Devices (APCD)
	3.01 Scrubbers
	3.02 Baghouses & Other Filter Collectors
	3.03 Electrostatic Precipitators
3	4.00 Emissions Data
1	5.00 Monitoring Information
	6.00 Fugitive Emission Sources
1	7.00 Air Modeling Information

10. **Construction or Modification Date**

Estimated Start Date: N/A

11. If confidential information is being submitted in this application, were the guidelines followed in the "Procedures for Requesting that Submitted Information be treated as Confidential"?

☐ No ☐ Yes

12. New Facility Emissions Summary

Criteria Pollutant	New Facility	
	Potential (tpy)	Actual (tpy)
Carbon monoxide (CO)		
Nitrogen oxides (NOx)		
Particulate Matter (PM) (filterable only)		
PM <10 microns (PM10)		
PM <2.5 microns (PM2.5)		
Sulfur dioxide (SO_2)		
Volatile Organic Compounds (VOC)		
Greenhouse Gases (GHGs) (in CO2e)		
Total Hazardous Air Pollutants (HAPs)		
Individual HAPs Listed Below:		

13. Existing Facility Emissions Summary

Criteria Pollutant	Current Facility		After Modification	
	Potential (tpy)	Actual (tpy)	Potential (tpy)	Actual (tpy)
Carbon monoxide (CO)	19.8		19.8	
Nitrogen oxides (NOx)	23.6		23.6	
Particulate Matter (PM) (filterable only)	1.98		1.98	
PM <10 microns (PM10)	1.98		1.98	
PM <2.5 microns (PM2.5)	1.98		1.98	
Sulfur dioxide (SO_2)	0.141		0.141	
Volatile Organic Compounds (VOC)	<249		654	
Greenhouse Gases (GHGs) (in CO2e)	28,436		28,436	
Total Hazardous Air Pollutants (HAPs)	620		852.7	
Individual HAPs Listed Below:				

14. 4-Digit Facility Identification Code:

SIC Code: 3713 SIC Description: Truck and Bus Bodies

NAICS Code: ______ NAICS Description: ______

15. Description of general production process and operation for which a permit is being requested. If necessary, attach additional sheets to give an adequate description. Include layout drawings, as necessary, to describe each process. References should be made to source codes used in the application.

Blue Bird Body Company specializes in the fabrication and assembly of bus chassis and complete school and shuttle buses. Production processes at the facility include material and parts receiving and handling, chassis manufacturing, assembly of wheels, axles, and engines onto the chassis, shell fabrication and installation, paint application and drying, and trimming/finishing.

16. Additional information provided in attachments as listed below:

Attachment A - SIP Forms

Attachment B - Emission Calculations

Attachment C - BACT Analysis

Attachment D - Toxics Modeling

Attachment E - Facility Maps and Process Flow Diagram

Attachment F - Proposed Permit Language

Attachment G - Electronic Files

Attachment H - MSDS of Coatings and Cleaners Used

Attachment I - Title V Certification

17. Additional Information: Unless previously submitted, include the following two items:

☒ Plot plan/map of facility location or date of previous submittal: ______

☒ Flow Diagram or date of previous submittal: ______

18. Other Environmental Permitting Needs:

Will this facility/modification trigger the need for environmental permits/approvals (other than air) such as Hazardous Waste Generation, Solid Waste Handling, Water withdrawal, water discharge, SWPPP, mining, landfill, etc.?

☒ **No** ☐ **Yes, please list below:**

Facility Name: Blue Bird Body Company **Date of Application:** August 2013

FORM 2.00 – EMISSION UNIT LIST

Emission Unit ID	Name	Manufacturer and Model Number	Description
BO06	Black and Primer Bake Oven	Unknown	Natural gas-fired oven used to dry painted buses/bus parts
BO07	Yellow Booth Bake Oven	Unknown	Natural gas-fired oven used to dry painted buses/bus parts
BO08	White Booth Bake Oven 1	Annadale Finishing System - 945-000	Natural gas-fired oven used to dry painted buses/bus parts
BO09	White Booth Bake Oven 2	Annadale Finishing System - 300	Natural gas-fired oven used to dry painted buses/bus parts
PB10	All American Touchup Booth	Unknown	Paint Booth
PB11	Overflow Paint Booth	Unknown	Paint Booth
PB27	Undercoat Booth	JBI	Paint booth used to apply undercoating material underneath buses/coached
PB28	Black and Primer Paint Booth	JBI	Trim and primer paint booth
PB29	Yellow Paint Booth	JBI	Booth for external painting operations
PB30	BBCV Touch Up Booth	Annadale Finishing System - Customs	Paint Booth
PB31	White Paint Booth	Unknown	Paint Booth

Facility Name: Blue Bird Body Company **Date of Application:** August 2013

FORM 2.01 – BOILERS AND FUEL BURNING EQUIPMENT

Emission Unit ID	Type of Burner	Type of Draft[1]	Design Capacity of Unit (MMBtu/hr Input)	Percent Excess Air	Dates		Date & Description of Last Modification
					Construction	Installation	
BO06	Direct		10		Post 1983	2003	N/A
BO07	Direct		10		Post 1983	2003	N/A
BO08	Direct		10		1998	2010	N/A
BO09	Direct		10		1998	2010	N/A

[1] This column does not have to be completed for natural gas only fired equipment.

Facility Name: Blue Bird Body Company **Date of Application:** June 2013

FUEL DATA

Emission Unit ID	Fuel Type	Potential Annual Consumption				Hourly Consumption		Heat Content		Percent Sulfur		Percent Ash in Solid Fuel	
		Total Quantity		Percent Use by Season									
		Amount	Units	Ozone Season May 1 - Sept 30	Non-ozone Season Oct 1 - Apr 30	Max.	Avg.	Min.	Avg.	Max.	Avg.	Max.	Avg.
BO06	Natural Gas	86	MMscf	50	50	9804 scf	9804 scf	1020 btu/scf	1020 btu/scf	0	0	0	0
BO07	Natural Gas	86	MMscf	50	50	9804 scf	9804 scf	1020 btu/scf	1020 btu/scf	0	0	0	0
BO08	Natural Gas	86	MMscf	50	50	9804 scf	9804 scf	1020 btu/scf	1020 btu/scf	0	0	0	0
BO09	Natural Gas	86	MMscf	50	50	9804 scf	9804 scf	1020 btu/scf	1020 btu/scf	0	0	0	0

Fuel Supplier Information

Fuel Type	Name of Supplier	Phone Number	Supplier Location			
			Address	City	State	Zip

Facility Name: Blue Bird Body Company **Date of Application:** August 2013

FORM 2.04 – SURFACE COATING OPERATIONS

Emission Unit ID	Emission Unit Name	Construction Date	Type of Coating Operation[1]	Item(s) Coated	Normal Operating Hours	Coating Method	VOC Potential to Emit (tons/yr)	VOC Max Actual Emissions (lb/day)
PB10	All American Touchup Booth	1996	L	Buses/Bus Parts	8760	Spray Booth	22.0	382
PB11	Overflow Paint Booth	Pre 1983	L	Buses/Bus Parts	8760	Spray Booth	35.7	196
PB27	Undercoat Booth	2003	L	Buses/Bus Parts	8760	Spray Booth	101.0	553.4
PB28	Black and Primer Paint Booth	2003	L	Buses/Bus Parts	8760	Spray Booth	200.0	1,863
PB29	Yellow Paint Booth	2003	L	Buses/Bus Parts	8760	Spray Booth	150	882
PB30	BBCV Touch Up Booth	1998	L	Buses/Bus Parts	8760	Spray Booth	49.0	382
PB31	White Paint Booth	Unknown	L	Buses/Bus Parts	8760	Spray Booth	95.0	1,962

[1] Indicate type of coating operation using the appropriate letter code from below:

A – Can Coating
B – Fabric and Vinyl Coating
C – Wire Coating
D – Pressure Sensitive Tape & label Surface Coating
E – Coil Coating
F – Metal Furniture Coating
G – Wood Furniture Coating
H – Magnetic Tape Coating
I – Polymeric Coating of Supporting Substrate
J – Paper Coating
K – Large Appliance Surface Coating
L – Misc. Metal Parts & Products Coating
M – Plastic Parts for Business Machines Coating
N – Automobile & Light Truck Manufacturing
O – Other (describe equipment coated under "Items Coated")

Facility Name: Blue Bird Body Company **Date of Application:** August 2013

FORM 2.06 – MANUFACTURING AND OPERATIONAL DATA

Normal Operating Schedule: 24 hours/day 7 days/week 52 weeks/yr

Additional Data Attached? ☒ - No ☐ - Yes, please include the attachment in list on Form 1.00, Item 16.

Seasonal and/or Peak Operating Periods: N/A

Dates of Annually Occurring Shutdowns: N/A

PRODUCTION INPUT FACTORS

Emission Unit ID	Emission Unit Name	Const. Date	Input Raw Material(s)	Annual Input	Hourly Process Input Rate		
					Design	Normal	Maximum
BO06	Black and Primer Bake Oven	Post 1983	Buses	20,000 units	6	6	6
BO07	Yellow Booth Bake Oven	Post 1983	Buses	20,000 units	6	6	6
BO08	White Booth Bake Oven 1	1998	Buses	20,000 units	6	6	6
BO09	White Booth Bake Oven 2	1998	Buses	20,000 units	6	6	6
PB10	All American Touchup Booth	1996	Buses	20,000 units	4	4	4
PB11	Overflow Paint Booth	Pre 1983	Buses	20,000 units	6	6	6
PB27	Undercoat Booth	2003	Buses	20,000 units	6	6	6
PB28	Black and Primer Paint Booth	2003	Buses	20,000 units	6	6	6
PB29	Yellow Paint Booth	2003	Buses	20,000 units	6	6	6
PB30	BBCV Touch Up Booth	1998	Buses	20,000 units	4	4	4
PB31	White Paint Booth	Unknown	Buses	20,000 units	6	6	6

PRODUCTS OF MANUFACTURING

Emission Unit ID	Description of Product	Production Schedule		Hourly Production Rate (Give units: e.g. lb/hr, ton/hr)			
		Units/yr	Hr/yr	Design	Normal	Maximum	Units
BO06	Black and Primer Bake Oven	20,000	8,760	6	6	6	Units/hr
BO07	Yellow Booth Bake Oven	20,000	8,760	6	6	6	Units/hr
BO08	White Booth Bake Oven 1	20,000	8,760	6	6	6	Units/hr
BO09	White Booth Bake Oven 2	20,000	8,760	6	6	6	Units/hr
PB10	All American Touchup Booth	20,000	8,760	4	4	4	Units/hr
PB11	Overflow Paint Booth	20,000	8,760	6	6	6	Units/hr
PB27	Undercoat Booth	20,000	8,760	6	6	6	Units/hr
PB28	Black and Primer Paint Booth	20,000	8,760	6	6	6	Units/hr
PB29	Yellow Paint Booth	20,000	8,760	6	6	6	Units/hr
PB30	BBCV Touch Up Booth	20,000	8,760	6	6	6	Units/hr
PB31	White Paint Booth	20,000	8,760	4	4	4	Units/hr

Facility Name: Blue Bird Body Company **Date of Application:** August 2013

Form 3.00 – AIR POLLUTION CONTROL DEVICES - PART A: GENERAL EQUIPMENT INFORMATION

APCD Unit ID	Emission Unit ID	APCD Type (Baghouse, ESP, Scrubber etc)	Date Installed	Make & Model Number (Attach Mfg. Specifications & Literature)	Unit Modified from Mfg Specifications?	Gas Temp. °F		Inlet Gas Flow Rate (acfm)
						Inlet	Outlet	
PF10	PB10	Filter	1996	Unknown	No	N/A	N/A	N/A
PF11	PB11	Filter	Pre 1983	Unknown	No	N/A	N/A	N/A
PF28	PB28	Filter	2003	Unknown	No	N/A	N/A	N/A
PF29	PB29	Filter	2003	Unknown	No	N/A	N/A	N/A
PF30	PB30	Filter	2009	Unknown	No	N/A	N/A	N/A
PF31	PB31	Filter	Unknown	Unknown	No	N/A	N/A	N/A

Facility Name: Blue Bird Body Company **Date of Application:** June 2013

Form 3.00 – AIR POLLUTION CONTROL DEVICES – PART B: EMISSION INFORMATION

APCD Unit ID	Pollutants Controlled	Percent Control Efficiency		Inlet Stream To APCD		Exit Stream From APCD		Pressure Drop Across Unit (Inches of water)
		Design	Actual	lb/hr	Method of Determination	lb/hr	Method of Determination	
PF10	PM	99	99	20	Mass Balance	0.020	Mass Balance	1
PF11	PM	99	99	12	Mass Balance	0.012	Mass Balance	1
PF28	PM	99	99	47	Mass Balance	0.047	Mass Balance	1
PF29	PM	99	99	41	Mass Balance	0.041	Mass Balance	1
PF30	PM	99	99	20	Mass Balance	0.020	Mass Balance	1
PF31	PM	99	99	51	Mass Balance	0.051	Mass Balance	1

Facility Name: Blue Bird Body Company **Date of Application:** August 2013

FORM 3.02 – BAGHOUSES & OTHER FILTER COLLECTORS

APCD ID	**Filter Surface Area** (ft^2)	**No. of Bags**	**Inlet Gas Dew Point Temp.** (°F)	**Inlet Gas Temp.** (°F)	**Bag or Filter Material**	**Pressure Drop** (inches of water)	**Cleaning Method**	**Gas Cooling Method**	**Leak Detection System Type**
PF10	1360	N/A	N/A	N/A	Polyester	1	Filter Replacement	N/A	Daily Pressure Drop Monitoring
PF11	1360	N/A	N/A	N/A	Polyester	1	Filter Replacement	N/A	Daily Pressure Drop Monitoring
PF28	1360	N/A	N/A	N/A	Polyester	1	Filter Replacement	N/A	Daily Pressure Drop Monitoring
PF29	1360	N/A	N/A	N/A	Polyester	1	Filter Replacement	N/A	Daily Pressure Drop Monitoring
PF30	1360	N/A	N/A	N/A	Polyester	1	Filter Replacement	N/A	Daily Pressure Drop Monitoring
PF31	1360	N/A	N/A	N/A	Polyester	1	Filter Replacement	N/A	Daily Pressure Drop Monitoring

Attach a physical description, dimensions and drawings for each baghouse and any additional information available such as particle size, maintenance schedules, monitoring procedures and breakdown/by-pass procedures. Explain how collected material is disposed of or utilized. Include the attachment in the list on Form 1.00 *General Information*, Item 16

Facility Name: Blue Bird Body Company **Date of Application:** August 2013

FORM 4.00 – EMISSION INFORMATION

Emission Unit ID	Air Pollution Control Device ID	Stack ID	Pollutant Emitted	Emission Rates				
				Hourly Actual Emissions (lb/hr)	Hourly Potential Emissions (lb/hr)	Actual Annual Emission (tpy)	Potential Annual Emission (tpy)	Method of Determination
BO06	N/A	B006/B016	NO_x		0.979		4.29	AP-42, Chapter 1.4
BO06	N/A	B006/B016	CO		0.824		3.61	AP-42, Chapter 1.4
BO06	N/A	B006/B016	SO_2		0.006		0.026	AP-42, Chapter 1.4
BO06	N/A	B006/B016	PM		0.074		0.326	AP-42, Chapter 1.4
BO06	N/A	B006/B016	VOC		0.054		0.236	AP-42, Chapter 1.4
BO06	N/A	B006/B016	Total HAP		0.018		0.081	AP-42, Chapter 1.4
BO06	N/A	B006/B016	Largest HAP (hexane)		0.018		0.077	AP-42, Chapter 1.4
BO06	N/A	B006/B016	GHG (toy CO_2e)		1,184		5,184	AP-42, Chapter 1.4
BO07	N/A	B007/B017	NO_x		0.979		4.29	AP-42, Chapter 1.4
BO07	N/A	B007/B017	CO		0.824		3.61	AP-42, Chapter 1.4
BO07	N/A	B007/B017	SO_2		0.006		0.026	AP-42, Chapter 1.4
BO07	N/A	B007/B017	PM		0.074		0.326	AP-42, Chapter 1.4
BO07	N/A	B007/B017	VOC		0.054		0.236	AP-42, Chapter 1.4
BO07	N/A	B007/B017	Total HAP		0.018		0.081	AP-42, Chapter 1.4
BO07	N/A	B007/B017	Largest HAP (hexane)		0.018		0.077	AP-42, Chapter 1.4
BO07	N/A	B007/B017	GHG (toy CO_2e)		1,184		5,184	AP-42, Chapter 1.4
BO08	N/A	B008/B018	NO_x		0.979		4.29	AP-42, Chapter 1.4
BO08	N/A	B008/B018	CO		0.824		3.61	AP-42, Chapter 1.4
BO08	N/A	B008/B018	SO_2		0.006		0.026	AP-42, Chapter 1.4
BO08	N/A	B008/B018	PM		0.074		0.326	AP-42, Chapter 1.4
BO08	N/A	B008/B018	VOC		0.054		0.236	AP-42, Chapter 1.4

Emission Unit ID	Air Pollution Control Device ID	Stack ID	Pollutant Emitted	Emission Rates				
				Hourly Actual Emissions (lb/hr)	Hourly Potential Emissions (lb/hr)	Actual Annual Emission (tpy)	Potential Annual Emission (tpy)	Method of Determination
BO08	N/A	B008/B018	Total HAP		0.018		0.081	AP-42, Chapter 1.4
BO08	N/A	B008/B018	Largest HAP (hexane)		0.018		0.077	AP-42, Chapter 1.4
BO08	N/A	B008/B018	GHG (toy CO_2e)		1,184		5,184	AP-42, Chapter 1.4
BO09	N/A	B009/B019	NO_x		0.979		4.29	AP-42, Chapter 1.4
BO09	N/A	B009/B019	CO		0.824		3.61	AP-42, Chapter 1.4
BO09	N/A	B009/B019	SO_2		0.006		0.026	AP-42, Chapter 1.4
BO09	N/A	B009/B019	PM		0.074		0.326	AP-42, Chapter 1.4
BO09	N/A	B009/B019	VOC		0.054		0.236	AP-42, Chapter 1.4
BO09	N/A	B009/B019	Total HAP		0.018		0.081	AP-42, Chapter 1.4
BO09	N/A	B009/B019	Largest HAP (hexane)		0.018		0.077	AP-42, Chapter 1.4
BO09	N/A	B009/B019	GHG (toy CO_2e)		1,184		5,184	AP-42, Chapter 1.4
PB10	PF10	TU01-04	PM		0.005		0.020	Mass Balance
PB10	PF10	TU01-04	VOC		15.9		22.0	Mass Balance
PB10	PF10	TU01-04	Total HAP		5.63		24.7	Mass Balance
PB10	PF10	TU01-04	Largest HAP (xylene)		4.74		20.8	Mass Balance
PB11	PF11	TU05-08	PM		0.003		0.012	Mass Balance
PB11	PF11	TU05-08	VOC		8.15		35.7	Mass Balance
PB11	PF11	TU05-08	Total HAP		3.36		14.7	Mass Balance
PB11	PF11	TU05-08	Largest HAP (xylene)		2.84		12.4	Mass Balance
PB27	N/A	UC01-04	VOC		23.06		101.0	Mass Balance
PB27	N/A	UC01-04	Total HAP		0.0		0.0	Mass Balance
PB27	N/A	UC01-04	Largest HAP		0.0		0.0	Mass Balance
PB28	PF28	BP01-04	PM		0.011		0.047	Mass Balance
PB28	PF28	BP01-04	VOC		74.2		200.0	Mass Balance

Emission Unit ID	Air Pollution Control Device ID	Stack ID	Pollutant Emitted	Emission Rates				
				Hourly Actual Emissions (lb/hr)	Hourly Potential Emissions (lb/hr)	Actual Annual Emission (tpy)	Potential Annual Emission (tpy)	Method of Determination
PB28	PF28	BP01-04	Total HAP		21.3		2.0	Mass Balance
PB28	PF28	BP01-04	Largest HAP (xylene)		0.3		1.2	Mass Balance
PB29	PF29	YB01-04	PM		0.009		0.041	Mass Balance
PB29	PF29	YB01-04	VOC		35.7		150.0	Mass Balance
PB29	PF29	YB01-04	Total HAP		0.14		0.6	Mass Balance
PB29	PF29	YB01-04	Largest HAP (xylene)		0.09		0.4	Mass Balance
PB30	PF30	BB01-04	PM		0.005		0.020	Mass Balance
PB30	PF30	BB01-04	VOC		15.9		49.0	Mass Balance
PB30	PF30	BB01-04	Total HAP		5.63		24.7	Mass Balance
PB30	PF30	BB01-04	Largest HAP (xylene)		4.74		20.8	Mass Balance
PB31	PF31	WB01-04	PM		0.012		0.051	Mass Balance
PB31	PF31	WB01-04	VOC		50.1		95.0	Mass Balance
PB31	PF31	WB01-04	Total HAP		18.8		82.0	Mass Balance
PB31	PF31	WB01-04	Largest HAP (xylene)		12.6		55.0	Mass Balance

Facility Name: Blue Bird Body Company **Date of Application:** August 2013

FORM 5.00 MONITORING INFORMATION

Emission Unit ID/ APCD ID	Emission Unit/APCD Name	Monitored Parameter		Monitoring Frequency
		Parameter	Units	
PF10	All American Touch Up Booth Dry Paint Filter	Pressure Drop	in. water	Once per Shift
PF11	Overflow Paint Booth Dry Paint Filter	Pressure Drop	in. water	Once per Shift
PF28	Black and Primer Paint Booth Dry Paint Filter	Pressure Drop	in. water	Once per Shift
PF29	Yellow Paint Booth Dry Paint Filter	Pressure Drop	in. water	Once per Shift
PF30	BBCV Touch Up Booth Dry Paint Filter	Pressure Drop	in. water	Once per Shift
PF31	White Paint Booth Dry Paint Filter	Pressure Drop	in. water	Once per Shift

Comments:

Facility Name: Blue Bird Body Company **Date of Application:** August 2013

FORM 7.00 – AIR MODELING INFORMATION: Stack Data

Stack ID	Emission Unit ID(s)	Stack Information			Dimensions of largest Structure Near Stack		Exit Gas Conditions at Maximum Emission Rate			
		Height Above Grade (ft)	Inside Diameter (ft)	Exhaust Direction	Height (ft)	Longest Side (ft)	Velocity (ft/sec)	Temperature (°F)	Flow Rate (acfm) Average	Flow Rate (acfm) Maximum
TU01	PB10	40	4	Towards the sky	N/A	N/A	0.313	77	12000	12000
TU02	PB10	40	4	Towards the sky	N/A	N/A	0.313	77	12000	12000
TU03	PB10	40	4	Towards the sky	N/A	N/A	0.313	77	12000	12000
TU04	PB10	40	4	Towards the sky	N/A	N/A	0.313	77	12000	12000
TU05	PB11	24	4	Horizontal	N/A	N/A	0.001	77	96000	96000
TU06	PB11	24	4	Horizontal	N/A	N/A	0.001	77	96000	96000
TU07	PB11	24	4	Horizontal	N/A	N/A	0.001	77	96000	96000
TU08	PB11	24	4	Horizontal	N/A	N/A	0.001	77	96000	96000
UC01	PB27	35	4	Towards the sky	N/A	N/A	0.863	77	29000	29000
UC02	PB27	35	4	Towards the sky	N/A	N/A	0.863	77	29000	29000
UC03	PB27	35	4	Towards the sky	N/A	N/A	0.863	77	29000	29000
UC04	PB27	35	4	Towards the sky	N/A	N/A	0.863	77	29000	29000
BP01	PB28	35	4	Towards the sky	N/A	N/A	2.86	77	96000	96000

NOTE: If emissions are not vented through a stack, describe point of discharge below and, if necessary, include an attachment. List the attachment in Form 1.00 *General Information*, Item 16.

Facility Name: Blue Bird Body Company **Date of Application:** August 2013

FORM 7.00 – AIR MODELING INFORMATION: Stack Data

Stack ID	Emission Unit ID(s)	Stack Information			Dimensions of largest Structure Near Stack		Exit Gas Conditions at Maximum Emission Rate			
		Height Above Grade (ft)	Inside Diameter (ft)	Exhaust Direction	Height (ft)	Longest Side (ft)	Velocity (ft/sec)	Temperature (°F)	Flow Rate (acfm) Average	Flow Rate (acfm) Maximum
BP02	PB28	35	4	Towards the sky	N/A	N/A	2.86	77	96000	96000
BP03	PB28	35	4	Towards the sky	N/A	N/A	2.86	77	96000	96000
BP04	PB28	35	4	Towards the sky	N/A	N/A	2.86	77	96000	96000
YB01	PB29	35	4	Towards the sky	N/A	N/A	2.86	77	96000	96000
YB02	PB29	35	4	Towards the sky	N/A	N/A	2.86	77	96000	96000
YB03	PB29	35	4	Towards the sky	N/A	N/A	2.86	77	96000	96000
YB04	PB29	35	4	Towards the sky	N/A	N/A	2.86	77	96000	96000
BB01	PB30	25	4	Towards the sky	N/A	N/A	0.799	77	18410	18410
BB02	PB30	25	4	Towards the sky	N/A	N/A	0.799	77	18410	18410
BB03	PB30	25	4	Towards the sky	N/A	N/A	0.799	77	18410	18410
BB04	PB30	25	4	Towards the sky	N/A	N/A	0.799	77	18410	18410
WB01	PB31	25	4	Towards the sky	N/A	N/A	0.500	77	12000	12000
WB02	PB31	25	4	Towards the sky	N/A	N/A	0.500	77	12000	12000

NOTE: If emissions are not vented through a stack, describe point of discharge below and, if necessary, include an attachment. List the attachment in Form 1.00 *General Information*, Item 16.

Facility Name: Blue Bird Body Company **Date of Application:** August 2013

FORM 7.00 – AIR MODELING INFORMATION: Stack Data

Stack ID	Emission Unit ID(s)	Stack Information			Dimensions of largest Structure Near Stack		Exit Gas Conditions at Maximum Emission Rate			
		Height Above Grade (ft)	Inside Diameter (ft)	Exhaust Direction	Height (ft)	Longest Side (ft)	Velocity (ft/sec)	Temperature (°F)	Flow Rate (acfm)	
									Average	Maximum
WB03	PB31	25	4	Towards the sky	N/A	N/A	0.500	77	12000	12000
WB04	PB31	25	4	Towards the sky	N/A	N/A	0.500	77	12000	12000
B006	BO06	32	4	Towards the sky	N/A	N/A	0.195	100	6000	6000
B016	BO06	32	4	Towards the sky	N/A	N/A	0.195	100	6000	6000
B007	BO07	32	4	Towards the sky	N/A	N/A	0.195	75	6000	6000
B017	BO07	25	4	Towards the sky	N/A	N/A	0.250	75	6000	6000
B008	BO08	25	4	Towards the sky	N/A	N/A	0.104	75	2500	2500
B018	BO08	25	4	Towards the sky	N/A	N/A	0.104	75	2500	2500
B009	BO09	25	4	Towards the sky	N/A	N/A	0.104	100	2500	2500
B019	BO09	25	4	Towards the sky	N/A	N/A	0.104	100	2500	2500

NOTE: If emissions are not vented through a stack, describe point of discharge below and, if necessary, include an attachment. List the attachment in Form 1.00 *General Information*, Item 16.

Facility Name: Blue Bird Body Company **Date of Application:** August 2013

FORM 7.00 AIR MODELING INFORMATION: Chemicals Data

Chemical	Potential Emission Rate (lb/hr)	Toxicity (mg/m^3)	Reference	MSDS Attached
Xylene	25.32	0.1 (annual)	IRIS rfc	☐
Ethyl Benzene	4.4	1 (annual)	IRIS rfc	☐
Toluene	0.26	5 (annual)	IRIS rfc	☐
Cumene	0.055	0.4 (annual)	IRIS rfc	☐
2-Butanone	3.95	5 (annual)	IRIS rfc	☐
n-Butyl Acetate	15.3	1.69 (24-hr)	OSHA	☐
1, 2, 4-Trimethylbenzene	1.28	0.30 (24-hr)	NIOSH	☐
Acetone	77.06	5.71 (24-hr)	OSHA	☐
Ethyl Alcohol	0.119	4.52 (24-hr)	OSHA	☐
Stoddard Solvent	0.064	6.9 (24-hr)	OSHA	☐
Tert-Butyl Acetate	13.0	2.26 (24-hr)	OSHA	☐
n-Butyl Alcohol	1.34	0.71 (24-hr)	OSHA	☐
Methyl (n-amyl) Ketone	4.53	1.11 (24-hr)	OSHA	☐
Isobutyl Alcohol	0.357	0.71 (24-hr)	OSHA	☐
n-Heptane	1.36	4.76 (24-hr)	OSHA	☐
Refined Solvent Naptha	1.10	180 (15-min) 0.83 (24-hr)	NIOSH	☐
2-Butoxyethanol	5.30	1.6 (annual)	IRIS rfc	☐
Propylene Glycol Monomethyl Ether	2.71	2.0 (annual)	IRIS rfc	☐
Methyl methacrylate	0.04	0.7	IRIS rfc	☐
Tert-Butyl-Alcohol	0.06	300	OSHA	☐
Acetic Acid	0.11	25.0	OSHA	☐
				☐
				☐
				☐
				☐
				☐
				☐
				☐
				☐
				☐
				☐

Attachment B

Emission Calculations

Index of Attachment B Tables

Table No.	Table Contents
1	Facility-wide PTE Summary
2	Emissions from Combustion Sources
3	Potential PM/PM10/PM2.5 Emissions from Paint Booths
4	Potential VOC from Paint Booths
5	Potential HAP Emissions from Paint Booths
6	1330-20-7 (xylenes) (HAP/TAP) Emissions from Paint Booths
7	100-41-4 (Ethyl Benzene) (HAP/TAP) from Paint Booths
8	108-88-3 (Toluene) (HAP/TAP) Emissions from Paint Booths
9	98-82-8 (Cumene) (HAP/TAP) Emissions from Paint Booths
10	80-62-6 (Methyl methacrylate) (HAP/TAP) Emissions from Paint Booths
11	78-93-3 (2-Butanone) (HAP/TAP) Emissions from Paint Booths
12	123-86-4 (n-Butyl Acetate) (TAP) Emissions from Paint Booths
13	95-63-6 (1,2,4-Trimethylbenzene) (TAP) from Paint Booths
14	67-64-1 (Acetone) (TAP) from Paint Booths
15	64-17-5 (Ethyl Alcohol) (TAP) Emissions from Paint Booths
16	8052-41-3 (Stoddard Solvent) (TAP) Emissions from Paint Booths
17	540-88-5 (Tert-Butyl Acetate) (TAP) Emissions from Paint Booths
18	71-36-3 (n-Butyl Alcohol) (TAP) Emissions from Paint Booths
19	110-43-0 (Methyl (n-amyl) ketone) (TAP) from Paint Booths
20	78-83-1 (Isobutyl alcohol) (TAP) Emissions from Paint Booths
21	142-82-5 (n-Heptane) (TAP) Emissions from Paint Booths
22	8032-32-4 (Refined Solvent Naphtha) (TAP) Emissions from Paint Booths
23	111-76-2 (2-Butoxyethanol) (TAP) Emissions from Paint Booths
24	107-98-2 (Propylene Glycol Monomethyl Ether) (TAP) Emissions from Paint Booths
25	75-65-0(Tert-Butyl Alcohol) (TAP) Emissions from Paint Booths
26	64-19-7 (Acetic Acid) (TAP) Emissions from Paint Booths
27	64742-89-8 (Solvent naphtha light distillate) (TAP) Emissions from Paint Booths
28	Coating Inventory
29	Potential TAP Emissions

Table 1: Facility-wide PTE Summary

Emission Unit	Emission Unit Decription	Potential Emissions (tpy)									
		NO_x	CO	SO_2	$PM/PM_{10}/PM_{2.5}$	VOC[1]	Total HAP	Largest HAP[2]	Largest TAP[3]	Total TAP	GHG
PB10	All American Touchup Booth	---	---	---	0.020	22.00	24.7	20.8	0.1	35.2	---
PB11	Overflow Paint Booth	---	---	---	0.012	35.70	14.7	12.4	1.1	19.3	---
PB27	Undercoat Paint Booth	---	---	---	---	101.00	0.0	0.0	196.3	210.5	---
PB28	Black and Primer Paint Booths	---	---	---	0.047	200.00	2.0	1.2	0.2	228.1	---
PB29	Yellow Paint Booth	---	---	---	0.041	150.00	0.6	0.4	8.8	76.5	---
PB30	BBCV Touchup Booth	---	---	---	0.020	49.00	24.7	20.8	0.1	35.2	---
PB31	White Paint Booth	---	---	---	0.051	95.00	82.4	55.3	130.9	248.0	---
BO06	Black and Primer Bake Oven	4.29	3.61	0.026	0.326	0.236	0.081	0.077	0.077	0.081	5,184
BO07	Yellow Booth Bake Oven	4.29	3.61	0.026	0.326	0.236	0.081	0.077	0.077	0.081	5,184
BO08	White Booth Bake Oven 1	4.29	3.61	0.026	0.326	0.236	0.081	0.077	0.077	0.081	5,184
BO09	White Booth Bake Oven 2	4.29	3.61	0.026	0.326	0.236	0.081	0.077	0.077	0.081	5,184
HF01-HF03	Hanging Furnaces	6.38	5.36	0.038	0.485	0.351	0.120	0.115	0.115	0.120	7,699
	Total Facility-wide Emissions:	**23.6**	**19.8**	**0.14**	**1.98**	**654.0**	**149.5**	**111.3**	**338.0**	**853.2**	**28,436**

Notes

1	VOC emissions from PB10, PB27, PB30, and PB31 are limited based on BACT determinations
2	Largest HAP Xylene (CAS No. 1330-20-7).
3	Largest TAP is Acetone (CAS 67-64-1)

Table 2: Emissions from Combustion Sources

Fuel-Burning Source	Emission Unit ID No.	Heat Transfer Type	Maximum Heat Input MMBtu/hr
Black and Primer Bake Oven	BO06	Direct	10.00
Yellow Booth Bake Oven	BO07	Direct	10.00
White Booth Bake Oven 1	BO08	Direct	10.00
White Booth Bake Oven 2	BO09	Direct	10.00
Hanging Furnaces[7]	HF01-HF03	Direct	14.85
	Total Plant Heat Input		**54.85**

Natural Gas Combustion Emission Factors[1] (lbs/ MMscf)	
NO_x	100
SO_2	0.6
CO	84
$PM/PM_{10}/PM_{2.5}$[3]	7.6
VOC	5.5
Combined HAP	1.88
Largest HAP[4]	1.8
GHG (as CO_2e)[5]	120,730

Potential Emissions from Fuel Combustion[2]

Fuel-Burning Source	Maximum Heat Input MMBtu/hr	NO_x (tpy)	CO (tpy)	SO_2 (tpy)	$PM/PM_{10}/PM_{2.5}$ (tpy)	VOC (tpy)	Total HAP (tpy)	Largest HAP[4] (tpy)	GHG[5] (tpy CO_2e)
Black and Primer Bake Oven	10.00	4.29	3.61	0.026	0.326	0.236	0.081	0.077	5,184
Yellow Booth Bake Oven	10.00	4.29	3.61	0.026	0.326	0.236	0.081	0.077	5,184
White Booth Bake Oven 1	10.00	4.29	3.61	0.026	0.326	0.236	0.081	0.077	5,184
White Booth Bake Oven 2	10.00	4.29	3.61	0.026	0.326	0.236	0.081	0.077	5,184
Hanging Furnaces	14.85	6.38	5.36	0.038	0.485	0.351	0.120	0.115	7,699
Potential Emissions (tpy)		**23.6**	**19.8**	**0.141**	**1.79**	**1.30**	**0.443**	**0.424**	**28,436**

Projected Actual Emissions from Fuel Combustion[6]

Fuel-Burning Source	Maximum Heat Input MMBtu/hour	NO_x (tpy)	CO (tpy)	SO_2 (tpy)	$PM/PM_{10}/PM_{2.5}$ (tpy)	VOC (tpy)	Total HAP (tpy)	Largest HAP[4] (tpy)	GHG[5] (tpy CO_2e)
Black and Primer Bake Oven	10.00	3.43	2.88	0.021	0.261	0.189	0.065	0.062	4,143
Yellow Booth Bake Oven	10.00	3.43	2.88	0.021	0.261	0.189	0.065	0.062	4,143
White Booth Bake Oven 1	10.00	3.43	2.88	0.021	0.261	0.189	0.065	0.062	4,143
White Booth Bake Oven 2	10.00	3.43	2.88	0.021	0.261	0.189	0.065	0.062	4,143
Hanging Furnaces	14.85	5.10	4.28	0.031	0.387	0.280	0.096	0.092	6,152
Actual Emissions (tpy)		**18.8**	**15.8**	**0.113**	**1.43**	**1.035**	**0.354**	**0.339**	**22,723**

Notes:

1	Emission factor is from AP-42, 5th Edition, Chapter 1.4, Tables 1.4-1 (SCC 1-01-006-02), 1.4-2, and 1.4-3 (for HAPs).
2	Potential usage calculated by dividing heat input by 1020 Btu/scf. Hourly rate multiplied by 8,760 hrs/yr.
3	PM emissions are to be considered to be <1.0 micron in diameter. Therefore PM is considered as $PM/PM_{10}/PM_{2.5}$ (considers condensibles)
4	Largest HAP from natural gas combustion is hexane, per AP-42 Chapter 1.4.
5	Includes emissions of CO_2, N_2O, and methane. Emission factor for each pollutant multiplied by their corresponding global warming potential, 100-year time horizon, from 40 CFR Part 98 Table A-1, and combined to form a composite GHG emission factor in terms of CO_2e
6	Projected actual emissions estimated at 7000 hours of operation per year at full load.
7	PB10, PB11, and PB30 utilize small hanging furnaces to bake coatings on. These hanging furnaces have a maximum heat input of 4.95 MMBtu/hr each

Table 3: Potential $PM/PM_{10}/PM_{2.5}$ Emissions from Paint Booths

Emission Unit ID	Emission Unit Descritption	Applicator Type	Type of Coating Applied[1]	Coating Name	Coating ID	Solids Content[2] (lb/gal)	Total Coating Quantity (gal/unit)	Throughput (units/hr)	Transfer Efficiency[3]	Fallout Factor[8] (%)	Control Efficiency	$PM/PM_{10}/PM_{2.5}$ Emissions[4,5] (lb/hr)	Total $PM/PM^{10}/PM^{2.5}$ Emissions[6] (lb/hr)	Potential $PM/PM_{10}/PM_{2.5}$ Emissions[6] (tpy)
PB10	All American Touchup Booth	NA	Cleaning Solvent	HD Wax and Grease Remover	CFX437	0.00	0.300	4	100%	0%	99.00%	0.0000	0.0045	0.02
		Air Assisted	Paint	Med Gloss Black Spectracron	SAC62000	2.77	0.253		20%	80%	99.00%	0.0045		
			Accelerator	Delta Accelerator	DX39	0.14	0.057		20%	80%	99.00%	0.0001		
PB11	Overflow Paint Booth	NA	Cleaning Solvent	HD Wax and Grease Remover	CFX437	0.00	0.120	6	100%	0%	99.00%	0.0000	0.0028	0.01
		HVLP	Paint	BSBY w/F3360+GXA 3.5/1 Blended RTS	HSU907616C	5.72	0.101		20%	90%	99.00%	0.0028		
			Accelerator	Delta Accelerator	DX39	0.14	0.023		20%	90%	99.00%	0.0000		
PB27	Undercoat Paint Booth	NA	Cleaning Solvent	Spectraclean Purge	GXS65745	0.00	2.000	6	100%	0%	0.00%	0.0000	0.00	0.00
			Undercoating	Undercoat	BCG 325	8.22	6.500		100%	0%	0.00%	0.0000		
PB28	Black and Primer Paint Booths	NA	Cleaning Solvent	VM&P NAPHTHA	70885	0.00	0.750	6	65%	0%	99.00%	0.0000	0.011	0.05
		HVLP	Primer	Spectracron Sep Primer AC	GXM71137	6.51	0.480		65%	90%	99.00%	0.0066		
			Paint	Med Gloss Black Spectracron	SAC62000	2.77	0.725		65%	90%	99.00%	0.0042		
			Accelerator	Delta Accelerator	DX39	0.14	0.145		65%	90%	99.00%	0.0000		
PB29	Yellow Paint Booth	NA	Cleaning Solvent	VM&P NAPHTHA	70885	0.00	0.250	6	100%	0%	99.00%	0.0000	0.0094	0.04
		HVLP	Paint	BSBY w/F3360+GXA 3.5/1 Blended RTS	HSU907616C	5.72	0.778		65%	90%	99.00%	0.0093		
			Accelerator	Delta Accelerator	DX39	0.14	0.222		65%	90%	99.00%	0.0001		
PB30	BBCV Touchup Booth	NA	Cleaning Solvent	HD Wax and Grease Remover	CFX437	0.00	0.300	4	100%	0%	99.00%	0.0000	0.0045	0.02
		Air Assisted	Paint	Med Gloss Black Spectracron	SAC62000	2.77	0.253		20%	80%	99.00%	0.0045		
			Accelerator	Delta Accelerator	DX39	0.14	0.057		20%	80%	99.00%	0.0001		
PB31	White Paint Booth	NA	Cleaning Solvent	Spectraclean Purge	GXS65745	0.00	1.000	6	100%	0%	99.00%	0.0000	0.012	0.05
		HVLP	Primer	Spectracron Sep Primer AC	GXM71137	6.51	0.080		65%	90%	99.00%	0.0011		
			Exterior Paint	Delfleet SPU Warm White	HSL907649	6.95	0.067		65%	90%	99.00%	0.0010		
			Interior Paint	Astro White Interior Alky	Q1255-3580	4.71	0.958		65%	90%	99.00%	0.0095		
			Accelerator	Delta Accelerator	DX39	0.14	0.205		65%	90%	99.00%	0.0001		
												Total from booths	**0.04**	**0.19**

Notes

1	Coatings used in calculations are coatings applied to school buses which are an overwhelming majority of production
2	See Table 24
3	Transfer Efficiency per EPA Document "Control Technology" Chapter 6 "Paint Spray Equipment" for Conventional Spray Guns (20%) and HVLP applicators (65%)
4	$PM/PM_{10}/PM_{2.5}$ Emissions, lb/hr = (Solids Content, lb/gal) * (Coating Quantity, gal/unit) * (Throughput, unit/hr) * (1-Transfer Efficiency, %) * (1-Control Efficiency, %) * (1-Fallout Factor, %)
5	All PM/PM_{10} considered to be $PM_{2.5}$
6	Total $PM/PM_{10}/PM_{2.5}$ Emissions, lb/hr = Sum of $PM/PM_{10}/PM_{2.5}$ emissions (lb/hr) from all coating types used in booth
7	Potential $PM/PM_{10}/PM_{2.5}$ Emissions, tpy = (Total $PM/PM_{10}/PM_{2.5}$ Emissions, lb/hr) * (8,760 hr/yr) / (2,000 lb/ton)
8	Fallout Factor represents fraction of coating that is not carried in suspension of airflow and does not get emitted through stack. Factors obtained from Texas Commission on Environmental Quality " painting basics and emission calculations for tceq air quality permit applications" October 11, 2006.

Table 4: Potential VOC from Paint Booths

Emission Unit ID	Emission Unit Descritption	Type of Coating Applied[1]	Coating Name	Coating ID	VOC Content[2] (lb/gal)	Coating Quantity (gal/unit)	Throughput (units/hr)	VOC Emissions Per Coating Type[3] (lb/hr)	Total VOC Emissions[4] (lb/hr)	Total VOC Emissions[5] (tpy)	Potential VOC Emissions (BACT Limits) (tpy)
PB10	All American Touchup Booth	Cleaning Solvent	HD Wax and Grease Remover	CFX437	6.94	0.300	4	8.33	15.9	69.8	**22.0**
		Paint	Med Gloss Black Spectracron	SAC62000	5.70	0.253		5.76			
		Accelerator	Delta Accelerator	DX39	8.01	0.057		1.83			
PB11	Overflow Paint Booth	Cleaning Solvent	HD Wax and Grease Remover	CFX437	6.94	0.120	6	5.00	8.15	35.7	**35.7**
		Paint	BSBY w/F3360+GXA 3.5/1 Blended RTS	HSU907616C	3.38	0.101		2.05			
		Accelerator	Delta Accelerator	DX39	8.01	0.023		1.10			
PB27	Undercoat Paint Booth	Cleaning Solvent	Spectraclean Purge	GXS65745	1.66	2.000	6	19.92	23.2	101	**101.0**
		Undercoating	Undercoat	BCG 325	0.08	6.500		3.24			
PB28	Black and Primer Paint Booths	Cleaning Solvent	VM&P NAPHTHA	70885	6.19	0.750	6	27.86	74.2	325	**200.0**
		Primer	Spectracron Sep Primer AC	GXM71137	5.06	0.480		14.58			
		Paint	Med Gloss Black Spectracron	SAC62000	5.70	0.725		24.79			
		Accelerator	Delta Accelerator	DX39	8.01	0.145		6.97			
PB29	Yellow Paint Booth	Cleaning Solvent	VM&P NAPHTHA	70885	6.19	0.250	6	9.29	35.7	157	**150.0**
		Paint	BSBY w/F3360+GXA 3.5/1 Blended RTS	HSU907616C	3.38	0.778		15.77			
		Accelerator	Delta Accelerator	DX39	8.01	0.222		10.68			
PB30	BBCV Touchup Booth	Cleaning Solvent	HD Wax and Grease Remover	CFX437	6.94	0.300	4	8.33	15.9	69.8	**49.0**
		Paint	Med Gloss Black Spectracron	SAC62000	5.70	0.253		5.76			
		Accelerator	Delta Accelerator	DX39	8.01	0.057		1.83			
PB31	White Paint Booth	Cleaning Solvent	Spectraclean Purge	GXS65745	1.66	1.000	6	9.96	50.1	219	**95.0**
		Primer	Spectracron Sep Primer AC	GXM71137	5.06	0.080		2.43			
		Exterior Paint	Delfleet SPU Warm White	HSL907649	3.73	0.067		1.49			
		Interior Paint	Astro White Interior Alky	Q1255-3580	4.58	0.958		26.33			
		Accelerator	Delta Accelerator	DX39	8.01	0.205		9.86			
								total from booths	**223**	**977**	**653**

Notes

1	Coatings used in calculations are coatings applied to school buses which are an overwhelming majority of production
2	See Table 24
3	Potential VOC Emissions per Coating Type, lb/hr = (Throughput, units/hr) * (Coating Quantity, gal/unit) * (VOC Content of Coating, lb/gal)
4	Total VOC Emissions, lb/hr = Sum of VOC emissions for each coating used in booth
5	Potential VOC Emissions, tpy = (Potential VOC Emissions, lb/hr) * (8,760 hr/yr) / (2,000 lb/ton)

Table 5: Potential HAP Emissions from Paint Booths

Emission Unit ID	Emission Unit Descritption	Type of Coating Applied[1]	Coating Name	Coating ID	Density[2] (lb/gal)	HAP Content[2] (%)	Total Coating Quantity (gal/unit)	Throughput (units/hr)	HAP Emissions Per Coating Type[3] (lb/hr)	Total HAP Emissions[4] (lb/hr)	Potential HAP Emissions[5] (tpy)
PB10	All American Touchup Booth	Cleaning Solvent	HD Wax and Grease Remover	CFX437	6.94	66.90%	0.300	4	5.57	5.63	24.7
		Paint	Med Gloss Black Spectracron	SAC62000	8.48	0.68%	0.253		0.06		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.057		0.00		
PB11	Overflow Paint Booth	Cleaning Solvent	HD Wax and Grease Remover	CFX437	6.94	66.90%	0.120	6	3.34	3.36	14.7
		Paint	BSBY w/F3360+GXA 3.5/1 Blended RTS	HSU907616C	9.53	0.32%	0.101		0.02		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.023		0.00		
PB27	Undercoat Paint Booth	Cleaning Solvent	Spectraclean Purge	GXS65745	6.64	0.00%	2.000	6	0.00	0.0	0
		Undercoating	Undercoat	BCG 325	8.30	0.00%	6.500		0.00		
PB28	Black and Primer Paint Booths	Cleaning Solvent	VM&P NAPHTHA	70885	6.19	0.00%	0.750	6	0.00	0.5	2.0
		Primer	Spectracron Sep Primer AC	GXM71137	11.57	0.60%	0.480		0.20		
		Paint	Med Gloss Black Spectracron	SAC62000	8.48	0.68%	0.725		0.25		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.145		0.00		
PB29	Yellow Paint Booth	Cleaning Solvent	VM&P NAPHTHA	70885	6.19	0.00%	0.250	6	0.00	0.14	0.6
		Paint	BSBY w/F3360+GXA 3.5/1 Blended RTS	HSU907616C	9.53	0.32%	0.778		0.14		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.222		0.00		
PB30	BBCV Touchup Booth	Cleaning Solvent	HD Wax and Grease Remover	CFX437	6.94	66.90%	0.300	4	5.57	5.63	24.7
		Paint	Med Gloss Black Spectracron	SAC62000	8.48	0.68%	0.253		0.06		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.057		0.00		
PB31	White Paint Booth	Cleaning Solvent	Spectraclean Purge	GXS65745	6.64	0.00%	1.000	6	0.00	18.8	82
		Primer	Spectracron Sep Primer AC	GXM71137	11.57	0.60%	0.080		0.03		
		Exterior Paint	Delfleet SPU Warm White	HSL907649	10.68	1.00%	0.067		0.04		
		Interior Paint	Astro White Interior Alky	Q1255-3580	9.29	35.09%	0.958		18.74		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.205		0.00		
									total from booths	**34**	**149**

Notes

1	Coatings used in calculations are coatings applied to school buses which are an overwhelming majority of production
2	See Table 24
3	Potential HAP Emissions per Coating Type, lb/hr = (Throughput, units/hr) * (Coating Quantity, gal/unit) * (HAP Content of Coating, %) * (Density of Coating, lb/gal)
4	Total HAP Emissions, lb/hr = Sum of HAP emissions for each coating used in booth
5	Potential HAP Emissions, tpy = (Potential HAP Emissions, lb/hr) * (8,760 hr/yr) / (2,000 lb/ton)

Table 6: 1330-20-7 (xylenes) (HAP/TAP) Emissions from Paint Booths

Emission Unit ID	Emission Unit Descritption	Type of Coating Applied[1]	Coating Name	Coating ID	Density[2] (lb/gal)	1330-20-7 Content[2] (%)	Coating Quantity (gal/unit)	Throughput (units/hr)	1330-20-7 Emissions Per Coating Type[3] (lb/hr)	Total 1330-20-7 Emissions[4] (lb/hr)	Potential 1330-20-7 Emissions[5] (tpy)
PB10	All American Touchup Booth	Cleaning Solvent	HD Wax and Grease Remover	CFX437	6.94	56.59%	0.300	4	4.71	4.74	20.8
		Paint	Med Gloss Black Spectracron	SAC62000	8.48	0.30%	0.253		0.03		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.057		0.00		
PB11	Overflow Paint Booth	Cleaning Solvent	HD Wax and Grease Remover	CFX437	6.94	56.59%	0.120	6	2.83	2.84	12.4
		Paint	BSBY w/F3360+GXA 3.5/1 Blended RTS	HSU907616C	9.53	0.21%	0.101		0.01		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.023		0.00		
PB27	Undercoat Paint Booth	Cleaning Solvent	Spectraclean Purge	GXS65745	6.64	0.00%	2.000	6	0.00	0.0	0
		Undercoating	Undercoat	BCG 325	8.30	0.00%	6.500		0.00		
PB28	Black and Primer Paint Booths	Cleaning Solvent	VM&P NAPHTHA	70885	6.19	0.00%	0.750	6	0.00	0.3	1.2
		Primer	Spectracron Sep Primer AC	GXM71137	11.57	0.49%	0.480		0.16		
		Paint	Med Gloss Black Spectracron	SAC62000	8.48	0.30%	0.725		0.11		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.145		0.00		
PB29	Yellow Paint Booth	Cleaning Solvent	VM&P NAPHTHA	70885	6.19	0.00%	0.250	6	0.00	0.09	0.4
		Paint	BSBY w/F3360+GXA 3.5/1 Blended RTS	HSU907616C	9.53	0.21%	0.778		0.09		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.222		0.00		
PB30	BBCV Touchup Booth	Cleaning Solvent	HD Wax and Grease Remover	CFX437	6.94	56.59%	0.300	4	4.71	4.74	20.8
		Paint	Med Gloss Black Spectracron	SAC62000	8.48	0.30%	0.253		0.03		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.057		0.00		
PB31	White Paint Booth	Cleaning Solvent	Spectraclean Purge	GXS65745	6.64	0.00%	1.000	6	0.00	12.6	55
		Primer	Spectracron Sep Primer AC	GXM71137	11.57	0.49%	0.080		0.03		
		Exterior Paint	Delfleet SPU Warm White	HSL907649	10.68	0.00%	0.067		0.00		
		Interior Paint	Astro White Interior Alky	Q1255-3580	9.29	23.60%	0.958		12.61		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.205		0.00		
									Total from Booths[6]	25	111

Notes

1 Coatings used in calculations are coatings applied to school buses which are an overwhelming majority of production
2 See Table 24
3 Potential TAC Emissions per Coating Type, lb/hr = (Throughput, units/hr) * (Coating Quantity, gal/unit) * (TAC Content of Coating, %) * (Density of Coating, lb/gal)
4 TAC Emissions, lb/hr = Sum of TAC emissions for each coating used in booth
5 Potential TAC Emissions, tpy = (Potential TAC Emissions, lb/hr) * (8,760 hr/yr) / (2,000 lb/ton)

Table 7: 100-41-4 (Ethyl Benzene) (HAP/TAP) from Paint Booths

Emission Unit ID	Emission Unit Descritption	Type of Coating Applied[1]	Coating Name	Coating ID	Density[2] (lb/gal)	100-41-4 Content[2] (%)	Total Coating Quantity (gal/unit)	Throughput (units/hr)	100-41-4 Emissions Per Coating Type[3] (lb/hr)	Total 100-41-4 Emissions[4] (lb/hr)	Potential 100 41-4 Emissions[5] (tpy)
PB10	All American Touchup Booth	Cleaning Solvent	HD Wax and Grease Remover	CFX437	6.94	10.04%	0.300	4	0.84	0.836	3.66
		Paint	Med Gloss Black Spectracron	SAC62000	8.48	0.00%	0.253		0.00		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.057		0.00		
PB11	Overflow Paint Booth	Cleaning Solvent	HD Wax and Grease Remover	CFX437	6.94	10.04%	0.120	6	0.50	0.502	2.20
		Paint	BSBY w/F3360+GXA 3.5/1 Blended RTS	HSU907616C	9.53	0.00%	0.101		0.00		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.023		0.00		
PB27	Undercoat Paint Booth	Cleaning Solvent	Spectraclean Purge	GXS65745	6.64	0.00%	2.000	6	0.00	0.00	0.0
		Undercoating	Undercoat	BCG 325	8.30	0.00%	6.500		0.00		
PB28	Black and Primer Paint Booths	Cleaning Solvent	VM&P NAPHTHA	70885	6.19	0.00%	0.750	6	0.00	0.04	0.2
		Primer	Spectracron Sep Primer AC	GXM71137	11.57	0.11%	0.480		0.04		
		Paint	Med Gloss Black Spectracron	SAC62000	8.48	0.00%	0.725		0.00		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.145		0.00		
PB29	Yellow Paint Booth	Cleaning Solvent	VM&P NAPHTHA	70885	6.19	0.00%	0.250	6	0.00	0.00	0.00
		Paint	BSBY w/F3360+GXA 3.5/1 Blended RTS	HSU907616C	9.53	0.00%	0.778		0.00		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.222		0.00		
PB30	BBCV Touchup Booth	Cleaning Solvent	HD Wax and Grease Remover	CFX437	6.94	10.04%	0.300	4	0.84	0.836	3.66
		Paint	Med Gloss Black Spectracron	SAC62000	8.48	0.00%	0.253		0.00		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.057		0.00		
PB31	White Paint Booth	Cleaning Solvent	Spectraclean Purge	GXS65745	6.64	0.00%	1.000	6	0.00	2.20	9.6
		Primer	Spectracron Sep Primer AC	GXM71137	11.57	0.11%	0.080		0.01		
		Exterior Paint	Delfleet SPU Warm White	HSL907649	10.68	0.00%	0.067		0.00		
		Interior Paint	Astro White Interior Alky	Q1255-3580	9.29	4.10%	0.958		2.19		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.205		0.00		
									Total from booths	4.4	19.3

Notes

1	Coatings used in calculations are coatings applied to school buses which are an overwhelming majority of production
2	See Table 24
3	Potential TAC Emissions per Coating Type, lb/hr = (Throughput, units/hr) * (Coating Quantity, gal/unit) * (TAC Content of Coating, %) * (Density of Coating, lb/gal)
4	TAC Emissions, lb/hr = Sum of TAC emissions for each coating used in booth
5	Potential TAC Emissions, tpy = (Potential TAC Emissions, lb/hr) * (8,760 hr/yr) / (2,000 lb/ton)

Table 8: 108-88-3 (Toluene) (HAP/TAP) Emissions from Paint Booths

Emission Unit ID	Emission Unit Descritption	Type of Coating Applied[1]	Coating Name	Coating ID	Density[2] (lb/gal)	108-88-3 Content[2] (%)	Total Coating Quantity (gal/unit)	Throughput (units/hr)	108-88-3 Emissions Per Coating Type[3] (lb/hr)	Total 108-88-3 Emissions[4] (lb/hr)	Potential 108-88-3 Emissions[5] (tpy)
PB10	All American Touchup Booth	Cleaning Solvent	HD Wax and Grease Remover	CFX437	6.94	0.27%	0.300	4	0.02	0.055	0.241
		Paint	Med Gloss Black Spectracron	SAC62000	8.48	0.38%	0.253		0.03		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.057		0.00		
PB11	Overflow Paint Booth	Cleaning Solvent	HD Wax and Grease Remover	CFX437	6.94	0.27%	0.120	6	0.01	0.013	0.059
		Paint	BSBY w/F3360+GXA 3.5/1 Blended RTS	HSU907616C	9.53	0.00%	0.101		0.00		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.023		0.00		
PB27	Undercoat Paint Booth	Cleaning Solvent	Spectraclean Purge	GXS65745	6.64	0.00%	2.000	6	0.00	0.000	0.000
		Undercoating	Undercoat	BCG 325	8.30	0.00%	6.500		0.00		
PB28	Black and Primer Paint Booths	Cleaning Solvent	VM&P NAPHTHA	70885	6.19	0.00%	0.750	6	0.00	0.140	0.614
		Primer	Spectracron Sep Primer AC	GXM71137	11.57	0.00%	0.480		0.00		
		Paint	Med Gloss Black Spectracron	SAC62000	8.48	0.38%	0.725		0.14		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.145		0.00		
PB29	Yellow Paint Booth	Cleaning Solvent	VM&P NAPHTHA	70885	6.19	0.00%	0.250	6	0.00	0.000	0.000
		Paint	BSBY w/F3360+GXA 3.5/1 Blended RTS	HSU907616C	9.53	0.00%	0.778		0.00		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.222		0.00		
PB30	BBCV Touchup Booth	Cleaning Solvent	HD Wax and Grease Remover	CFX437	6.94	0.27%	0.300	4	0.02	0.055	0.241
		Paint	Med Gloss Black Spectracron	SAC62000	8.48	0.38%	0.253		0.03		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.057		0.00		
PB31	White Paint Booth	Cleaning Solvent	Spectraclean Purge	GXS65745	6.64	0.00%	1.000	6	0.00	0.000	0.000
		Primer	Spectracron Sep Primer AC	GXM71137	11.57	0.00%	0.080		0.00		
		Exterior Paint	Delfleet SPU Warm White	HSL907649	10.68	0.00%	0.067		0.00		
		Interior Paint	Astro White Interior Alky	Q1255-3580	9.29	0.00%	0.958		0.00		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.205		0.00		
									Total from booths	**0.264**	**1.16**

Notes

1 Coatings used in calculations are coatings applied to school buses which are an overwhelming majority of production
2 See Table 24
3 Potential TAC Emissions per Coating Type, lb/hr = (Throughput, units/hr) * (Coating Quantity, gal/unit) * (TAC Content of Coating, %) * (Density of Coating, lb/gal)
4 TAC Emissions, lb/hr = Sum of TAC emissions for each coating used in booth
5 Potential TAC Emissions, tpy = (Potential TAC Emissions, lb/hr) * (8,760 hr/yr) / (2,000 lb/ton)

Table 9: 98-82-8 (Cumene) (HAP/TAP) Emissions from Paint Booths

Emission Unit ID	Emission Unit Descritption	Type of Coating Applied[1]	Coating Name	Coating ID	Density[2] (lb/gal)	98-82-8 Content[2] (%)	Total Coating Quantity (gal/unit)	Throughput (units/hr)	98-82-8 Emissions Per Coating Type[3] (lb/hr)	Total 98-82-8 Emissions[4] (lb/hr)	Potential 98-82-8 Emissions[5] (tpy)
PB10	All American Touchup Booth	Cleaning Solvent	HD Wax and Grease Remover	CFX437	6.94	0.00%	0.300	4	0.00	0.000	0.000
		Paint	Med Gloss Black Spectracron	SAC62000	8.48	0.00%	0.253		0.00		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.057		0.00		
PB11	Overflow Paint Booth	Cleaning Solvent	HD Wax and Grease Remover	CFX437	6.94	0.00%	0.120	6	0.00	0.006	0.028
		Paint	BSBY w/F3360+GXA 3.5/1 Blended RTS	HSU907616C	9.53	0.11%	0.101		0.01		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.023		0.00		
PB27	Undercoat Paint Booth	Cleaning Solvent	Spectraclean Purge	GXS65745	6.64	0.00%	2.000	6	0.00	0.000	0.000
		Undercoating	Undercoat	BCG 325	8.30	0.00%	6.500		0.00		
PB28	Black and Primer Paint Booths	Cleaning Solvent	VM&P NAPHTHA	70885	6.19	0.00%	0.750	6	0.00	0.000	0.000
		Primer	Spectracron Sep Primer AC	GXM71137	11.57	0.00%	0.480		0.00		
		Paint	Med Gloss Black Spectracron	SAC62000	8.48	0.00%	0.725		0.00		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.145		0.00		
PB29	Yellow Paint Booth	Cleaning Solvent	VM&P NAPHTHA	70885	6.19	0.00%	0.250	6	0.00	0.049	0.214
		Paint	BSBY w/F3360+GXA 3.5/1 Blended RTS	HSU907616C	9.53	0.11%	0.778		0.05		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.222		0.00		
PB30	BBCV Touchup Booth	Cleaning Solvent	HD Wax and Grease Remover	CFX437	6.94	0.00%	0.300	4	0.00	0.000	0.000
		Paint	Med Gloss Black Spectracron	SAC62000	8.48	0.00%	0.253		0.00		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.057		0.00		
PB31	White Paint Booth	Cleaning Solvent	Spectraclean Purge	GXS65745	6.64	0.00%	1.000	6	0.00	0.000	0.000
		Primer	Spectracron Sep Primer AC	GXM71137	11.57	0.00%	0.080		0.00		
		Exterior Paint	Delfleet SPU Warm White	HSL907649	10.68	0.00%	0.067		0.00		
		Interior Paint	Astro White Interior Alky	Q1255-3580	9.29	0.00%	0.958		0.00		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.205		0.00		
									Total from booths	0.055	0.242

Notes

1	Coatings used in calculations are coatings applied to school buses which are an overwhelming majority of production
2	See Table 24
3	Potential TAC Emissions per Coating Type, lb/hr = (Throughput, units/hr) * (Coating Quantity, gal/unit) * (TAC Content of Coating, %) * (Density of Coating, lb/gal)
4	TAC Emissions, lb/hr = Sum of TAC emissions for each coating used in booth
5	Potential TAC Emissions, tpy = (Potential TAC Emissions, lb/hr) * (8,760 hr/yr) / (2,000 lb/ton)

Table 10: 80-62-6 (Methyl methacrylate) (HAP/TAP) Emissions from Paint Booths

Emission Unit ID	Emission Unit Descritption	Type of Coating Applied[1]	Coating Name	Coating ID	Density[2] (lb/gal)	80-62-6 Content[2] (%)	Total Coating Quantity (gal/unit)	Throughput (units/hr)	80-62-6 Emissions Per Coating Type[3] (lb/hr)	Total 80-62-6 Emissions[4] (lb/hr)	Potential 80-62-6 Emissions[5] (tpy)
PB10	All American Touchup Booth	Cleaning Solvent	HD Wax and Grease Remover	CFX437	6.94	0.00%	0.300	4	0.00	0.00	0.00
		Paint	Med Gloss Black Spectracron	SAC62000	8.48	0.00%	0.253		0.00		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.057		0.00		
PB11	Overflow Paint Booth	Cleaning Solvent	HD Wax and Grease Remover	CFX437	6.94	0.00%	0.120	6	0.00	0.00	0.00
		Paint	BSBY w/F3360+GXA 3.5/1 Blended RTS	HSU907616C	9.53	0.00%	0.101		0.00		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.023		0.00		
PB27	Undercoat Paint Booth	Cleaning Solvent	Spectraclean Purge	GXS65745	6.64	0.00%	2.000	6	0.00	0.00	0.00
		Undercoating	Undercoat	BCG 325	8.30	0.00%	6.500		0.00		
PB28	Black and Primer Paint Booths	Cleaning Solvent	VM&P NAPHTHA	70885	6.19	0.00%	0.750	6	0.00	0.00	0.00
		Primer	Spectracron Sep Primer AC	GXM71137	11.57	0.00%	0.480		0.00		
		Paint	Med Gloss Black Spectracron	SAC62000	8.48	0.00%	0.725		0.00		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.145		0.00		
PB29	Yellow Paint Booth	Cleaning Solvent	VM&P NAPHTHA	70885	6.19	0.00%	0.250	6	0.00	0.00	0.00
		Paint	BSBY w/F3360+GXA 3.5/1 Blended RTS	HSU907616C	9.53	0.00%	0.778		0.00		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.222		0.00		
PB30	BBCV Touchup Booth	Cleaning Solvent	HD Wax and Grease Remover	CFX437	6.94	0.00%	0.300	4	0.00	0.00	0.00
		Paint	Med Gloss Black Spectracron	SAC62000	8.48	0.00%	0.253		0.00		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.057		0.00		
PB31	White Paint Booth	Cleaning Solvent	Spectraclean Purge	GXS65745	6.64	0.00%	1.000	6	0.00	0.04	0.2
		Primer	Spectracron Sep Primer AC	GXM71137	11.57	0.00%	0.080		0.00		
		Exterior Paint	Delfleet SPU Warm White	HSL907649	10.68	1.00%	0.067		0.04		
		Interior Paint	Astro White Interior Alky	Q1255-3580	9.29	0.00%	0.958		0.00		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.205		0.00		
									Total from booths	**0.04**	**0.2**

Notes

1	Coatings used in calculations are coatings applied to school buses which are an overwhelming majority of production
2	See Table 24
3	Potential TAC Emissions per Coating Type, lb/hr = (Throughput, units/hr) * (Coating Quantity, gal/unit) * (TAC Content of Coating, %) * (Density of Coating, lb/gal)
4	TAC Emissions, lb/hr = Sum of TAC emissions for each coating used in booth
5	Potential TAC Emissions, tpy = (Potential TAC Emissions, lb/hr) * (8,760 hr/yr) / (2,000 lb/ton)

Table 11: 78-93-3 (2-Butanone) (HAP/TAP) Emissions from Paint Booths

Emission Unit ID	Emission Unit Descritption	Type of Coating Applied[1]	Coating Name	Coating ID	Density[2] (lb/gal)	78-93-3 Content[2] (%)	Total Coating Quantity (gal/unit)	Throughput (units/hr)	78-93-3 Emissions Per Coating Type[3] (lb/hr)	Total 78-93-3 Emissions[4] (lb/hr)	Potential 78-93-3 Emissions[5] (tpy)
PB10	All American Touchup Booth	Cleaning Solvent	HD Wax and Grease Remover	CFX437	6.94	0.00%	0.300	4	0.00	0.00	0.00
		Paint	Med Gloss Black Spectracron	SAC62000	8.48	0.00%	0.253		0.00		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.057		0.00		
PB11	Overflow Paint Booth	Cleaning Solvent	HD Wax and Grease Remover	CFX437	6.94	0.00%	0.120	6	0.00	0.00	0.00
		Paint	BSBY w/F3360+GXA 3.5/1 Blended RTS	HSU907616C	9.53	0.00%	0.101		0.00		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.023		0.00		
PB27	Undercoat Paint Booth	Cleaning Solvent	Spectraclean Purge	GXS65745	6.64	0.00%	2.000	6	0.00	0.00	0.00
		Undercoating	Undercoat	BCG 325	8.30	0.00%	6.500		0.00		
PB28	Black and Primer Paint Booths	Cleaning Solvent	VM&P NAPHTHA	70885	6.19	0.00%	0.750	6	0.00	0.00	0.00
		Primer	Spectracron Sep Primer AC	GXM71137	11.57	0.00%	0.480		0.00		
		Paint	Med Gloss Black Spectracron	SAC62000	8.48	0.00%	0.725		0.00		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.145		0.00		
PB29	Yellow Paint Booth	Cleaning Solvent	VM&P NAPHTHA	70885	6.19	0.00%	0.250	6	0.00	0.00	0.00
		Paint	BSBY w/F3360+GXA 3.5/1 Blended RTS	HSU907616C	9.53	0.00%	0.778		0.00		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.222		0.00		
PB30	BBCV Touchup Booth	Cleaning Solvent	HD Wax and Grease Remover	CFX437	6.94	0.00%	0.300	4	0.00	0.00	0.00
		Paint	Med Gloss Black Spectracron	SAC62000	8.48	0.00%	0.253		0.00		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.057		0.00		
PB31	White Paint Booth	Cleaning Solvent	Spectraclean Purge	GXS65745	6.64	0.00%	1.000	6	0.00	3.95	17.3
		Primer	Spectracron Sep Primer AC	GXM71137	11.57	0.00%	0.080		0.00		
		Exterior Paint	Delfleet SPU Warm White	HSL907649	10.68	0.00%	0.067		0.00		
		Interior Paint	Astro White Interior Alky	Q1255-3580	9.29	7.39%	0.958		3.95		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.205		0.00		
									Total from booths	**3.95**	**17.3**

Notes

1	Coatings used in calculations are coatings applied to school buses which are an overwhelming majority of production
2	See Table 24
3	Potential TAC Emissions per Coating Type, lb/hr = (Throughput, units/hr) * (Coating Quantity, gal/unit) * (TAC Content of Coating, %) * (Density of Coating, lb/gal)
4	TAC Emissions, lb/hr = Sum of TAC emissions for each coating used in booth
5	Potential TAC Emissions, tpy = (Potential TAC Emissions, lb/hr) * (8,760 hr/yr) / (2,000 lb/ton)

Table 12: 123-86-4 (n-Butyl Acetate) (TAP) Emissions from Paint Booths

Emission Unit ID	Emission Unit Descritption	Type of Coating Applied[1]	Coating Name	Coating ID	Density[2] (lb/gal)	123-86-4 Content[2] (%)	Total Coating Quantity (gal/unit)	Throughput (units/hr)	123-86-4 Emissions Per Coating Type[3] (lb/hr)	Total 123-86-4 Emissions[4] (lb/hr)	Potential 123-86-4 Emissions[5] (tpy)
PB10	All American Touchup Booth	Cleaning Solvent	HD Wax and Grease Remover	CFX437	6.94	0.00%	0.300	4	0.00	1.52	6.65
		Paint	Med Gloss Black Spectracron	SAC62000	8.48	17.72%	0.253		1.52		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.057		0.00		
PB11	Overflow Paint Booth	Cleaning Solvent	HD Wax and Grease Remover	CFX437	6.94	0.00%	0.120	6	0.00	0.392	1.72
		Paint	BSBY w/F3360+GXA 3.5/1 Blended RTS	HSU907616C	9.53	6.78%	0.101		0.39		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.023		0.00		
PB27	Undercoat Paint Booth	Cleaning Solvent	Spectraclean Purge	GXS65745	6.64	0.00%	2.000	6	0.00	0.000	0.000
		Undercoating	Undercoat	BCG 325	8.30	0.00%	6.500		0.00		
PB28	Black and Primer Paint Booths	Cleaning Solvent	VM&P NAPHTHA	70885	6.19	0.00%	0.750	6	0.00	6.54	28.6
		Primer	Spectracron Sep Primer AC	GXM71137	11.57	0.00%	0.480		0.00		
		Paint	Med Gloss Black Spectracron	SAC62000	8.48	17.72%	0.725		6.54		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.145		0.00		
PB29	Yellow Paint Booth	Cleaning Solvent	VM&P NAPHTHA	70885	6.19	0.00%	0.250	6	0.00	3.02	13.2
		Paint	BSBY w/F3360+GXA 3.5/1 Blended RTS	HSU907616C	9.53	6.78%	0.778		3.02		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.222		0.00		
PB30	BBCV Touchup Booth	Cleaning Solvent	HD Wax and Grease Remover	CFX437	6.94	0.00%	0.300	4	0.00	1.52	6.65
		Paint	Med Gloss Black Spectracron	SAC62000	8.48	17.72%	0.253		1.52		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.057		0.00		
PB31	White Paint Booth	Cleaning Solvent	Spectraclean Purge	GXS65745	6.64	0.00%	1.000	6	0.00	2.31	10.1
		Primer	Spectracron Sep Primer AC	GXM71137	11.57	0.00%	0.080		0.00		
		Exterior Paint	Delfleet SPU Warm White	HSL907649	10.68	10.00%	0.067		0.43		
		Interior Paint	Astro White Interior Alky	Q1255-3580	9.29	3.53%	0.958		1.89		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.205		0.00		
									Total from booths	15.3	67.0

Notes

1 Coatings used in calculations are coatings applied to school buses which are an overwhelming majority of production
2 See Table 24
3 Potential TAC Emissions per Coating Type, lb/hr = (Throughput, units/hr) * (Coating Quantity, gal/unit) * (TAC Content of Coating, %) * (Density of Coating, lb/gal)
4 TAC Emissions, lb/hr = Sum of TAC emissions for each coating used in booth
5 Potential TAC Emissions, tpy = (Potential TAC Emissions, lb/hr) * (8,760 hr/yr) / (2,000 lb/ton)

Table 13: 95-63-6 (1,2,4-Trimethylbenzene) (TAP) from Paint Booths

Emission Unit ID	Emission Unit Descritption	Type of Coating Applied[1]	Coating Name	Coating ID	Density[2] (lb/gal)	95-63-6 Content[2] (%)	Total Coating Quantity (gal/unit)	Throughput (units/hr)	95-63-6 Emissions Per Coating Type[3] (lb/hr)	Total 95-63-6 Emissions[4] (lb/hr)	Potential 95-63-6 Emissions[5] (tpy)
PB10	All American Touchup Booth	Cleaning Solvent	HD Wax and Grease Remover	CFX437	6.94	0.00%	0.300	4	0.00	0.035	0.154
		Paint	Med Gloss Black Spectracron	SAC62000	8.48	0.41%	0.253		0.04		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.057		0.00		
PB11	Overflow Paint Booth	Cleaning Solvent	HD Wax and Grease Remover	CFX437	6.94	0.00%	0.120	6	0.00	0.122	0.534
		Paint	BSBY w/F3360+GXA 3.5/1 Blended RTS	HSU907616C	9.53	2.11%	0.101		0.12		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.023		0.00		
PB27	Undercoat Paint Booth	Cleaning Solvent	Spectraclean Purge	GXS65745	6.64	0.00%	2.000	6	0.00	0.000	0.000
		Undercoating	Undercoat	BCG 325	8.30	0.00%	6.500		0.00		
PB28	Black and Primer Paint Booths	Cleaning Solvent	VM&P NAPHTHA	70885	6.19	0.00%	0.750	6	0.00	0.151	0.662
		Primer	Spectracron Sep Primer AC	GXM71137	11.57	0.00%	0.480		0.00		
		Paint	Med Gloss Black Spectracron	SAC62000	8.48	0.41%	0.725		0.15		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.145		0.00		
PB29	Yellow Paint Booth	Cleaning Solvent	VM&P NAPHTHA	70885	6.19	0.00%	0.250	6	0.00	0.938	4.11
		Paint	BSBY w/F3360+GXA 3.5/1 Blended RTS	HSU907616C	9.53	2.11%	0.778		0.94		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.222		0.00		
PB30	BBCV Touchup Booth	Cleaning Solvent	HD Wax and Grease Remover	CFX437	6.94	0.00%	0.300	4	0.00	0.035	0.154
		Paint	Med Gloss Black Spectracron	SAC62000	8.48	0.41%	0.253		0.04		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.057		0.00		
PB31	White Paint Booth	Cleaning Solvent	Spectraclean Purge	GXS65745	6.64	0.00%	1.000	6	0.00	0.000	0.000
		Primer	Spectracron Sep Primer AC	GXM71137	11.57	0.00%	0.080		0.00		
		Exterior Paint	Delfleet SPU Warm White	HSL907649	10.68	0.00%	0.067		0.00		
		Interior Paint	Astro White Interior Alky	Q1255-3580	9.29	0.00%	0.958		0.00		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.205		0.00		
									Total from booths	**1.28**	**5.61**

Notes

1	Coatings used in calculations are coatings applied to school buses which are an overwhelming majority of production
2	See Table 24
3	Potential TAC Emissions per Coating Type, lb/hr = (Throughput, units/hr) * (Coating Quantity, gal/unit) * (TAC Content of Coating, %) * (Density of Coating, lb/gal)
4	TAC Emissions, lb/hr = Sum of TAC emissions for each coating used in booth
5	Potential TAC Emissions, tpy = (Potential TAC Emissions, lb/hr) * (8,760 hr/yr) / (2,000 lb/ton)

Table 14: 67-64-1 (Acetone) (TAP) from Paint Booths

Emission Unit ID	Emission Unit Descritption	Type of Coating Applied[1]	Coating Name	Coating ID	Density[2] (lb/gal)	67-64-1 Content[2] (%)	Total Coating Quantity (gal/unit)	Throughput (units/hr)	67-64-1 Emissions Per Coating Type[3] (lb/hr)	Total 67-64-1 Emissions[4] (lb/hr)	Potential 67-64-1 Emissions[5] (tpy)
PB10	All American Touchup Booth	Cleaning Solvent	HD Wax and Grease Remover	CFX437	6.94	0.00%	0.250	4	0.00	0.013	0.056
		Paint	Med Gloss Black Spectracron	SAC62000	8.48	0.15%	0.253		0.01		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.057		0.00		
PB11	Overflow Paint Booth	Cleaning Solvent	HD Wax and Grease Remover	CFX437	6.94	0.00%	0.100	6	0.00	0.262	1.15
		Paint	BSBY w/F3360+GXA 3.5/1 Blended RTS	HSU907616C	9.53	4.54%	0.101		0.26		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.023		0.00		
PB27	Undercoat Paint Booth	Cleaning Solvent	Spectraclean Purge	GXS65745	6.64	75.00%	1.500	6	44.82	44.820	196.3
		Undercoating	Undercoat	BCG 325	8.30	0.00%	6.500		0.00		
PB28	Black and Primer Paint Booths	Cleaning Solvent	VM&P NAPHTHA	70885	6.19	0.00%	0.750	6	0.00	0.055	0.242
		Primer	Spectracron Sep Primer AC	GXM71137	11.57	0.00%	0.480		0.00		
		Paint	Med Gloss Black Spectracron	SAC62000	8.48	0.15%	0.725		0.06		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.145		0.00		
PB29	Yellow Paint Booth	Cleaning Solvent	VM&P NAPHTHA	70885	6.19	0.00%	0.250	6	0.00	2.02	8.84
		Paint	BSBY w/F3360+GXA 3.5/1 Blended RTS	HSU907616C	9.53	4.54%	0.778		2.02		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.222		0.00		
PB30	BBCV Touchup Booth	Cleaning Solvent	HD Wax and Grease Remover	CFX437	6.94	0.00%	0.250	4	0.00	0.013	0.056
		Paint	Med Gloss Black Spectracron	SAC62000	8.48	0.15%	0.253		0.01		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.057		0.00		
PB31	White Paint Booth	Cleaning Solvent	Spectraclean Purge	GXS65745	6.64	75.00%	1.000	6	29.88	29.880	130.874
		Primer	Spectracron Sep Primer AC	GXM71137	11.57	0.00%	0.080		0.00		
		Exterior Paint	Delfleet SPU Warm White	HSL907649	10.68	0.00%	0.067		0.00		
		Interior Paint	Astro White Interior Alky	Q1255-3580	9.29	0.00%	0.958		0.00		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.205		0.00		
									Total from booths	77.06	337.5

Notes

1	Coatings used in calculations are coatings applied to school buses which are an overwhelming majority of production
2	See Table 24
3	Potential TAC Emissions per Coating Type, lb/hr = (Throughput, units/hr) * (Coating Quantity, gal/unit) * (TAC Content of Coating, %) * (Density of Coating, lb/gal)
4	TAC Emissions, lb/hr = Sum of TAC emissions for each coating used in booth
5	Potential TAC Emissions, tpy = (Potential TAC Emissions, lb/hr) * (8,760 hr/yr) / (2,000 lb/ton)

Table 15: 64-17-5 (Ethyl Alcohol) (TAP) Emissions from Paint Booths

Emission Unit ID	Emission Unit Descritption	Type of Coating Applied[1]	Coating Name	Coating ID	Density[2] (lb/gal)	64-17-5 Content[2] (%)	Total Coating Quantity (gal/unit)	Throughput (units/hr)	64-17-5 Emissions Per Coating Type[3] (lb/hr)	Total 64-17-5 Emissions[4] (lb/hr)	Potential 64-17-5 Emissions[5] (tpy)
PB10	All American Touchup Booth	Cleaning Solvent	HD Wax and Grease Remover	CFX437	6.94	0.00%	0.300	4	0.00	0.019	0.083
		Paint	Med Gloss Black Spectracron	SAC62000	8.48	0.22%	0.253		0.02		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.057		0.00		
PB11	Overflow Paint Booth	Cleaning Solvent	HD Wax and Grease Remover	CFX437	6.94	0.00%	0.120	6	0.00	0.000	0.000
		Paint	BSBY w/F3360+GXA 3.5/1 Blended RTS	HSU907616C	9.53	0.00%	0.101		0.00		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.023		0.00		
PB27	Undercoat Paint Booth	Cleaning Solvent	Spectraclean Purge	GXS65745	6.64	0.00%	2.000	6	0.00	0.000	0.000
		Undercoating	Undercoat	BCG 325	8.30	0.00%	6.500		0.00		
PB28	Black and Primer Paint Booths	Cleaning Solvent	VM&P NAPHTHA	70885	6.19	0.00%	0.750	6	0.00	0.081	0.355
		Primer	Spectracron Sep Primer AC	GXM71137	11.57	0.00%	0.480		0.00		
		Paint	Med Gloss Black Spectracron	SAC62000	8.48	0.22%	0.725		0.08		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.145		0.00		
PB29	Yellow Paint Booth	Cleaning Solvent	VM&P NAPHTHA	70885	6.19	0.00%	0.250	6	0.00	0.000	0.000
		Paint	BSBY w/F3360+GXA 3.5/1 Blended RTS	HSU907616C	9.53	0.00%	0.778		0.00		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.222		0.00		
PB30	BBCV Touchup Booth	Cleaning Solvent	HD Wax and Grease Remover	CFX437	6.94	0.00%	0.300	4	0.00	0.019	0.083
		Paint	Med Gloss Black Spectracron	SAC62000	8.48	0.22%	0.253		0.02		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.057		0.00		
PB31	White Paint Booth	Cleaning Solvent	Spectraclean Purge	GXS65745	6.64	0.00%	1.000	6	0.00	0.000	0.000
		Primer	Spectracron Sep Primer AC	GXM71137	11.57	0.00%	0.080		0.00		
		Exterior Paint	Delfleet SPU Warm White	HSL907649	10.68	0.00%	0.067		0.00		
		Interior Paint	Astro White Interior Alky	Q1255-3580	9.29	0.00%	0.958		0.00		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.205		0.00		
									Total from booths	**0.119**	**0.521**

Notes

1	Coatings used in calculations are coatings applied to school buses which are an overwhelming majority of production
2	See Table 24
3	Potential TAC Emissions per Coating Type, lb/hr = (Throughput, units/hr) * (Coating Quantity, gal/unit) * (TAC Content of Coating, %) * (Density of Coating, lb/gal)
4	TAC Emissions, lb/hr = Sum of TAC emissions for each coating used in booth
5	Potential TAC Emissions, tpy = (Potential TAC Emissions, lb/hr) * (8,760 hr/yr) / (2,000 lb/ton)

Table 16: 8052-41-3 (Stoddard Solvent) (TAP) Emissions from Paint Booths

Emission Unit ID	Emission Unit Descritption	Type of Coating Applied[1]	Coating Name	Coating ID	Density[2] (lb/gal)	8052-41-3 Content[2] (%)	Total Coating Quantity (gal/unit)	Throughput (units/hr)	8052-41-3 Emissions Per Coating Type[3] (lb/hr)	Total 8052-41-3 Emissions[4] (lb/hr)	Potential 8052-41-3 Emissions[5] (tpy)
PB10	All American Touchup Booth	Cleaning Solvent	HD Wax and Grease Remover	CFX437	6.94	0.00%	0.300	4	0.00	0.000	0.000
		Paint	Med Gloss Black Spectracron	SAC62000	8.48	0.00%	0.253		0.00		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.057		0.00		
PB11	Overflow Paint Booth	Cleaning Solvent	HD Wax and Grease Remover	CFX437	6.94	0.00%	0.120	6	0.00	0.000	0.000
		Paint	BSBY w/F3360+GXA 3.5/1 Blended RTS	HSU907616C	9.53	0.00%	0.101		0.00		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.023		0.00		
PB27	Undercoat Paint Booth	Cleaning Solvent	Spectraclean Purge	GXS65745	6.64	0.00%	2.000	6	0.00	0.000	0.000
		Undercoating	Undercoat	BCG 325	8.30	0.00%	6.500		0.00		
PB28	Black and Primer Paint Booths	Cleaning Solvent	VM&P NAPHTHA	70885	6.19	0.00%	0.750	6	0.00	0.000	0.000
		Primer	Spectracron Sep Primer AC	GXM71137	11.57	0.00%	0.480		0.00		
		Paint	Med Gloss Black Spectracron	SAC62000	8.48	0.00%	0.725		0.00		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.145		0.00		
PB29	Yellow Paint Booth	Cleaning Solvent	VM&P NAPHTHA	70885	6.19	0.00%	0.250	6	0.00	0.000	0.000
		Paint	BSBY w/F3360+GXA 3.5/1 Blended RTS	HSU907616C	9.53	0.00%	0.778		0.00		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.222		0.00		
PB30	BBCV Touchup Booth	Cleaning Solvent	HD Wax and Grease Remover	CFX437	6.94	0.00%	0.300	4	0.00	0.000	0.000
		Paint	Med Gloss Black Spectracron	SAC62000	8.48	0.00%	0.253		0.00		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.057		0.00		
PB31	White Paint Booth	Cleaning Solvent	Spectraclean Purge	GXS65745	6.64	0.00%	1.000	6	0.00	0.064	0.281
		Primer	Spectracron Sep Primer AC	GXM71137	11.57	0.00%	0.080		0.00		
		Exterior Paint	Delfleet SPU Warm White	HSL907649	10.68	0.00%	0.067		0.00		
		Interior Paint	Astro White Interior Alky	Q1255-3580	9.29	0.12%	0.958		0.06		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.205		0.00		
									Total from booths	0.064	0.281

Notes

1. Coatings used in calculations are coatings applied to school buses which are an overwhelming majority of production
2. See Table 24
3. Potential TAC Emissions per Coating Type, lb/hr = (Throughput, units/hr) * (Coating Quantity, gal/unit) * (TAC Content of Coating, %) * (Density of Coating, lb/gal)
4. TAC Emissions, lb/hr = Sum of TAC emissions for each coating used in booth
5. Potential TAC Emissions, tpy = (Potential TAC Emissions, lb/hr) * (8,760 hr/yr) / (2,000 lb/ton)

Table 17: 540-88-5 (Tert-Butyl Acetate) (TAP) Emissions from Paint Booths

Emission Unit ID	Emission Unit Descritption	Type of Coating Applied[1]	Coating Name	Coating ID	Density[2] (lb/gal)	540-88-5 Content[2] (%)	Total Coating Quantity (gal/unit)	Throughput (units/hr)	540-88-5 Emissions Per Coating Type[3] (lb/hr)	Total 540-88-5 Emissions[4] (lb/hr)	Potential 540-88-5 Emissions[5] (tpy)
PB10	All American Touchup Booth	Cleaning Solvent	HD Wax and Grease Remover	CFX437	6.94	0.00%	0.300	4	0.00	0.000	0.000
		Paint	Med Gloss Black Spectracron	SAC62000	8.48	0.00%	0.253		0.00		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.057		0.00		
PB11	Overflow Paint Booth	Cleaning Solvent	HD Wax and Grease Remover	CFX437	6.94	0.00%	0.120	6	0.00	0.208	0.909
		Paint	BSBY w/F3360+GXA 3.5/1 Blended RTS	HSU907616C	9.53	3.59%	0.101		0.21		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.023		0.00		
PB27	Undercoat Paint Booth	Cleaning Solvent	Spectraclean Purge	GXS65745	6.64	0.00%	2.000	6	0.00	0.000	0.000
		Undercoating	Undercoat	BCG 325	8.30	0.00%	6.500		0.00		
PB28	Black and Primer Paint Booths	Cleaning Solvent	VM&P NAPHTHA	70885	6.19	0.00%	0.750	6	0.00	9.57	41.9
		Primer	Spectracron Sep Primer AC	GXM71137	11.57	28.73%	0.480		9.57		
		Paint	Med Gloss Black Spectracron	SAC62000	8.48	0.00%	0.725		0.00		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.145		0.00		
PB29	Yellow Paint Booth	Cleaning Solvent	VM&P NAPHTHA	70885	6.19	0.00%	0.250	6	0.00	1.60	6.99
		Paint	BSBY w/F3360+GXA 3.5/1 Blended RTS	HSU907616C	9.53	3.59%	0.778		1.60		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.222		0.00		
PB30	BBCV Touchup Booth	Cleaning Solvent	HD Wax and Grease Remover	CFX437	6.94	0.00%	0.300	4	0.00	0.000	0.000
		Paint	Med Gloss Black Spectracron	SAC62000	8.48	0.00%	0.253		0.00		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.057		0.00		
PB31	White Paint Booth	Cleaning Solvent	Spectraclean Purge	GXS65745	6.64	0.00%	1.000	6	0.00	1.60	6.99
		Primer	Spectracron Sep Primer AC	GXM71137	11.57	28.73%	0.080		1.60		
		Exterior Paint	Delfleet SPU Warm White	HSL907649	10.68	0.00%	0.067		0.00		
		Interior Paint	Astro White Interior Alky	Q1255-3580	9.29	0.00%	0.958		0.00		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.205		0.00		
									Total from booths	**13.0**	**56.8**

Notes

1 Coatings used in calculations are coatings applied to school buses which are an overwhelming majority of production
2 See Table 24
3 Potential TAC Emissions per Coating Type, lb/hr = (Throughput, units/hr) * (Coating Quantity, gal/unit) * (TAC Content of Coating, %) * (Density of Coating, lb/gal)
4 TAC Emissions, lb/hr = Sum of TAC emissions for each coating used in booth
5 Potential TAC Emissions, tpy = (Potential TAC Emissions, lb/hr) * (8,760 hr/yr) / (2,000 lb/ton)

Table 18: 71-36-3 (n-Butyl Alcohol) (TAP) Emissions from Paint Booths

Emission Unit ID	Emission Unit Descritption	Type of Coating Applied[1]	Coating Name	Coating ID	Density[2] (lb/gal)	71-36-3 Content[2] (%)	Total Coating Quantity (gal/unit)	Throughput (units/hr)	71-36-3 Emissions Per Coating Type[3] (lb/hr)	Total 71-36-3 Emissions[4] (lb/hr)	Potential 71-36-3 Emissions[5] (tpy)
PB10	All American Touchup Booth	Cleaning Solvent	HD Wax and Grease Remover	CFX437	6.94	0.00%	0.300	4	0.00	0.060	0.263
		Paint	Med Gloss Black Spectracron	SAC62000	8.48	0.70%	0.253		0.06		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.057		0.00		
PB11	Overflow Paint Booth	Cleaning Solvent	HD Wax and Grease Remover	CFX437	6.94	0.00%	0.120	6	0.00	0.000	0.000
		Paint	BSBY w/F3360+GXA 3.5/1 Blended RTS	HSU907616C	9.53	0.00%	0.101		0.00		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.023		0.00		
PB27	Undercoat Paint Booth	Cleaning Solvent	Spectraclean Purge	GXS65745	6.64	0.00%	2.000	6	0.00	0.000	0.000
		Undercoating	Undercoat	BCG 325	8.30	0.00%	6.500		0.00		
PB28	Black and Primer Paint Booths	Cleaning Solvent	VM&P NAPHTHA	70885	6.19	0.00%	0.750	6	0.00	1.08	4.75
		Primer	Spectracron Sep Primer AC	GXM71137	11.57	2.48%	0.480		0.83		
		Paint	Med Gloss Black Spectracron	SAC62000	8.48	0.70%	0.725		0.26		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.145		0.00		
PB29	Yellow Paint Booth	Cleaning Solvent	VM&P NAPHTHA	70885	6.19	0.00%	0.250	6	0.00	0.000	0.000
		Paint	BSBY w/F3360+GXA 3.5/1 Blended RTS	HSU907616C	9.53	0.00%	0.778		0.00		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.222		0.00		
PB30	BBCV Touchup Booth	Cleaning Solvent	HD Wax and Grease Remover	CFX437	6.94	0.00%	0.300	4	0.00	0.060	0.263
		Paint	Med Gloss Black Spectracron	SAC62000	8.48	0.70%	0.253		0.06		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.057		0.00		
PB31	White Paint Booth	Cleaning Solvent	Spectraclean Purge	GXS65745	6.64	0.00%	1.000	6	0.00	0.138	0.603
		Primer	Spectracron Sep Primer AC	GXM71137	11.57	2.48%	0.080		0.14		
		Exterior Paint	Delfleet SPU Warm White	HSL907649	10.68	0.00%	0.067		0.00		
		Interior Paint	Astro White Interior Alky	Q1255-3580	9.29	0.00%	0.958		0.00		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.205		0.00		
									Total from booths	1.34	5.88

Notes

1	Coatings used in calculations are coatings applied to school buses which are an overwhelming majority of production
2	See Table 24
3	Potential TAC Emissions per Coating Type, lb/hr = (Throughput, units/hr) * (Coating Quantity, gal/unit) * (TAC Content of Coating, %) * (Density of Coating, lb/gal)
4	TAC Emissions, lb/hr = Sum of TAC emissions for each coating used in booth
5	Potential TAC Emissions, tpy = (Potential TAC Emissions, lb/hr) * (8,760 hr/yr) / (2,000 lb/ton)

Table 19: 110-43-0 (Methyl (n-amyl) ketone) (TAP) from Paint Booths

Emission Unit ID	Emission Unit Descritption	Type of Coating Applied[1]	Coating Name[6]	Coating ID	Density[2] (lb/gal)	110-43-0 Content[2] (%)	Total Coating Quantity (gal/unit)	Throughput (units/hr)	110-43-0 Emissions Per Coating Type[3] (lb/hr)	Total 110-43-0 Emissions[4] (lb/hr)	Potential 110-43-0 Emissions[5] (tpy)
PB10	All American Touchup Booth	Cleaning Solvent	HD Wax and Grease Remover	CFX437	6.94	0.00%	0.300	4	0.00	0.310	1.356
		Paint	Med Gloss Black Spectracron	SAC62000	8.48	3.61%	0.253		0.31		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.057		0.00		
PB11	Overflow Paint Booth	Cleaning Solvent	HD Wax and Grease Remover	CFX437	6.94	0.00%	0.120	6	0.00	0.061	0.268
		Paint	BSBY w/F3360+GXA 3.5/1 Blended RTS	HSU907616C	9.53	1.06%	0.101		0.06		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.023		0.00		
PB27	Undercoat Paint Booth	Cleaning Solvent	Spectraclean Purge	GXS65745	6.64	0.00%	2.000	6	0.00	0.000	0.000
		Undercoating	Undercoat	BCG 325	8.30	0.00%	6.500		0.00		
PB28	Black and Primer Paint Booths	Cleaning Solvent	VM&P NAPHTHA	70885	6.19	0.00%	0.750	6	0.00	1.99	8.71
		Primer	Spectracron Sep Primer AC	GXM71137	11.57	1.97%	0.480		0.66		
		Paint	Med Gloss Black Spectracron	SAC62000	8.48	3.61%	0.725		1.33		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.145		0.00		
PB29	Yellow Paint Booth	Cleaning Solvent	VM&P NAPHTHA	70885	6.19	0.00%	0.250	6	0.00	0.471	2.065
		Paint	BSBY w/F3360+GXA 3.5/1 Blended RTS	HSU907616C	9.53	1.06%	0.778		0.47		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.222		0.00		
PB30	BBCV Touchup Booth	Cleaning Solvent	HD Wax and Grease Remover	CFX437	6.94	0.00%	0.300	4	0.00	0.310	1.356
		Paint	Med Gloss Black Spectracron	SAC62000	8.48	3.61%	0.253		0.31		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.057		0.00		
PB31	White Paint Booth	Cleaning Solvent	Spectraclean Purge	GXS65745	6.64	0.00%	1.000	6	0.00	1.391	6.093
		Primer	Spectracron Sep Primer AC	GXM71137	11.57	1.97%	0.080		0.11		
		Exterior Paint	Delfleet SPU Warm White	HSL907649	10.68	30.00%	0.067		1.28		
		Interior Paint	Astro White Interior Alky	Q1255-3580	9.29	0.00%	0.958		0.00		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.205		0.00		
									Total from booths	4.53	19.8

Notes

1	Coatings used in calculations are coatings applied to school buses which are an overwhelming majority of production
2	See Table 24
3	Potential TAC Emissions per Coating Type, lb/hr = (Throughput, units/hr) * (Coating Quantity, gal/unit) * (TAC Content of Coating, %) * (Density of Coating, lb/gal)
4	TAC Emissions, lb/hr = Sum of TAC emissions for each coating used in booth
5	Potential TAC Emissions, tpy = (Potential TAC Emissions, lb/hr) * (8,760 hr/yr) / (2,000 lb/ton)

Table 12: 78-83-1 (Isobutyl alcohol) (TAP) Emissions from Paint Booths

Emission Unit ID	Emission Unit Descritption	Type of Coating Applied[1]	Coating Name	Coating ID	Density[2] (lb/gal)	78-83-1 Content[2] (%)	Total Coating Quantity (gal/unit)	Throughput (units/hr)	78-83-1 Emissions Per Coating Type[3] (lb/hr)	Total 78-83-1 Emissions[4] (lb/hr)	Potential 78-83-1 Emissions[5] (tpy)
PB10	All American Touchup Booth	Cleaning Solvent	HD Wax and Grease Remover	CFX437	6.94	0.00%	0.300	4	0.00	0.057	0.248
		Paint	Med Gloss Black Spectracron	SAC62000	8.48	0.66%	0.253		0.06		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.057		0.00		
PB11	Overflow Paint Booth	Cleaning Solvent	HD Wax and Grease Remover	CFX437	6.94	0.00%	0.120	6	0.00	0.000	0.000
		Paint	BSBY w/F3360+GXA 3.5/1 Blended RTS	HSU907616C	9.53	0.00%	0.101		0.00		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.023		0.00		
PB27	Undercoat Paint Booth	Cleaning Solvent	Spectraclean Purge	GXS65745	6.64	0.00%	2.000	6	0.00	0.000	0.000
		Undercoating	Undercoat	BCG 325	8.30	0.00%	6.500		0.00		
PB28	Black and Primer Paint Booths	Cleaning Solvent	VM&P NAPHTHA	70885	6.19	0.00%	0.750	6	0.00	0.243	1.07
		Primer	Spectracron Sep Primer AC	GXM71137	11.57	0.00%	0.480		0.00		
		Paint	Med Gloss Black Spectracron	SAC62000	8.48	0.66%	0.725		0.24		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.145		0.00		
PB29	Yellow Paint Booth	Cleaning Solvent	VM&P NAPHTHA	70885	6.19	0.00%	0.250	6	0.00	0.000	0.000
		Paint	BSBY w/F3360+GXA 3.5/1 Blended RTS	HSU907616C	9.53	0.00%	0.778		0.00		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.222		0.00		
PB30	BBCV Touchup Booth	Cleaning Solvent	HD Wax and Grease Remover	CFX437	6.94	0.00%	0.300	4	0.00	0.057	0.248
		Paint	Med Gloss Black Spectracron	SAC62000	8.48	0.66%	0.253		0.06		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.057		0.00		
PB31	White Paint Booth	Cleaning Solvent	Spectraclean Purge	GXS65745	6.64	0.00%	1.000	6	0.00	0.000	0.000
		Primer	Spectracron Sep Primer AC	GXM71137	11.57	0.00%	0.080		0.00		
		Exterior Paint	Delfleet SPU Warm White	HSL907649	10.68	0.00%	0.067		0.00		
		Interior Paint	Astro White Interior Alky	Q1255-3580	9.29	0.00%	0.958		0.00		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.205		0.00		
									Total from booths	**0.357**	**1.56**

Notes

1	Coatings used in calculations are coatings applied to school buses which are an overwhelming majority of production
2	See Table 24
3	Potential TAC Emissions per Coating Type, lb/hr = (Throughput, units/hr) * (Coating Quantity, gal/unit) * (TAC Content of Coating, %) * (Density of Coating, lb/gal)
4	TAC Emissions, lb/hr = Sum of TAC emissions for each coating used in booth
5	Potential TAC Emissions, tpy = (Potential TAC Emissions, lb/hr) * (8,760 hr/yr) / (2,000 lb/ton)

Table 21: 142-82-5 (n-Heptane) (TAP) Emissions from Paint Booths

Emission Unit ID	Emission Unit Descritption	Type of Coating Applied[1]	Coating Name	Coating ID	Density[2] (lb/gal)	142-82-5 Content[2] (%)	Total Coating Quantity (gal/unit)	Throughput (units/hr)	142-82-5 Emissions Per Coating Type[3] (lb/hr)	Total 142-82-5 Emissions[4] (lb/hr)	Potential 142-82-5 Emissions[5] (tpy)
PB10	All American Touchup Booth	Cleaning Solvent	HD Wax and Grease Remover	CFX437	6.94	0.00%	0.300	4	0.00	0.215	0.943
		Paint	Med Gloss Black Spectracron	SAC62000	8.48	2.51%	0.253		0.22		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.057		0.00		
PB11	Overflow Paint Booth	Cleaning Solvent	HD Wax and Grease Remover	CFX437	6.94	0.00%	0.120	6	0.00	0.000	0.000
		Paint	BSBY w/F3360+GXA 3.5/1 Blended RTS	HSU907616C	9.53	0.00%	0.101		0.00		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.023		0.00		
PB27	Undercoat Paint Booth	Cleaning Solvent	Spectraclean Purge	GXS65745	6.64	0.00%	2.000	6	0.00	0.000	0.000
		Undercoating	Undercoat	BCG 325	8.30	0.00%	6.500		0.00		
PB28	Black and Primer Paint Booths	Cleaning Solvent	VM&P NAPHTHA	70885	6.19	0.00%	0.750	6	0.00	0.926	4.06
		Primer	Spectracron Sep Primer AC	GXM71137	11.57	0.00%	0.480		0.00		
		Paint	Med Gloss Black Spectracron	SAC62000	8.48	2.51%	0.725		0.93		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.145		0.00		
PB29	Yellow Paint Booth	Cleaning Solvent	VM&P NAPHTHA	70885	6.19	0.00%	0.250	6	0.00	0.000	0.000
		Paint	BSBY w/F3360+GXA 3.5/1 Blended RTS	HSU907616C	9.53	0.00%	0.778		0.00		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.222		0.00		
PB30	BBCV Touchup Booth	Cleaning Solvent	HD Wax and Grease Remover	CFX437	6.94	0.00%	0.300	4	0.00	0.215	0.943
		Paint	Med Gloss Black Spectracron	SAC62000	8.48	2.51%	0.253		0.22		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.057		0.00		
PB31	White Paint Booth	Cleaning Solvent	Spectraclean Purge	GXS65745	6.64	0.00%	1.000	6	0.00	0.000	0.000
		Primer	Spectracron Sep Primer AC	GXM71137	11.57	0.00%	0.080		0.00		
		Exterior Paint	Delfleet SPU Warm White	HSL907649	10.68	0.00%	0.067		0.00		
		Interior Paint	Astro White Interior Alky	Q1255-3580	9.29	0.00%	0.958		0.00		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.205		0.00		
									Total from booths	1.36	5.94

Notes

1 Coatings used in calculations are coatings applied to school buses which are an overwhelming majority of production
2 See Table 24
3 Potential TAC Emissions per Coating Type, lb/hr = (Throughput, units/hr) * (Coating Quantity, gal/unit) * (TAC Content of Coating, %) * (Density of Coating, lb/gal)
4 TAC Emissions, lb/hr = Sum of TAC emissions for each coating used in booth
5 Potential TAC Emissions, tpy = (Potential TAC Emissions, lb/hr) * (8,760 hr/yr) / (2,000 lb/ton)

Table 22: 8032-32-4 (Refined Solvent Naphtha) (TAP) Emissions from Paint Booths

Emission Unit ID	Emission Unit Descritption	Type of Coating Applied[1]	Coating Name	Coating ID	Density[2] (lb/gal)	8032-32-4 Content[2] (%)	Total Coating Quantity (gal/unit)	Throughput (units/hr)	8032-32-4 Emissions Per Coating Type[3] (lb/hr)	Total 8032-32-4 Emissions[4] (lb/hr)	Potential 8032-32-4 Emissions[5] (tpy)
PB10	All American Touchup Booth	Cleaning Solvent	HD Wax and Grease Remover	CFX437	6.94	0.00%	0.300	4	0.00	0.174	0.762
		Paint	Med Gloss Black Spectracron	SAC62000	8.48	2.03%	0.253		0.17		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.057		0.00		
PB11	Overflow Paint Booth	Cleaning Solvent	HD Wax and Grease Remover	CFX437	6.94	0.00%	0.120	6	0.00	0.000	0.000
		Paint	BSBY w/F3360+GXA 3.5/1 Blended RTS	HSU907616C	9.53	0.00%	0.101		0.00		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.023		0.00		
PB27	Undercoat Paint Booth	Cleaning Solvent	Spectraclean Purge	GXS65745	6.64	0.00%	2.000	6	0.00	0.000	0.000
		Undercoating	Undercoat	BCG 325	8.30	0.00%	6.500		0.00		
PB28	Black and Primer Paint Booths	Cleaning Solvent	VM&P NAPHTHA	70885	6.19	0.00%	0.750	6	0.00	0.749	3.28
		Primer	Spectracron Sep Primer AC	GXM71137	11.57	0.00%	0.480		0.00		
		Paint	Med Gloss Black Spectracron	SAC62000	8.48	2.03%	0.725		0.75		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.145		0.00		
PB29	Yellow Paint Booth	Cleaning Solvent	VM&P NAPHTHA	70885	6.19	0.00%	0.250	6	0.00	0.000	0.000
		Paint	BSBY w/F3360+GXA 3.5/1 Blended RTS	HSU907616C	9.53	0.00%	0.778		0.00		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.222		0.00		
PB30	BBCV Touchup Booth	Cleaning Solvent	HD Wax and Grease Remover	CFX437	6.94	0.00%	0.300	4	0.00	0.174	0.762
		Paint	Med Gloss Black Spectracron	SAC62000	8.48	2.03%	0.253		0.17		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.057		0.00		
PB31	White Paint Booth	Cleaning Solvent	Spectraclean Purge	GXS65745	6.64	0.00%	1.000	6	0.00	0.000	0.000
		Primer	Spectracron Sep Primer AC	GXM71137	11.57	0.00%	0.080		0.00		
		Exterior Paint	Delfleet SPU Warm White	HSL907649	10.68	0.00%	0.067		0.00		
		Interior Paint	Astro White Interior Alky	Q1255-3580	9.29	0.00%	0.958		0.00		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.205		0.00		
									Total from booths	**1.10**	**4.80**

Notes

1	Coatings used in calculations are coatings applied to school buses which are an overwhelming majority of production
2	See Table 24
3	Potential TAC Emissions per Coating Type, lb/hr = (Throughput, units/hr) * (Coating Quantity, gal/unit) * (TAC Content of Coating, %) * (Density of Coating, lb/gal)
4	TAC Emissions, lb/hr = Sum of TAC emissions for each coating used in booth
5	Potential TAC Emissions, tpy = (Potential TAC Emissions, lb/hr) * (8,760 hr/yr) / (2,000 lb/ton)

Table 23: 111-76-2 (2-Butoxyethanol) (TAP) Emissions from Paint Booths

Emission Unit ID	Emission Unit Descritption	Type of Coating Applied[1]	Coating Name	Coating ID	Density[2] (lb/gal)	111-76-2 Content[2] (%)	Total Coating Quantity (gal/unit)	Throughput (units/hr)	111-76-2 Emissions Per Coating Type[3] (lb/hr)	Total 111-76-2 Emissions[4] (lb/hr)	Potential 111-76-2 Emissions[5] (tpy)
PB10	All American Touchup Booth	Cleaning Solvent	HD Wax and Grease Remover	CFX437	6.94	0.00%	0.300	4	0.00	0.000	0.000
		Paint	Med Gloss Black Spectracron	SAC62000	8.48	0.00%	0.253		0.00		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.057		0.00		
PB11	Overflow Paint Booth	Cleaning Solvent	HD Wax and Grease Remover	CFX437	6.94	0.00%	0.120	6	0.00	0.000	0.000
		Paint	BSBY w/F3360+GXA 3.5/1 Blended RTS	HSU907616C	9.53	0.00%	0.101		0.00		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.023		0.00		
PB27	Undercoat Paint Booth	Cleaning Solvent	Spectraclean Purge	GXS65745	6.64	0.00%	2.000	6	0.00	3.24	14.2
		Undercoating	Undercoat	BCG 325	8.30	1.00%	6.500		3.24		
PB28	Black and Primer Paint Booths	Cleaning Solvent	VM&P NAPHTHA	70885	6.19	0.00%	0.750	6	0.00	0.000	0.000
		Primer	Spectracron Sep Primer AC	GXM71137	11.57	0.00%	0.480		0.00		
		Paint	Med Gloss Black Spectracron	SAC62000	8.48	0.00%	0.725		0.00		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.145		0.00		
PB29	Yellow Paint Booth	Cleaning Solvent	VM&P NAPHTHA	70885	6.19	0.00%	0.250	6	0.00	0.000	0.000
		Paint	BSBY w/F3360+GXA 3.5/1 Blended RTS	HSU907616C	9.53	0.00%	0.778		0.00		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.222		0.00		
PB30	BBCV Touchup Booth	Cleaning Solvent	HD Wax and Grease Remover	CFX437	6.94	0.00%	0.300	4	0.00	0.000	0.000
		Paint	Med Gloss Black Spectracron	SAC62000	8.48	0.00%	0.253		0.00		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.057		0.00		
PB31	White Paint Booth	Cleaning Solvent	Spectraclean Purge	GXS65745	6.64	0.00%	1.000	6	0.00	2.06	9.03
		Primer	Spectracron Sep Primer AC	GXM71137	11.57	0.00%	0.080		0.00		
		Exterior Paint	Delfleet SPU Warm White	HSL907649	10.68	0.00%	0.067		0.00		
		Interior Paint	Astro White Interior Alky	Q1255-3580	9.29	3.86%	0.958		2.06		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.205		0.00		
									Total from booths	**5.30**	**23.2**

Notes

1 Coatings used in calculations are coatings applied to school buses which are an overwhelming majority of production
2 See Table 24
3 Potential TAC Emissions per Coating Type, lb/hr = (Throughput, units/hr) * (Coating Quantity, gal/unit) * (TAC Content of Coating, %) * (Density of Coating, lb/gal)
4 TAC Emissions, lb/hr = Sum of TAC emissions for each coating used in booth
5 Potential TAC Emissions, tpy = (Potential TAC Emissions, lb/hr) * (8,760 hr/yr) / (2,000 lb/ton)

Table 24: 107-98-2 (Propylene Glycol Monomethyl Ether) (TAP) Emissions from Paint Booths

Emission Unit ID	Emission Unit Descritption	Type of Coating Applied[1]	Coating Name	Coating ID	Density[2] (lb/gal)	107-98-2 Content[2] (%)	Total Coating Quantity (gal/unit)	Throughput (units/hr)	107-98-2 Emissions Per Coating Type[3] (lb/hr)	Total 107-98-2 Emissions[4] (lb/hr)	Potential 107-98-2 Emissions[5] (tpy)
PB10	All American Touchup Booth	Cleaning Solvent	HD Wax and Grease Remover	CFX437	6.94	0.00%	0.300	4	0.00	0.000	0.000
		Paint	Med Gloss Black Spectracron	SAC62000	8.48	0.00%	0.253		0.00		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.057		0.00		
PB11	Overflow Paint Booth	Cleaning Solvent	HD Wax and Grease Remover	CFX437	6.94	0.00%	0.120	6	0.00	0.000	0.000
		Paint	BSBY w/F3360+GXA 3.5/1 Blended RTS	HSU907616C	9.53	0.00%	0.101		0.00		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.023		0.00		
PB27	Undercoat Paint Booth	Cleaning Solvent	Spectraclean Purge	GXS65745	6.64	0.00%	2.000	6	0.00	0.00	0.0
		Undercoating	Undercoat	BCG 325	8.30	0.00%	6.500		0.00		
PB28	Black and Primer Paint Booths	Cleaning Solvent	VM&P NAPHTHA	70885	6.19	0.00%	0.750	6	0.00	2.319	10.158
		Primer	Spectracron Sep Primer AC	GXM71137	11.57	6.96%	0.480		2.32		
		Paint	Med Gloss Black Spectracron	SAC62000	8.48	0.00%	0.725		0.00		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.145		0.00		
PB29	Yellow Paint Booth	Cleaning Solvent	VM&P NAPHTHA	70885	6.19	0.00%	0.250	6	0.00	0.000	0.000
		Paint	BSBY w/F3360+GXA 3.5/1 Blended RTS	HSU907616C	9.53	0.00%	0.778		0.00		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.222		0.00		
PB30	BBCV Touchup Booth	Cleaning Solvent	HD Wax and Grease Remover	CFX437	6.94	0.00%	0.300	4	0.00	0.000	0.000
		Paint	Med Gloss Black Spectracron	SAC62000	8.48	0.00%	0.253		0.00		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.057		0.00		
PB31	White Paint Booth	Cleaning Solvent	Spectraclean Purge	GXS65745	6.64	0.00%	1.000	6	0.00	0.39	1.69
		Primer	Spectracron Sep Primer AC	GXM71137	11.57	6.96%	0.080		0.39		
		Exterior Paint	Delfleet SPU Warm White	HSL907649	10.68	0.00%	0.067		0.00		
		Interior Paint	Astro White Interior Alky	Q1255-3580	9.29	0.00%	0.958		0.00		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.205		0.00		
									Total from booths	2.71	11.9

Notes

1	Coatings used in calculations are coatings applied to school buses which are an overwhelming majority of production
2	See Table 24
3	Potential TAC Emissions per Coating Type, lb/hr = (Throughput, units/hr) * (Coating Quantity, gal/unit) * (TAC Content of Coating, %) * (Density of Coating, lb/gal)
4	TAC Emissions, lb/hr = Sum of TAC emissions for each coating used in booth
5	Potential TAC Emissions, tpy = (Potential TAC Emissions, lb/hr) * (8,760 hr/yr) / (2,000 lb/ton)

Table 25: 75-65-0(Tert-Butyl Alcohol) (TAP) Emissions from Paint Booths

Emission Unit ID	Emission Unit Descritption	Type of Coating Applied[1]	Coating Name	Coating ID	Density[2] (lb/gal)	75-65-0 Content[2] (%)	Total Coating Quantity (gal/unit)	Throughput (units/hr)	75-65-0 Emissions Per Coating Type[3] (lb/hr)	Total 75-65-0 Emissions[4] (lb/hr)	Potential 75-65-0 Emissions[5] (tpy)
PB10	All American Touchup Booth	Cleaning Solvent	HD Wax and Grease Remover	CFX437	6.94	0.00%	0.300	4	0.00	0.000	0.000
		Paint	Med Gloss Black Spectracron	SAC62000	8.48	0.00%	0.253		0.00		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.057		0.00		
PB11	Overflow Paint Booth	Cleaning Solvent	HD Wax and Grease Remover	CFX437	6.94	0.00%	0.120	6	0.00	0.000	0.000
		Paint	BSBY w/F3360+GXA 3.5/1 Blended RTS	HSU907616C	9.53	0.00%	0.101		0.00		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.023		0.00		
PB27	Undercoat Paint Booth	Cleaning Solvent	Spectraclean Purge	GXS65745	6.64	0.00%	2.000	6	0.00	0.00	0.0
		Undercoating	Undercoat	BCG 325	8.30	0.00%	6.500		0.00		
PB28	Black and Primer Paint Booths	Cleaning Solvent	VM&P NAPHTHA	70885	6.19	0.00%	0.750	6	0.00	0.050	0.219
		Primer	Spectracron Sep Primer AC	GXM71137	11.57	0.15%	0.480		0.05		
		Paint	Med Gloss Black Spectracron	SAC62000	8.48	0.00%	0.725		0.00		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.145		0.00		
PB29	Yellow Paint Booth	Cleaning Solvent	VM&P NAPHTHA	70885	6.19	0.00%	0.250	6	0.00	0.000	0.000
		Paint	BSBY w/F3360+GXA 3.5/1 Blended RTS	HSU907616C	9.53	0.00%	0.778		0.00		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.222		0.00		
PB30	BBCV Touchup Booth	Cleaning Solvent	HD Wax and Grease Remover	CFX437	6.94	0.00%	0.300	4	0.00	0.000	0.000
		Paint	Med Gloss Black Spectracron	SAC62000	8.48	0.00%	0.253		0.00		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.057		0.00		
PB31	White Paint Booth	Cleaning Solvent	Spectraclean Purge	GXS65745	6.64	0.00%	1.000	6	0.00	0.01	0.04
		Primer	Spectracron Sep Primer AC	GXM71137	11.57	0.15%	0.080		0.01		
		Exterior Paint	Delfleet SPU Warm White	HSL907649	10.68	0.00%	0.067		0.00		
		Interior Paint	Astro White Interior Alky	Q1255-3580	9.29	0.00%	0.958		0.00		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.205		0.00		
									Total from booths	0.06	0.3

Notes

1	Coatings used in calculations are coatings applied to school buses which are an overwhelming majority of production
2	See Table 24
3	Potential TAC Emissions per Coating Type, lb/hr = (Throughput, units/hr) * (Coating Quantity, gal/unit) * (TAC Content of Coating, %) * (Density of Coating, lb/gal)
4	TAC Emissions, lb/hr = Sum of TAC emissions for each coating used in booth
5	Potential TAC Emissions, tpy = (Potential TAC Emissions, lb/hr) * (8,760 hr/yr) / (2,000 lb/ton)

Table 26: 64-19-7 (Acetic Acid) (TAP) Emissions from Paint Booths

Emission Unit ID	Emission Unit Descritption	Type of Coating Applied[1]	Coating Name	Coating ID	Density[2] (lb/gal)	64-19-7 Content[2] (%)	Total Coating Quantity (gal/unit)	Throughput (units/hr)	64-19-7 Emissions Per Coating Type[3] (lb/hr)	Total 64-19-7 Emissions[4] (lb/hr)	Potential 64-19-7 Emissions[5] (tpy)
PB10	All American Touchup Booth	Cleaning Solvent	HD Wax and Grease Remover	CFX437	6.94	0.00%	0.300	4	0.00	0.000	0.000
		Paint	Med Gloss Black Spectracron	SAC62000	8.48	0.00%	0.253		0.00		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.057		0.00		
PB11	Overflow Paint Booth	Cleaning Solvent	HD Wax and Grease Remover	CFX437	6.94	0.00%	0.120	6	0.00	0.000	0.000
		Paint	BSBY w/F3360+GXA 3.5/1 Blended RTS	HSU907616C	9.53	0.00%	0.101		0.00		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.023		0.00		
PB27	Undercoat Paint Booth	Cleaning Solvent	Spectraclean Purge	GXS65745	6.64	0.00%	2.000	6	0.00	0.00	0.0
		Undercoating	Undercoat	BCG 325	8.30	0.00%	6.500		0.00		
PB28	Black and Primer Paint Booths	Cleaning Solvent	VM&P NAPHTHA	70885	6.19	0.00%	0.750	6	0.00	0.097	0.423
		Primer	Spectracron Sep Primer AC	GXM71137	11.57	0.29%	0.480		0.10		
		Paint	Med Gloss Black Spectracron	SAC62000	8.48	0.00%	0.725		0.00		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.145		0.00		
PB29	Yellow Paint Booth	Cleaning Solvent	VM&P NAPHTHA	70885	6.19	0.00%	0.250	6	0.00	0.000	0.000
		Paint	BSBY w/F3360+GXA 3.5/1 Blended RTS	HSU907616C	9.53	0.00%	0.778		0.00		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.222		0.00		
PB30	BBCV Touchup Booth	Cleaning Solvent	HD Wax and Grease Remover	CFX437	6.94	0.00%	0.300	4	0.00	0.000	0.000
		Paint	Med Gloss Black Spectracron	SAC62000	8.48	0.00%	0.253		0.00		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.057		0.00		
PB31	White Paint Booth	Cleaning Solvent	Spectraclean Purge	GXS65745	6.64	0.00%	1.000	6	0.00	0.02	0.07
		Primer	Spectracron Sep Primer AC	GXM71137	11.57	0.29%	0.080		0.02		
		Exterior Paint	Delfleet SPU Warm White	HSL907649	10.68	0.00%	0.067		0.00		
		Interior Paint	Astro White Interior Alky	Q1255-3580	9.29	0.00%	0.958		0.00		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.205		0.00		
									Total from booths	**0.11**	**0.5**

Notes

1	Coatings used in calculations are coatings applied to school buses which are an overwhelming majority of production
2	See Table 24
3	Potential TAC Emissions per Coating Type, lb/hr = (Throughput, units/hr) * (Coating Quantity, gal/unit) * (TAC Content of Coating, %) * (Density of Coating, lb/gal)
4	TAC Emissions, lb/hr = Sum of TAC emissions for each coating used in booth
5	Potential TAC Emissions, tpy = (Potential TAC Emissions, lb/hr) * (8,760 hr/yr) / (2,000 lb/ton)

Table 27: 64742-89-8 (Solvent naphtha light distillate) (TAP) Emissions from Paint Booths

Emission Unit ID	Emission Unit Descritption	Type of Coating Applied[1]	Coating Name	Coating ID	Density[2] (lb/gal)	64742-89-8 Content[2] (%)	Total Coating Quantity (gal/unit)	Throughput (units/hr)	64742-89-8 Emissions Per Coating Type[3] (lb/hr)	Total 64742-89-8 Emissions[4] (lb/hr)	Potential 64742-89-8 Emissions[5] (tpy)
PB10	All American Touchup Booth	Cleaning Solvent	HD Wax and Grease Remover	CFX437	6.94	0.00%	0.300	4	0.00	0.000	0.000
		Paint	Med Gloss Black Spectracron	SAC62000	8.48	0.00%	0.253		0.00		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.057		0.00		
PB11	Overflow Paint Booth	Cleaning Solvent	HD Wax and Grease Remover	CFX437	6.94	0.00%	0.120	6	0.00	0.000	0.000
		Paint	BSBY w/F3360+GXA 3.5/1 Blended RTS	HSU907616C	9.53	0.00%	0.101		0.00		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.023		0.00		
PB27	Undercoat Paint Booth	Cleaning Solvent	Spectraclean Purge	GXS65745	6.64	0.00%	2.000	6	0.00	0.00	0.0
		Undercoating	Undercoat	BCG 325	8.30	0.00%	6.500		0.00		
PB28	Black and Primer Paint Booths	Cleaning Solvent	VM&P NAPHTHA	70885	6.19	100.00%	0.750	6	27.86	27.855	122.005
		Primer	Spectracron Sep Primer AC	GXM71137	11.57	0.00%	0.480		0.00		
		Paint	Med Gloss Black Spectracron	SAC62000	8.48	0.00%	0.725		0.00		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.145		0.00		
PB29	Yellow Paint Booth	Cleaning Solvent	VM&P NAPHTHA	70885	6.19	100.00%	0.250	6	9.29	9.285	40.668
		Paint	BSBY w/F3360+GXA 3.5/1 Blended RTS	HSU907616C	9.53	0.00%	0.778		0.00		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.222		0.00		
PB30	BBCV Touchup Booth	Cleaning Solvent	HD Wax and Grease Remover	CFX437	6.94	0.00%	0.300	4	0.00	0.000	0.000
		Paint	Med Gloss Black Spectracron	SAC62000	8.48	0.00%	0.253		0.00		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.057		0.00		
PB31	White Paint Booth	Cleaning Solvent	Spectraclean Purge	GXS65745	6.64	0.00%	1.000	6	0.00	0.00	0.00
		Primer	Spectracron Sep Primer AC	GXM71137	11.57	0.00%	0.080		0.00		
		Exterior Paint	Delfleet SPU Warm White	HSL907649	10.68	0.00%	0.067		0.00		
		Interior Paint	Astro White Interior Alky	Q1255-3580	9.29	0.00%	0.958		0.00		
		Accelerator	Delta Accelerator	DX39	8.15	0.00%	0.205		0.00		
									Total from booths	37.14	162.7

Notes

1	Coatings used in calculations are coatings applied to school buses which are an overwhelming majority of production
2	See Table 24
3	Potential TAC Emissions per Coating Type, lb/hr = (Throughput, units/hr) * (Coating Quantity, gal/unit) * (TAC Content of Coating, %) * (Density of Coating, lb/gal)
4	TAC Emissions, lb/hr = Sum of TAC emissions for each coating used in booth
5	Potential TAC Emissions, tpy = (Potential TAC Emissions, lb/hr) * (8,760 hr/yr) / (2,000 lb/ton)

Table 28: Coating Inventory

Paint/Coating ID	Paint/Coating Description	Density (lb/gal)	VOC Content (% by wt.)	VOC content minus exempts[1] (% by wt.)	VOC (lb/gal)	HAP (lb/gal)	HAPS (% by weight) Xylene 1330-20-7	Ethyl Benzene 100-41-4	Toluene 108-88-3	Cumene 98-82-8	2-Butanone 80-62-6	n-Butyl Acetate 78-93-3
DX39	Delta Accelerator	8.15	98.32	98.32	8.01308	0.00						
DX437	Heavy Duty Wax and Grease	6.94	100	100	6.94	4.64	56.87	10.04				
SAC62000	Med Gloss Black Spectracron	8.48	67.36	67.21	5.699408	0.06	0.3		0.38			
HSU907616C	BSBY w/F3360+GXA 3.5/1 Blended RTS	9.53	39.99	35.45	3.378385	0.030	0.21			0.11		
GXS65745	Spectraclean Purge	6.64	100	25	1.66	0.00						
BCG 325	Undercoat	8.3	1	0	0.083	0.00						
70885	VM&P NAPHTHA	6.19	100	100	6.19	0.00						
GXM71137	Spectracron Sep Primer AC	11.57	43.75	43.75	5.061875	0.069	0.49	0.11				
HSL907649	Delfleet SPU Warm White	10.68	34.88	34.88	3.725184	0.11					1.00	
Q1255-3580	Astro White Interior Alky	9.29	49.3	49.3	4.57997	3.26	23.6	4.1				7.39

Notes

1 Per 40 CFR §51.100(s)(1) Acetone (CAS No. 67-64-1) is not regulated as a VOC

TACs (% by weight)

Paint/Coating ID	Paint/Coating Description	Density (lb/gal)	Acetylacetone 123-54-6	Acetic Acid 64-19-7	Naphtha (petroleum), hydrotreated heavy 64742-48-9	n-Butyl Acetate 123-86-4	Propylene glycol monomethyl ether acetate 108-65-6	Solvent naphtha (petroleum), light arom. 64742-95-6	1,2,4-Trimethyl benzene 95-63-6	2-methoxypropyl acetate 70657-70-4	Acetone 67-64-1	Ethyl Alcohol 64-17-5	Ketones 71808-49-6	Stoddard Solvent 8052-41-3
DX39	Delta Accelerator	8.15	98.31											
DX437	Heavy Duty Wax and Grease	6.94			33.09									
SAC62000	Med Gloss Black Spectracron	8.48				17.72	1.85	0.81	0.41		0.15	0.22		
HSU907616C	BSBY w/F3360+GXA 3.5/1 Blended RTS	9.53	1.26		0.24	6.78	13.63	4.02	2.11	0.14	4.54		1.23	
GXS65745	Spectraclean Purge	6.64									75			
BCG 325	Undercoat	8.3												
70885	VM&P NAPHTHA	6.19												
GXM71137	Spectracron Sep Primer AC	11.57		0.29										
HSL907649	Delfleet SPU Warm White	10.68				10								
Q1255-3580	Astro White Interior Alky	9.29			0.12	3.53	6.19			0.12				0.12

Paint/Coating ID	Dimethyl glutarate 1119-40-0	Trimethylbenzene 25551-13-7	Tert-Butyl Acetate 540-88-5	Propylene Glycol Monomethyl Ether 107-98-2	n-Butyl Alcohol 71-36-3	Ethyl 3-ethoxypropionate 763-69-9	Methyl (n-amyl) ketone 110-43-0	Tert-Butyl Alcohol 75-65-0	1-Methyl-2-pyrrolidone 872-50-4	Pentyl propanoate 624-54-4	2-(2H-Benzotriazol-2-yl)-4,6-ditertpentylphenol 25973-55-1	Isobutyl alcohol 78-83-1	n-Heptane 142-82-5	Refined Solvent Naphtha 8032-32-4	Naphtha (petroleum) light alkylate 64741-66-8	Solvent Naphtha Light Distillate 64742-89-8	2-Butoxyethanol 111-76-2
DX39																	
DX437																	
SAC62000					0.7		3.61					0.66	2.51	2.03	1.2		
HSU907616C	0.11	0.14	3.59				1.06										
GXS65745									2								
BCG 325																	1
70885																100	
GXM71137			28.73	6.96	2.48	2.03	1.97	0.15									
HSL907649							30			7	1						
Q1255-3580																	3.86

Table 29: Potential TAP Emissions

Point Sources

Emission Unit ID	Xylene 1330-20-7	Ethyl Benzye 100-41-4	Toluene 108-88-3	Cumene 98-82-8	Methyl methacrylate 80-62-6	2-Butanone 78-93-3	n-Butyl Acetate 123-86-4	1, 2, 2-Trimethyl benzene 95-63-6	Acetone 67-64-1	Ethyl Alcohol 64-17-5	Stoddard Solvent 8052-41-3	Tert-Butyl Acetate 540-88-5	n-Butyl Alcohol 71-36-3	Methyl (n-amyl) ketone 110-43-0	Isobutyl alcohol 78-83-1	n-Heptane 142-82-5	Refined Solvent Naphtha 8032-32-4	2-Butoxyethanol 111-76-2	Propylene Glycol Monomethyl Ether 107-98-2	Acetic Acid 64-19-7	Tert-Butyl Alcohol 75-65-0	Total TAP (tpy)
	Potential TAP Emission Rates (tpy)																					
PB10	20.75	3.66	0.24	0.00	0.00	0.00	6.65	0.15	0.06	0.083	0.00	0.00	0.26	1.36	0.25	0.94	0.76	0.00	0.00	0.00	0.00	35.18
PB11	12.44	2.20	0.059	0.028	0.00	0.00	1.72	0.53	1.15	0.00	0.00	0.91	0.00	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	19.30
PB27	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	14.18	0.00	0.00	0.00	14.2
PB28	1.20	0.16	0.61	0.00	0.00	0.00	28.63	0.66	0.24	0.36	0.00	41.93	4.75	8.71	1.07	4.06	3.28	0.00	10.16	0.02	0.22	106.1
PB29	0.41	0.00	0.00	0.21	0.00	0.00	13.21	4.11	8.84	0.00	0.00	6.99	0.00	2.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	35.84
PB30	20.75	3.66	0.24	0.00	0.00	0.00	6.65	0.15	0.06	0.083	0.00	0.00	0.26	1.36	0.25	0.94	0.76	0.00	0.00	0.00	0.00	35.18
PB31	55	9.62	0.00	0.00	0.01	17.29	10.13	0.00	0.00	0.00	0.28	6.99	0.60	6.09	0.00	0.00	0.00	9.03	1.69	0.004	0.04	117.1
Total	111	19.30	1.16	0.24	0.01	17.29	66.99	5.61	10.35	0.52	0.28	56.82	5.88	19.85	1.56	5.94	4.80	23.21	11.85	0.03	0.26	362.8

Volume Source

Emission Unit ID	Acetone 67-64-1	Solvent Naphtha Light Distillate 64742-89-8	Total TAP (tpy)
	TAP (tpy)		
VOL1	65.44	32.53	97.97
VOL2	65.44	32.53	97.97
VOL3	65.44	32.53	97.97
VOL4	65.44	32.53	97.97
VOL5	65.44	32.53	97.97
Total	327.19	162.67	489.86

Attachment C

VOC BACT Analysis

Introduction

The purpose of this document is to demonstrate compliance with 40 CFR 52.21(j) as it applies to new or modified sources. As the modifications presented in this application trigger PSD review for VOC, the facility must conduct a BACT analysis to determine the most appropriate control technology for reducing VOC emissions.

1.0 Best Available Control Technology Evaluation for VOCs

Section 169 of the CAA defines BACT as an emission limitation based on the maximum degree of reduction of a pollutant which the permitting authority (GA EPD), on a case-by-case basis, taking into account energy, environmental, economic impacts and other costs, determines is achievable for such facility through application of production processes and available methods, systems, and techniques. Additionally, if there is no economically or technically feasible means to measure emissions, and hence to impose an enforceable emissions standard, the source may use a design, work practice, operations standard or combination thereof, to satisfy the requirements for the application of BACT.

Neither state nor federal regulations establish specific control technologies or emission limits as BACT because of the extensive diversity of facility types and emissions reduction options makes such specifications impractical. Instead, Blue Bird Body Company will determine BACT for the paint booths using the following "top-down" analysis.

2.0 Top-down BACT Analysis

The procedures for performing top-down BACT analysis as described in Chapter B of the NSR Workshop Manual dated October 1990, hereafter referred to as the guidance, are being followed. One critical step in the BACT analysis is to determine if a control option is technically feasible. If a control is determined to be infeasible, it is eliminated from further consideration. The guidance requires several criteria to be applied in determining technical feasibility. The first criteria is straightforward. If the control has been installed and operated successfully by the type of source under review, it is demonstrated and technically feasible, unless source specific factors exist and are documented to justify technical infeasibility.

For controls not demonstrated using this straightforward approach, the guidance applies a more complex approach that involves two concepts for determining technical feasibility: availability and applicability. A technology is considered available if it commercially available for purchase. An available control is applicable if it can be reasonably installed and operated on the source type under consideration. A technology that is available and applicable is considered technically feasible.

The five steps of a top-down BACT review procedure as identified in Chapter B of the NSR Workshop Manual are listed below:

Step 1: Identify all available control technologies.

Step 2: Eliminate technically infeasible options.

Step 3: Rank remaining control technologies by control effectiveness.

Step 4: Evaluate energy, environmental and economic impacts of most effective controls and document results.

Step 5: Select BACT

3.0 Nature of VOC emissions and Identification of Applicable Control Technologies (Step 1)

Blue Bird Body Company produces VOC emissions from two source types: coating evaporations in the paint booths and combustion in the ovens and hanging furnaces. Through analysis of VOC controls at similar facilities, and the BACT determinations made for PSD major sites found on the RACT/BACT/LAER clearinghouse, the most practical and demonstrable technologies currently available which have the potential to reduce emissions of VOCs from the sources in question include thermal oxidation, catalytic oxidation, carbon adsorption, biofiltration, and pollution prevention using Good Work Practices, Low-VOC Coatings, High Efficiency Applicators, and Good Combustion Practices. Table 1.3-1, below, shows PSD BACT determinations at several automobile assembly plants

Table 1.3-1: BACT Determinations for Vehicular Coating Operations

Facility Name	Location	Agency	Permit Date	Process Type[1]	Process Description	Controls / Type	Emission Limits/ Description
Kenworth Truck Co.	Ross, OH	Ohio EPA	1/29/2008	41.002	Robotic Cab Paint Booths, Line 1	Thermal Oxidizer	1.66 lb/hr 7.27 tpy
	Ross, OH	Ohio EPA	1/29/2008	41.002	Robotic Cab Paint Booths, Line 2	Thermal Oxidizer	3.32 lb/hr 14.54 tpy
	Ross, OH	Ohio EPA	1/29/2008	41.002	Drying Ovens and Flash Tunnels for Cab Booths	Thermal Oxidizer	9.63 lb/hr 42.18 tpy
KIA Motors Manufacturing Georgia	Troup, GA	GA EPD	7/27/2007	41.002	E-Coat Tank and Curing	RTO Controlling Emissions from Oven	0.19 lb/gal monthly - applied solid minimum 95% destruction removal efficiency for RTO
	Troup, GA	GA EPD	7/27/2007	41.002	Guidecoat and Topcoat Painting	RTO	2.92 lb/gal applied solid guidecoat/surfacer, monthly average 5.20 lb/gal applied solid topcoat (base/clear, avg)
	Troup, GA	GA EPD	7/27/2007	41.002	Rocker Panel Priming	RTO	4.70 lb/gal monthly - applied solid
	Troup, GA	GA EPD	7/27/2007	41.002	Blackout Coatings	low VOC materials	1.00 lb/gal monthly
	Troup, GA	GA EPD	7/27/2007	41.002	Miscellaneous VOC Sources	Work Practice Standards	90.00 tpy Misc. plant wide solvent usage
Toledo Supplier Park - Paint Shop	Lucas, Ohio	Ohio EPA	5/3/2007	41.002	Topcoat Booths (2) for Basecoat and Clear coat	Thermal Incinerator 7.5 MMBtu/hr	247.00 lb/hr 300.60 tpy per rolling 12-month 5.42 lb/gal app. Coat solid as VOC-weighted daily average
Country Coach, Inc.	Lane, OR	LANE REGIONAL AIR POLL AUTHORITY, OR	8/4/2005	41.002	Coach Painting and Finishing, Pretreatment	Low-VOC Coatings, Transfer Efficiency, Operator Training, and Closed Container Requirements	6.50 lb/gal as applied for pretreatment
Hyundai Motor Manufacturing Alabama, LLC	Montgomery, AL	ADEM	3/14/2005	41.002	Painting Booth, Rocker Panel Primer (RP-1)	RTO (95% Destruction) and Airless Gun	1.00 lb/gal acs after control device

Facility Name	Location	Agency	Permit Date	Process Type[1]	Process Description	Controls / Type	Emission Limits/ Description
Toyota Motor Manufacturing Kentucky, Incorporated	Scott, KY	KDEP	7/30/2004	41.002	Paint Booths & Ovens, Exterior Molded, A/B	VOC Carry Over to Oven Catalytic Incinerators for Each Booth	0.917 lb/unit
Hyundai Motor Manufacturing of Alabama, LLC	Montgomery, AL	ADEM	3/23/2004	41.002	Primer Surface Operations	RTO Controlling Oven; Water-based Primer Surfacer	4.10 lb/gal acs
	Montgomery, AL	ADEM	3/23/2004	41.002	Topcoat Operations	OP-Coat Operation; RTO Controlling Oven & Auto Clear Coat; Water-based Basecoat/Solvent-based Clearcoat	5.20 lb/gal acs
Toyota Motor Manufacturing Texas	Bexar Texas	TCEQ	12/17/2003	41.002	Surface Coating System	None	712.00 tpy
	Bexar Texas	TCEQ	12/17/2003	41.002	Misc. Metal Coating	None	70.10 tpy
	Bexar Texas	TCEQ	12/17/2003	41.002	Misc. Body coating	None	366.70 tpy
GMC Truck and Bus, Moraine Assembly Plant	Montgomery, OH	Ohio EPA	1/14/2003	41.002	Topcoat Lines (4)	Carbon Adsorption followed by Thermal Incineration	305.00 lb/hr 737.06 tpy 8.24 lb/gal acs
	Montgomery, OH	Ohio EPA	1/14/2003	41.002	Miscellaneous Solvent Usage	none	629.00 tpy

[1] 41.002 = Automobiles and Trucks Surface Coating

The control technologies included in Table 1.3-1 are summarized below in Table 1.3-2.

Table 1.3-2: List of Control Technologies for Consideration

Option No.	*Control Technology*
1	Regenerative/Recuperative Thermal Oxidation
2	Carbon Adsorption
3	Biofiltration
4	Catalytic Oxidation
5	Good Work Practices/Low-VOC Materials/High Efficiency Applicators (paint booths)

4.0 Eliminate Technically Infeasible Options (Step 2)

Blue Bird Body Company considers all of the control technologies included in Table 1.3-1 to be technically feasible. To effectively control the VOC emissions from cleaning operations associated with PB27, PB28, PB29, and PB31, the facility would require canopy fume hoods. Details regarding the design of the canopy fume hoods are provided in Appendix B to Attachment C. The increase flow and added cost of the hoods has been included in the BACT cost effectiveness calculations included in Appendix A to Attachment C for PB27, PB28, PB29, and PB31.

Additionally, to reduce the size, and thus the cost effectiveness, of control options 1-4, this analysis has included the use of a rotor concentrator. The concentrator will concentrate the VOC content of the waste gas stream from each booth and reduce the airflow of the waste gas routed to the control device by a factor of 30:1. While the rotor concentrator presents additional capital cost, the upfront capital cost is offset by the reduction in operational costs of each control technology. For comparison, the annual cost per ton of VOC reduced for each booth, for all control options (both with and without a rotor concentrator) has been provided in Table A-15. Since the use of a rotor concentrator to reduce flow and concentrate VOC in the waste gas stream from each booth significantly reduces control system costs for thermal and catalytic incineration and carbon adsorption options, and has a negligible impact on the cost effectiveness of biofiltration, this BACT analysis only considers control options in conjunction with a rotor concentrator.

While the use of a rotor concentrator reduces the cost per ton VOC reduced for each control device, it also reduces the control efficiency of each device as concentrators are not 100% efficient at concentrating the entire VOC fraction from waste gas stream. Additionally, as each paint booth has the potential to emit several species of VOC, a high efficiency cannot be guaranteed from the concentrator. Due to the variability of molecular sizes of the VOCs present in the waste gas stream such as refined solvent naphtha (CAS No. 8032-32-4) and ethyl alcohol (CAS No. 64-17-5), an adsorption media capable of adsorbing a large range in molecular sizes must be selected. While this problem can be partially addressed by proper adsorption media selection, the variable nature of the waste gas stream presents a challenge for the rotor concentrator to have a high efficiency of concentration. Therefore, It is estimated that a rotor concentrator with a 30:1 reduction ratio will emit 8.2% of the VOC content of the waste gas stream uncontrolled.

5.0 Rank Remaining Control Technologies by Control Effectiveness (Step 3)

It is assumed that regenerative, recouperative, and catalytic oxidizers, as well as carbon adsorption can achieve a VOC control efficiency of 98%. It is estimated that boifiltration can achieve a VOC control efficiency of 90%. Additionally, in order to concentrate the VOC fraction of the waste gas stream, it is estimated that 8.2% of the VOC fraction entering the concentrator is emitted uncontrolled. Therefore, the effective control efficiency of each control system has been summarized below, in Table 5.0-1.

Table 5.0-1: Efficiency of Technically Feasible Control Technologies

Control Technology Ranking	Option No.	Control Technology	Control Efficiency[1]
1 (tie)	1	Regenerative/Recuperative Thermal Oxidation with Rotor Concentrator	90%
1 (tie)	2	Carbon Adsorption with Rotor Concentrator	90%
1 (tie)	4	Catalytic Oxidation with Rotor Concentrator	90%
2	3	Biofiltration with Rotor Concentrator	83%
3	5	Good Work Practices/Low-VOC Materials/High Efficiency Applicators (paint booths)	N/A

[1]Assuming 100% VOC capture efficiency. Destruction/control efficiency values are selected based upon engineering judgment and are believed to be conservatively high estimates of real-world control efficiency.

6.0 Evaluate Energy, Environmental and Economic Impacts of Most Effective Controls and Document Results (Step 4)

6.1. Energy Impacts

The energy consumption of each control technology and emission unit pairing was calculated using the procedures specified in the EPA Air Pollution Control Cost Manual[1] and the US EPA NSR Manual[2]. These impacts are important because the nation's energy supply and distribution capacity is limited, and the securing, production, and distribution of energy has impacts on the availability and cost of energy, the nation's balance of trade, and national security. While estimating the cost of these externalities is beyond the scope of this analysis, it is important that the magnitude of these impacts is considered when evaluating potential pollution control technologies. As such, the estimated annual consumption of electricity and natural gas for each such control technology-emission unit pairing is listed below in Table 6.1-1.

[1] US EPA, Air Pollution Control Cost Manual, Section 3 VOC Control, Chapter 2 Incinerators, July 2002.

[2] US EPA, New Source Review Workshop Manual, Prevention of Signification Deterioration and Nonattainment Area Permitting, Chapter B, Best Available Control Technology, October 1990.

Table 6.1-1: Estimated Energy Impacts of Evaluated Control Technologies[3]

Unit	Natural Gas Consumption[1] (Mscf/yr)	Electricity Consumption[1] (kWh/yr)	Total Energy Consumed[1] (MMBtu/year)	Total Energy Consumed[1] (MMBtu/hr)
Regenerative Thermal Oxidizer				
PB10	17	1,131,109	3,878	0.44
PB11	58	3,938,750	13,503	1.54
PB27	75	5,065,326	17,365	1.98
PB28	72	4,832,768	16,567	1.89
PB29	72	4,832,768	16,567	1.89
PB30	22	1,462,271	5,013	0.57
PB31	40	2,694,870	9,238	1.05
Catalytic Oxidizer				
PB10	4,778	1,640,183	10,472	1.20
PB11	38,232	13,121,461	83,780	9.6
PB27	58,142	19,955,555	127,413	14.5
PB28	53,757	18,452,054	117,809	13.4
PB29	53,759	18,452,054	117,811	13.4
PB30	7,330	2,516,313	16,065	1.8
PB31	20,307	6,970,776	44,504	5.1
Recuperative Thermal Oxidizer				
PB10	11,084	59,126	11,507	1.31
PB11	88,679	462,952	92,032	10.5
PB27	134,863	1,026,024	141,062	16.1
PB28	124,697	975,276	130,520	14.9
PB29	124,699	915,698	130,319	14.9
PB30	17,004	99,757	17,684	2.0
PB31	47,107	354,948	49,260	5.6
Carbon Adsorber				
PB10	151	88,340	456	0.05
PB11	245	243,836	1,082	0.12
PB27	376,444	693	737,518	3,224
PB28	1,373	1,993,854	8,205	0.94
PB29	1,029	1,294,395	5,468	0.62
PB30	336	232,059	1,135	0.13
PB31	652	383,739	1,975	0.23
Biofilter				
PB10	0	63,877	218	0.02
PB11	0	222,433	759	0.09
PB27	0	286,054	976	0.11
PB28	0	272,921	931	0.11
PB29	0	272,921	931	0.11
PB30	0	82,579	282	0.03
PB31	0	152,187	519	0.06

[3] Thermal oxidation assumed to use recuperative heat recovery with 70% heat recovery. Energy impacts for each case calculated from the hourly energy input rates calculated in the respective case's cost calculations in Appendix A to this Attachment; see "Direct Annual Operating Costs", "Utility Cost Inputs" on Page 3 of each case's analysis. These hourly energy input rates are multiplied by 8,760 hours per year and shown here.

6.2. Environmental Impacts

BACT evaluations are also to consider the secondary environmental impacts of proposed control technologies, as they may create collateral emissions of one type while controlling emissions of another. Based on the estimated annual energy consumption of each control technology-emission unit pairing previously listed above in Table 6.1-1, the estimated collateral NO_x, SO_2, and greenhouse gas (GHG) emissions of each pairing are summarized below in Table 6.2-1. This table is not intended to describe comprehensively the emissions attributable to each control technology; rather, it highlights certain emissions of regional and national interest for consideration relative to the potential VOC reduction each option offers.

Table 6.2-1: Selected Environmental Impacts of Evaluated Control Technologies

Unit	Change In VOC Emissions (tpy)	Change In NO_x Emissions (tpy)	Change In CO Emissions (tpy)	Change In GHG Emissions (tpy CO_2e)
Regenerative Thermal Oxidizer				
PB10	- 19.8	+ 0.00	+ 0.00	+ 73
PB11	- 32.13	+ 0.00	+ 0.00	+ 120
PB27	- 90.9	+ 0.00	+ 0.00	+ 333
PB28	- 180	+ 0.00	+ 0.00	+ 654
PB29	- 135	+ 0.00	+ 0.00	+ 492
PB30	- 44.1	+ 0.00	+ 0.00	+ 161
PB31	- 85.5	+ 0.00	+ 0.00	+ 311
Catalytic Oxidizer				
PB10	- 19.8	+ 0.24	+ 0.20	+ 360
PB11	- 32.13	+ 1.91	+ 1.61	+ 2424
PB27	- 90.9	+ 2.91	+ 2.44	+ 3838
PB28	- 180	+ 2.69	+ 2.26	+ 3895
PB29	- 135	+ 2.69	+ 2.26	+ 3733
PB30	- 44.1	+ 0.37	+ 0.31	+ 602
PB31	- 85.5	+ 1.02	+ 0.85	+ 1535
Recuperative Thermal Oxidizer				
PB10	- 19.8	+ 0.55	+ 0.47	+ 741
PB11	- 32.13	+ 4.43	+ 3.72	+ 5469
PB27	- 90.9	+ 6.74	+ 5.66	+ 8469
PB28	- 180	+ 6.23	+ 5.24	+ 8177
PB29	- 135	+ 6.23	+ 5.24	+ 8015
PB30	- 44.1	+ 0.85	+ 0.71	+ 1186
PB31	- 85.5	+ 2.36	+ 1.98	+ 3152
Carbon Adsorber				
PB10	- 19.8	+ 0.008	+ 0.006	+ 81
PB11	- 32.13	+ 0.012	+ 0.010	+ 131
PB27	- 90.9	+ 0.035	+ 0.029	+ 370
PB28	- 180	+ 0.069	+ 0.058	+ 733
PB29	- 135	+ 0.051	+ 0.043	+ 550
PB30	- 44.1	+ 0.017	+ 0.014	+ 180
PB31	- 85.5	+ 0.033	+ 0.027	+ 348

Table 6.2-1: Selected Environmental Impacts of Evaluated Control Technologies

Unit	Change In VOC Emissions (tpy)	Change In NO_x Emissions (tpy)	Change In CO Emissions (tpy)	Change In GHG Emissions (tpy CO_2e)
Biofilter				
PB10	- 18.26	0.00	0.0	+ 72
PB11	- 29.63	0.00	0.0	+ 116
PB27	- 83.83	0.00	0.0	+ 328
PB28	- 166	0.00	0.0	+ 650
PB29	- 124.5	0.00	0.0	+ 488
PB30	- 40.67	0.00	0.0	+ 159
PB31	- 78.85	0.00	0.0	+ 309

6.3. Cost Effectiveness

The cost effectiveness, or cost per ton of VOC reduction, was evaluated in accordance with the procedures established in the EPA Air Pollution Control Cost Manual[4] and the US EPA NSR Manual[5], considering the initial capital expenditures and the annualized direct cost of each technically feasible control option. Replacement costs due to the aging of capital are addressed using the annualization technique in the EPA Air Pollution Control Cost Manual, known as Capital Recovery Cost[6], such that when the equipment reaches the end of its expected service life, sufficient capital funds will be available for its replacement. In each case, the interest rate used for cost-effectiveness evaluation was 13.5%, which is the working capital cost as provided by Blue Bird Body Company. Utility expenses for each evaluated control technology were determined from the most representative data sources available. These include the latest available US Department of Energy average natural gas and electricity prices for industrial facilities in Georgia.

Costing for biotrickling filters was based on MEGTEC quote 14110-10013866 for a similar unit adjusted using "6/10th rule" (for capital cost), the EPA Cost Manual (gas absorbers installation costs were used as such a device is similar to a biotrickling filter for these purposes), and a leading scholarly paper[7] on the cost-effectiveness of biotrickling filters (for site preparation costs).

Due to the large flow rates of each paint booth, rotor concentrators were included in cost effectiveness calculations for each control device. By concentrating the VOC fraction in the waste gas stream, operational costs for each control device are greatly reduced. Cost estimates for rotor concentrators are based on a Munters quote No. 21329489 and were adjusted using the "6/10th rule" to scale to each paint booth's exhaust flow rate.

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[4] US EPA, Air Pollution Control Cost Manual, Section 3 VOC Control, Chapter 2 Incinerators, July 2002.

[5] US EPA, New Source Review Workshop Manual, Prevention of Signification Deterioration and Nonattainment Area Permitting, Chapter B, Best Available Control Technology, October 1990.

[6] US EPA, Air Pollution Control Cost Manual, Section 1 (Introduction), Chapter 2 (Cost Estimation), Section 2.4.4.4, July 2002.

[7] Source: Biofiltration of Ethanol Emissions from Bakery Operations, Dr. Rakesh Govind (1999).

Potential VOC emissions from each unit are specified as the proposed VOC emissions limits with this application. Detailed calculations and results are presented in Appendix A of this attachment. As the oxidation technologies benefit from heat from the oxidation of the VOC being destroyed, and the fuel value of various VOC compounds varies, the cost-effectiveness evaluation must consider the fuel value of the particular VOC species present.

6.3.1. Options 1: Recuperative and Regenerative Thermal Oxidation.

VOCs can be oxidized to carbon dioxide and water vapor at high temperatures (generally 300°F above the auto ignition temperature of the VOC with a residence time of 0.5 to 1.0 second) using thermal oxidizers. Thermal oxidizers can recover heat energy using recuperative or regenerative methods. Regenerative thermal oxidizers can achieve a much higher heat recovery rate than recuperative thermal oxidizers. Both types of units can achieve a destruction efficiency of 98%.

In the most recent publication of the EPA Air Pollution Control Cost Manual (2002), EPA provides cost correlations for regenerative thermal oxidizers for flue gas flow rates 10,000-100,000 scfm, and recuperative thermal oxidizers for flue gas flow rates 500-50,000 scfm. As the paint booths have flows varying from 48,000 acfm to 584,000 acfm, controls have been analyzed as a system of a rotor concentrator used to reduce the volume of the waste gas stream to the appropriate operating range for a single control device.

Table 6.3.1-1 lists the cost effectiveness of using a recuperative or regenerative thermal oxidizer. Based on the total annualized cost and cost per ton of VOC reduced, Blue Bird Body Company believes it is not economically feasible to reduce VOC emissions from the paint booths using a recuperative or regenerative thermal oxidizer. Therefore, thermal oxidation should not be considered as BACT.

Table 6.3.1-1: Cost Effectiveness of Thermal Oxidizers with Rotor Concentrator– Option No. 1

Unit	Cost per Ton VOC Reduced - Recuperative Oxidizer	Cost per Ton VOC Reduced - Regenerative Oxidizer	BACT	Notes	Reference
PB10	$23,304	$31,182	No	Based on potential emissions rate of 22.0 tons VOC per 12-month period	Table A-2 and A-5
PB11	$62,187	$73,514	No	Based on potential emissions rate of 35.7 tons VOC per 12-month period	Table A-2 and A-5
PB27	$30,174	$33,443	No	Based on potential emissions rate of 101.0 tons VOC per 12-month period	Table A-2 and A-5
PB28	$14,408	$16,124	No	Based on potential emissions rate of 200.0 tons VOC per 12-month period	Table A-2 and A-5

Unit	Cost per Ton VOC Reduced - Recuperative Oxidizer	Cost per Ton VOC Reduced - Regenerative Oxidizer	BACT	Notes	Reference
PB29	$19,172	$21,498	No	Based on potential emissions rate of 150.0 tons VOC per 12-month period	Table A-2 and A-5
PB30	$14,119	$20,350	No	Based on potential emissions rate of 49.0 tons VOC per 12-month period	Table A-2 and A-5
PB31	$15,015	$19,010	No	Based on potential emissions rate of 95.0 tons VOC per 12-month period	Table A-2 and A-5

6.3.2. Option 2: Carbon Adsorption

Carbon adsorbers typically employ activated carbon, which has an afinity to adsorb VOCs, along with a beneficially large surface area per unit volume. While variables such as the properties of the individual VOC being absorbed, the gas stream concentration of the VOC, and the gas stream temperature, will affect the efficiency of the control process, a VOC-laden gas stream passing over a bed of activated carbon will cause VOC to be adsorbed in the carbon bed. Over time, the adsorptive capacity of the carbon is consumed, as its surface area becomes saturated with adsorbate. When this occurs, the carbon can either be exchanged with fresh carbon, or treated through a regeneration process to release the adsorbate.

The regeneration process typically involves heating the carbon bed via steam injection, then drying and cooling the bed using fan-forced air. The exhaust from the vessel during the regeneration process is passed through a condenser/decanter to recover the VOC. Carbon adsorption has the advantage of being relatively effective on low-concentration gas streams, compatible with large airflow volumes, and more energy efficient in many cases compared to thermal or catalytic oxidation techniques. However, due to the large waste gas volume from the paint booths, costs have been considered for units controlling concentrated, and unconcentrated, waste gas streams. The control efficiency of a carbon adsorber, when properly maintained and operated, can be as high as 98%.[8]

Table 6.3.2-1 lists the cost effectiveness of using a carbon adsorber. Based on the total annualized cost and cost per ton of VOC reduction estimated, Blue Bird Body Company believes it is not economically feasible to reduce VOC emissions from the paint booths using a carbon adsorber. Therefore, carbon adsorption should not be considered as BACT for the paint booths.

[8] Per US EPA Document EPA 456/F-99-004, Choosing An Adsorption System for VOC: Carbon, Zeolite, or Polymers? May 1999, p. 16

Table 6.3.2-1 Cost Effectiveness of Carbon Adsorption – Option 2

Unit	Cost per Ton VOC Reduced	BACT	Notes	Reference
PB10	$19,899	No	Based on potential emissions rate of 22.0 tons VOC per 12-month period	Table A-2
PB11	$48,790	No	Based on potential emissions rate of 35.7 tons VOC per 12-month period	Table A-2
PB27	$24,614	No	Based on potential emissions rate of 101.0 tons VOC per 12-month period	Table A-2
PB28	$14,103	No	Based on potential emissions rate of 200.0 tons VOC per 12-month period	Table A-2
PB29	$17,303	No	Based on potential emissions rate of 150.0 tons VOC per 12-month period	Table A-2
PB30	$13,076	No	Based on potential emissions rate of 49.0 tons VOC per 12-month period	Table A-2
PB31	$13,340	No	Based on potential emissions rate of 95.0 tons VOC per 12-month period	Table A-2

6.3.3. Option 3: Biofiltration

Bioreactors use microbes to consume pollutants from a contaminated air stream. Microbes can easily decompose organic compounds, or VOCs, into CO_2 and water. The control efficiency of a bioreactor is approximately 80% to 99%, and is assumed to be 90% in this analysis. Factors that affect the performance of the bioreactor include temperature, moisture, nutrients, acidity, and microbe population. Microbes can survive at temperatures between 60 to 105°F in a moist, neutral environment (pH=7) and need to be fed a diet of balanced nutrients.

The US EPA identifies three types of bioreactors: the basic biofilter, the biotrickling filter, and the bioscrubber. The basic biofilter consists of a large flat surface covered with bed media, such as peat, bark, coarse soil, or gravel. Air moves through the bed and comes into contact with microbes, which then decompose the pollutants. Basic biofilters have significant disadvantages. The traditional design requires large open areas and provides no continuous liquid flow in which to adjust pH, keep moisture, or add nutrients; thus, it is not a practical design to control VOCs from automotive finishing operations. In a biotrickling filter, liquid is sprayed onto a plastic media, where a biofilm is formed. As the air passes through the media, pollutants are absorbed into the liquid phase and come into contact with the microbes. The continuous flow of liquid allows the operator to neutralize acid buildup and provide nutrients when required. The plastic bed can have a void space of up to 95%, which greatly reduces pressure drop across the packing, and the synthetic material is not consumed by the microbes. Bioscrubbers utilize a chemical scrubber and are more similar to chemical-processing equipment than other bioreactors. Discharge effluent is collected in a storage tank which allows additional time for the microbes to consume pollutants. In the US EPA Clean Air Technology Center's (CATC) report, Using Bioreactors to Control Air

Pollution[9], bioscrubbers were shown to have much greater capital costs and slightly greater annual costs than combustion control devices. Therefore, biotrickling filters were chosen as the most feasible form of bioreactor for the paint booths.

The cost of the biofilter was determined based on upon MEGTEC quote 14110-10013866 for a similar unit adjusted using the "6/10th rule". Due to the large flowrate, a control system in which a rotor concentrator is employed to concentrate the VOC fraction in the waste gas stream was analyzed. Table 6.3.3-1 lists the cost effectiveness of using a biotrickling filter. Based on the total annualized cost and cost per ton of VOC reduction, Blue Bird Body Company believes that biofiltration should not be considered as BACT for VOC reduction from the paint booths.

Table 6.3.3-1: Cost Effectiveness of Biotrickling Filter – Option 3

Unit	Cost per Ton VOC Reduced	BACT	Notes	Reference
PB10	$26,389	No	Based on potential emissions rate of 22.0 tons VOC per 12-month period	Table A-3
PB11	$68,914	No	Based on potential emissions rate of 35.7 tons VOC per 12-month period	Table A-3
PB27	$31,796	No	Based on potential emissions rate of 101.0 tons VOC per 12-month period	Table A-3
PB28	$15,307	No	Based on potential emissions rate of 200.0 tons VOC per 12-month period	Table A-3
PB29	$20,410	No	Based on potential emissions rate of 150.0 tons VOC per 12-month period	Table A-3
PB30	$16,362	No	Based on potential emissions rate of 49.0 tons VOC per 12-month period	Table A-3
PB31	$17,212	No	Based on potential emissions rate of 95.0 tons VOC per 12-month period	Table A-3

6.3.4. Option 4: Catalytic Oxidation

A catalytic oxidizer is similar to a recuperative thermal oxidizer, but utilizes a catalyst bed to lower the temperature required to achieve oxidation. As a result, less auxiliary fuel is required than in a recuperative thermal oxidizer. The control efficiency can be as high as 98 percent and tends to be slightly lower on average than a recuperative thermal oxidizer. However, the fuel savings may be offset by higher operational costs related to catalyst replacement and maintenance, especially for high volume dilute waste gas streams. Like thermal oxidizers, catalytic oxidizers are limited by sizing issues. As such, this analysis considers the use of a

9 See http://www.epa.gov/ttn/catc/dir1/fbiorect.pdf

rotor concentrator to improve the cost effectiveness of the control device operational costs.

Table 6.3.4-1 lists the cost effectiveness of using a catalytic oxidizer. Based on the total annualized cost and cost per ton of VOC reduction estimated Blue Bird Body Company believes it is not economically feasible to reduce VOC emissions from the paint booths using a catalytic oxidizer. Therefore, a catalytic oxidizer should not be considered as BACT.

Table 6.3.4-1: Cost Effectiveness of Catalytic Oxidizer – Option No. 4[10]

Unit	Cost per Ton VOC Reduced	BACT	Notes	Reference
PB10	$27,105	No	Based on potential emissions rate of 22.0 tons VOC per 12-month period	Table A-4
PB11	$88,887	No	Based on potential emissions rate of 35.7 tons VOC per 12-month period	Table A-4
PB27	$44,359	No	Based on potential emissions rate of 200.0 tons VOC per 12-month period	Table A-4
PB28	$21,010	No	Based on potential emissions rate of 200.0 tons VOC per 12-month period	Table A-4
PB29	$28,013	No	Based on potential emissions rate of 150.0 tons VOC per 12-month period	Table A-4
PB30	$17,166	No	Based on potential emissions rate of 49.0 tons VOC per 12-month period	Table A-4
PB31	$20,052	No	Based on potential emissions rate of 95.0 tons VOC per 12-month period	Table A-4

6.3.5. Option 5: Good Work Practices, Low-VOC Material, and High Efficiency Applicators

Pollution prevention using good work practices, low-VOC materials, and high efficiency applicators such as high volume low pressure (HVLP) paint spray applicators is an accepted means for controlling emissions from permitted sources.

The facility utilizes HVLP applicators in the paint booths where the bulk of coatings are applied (PB28, PB29, and PB31). Using high efficiency coating applicators in the touch up booths does not provide significant emission reduction due to the low usage in these booths. Additionally, high efficiency applicators are not necessary for emission reduction from the undercoat booth, as the undercoating is applied with a transfer efficiency of 100%

Work practices including keeping VOC containing coatings and solvents in closed, air tight, containers, preventing unnecessary emissions of VOC. Additionally, any wash rags that may contain excess solvents and cleaners are stored in air tight containers after use to prevent VOC emissions.

[10] Recuperative catalytic oxidizer analyzed assuming 70% heat recovery.

As such, Blue Bird Body Company proposes VOC emissions limitations for each paint booth on a 12-month rolling total basis. VOC emissions from coating evaporations can be determined monthly on a mass balance with coating usage and VOC content data for each coating used.

6.4. Step 5 - Select BACT

Blue Bird Body Company has determined that although reducing VOCs from the paint booths by way of thermal oxidization, catalytic oxidation, carbon adsorption, or biofiltration was determined to be technically feasible (all with, and without the use of a rotor concentrator), the implementation of any such pollution control is not believed to be economically cost effective. Furthermore, thermal oxidation, catalytic oxidation, and carbon adsorption techniques have undesirable energy and environmental impacts that cannot be expressed as a direct cost. Blue Bird Body Company proposes that GA EPD consider the proposed VOC emission limits in Table 6.4-1 as the best available technology for controlling VOC emissions from the paint booths, and thereby find it as BACT for this case. Blue Bird Body Company voluntarily stipulates these limitations to be feasible and cost-effective.

Table 6.4-1 below summarizes the proposed BACT for VOC emissions from the paint booths.

Table 6.4-1: Proposed Process BACT Requirements

Emission Unit	Pollutant	Proposed 12-Month Rolling Total VOC Limitation
PB10	VOC	22.0 tons
PB11	VOC	35.7 tons
PB27	VOC	101.0 tons
PB28	VOC	200.0 tons
PB29	VOC	150.0 tons
PB30	VOC	37.0 tons
PB31	VOC	95.0 tons

6.5. VOC Review: Combustion Units (BO06-BO09 and HF01-HF03)

Volatile Organic Compounds (VOC) are emitted from the ovens and hanging furnaces due to incomplete combustion of fuel (natural gas). Combustion VOC emissions can be minimized by practices that promote high combustion temperatures and turbulent mixing of fuel and combustion air. All of the bake ovens and hanging furnaces at the facility are small units (10 MMBtu/hr and 4.95 MMBtu/hr, respectively, for each unit type) and are exclusively fired with natural gas. Therefore, potential VOC emissions are calculated to be 0.24 tpy from each oven and 0.12 from each hanging furnace (see Attachment B, Table 2).

Due to the minimal potential VOC emission rate for each oven, it has been determined that a full topdown BACT analysis for each oven and hanging furnace is not necessary as add on controls would be economically infeasible. The facility has determined that good combustion practices in addition to the exclusive use of natural gas as fuel in each oven constitutes BACT for each unit.

7.0 Conclusion

For paint booths PB10, PB11, and PB27-31, Blue Bird Body Company has proposed technologies, practices, and/or emission limitations that it believes constitute BACT. The recommended BACT findings are summarized above in Table 6.4-1.

Appendix A.1 to Attachment C

BACT Cost Effectiveness Calculations for Paint Booths PB10, PB11, and PB27-PB31 - Concentrated Flow

Table A-1: Blue Bird Body Company - Regenerative Thermal Oxidizer

Best Available Technology Cost Effectiveness Analysis

Regenerative Thermal Oxidizer

		PB10	PB11	PB27	PB28	PB29	PB30	PB31
Regenerative Thermal Oxidizer Input Parameters								
Gas flowrate:[3]	[acfm]	48,000	384,000	584,000	540,000	540,000	73,640	204,000
Reference temperature:	[°F]	77	77	77	77	77	77	77
Inlet gas temperature:[4]	[°F]	77	77	77	77	77	77	77
Gas flowrate:	[scfm]	48,000	384,000	584,000	540,000	540,000	73,640	204,000
Inlet gas density:[5]	[lb/acf]	0.074	0.074	0.074	0.074	0.074	0.074	0.074
Primary heat recovery:	[fraction]	0.950	0.950	0.950	0.950	0.950	0.950	0.950
Waste gas heat content:[6]	[Btu/lb]	0.442	0.090	0.167	0.358	0.268	0.642	0.450
Waste gas heat capacity:[7]	[Btu/lb-°F]	0.255	0.255	0.255	0.255	0.255	0.255	0.255
Combustion temperature:	[°F]	1,800	1,800	1,800	1,800	1,800	1,800	1,800
Heat loss:	[fraction]	0.015	0.015	0.015	0.015	0.015	0.015	0.015
Exhaust Gas Exit Temperature:	[°F]	163	163	163	163	163	163	163
Fuel heat of combustion:[8]	[Btu/lb]	21,502	21,502	21,502	21,502	21,502	21,502	21,502
Fuel density:[8]	[lb/ft^3]	0.041	0.041	0.041	0.041	0.041	0.041	0.041
Regenerative Thermal Oxidizer Design Parameters								
Auxiliary Fuel Requirement:[9]	[lb/min]	0.15	1.25	1.90	1.75	1.75	0.24	0.66
Auxiliary Fuel Requirement:[9]	[scfm]	3.79	30.74	46.62	42.82	42.95	5.78	16.12
Total Waste Gas Flowrate:	[scfm]	48,004	384,031	584,047	540,043	540,043	73,646	204,016
Reduced Flow Rate	[scfm]	1,600	12,801	19,468	18,001	18,001	2,455	6,801
Waste Gas Capture System For Regenerative Thermal Oxidizer[10]								
Length of Ductwork:	[ft]	100	100	750	835	700	275	700
No. of Duct elbows:		8	8	8	8	8	8	8
No. of Damper/Louvers:		4	4	4	4	4	4	4
Duct diameter:[11]	[ft]	5.526	6.990	6.815	7.006	7.006	6.845	6.577
Pressure Loss:[12]	[w.c.]	0.718	0.702	1.024	1.052	0.988	0.789	1.014
Potential Emissions								
Potential VOC Emissions:[31]	[tpy]	22.00	35.70	101.00	200.00	150.00	49.00	95.00
Control efficiency:[32] 90% Controlled VOC:[31]	[tpy]	19.80	32.13	90.90	180.00	135.00	44.10	85.50
VOC Concentration and Heat of Combustion (Waste Gas) Calculations								
Molecular Weight of VOC (xylenes):	[lb/lb-mol]	106.16	106.16	106.16	106.16	106.16	106.16	106.16
Concentration of VOC by Weight:[33]	[ppmw]	23.7	4.8	9.0	19.2	14.4	34.4	24.1
Concentration of VOC by Volume:[34]	[ppmv]	6.4	1.3	2.4	5.2	3.9	9.3	6.5
Waste Gas O2 Content:	[%]	20.9	20.9	20.9	20.9	20.9	20.9	20.9
Lower Explosive Limit (LEL):	[%]	4.3	4.3	4.3	4.3	4.3	4.3	4.3
LEL of VOC/Air Mixture:	[%]	0.015	0.003	0.006	0.012	0.009	0.022	0.015
Heat of Combustion of VOC:	[Btu/lb]	18,651	18,651	18,651	18,651	18,651	18,651	18,651
Heat of Combustion of Waste Gas:[35]	[Btu/lb]	0.442	0.090	0.167	0.358	0.268	0.642	0.450
Heat of Combustion of Waste Gas:	[Btu/scf]	0.033	0.007	0.012	0.026	0.020	0.047	0.033
BACT Cost Effectiveness (from Page 3)		**31,181.7 $/ton**	**73,513.9 $/ton**	**33,442.8 $/ton**	**16,123.6 $/ton**	**21,498.2 $/ton**	**20,350.4 $/ton**	**19,009.5 $/ton**

Table A-1: Blue Bird Body Company - Regenerative Thermal Oxidizer

Best Available Technology Cost Effectiveness Analysis

Regenerative Thermal Oxidizer

Direct Costs

Bureau of Labor Statistics - Producer Price Index - Capital Equipment

Reference Year Cost Index- Equipment (Base year 1988):[1, 2, 13]	114.3
Reference Year Cost Index- Capture System (Base year 1993):[1, 2, 13]	131.4
Current Year - Producer Price Index (First Quarter 2013):[1, 2, 13]	163.86

Purchase Equipment

	Basis / Average Cost Factor[17]	Adjustment Factor[18]		PB10	PB11	PB27	PB28	PB29	PB30	PB31
Basic Equipment Cost[1,13]	USEPA Cost Manual (1988 dollars)		(A)	$ 342,505.34	$ 528,291.31	$ 638,878.12	$ 614,548.85	$ 614,548.92	$ 356,682.54	$ 428,763.01
Basic Equipment Cost[1,13]	Munters Quote - Rotor Cocentrator		(A)	$ 612,200.40	$ 2,796,187.17	$ 3,636,480.02	$ 3,464,520.12	$ 3,464,520.04	$ 877,538.83	$ 1,845,825.77
Capture System Cost[14, 15, 16, 36]	USEPA Cost Manual (1993 dollars)		(B)	$ 21,095.01	$ 127,624.52	$ 201,102.02	$ 191,125.61	$ 191,125.61	$ 25,524.90	$ 73,856.85
Total Equipment Cost	(Basic Equipment (A) + Capture System (B)		(C)	$ 975,800.76	$ 3,452,103.01	$ 4,476,460.16	$ 4,270,194.57	$ 4,270,194.57	$ 1,259,746.27	$ 2,348,445.63
Instrumentation/Controls	0.10	1	(D)	$ 97,580.08	$ 345,210.30	$ 447,646.02	$ 427,019.46	$ 427,019.46	$ 125,974.63	$ 234,844.56
Freight	0.05	1	(E)	$ 48,790.04	$ 172,605.15	$ 223,823.01	$ 213,509.73	$ 213,509.73	$ 62,987.31	$ 117,422.28
Taxes (exempt)	0.03	1	(F)	$ 29,274.02	$ 103,563.09	$ 134,293.80	$ 128,105.84	$ 128,105.84	$ 37,792.39	$ 70,453.37
Base Price	(Subtotal of C through E)		(G)	$ 1,151,444.89	$ 4,073,481.55	$ 5,282,222.99	$ 5,038,829.59	$ 5,038,829.59	$ 1,486,500.60	$ 2,771,165.84

Installation Costs

	Average Cost Factor[17]	Adjustment Factor[18]		PB10	PB11	PB27	PB28	PB29	PB30	PB31
Foundations and Support	0.08	1	(H)	$ 92,115.59	$ 325,878.52	$ 422,577.84	$ 403,106.37	$ 403,106.37	$ 118,920.05	$ 221,693.27
Erection and Handling	0.14	1	(I)	$ 161,202.28	$ 570,287.42	$ 739,511.22	$ 705,436.14	$ 705,436.14	$ 208,110.08	$ 387,963.22
Electrical	0.04	1	(J)	$ 46,057.80	$ 162,939.26	$ 211,288.92	$ 201,553.18	$ 201,553.18	$ 59,460.02	$ 110,846.63
Piping	0.02	1	(K)	$ 23,028.90	$ 81,469.63	$ 105,644.46	$ 100,776.59	$ 100,776.59	$ 29,730.01	$ 55,423.32
Insulation	0.01	1	(L)	$ 11,514.45	$ 40,734.82	$ 52,822.23	$ 50,388.30	$ 50,388.30	$ 14,865.01	$ 27,711.66
Painting	0.01	1	(M)	$ 11,514.45	$ 40,734.82	$ 52,822.23	$ 50,388.30	$ 50,388.30	$ 14,865.01	$ 27,711.66
Site Preparation	No Estimate		(N)	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Facilities and Buildings	No Estimate		(O)	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Installation Cost	(Subtotal of H through O)		(P)	$ 345,433.47	$ 1,222,044.46	$ 1,584,666.90	$ 1,511,648.88	$ 1,511,648.88	$ 445,950.18	$ 831,349.75
Total Direct Costs	(Base Price (G) + Installation Cost (P))		(Q)	$ 1,496,878.36	$ 5,295,526.01	$ 6,866,889.89	$ 6,550,478.47	$ 6,550,478.47	$ 1,932,450.78	$ 3,602,515.60

Indirect Installation Cost

	Average Cost Factor[17]	Adjustment Factor[18]		PB10	PB11	PB27	PB28	PB29	PB30	PB31
Engineering/Supervision	0.10	1	(R)	$ 115,144.49	$ 407,348.15	$ 528,222.30	$ 503,882.96	$ 503,882.96	$ 148,650.06	$ 277,116.58
Construction/Field	0.05	1	(S)	$ 57,572.24	$ 203,674.08	$ 264,111.15	$ 251,941.48	$ 251,941.48	$ 74,325.03	$ 138,558.29
Contractor Fees	0.10	1	(T)	$ 115,144.49	$ 407,348.15	$ 528,222.30	$ 503,882.96	$ 503,882.96	$ 148,650.06	$ 277,116.58
Start-up	0.02	1	(U)	$ 23,028.90	$ 81,469.63	$ 105,644.46	$ 100,776.59	$ 100,776.59	$ 29,730.01	$ 55,423.32
Performance Test	0.01	1	(V)	$ 11,514.45	$ 40,734.82	$ 52,822.23	$ 50,388.30	$ 50,388.30	$ 14,865.01	$ 27,711.66
Model Study	0.00	1	(W)	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Contingencies	0.03	1	(X)	$ 34,543.35	$ 122,204.45	$ 158,466.69	$ 151,164.89	$ 151,164.89	$ 44,595.02	$ 83,134.98
Total Indirect Cost	(Subtotal of R through X)		(Y)	$ 356,947.92	$ 1,262,779.28	$ 1,637,489.13	$ 1,562,037.17	$ 1,562,037.17	$ 460,815.19	$ 859,061.41
Total Capital Costs	(Direct Cost (Q) + Indirect Cost (Y))		(Z)	$ 1,853,826.28	$ 6,558,305.29	$ 8,504,379.01	$ 8,112,515.65	$ 8,112,515.65	$ 2,393,265.96	$ 4,461,577.01

Table A-1: Blue Bird Body Company - Regenerative Thermal Oxidizer

Best Available Technology Cost Effectiveness Analysis

					Regenerative Thermal Oxidizer						
					PB10	**PB11**	**PB27**	**PB28**	**PB29**	**PB30**	**PB31**
Direct Annualized Operating Costs											
Labor Cost Inputs											
	Average Labor Cost[19]	Operating Labor Factor[20]	No. Shifts per Year[21]								
Operating Labor	30.00 $/hr	0.50	1,095	(AA)	$ 16,425.00	$ 16,425.00	$ 16,425.00	$ 16,425.00	$ 16,425.00	$ 16,425.00	$ 16,425.00
Supervisory Labor[22]	30.00 $/hr	0.075	1,095	(BB)	$ 2,463.75	$ 2,463.75	$ 2,463.75	$ 2,463.75	$ 2,463.75	$ 2,463.75	$ 2,463.75
Maintenance Labor[23]	30.00 $/hr	0.50	365	(CC)	$ 5,475.00	$ 5,475.00	$ 5,475.00	$ 5,475.00	$ 5,475.00	$ 5,475.00	$ 5,475.00
Maintenance Material Costs											
Maintenance Materials[24]	Assumed 100% of Mainenance Labor Cost			(DD)	$ 5,475.00	$ 5,475.00	$ 5,475.00	$ 5,475.00	$ 5,475.00	$ 5,475.00	$ 5,475.00
Utility Cost Inputs											
	Estimated Hours of Operation										
Natural Gas and Electricity[27]	8760 hrs			(EE and FF)	$ 147,006.95	$ 511,907.95	$ 658,325.76	$ 628,100.87	$ 628,100.87	$ 190,047.17	$ 350,244.43
Indirect Annualized Operating Costs											
Overhead[24]	60% of O & M			(GG)	$ 17,903.25	$ 325,048.02	$ 412,898.70	$ 394,763.77	$ 394,763.77	$ 131,931.55	$ 228,049.91
Property Tax[24]	1% of Capital Costs (Z)			(HH)	$ 18,538.26	$ 65,583.05	$ 85,043.79	$ 81,125.16	$ 81,125.16	$ 23,932.66	$ 44,615.77
Insurance[24]	1% of Capital Costs (Z)			(II)	$ 18,538.26	$ 65,583.05	$ 85,043.79	$ 81,125.16	$ 81,125.16	$ 23,932.66	$ 44,615.77
Administration[24]	2% of Capital Costs (Z)			(JJ)	$ 37,076.53	$ 131,166.11	$ 170,087.58	$ 162,250.31	$ 162,250.31	$ 47,865.32	$ 89,231.54
Capital Recovery Cost Inputs[29]											
	Average Life Expectancy	Working Capital Cost	Capital Recovery Factor[30]								
Capital Cost Recovery	10 years	13.5%	0.188	(KK)	$ 348,495.20	$ 1,232,875.99	$ 1,598,712.51	$ 1,525,047.30	$ 1,525,047.30	$ 449,902.84	$ 838,718.38
Total Annualized Cost	(Subtotal of AA through KK)			(LL)	$ 617,397.21	$ 2,362,002.92	$ 3,039,950.88	$ 2,902,251.32	$ 2,902,251.32	$ 897,450.95	$ 1,625,314.55
BACT Cost Effectiveness	Total Annualized Cost/Tons VOC Reduced			(MM)	**31,181.7 $/ton**	**73,513.9 $/ton**	**33,442.8 $/ton**	**16,123.6 $/ton**	**21,498.2 $/ton**	**20,350.4 $/ton**	**19,009.5 $/ton**

Table A-2: Blue Bird Body Company - Carbon Adsorber

Best Available Control Technology Cost Effectiveness Analysis

Fixed-bed Carbon Adsorber

	PB10	PB11	PB27	PB28	PB29	PB30	PB31
Fixed-bed Carbon Adsorber Input Parameters							
Gas flowrate:[3] [acfm]	48,000	384,000	584,000	540,000	540,000	73,640	204,000
Reduced Flow	1,600	12,800	19,467	18,000	18,000	2,455	6,800
Inlet gas temperature:[4] [°F]	77	77	77	77	77	77	77
Number of Adsorbing Vessels (N_a): [ ]	1	2	2	2	2	1	1
Number of Desorbing Vessels (N_d): [ ]	1	2	2	2	2	1	1
Capacity Factor (f):[5] [ ]	2	2	2	2.00	2	2	2
Carbon Equilibrium Capacity (w_e):[6] [lb VOC/lb C]	0.67	0.67	0.67	0.67	0.67	0.67	0.67
Working Capacity (w_c):[7] [lb VOC/lb C]	0.34	0.34	0.34	0.34	0.34	0.34	0.34
Adsorption Time (θ_a):[8] [hrs]	12	12	12	12	12	12	12
Desorption Time (θ_d):[8] [hrs]	6	6	6	6	6	6	6
Carbon Requirement for Continuous System (M_c):[9] [lb]	359.84	583.93	1,652.01	3,271.31	2,453.49	801.47	1,553.87
Superficial Bed Velocity (v_b):[10] [fpm]	65	65	65	65	65	65	65
Carbon Vessel Diameter (D):[11] [ft]	5.60	11.20	13.81	13.28	13.28	6.93	11.54
Carbon Vessel Length/Height (L):[12] [ft]	5.49	5.20	5.37	5.79	5.59	5.71	5.50
Carbon Vessel Surface Area (S):[13] [ft^2]	145.74	379.75	532.33	518.34	510.12	199.86	408.47
Carbon Bed Thickness (t_b):[14] [in]	5.85	2.37	4.41	9.45	7.09	8.49	5.94
Carbon Bed Pressure Drop (Δp_b):[15] [inH_2O]	3.44	1.40	2.60	5.57	4.17	5.00	3.50
Total System Pressure Drop (Δp_s):[15] [inH_2O]	4.44	2.40	3.60	6.57	5.17	6.00	4.50
Waste Gas Capture System For Fixed-bed Carbon Adsorber[18]							
Length of Ductwork: [ft]	100	100	750	835	700	275	700
No. of Duct elbows: [ ]	8	8	8	8	8	8	8
No. of Damper/Louvers: [ ]	4	4	4	4	4	4	4
Duct diameter:[16] [ft]	5.526	6.990	6.815	7.006	7.006	6.845	6.577
Pressure Loss:[17] [w.c.]	0.718	0.702	1.024	1.052	0.988	0.789	1.014
Potential Emissions							
Potential VOC Emissions:[19] [tpy]	22.00	35.70	101.00	200.00	150.00	49.00	95.00
Potential VOC Emissions from Fuel Combustion:[20] [tpy]	0	0	0	0	0	0	0
Control Efficiency 90% Tons VOC Reduced:[21] [tpy]	19.80	32.13	90.90	180.00	135.00	44.10	85.50
VOC Concentration and Heat of Combustion (Waste Gas) Calculations							
	Xylenes	Xylenes	Xylenes	Xylenes	Xylenes	Xylenes	Xylenes
Molecular Weight of VOC: [lb/lb-mol]	106.16	106.16	106.16	106.16	106.16	106.16	106.16
Inlet Concentration of VOC by Weight:[22] [ppmw]	24	5	9	19	14	34	24
Inlet Concentration of VOC by Volume:[23] [ppmv]	6	1	2	5	4	9	7
BACT Cost Effectiveness (from Page 3)	**19,898.9 $/ton**	**48,789.6 $/ton**	**24,614.3 $/ton**	**14,102.9 $/ton**	**17,302.6 $/ton**	**13,075.9 $/ton**	**13,340.2 $/ton**

Direct Costs

Table A-2: Blue Bird Body Company - Carbon Adsorber

Best Available Control Technology Cost Effectiveness Analysis — Fixed-bed Carbon Adsorber

Bureau of Labor Statistics - Producer Price Index - Capital Equipment

Reference Year Cost Index (Base - 1993):[2]	131
Reference Year Cost Index (Base - 1999):[2]	137.6
Current Year - Producer Price Index (First Quarter 2013):[1, 2, 13]	163.9

Purchase Equipment

Item	Basis / Average Cost Factor[28]	Adjustment Factor[29]	Ref	PB10	PB11	PB27	PB28	PB29	PB30	PB31
Base Equipment Cost	USEPA Cost Manual (1999 dollars)		(A)	$ 43,789.79	$ 152,151.68	$ 188,305.58	$ 188,545.20	$ 185,195.83	$ 53,420.79	$ 81,565.90
Base Equipment Cost	Munters Quote - Rotor Cocentrator		(A)	$ 612,200.40	$ 2,796,187.17	$ 3,636,480.02	$ 3,464,520.12	$ 3,464,520.04	$ 877,538.83	$ 1,845,825.77
Capture System Cost[25, 26, 27, 43]	USEPA Cost Manual (1993 dollars)		(B)	$ 21,095.01	$ 127,624.52	$ 201,102.02	$ 191,125.61	$ 191,125.61	$ 25,524.90	$ 73,856.85
Total Equipment Cost	(Basic Equipment (A) + Capture System (B)		(C)	$ 677,085.21	$ 3,075,963.37	$ 4,025,887.62	$ 3,844,190.92	$ 3,840,841.48	$ 956,484.52	$ 2,001,248.52
Instrumentation/Controls	0.10	1	(D)	$ 67,708.52	$ 307,596.34	$ 402,588.76	$ 384,419.09	$ 384,084.15	$ 95,648.45	$ 200,124.85
Freight	0.05	1	(E)	$ 33,854.26	$ 153,798.17	$ 201,294.38	$ 192,209.55	$ 192,042.07	$ 47,824.23	$ 100,062.43
Taxes (unless exempt)	0.03	1	(F)	$ 20,312.56	$ 92,278.90	$ 120,776.63	$ 115,325.73	$ 115,225.24	$ 28,694.54	$ 60,037.46
Base Price	(Subtotal of C through E)		(G)	$ 798,960.55	$ 3,629,636.78	$ 4,750,547.39	$ 4,536,145.28	$ 4,532,192.94	$ 1,128,651.73	$ 2,361,473.25

Installation Costs

Item	Average Cost Factor[28]	Adjustment Factor[29]	Ref	PB10	PB11	PB27	PB28	PB29	PB30	PB31
Foundations and Support	0.08	1	(H)	$ 63,916.84	$ 290,370.94	$ 380,043.79	$ 362,891.62	$ 362,575.44	$ 90,292.14	$ 188,917.86
Erection and Handling	0.14	1	(I)	$ 111,854.48	$ 508,149.15	$ 665,076.64	$ 635,060.34	$ 634,507.01	$ 158,011.24	$ 330,606.26
Electrical	0.04	1	(J)	$ 31,958.42	$ 145,185.47	$ 190,021.90	$ 181,445.81	$ 181,287.72	$ 45,146.07	$ 94,458.93
Piping	0.02	1	(K)	$ 15,979.21	$ 72,592.74	$ 95,010.95	$ 90,722.91	$ 90,643.86	$ 22,573.03	$ 47,229.47
Insulation	0.01	1	(L)	$ 7,989.61	$ 36,296.37	$ 47,505.47	$ 45,361.45	$ 45,321.93	$ 11,286.52	$ 23,614.73
Painting	0.02	1	(M)	$ 15,979.21	$ 72,592.74	$ 95,010.95	$ 90,722.91	$ 90,643.86	$ 22,573.03	$ 47,229.47
Site Preparation	No Estimate		(N)	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Facilities and Buildings	No Estimate		(O)	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Installation Cost	(Subtotal of H through O)		(P)	$ 247,677.77	$ 1,125,187.40	$ 1,472,669.69	$ 1,406,205.04	$ 1,404,979.81	$ 349,882.04	$ 732,056.71
Total Direct Costs	(Base Price (G) + Installation Cost (P))		(Q)	$ 1,046,638.32	$ 4,754,824.18	$ 6,223,217.09	$ 5,942,350.32	$ 5,937,172.76	$ 1,478,533.77	$ 3,093,529.96

Indirect Installation Cost

Item	Average Cost Factor[28]	Adjustment Factor[29]	Ref	PB10	PB11	PB27	PB28	PB29	PB30	PB31
Engineering/Supervision	0.10	1	(R)	$ 79,896.06	$ 362,963.68	$ 475,054.74	$ 453,614.53	$ 453,219.29	$ 112,865.17	$ 236,147.33
Construction/Field	0.05	1	(S)	$ 39,948.03	$ 181,481.84	$ 237,527.37	$ 226,807.26	$ 226,609.65	$ 56,432.59	$ 118,073.66
Contractor Fees	0.10	1	(T)	$ 79,896.06	$ 362,963.68	$ 475,054.74	$ 453,614.53	$ 453,219.29	$ 112,865.17	$ 236,147.33
Start-up	0.02	1	(U)	$ 15,979.21	$ 72,592.74	$ 95,010.95	$ 90,722.91	$ 90,643.86	$ 22,573.03	$ 47,229.47
Performance Test	0.01	1	(V)	$ 7,989.61	$ 36,296.37	$ 47,505.47	$ 45,361.45	$ 45,321.93	$ 11,286.52	$ 23,614.73
Model Study	0.00	1	(W)	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Contingencies	0.03	1	(X)	$ 23,968.82	$ 108,889.10	$ 142,516.42	$ 136,084.36	$ 135,965.79	$ 33,859.55	$ 70,844.20
Total Indirect Cost	(Subtotal of R through X)		(Y)	$ 247,677.77	$ 1,125,187.40	$ 1,472,669.69	$ 1,406,205.04	$ 1,404,979.81	$ 349,882.04	$ 732,056.71
Total Capital Costs	(Direct Cost (Q) + Indirect Cost (Y))		(Z)	$ 1,294,316.09	$ 5,880,011.58	$ 7,695,886.78	$ 7,348,555.36	$ 7,342,152.57	$ 1,828,415.80	$ 3,825,586.67

Table A-2: Blue Bird Body Company - Carbon Adsorber

Best Available Control Technology Cost Effectiveness Analysis

Fixed-bed Carbon Adsorber

					PB10	PB11	PB27	PB28	PB29	PB30	PB31
Direct Annualized Operating Costs											
Labor Cost Inputs											
	Average Labor Cost[30]	Operating Labor Factor[31]	No. Shifts per Year[32]								
Operating Labor	30.00 $/hr	0.50	1,095	(AA)	$ 16,425.00	$ 16,425.00	$ 16,425.00	$ 16,425.00	$ 16,425.00	$ 16,425.00	$ 16,425.00
Supervisory Labor[33]	30.00 $/hr	0.075	1,095	(BB)	$ 2,463.75	$ 2,463.75	$ 2,463.75	$ 2,463.75	$ 2,463.75	$ 2,463.75	$ 2,463.75
Maintenance Labor[34]	30.00 $/hr	0.50	365	(CC)	$ 5,475.00	$ 5,475.00	$ 5,475.00	$ 5,475.00	$ 5,475.00	$ 5,475.00	$ 5,475.00
Maintenance Material Costs											
Maintenance Materials[34]	Assumed 100% of Mainenance Labor Cost			(DD)	$ 5,475.00	$ 5,475.00	$ 5,475.00	$ 5,475.00	$ 5,475.00	$ 5,475.00	$ 5,475.00
Carbon Replacement											
Carbon Replacement Cost[35]	Taxes, Freight, Carbon Cost, and Labor			(EE)	$ 406.62	$ 659.84	$ 1,866.78	$ 3,696.59	$ 2,772.44	$ 905.66	$ 1,755.88
Utility Cost Inputs											
	Average Unit Cost[36, 37]	Operating Time (hrs)									
Steam[38]	8.09 $/klbs			(FF)	$ 1,245.55	$ 2,021.19	$ 5,718.22	$ 11,323.20	$ 8,492.40	$ 2,774.18	$ 5,378.52
System, Cool/Dry Fans[39]	0.089 $/kWh			(GG)	$ 7,862.28	$ 21,701.39	$ 65,639.13	$ 177,453.00	$ 115,201.17	$ 20,653.28	$ 34,152.79
System Energy Requirement	0.089 $/kWh	8,760		(HH)	$ 32,432.48	$ 139,954.10	$ 319,570.86	$ 539,096.99	$ 424,846.76	$ 67,178.08	$ 139,551.79
Cooling Water[40]	6.11 $/kgal			(II)	$ 387.85	$ 629.37	$ 1,780.58	$ 3,525.89	$ 2,644.42	$ 863.84	$ 1,674.80
Indirect Annualized Operating Costs											
Overhead[34]	60% of O & M			(JJ)	$ 18,147.22	$ 18,299.15	$ 19,023.32	$ 20,121.20	$ 19,566.71	$ 18,446.65	$ 18,956.78
Property Tax[34]	1% of Capital Costs (Z)			(KK)	$ 12,943.16	$ 58,800.12	$ 76,958.87	$ 73,485.55	$ 73,421.53	$ 18,284.16	$ 38,255.87
Insurance[34]	1% of Capital Costs (Z)			(LL)	$ 12,943.16	$ 58,800.12	$ 76,958.87	$ 73,485.55	$ 73,421.53	$ 18,284.16	$ 38,255.87
Administration[34]	2% of Capital Costs (Z)			(MM)	$ 25,886.32	$ 117,600.23	$ 153,917.74	$ 146,971.11	$ 146,843.05	$ 36,568.32	$ 76,511.73
Hazardous Waste Disposal[44]	430$ per ton				$ 8,514.00	$ 13,815.90	$ 39,087.00	$ 77,400.00	$ 58,050.00	$ 18,963.00	$ 36,765.00
Capital Recovery Cost Inputs[29]											
	Average Life Expectancy[41]	Working Capital Cost	Capital Recovery Factor[42]								
Carbon Cost Recovery[35]	10 years	13.5%	0.188	(NN)	$ 76.44	$ 124.04	$ 350.93	$ 694.91	$ 521.18	$ 170.25	$ 330.08
System Cost Recovery	10 years	13.5%	0.188	(OO)	$ 243,314.57	$ 1,105,365.61	$ 1,446,726.50	$ 1,381,432.71	$ 1,380,229.07	$ 343,718.36	$ 719,160.48
Total Annualized Cost	(Subtotal of AA-DD and FF-OO)			(PP)	$ 393,998.42	$ 1,567,609.81	$ 2,237,437.52	$ 2,538,525.45	$ 2,335,849.02	$ 576,648.70	$ 1,140,588.33
BACT Cost Effectiveness	Total Annualized Cost/Tons VOC Reduced			(QQ)	**19,898.9 $/ton**	**48,789.6 $/ton**	**24,614.3 $/ton**	**14,102.9 $/ton**	**17,302.6 $/ton**	**13,075.9 $/ton**	**13,340.2 $/ton**

Table A-3: Blue Bird Body Company - Biotrickling Filter

Rule 702 Best Available Control Technology Cost Effectiveness Spreadsheet

		PB10	PB11	PB27	PB28	PB29	PB30	PB31
Input Parameters								
Gas flowrate:[1]	[acfm]	48,000	384,000	584,000	540,000	540,000	73,640	204,000
Reference temperature:	[°F]	77	77	77	77	77	77	77
Inlet gas temperature:[2]	[°F]	77	77	77	77	77	77	77
Gas flowrate:	[scfm]	48,000	384,000	584,000	540,000	540,000	73,640	204,000
Inlet gas density:[3]	[lb/acf]	0.074	0.074	0.074	0.074	0.074	0.074	0.074
Fractional moisture content of inlet gas:[4]		0.10	0.10	0.10	0.10	0.10	0.10	0.10
Reduced Gas Flow Rate	[scfm]	1,600	12,800	19,467	18,000	18,000	2,455	6,800
Waste Gas Capture System For Biotrickling Filter								
Length of Ductwork:[5]	[ft]	100	100	750	835	700	275	700
No. of Duct elbows:		8	8	8	8	8	8	8
No. of Damper/Louvers:		4	4	4	4	4	4	4
Duct diameter:[6]	[ft]	5.526	6.990	6.815	7.006	7.006	6.845	6.577
Pressure Loss:[7]	[w.c.]	0.718	0.702	1.024	1.052	0.988	0.789	1.014
Potential Emissions								
Potential VOC Emissions	[tpy]	22.00	35.70	101.00	200.00	150.00	49.00	95.00
Tons VOC Reduced with 83% efficiency:[9]	[tpy]	18.26	29.63	83.83	166.00	124.50	40.67	78.85
BACT Cost Effectiveness (from Page 3)		**26,389.4 $/ton**	**68,913.7 $/ton**	**31,796.3 $/ton**	**15,307.2 $/ton**	**20,409.6 $/ton**	**16,362.0 $/ton**	**17,211.9 $/ton**

Table A-3: Blue Bird Body Company - Biotrickling Filter

Rule 702 Best Available Control Technology Cost Effectiveness Spreadsheet

Direct Costs

Bureau of Labor Statistics - Producer Price Index - Capital Equipment

Reference Year Cost Index- Capture System (Base year 1993):[1, 2, 13] 131.4

Reference Year Cost Index- Equipment (Base year 2008):[1, 2, 13] 153.8

Current Year - Producer Price Index (First Quarter 2013):[1, 2, 13] 163.86

Reference Year Cost Index- Equipment (Base year 1988):[1, 2, 13]

Reference Year Cost Index- Capture System (Base year 1993):[1, 2, 13]

Bureau of Labor Statistics Data (First Quarter 2013):[1, 2, 13]

Purchase Equipment

				PB10	PB11	PB27	PB28	PB29	PB30	PB31
Basic Equipment Cost[1,13]	Based upon MEGTEC Vendor Quote and 6/10th Rule		(A)	$ 86,603.85	$ 301,572.13	$ 387,828.91	$ 370,023.00	$ 370,023.00	$ 111,959.44	$ 206,333.89
Basic Equipment Cost[1,13]	Munters Quote - Rotor Cocentrator		(B)	$ 612,200.40	$ 2,796,187.17	$ 3,636,480.02	$ 3,464,520.12	$ 3,464,520.04	$ 877,538.83	$ 1,845,825.77
Capture System Cost[12,13,14, 32]	USEPA Cost Manual		(C)	$ 21,095.01	$ 127,624.52	$ 201,102.02	$ 191,125.61	$ 191,125.61	$ 25,524.90	$ 73,856.85
Total Equipment Cost	(Control Device (A+B) + Capture System (C))		(D)	$ 719,899.27	$ 3,225,383.82	$ 4,225,410.95	$ 4,025,668.73	$ 4,025,668.65	$ 1,015,023.18	$ 2,126,016.51
	Average Cost Factor[15]	Adjustment Factor[16]	(D)							
Instrumentation/Controls	0.10	1	(E)	$ 71,989.93	$ 322,538.38	$ 422,541.10	$ 402,566.87	$ 402,566.87	$ 101,502.32	$ 212,601.65
Freight	0.05	1	(F)	$ 35,994.96	$ 161,269.19	$ 211,270.55	$ 201,283.44	$ 201,283.43	$ 50,751.16	$ 106,300.83
Taxes (exempt)	0.03	0	(G)	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Base Price	(Subtotal of D through G)		(H)	$ 827,884.16	$ 3,709,191.40	$ 4,859,222.59	$ 4,629,519.03	$ 4,629,518.95	$ 1,167,276.65	$ 2,444,918.99
Installation Costs										
	Average Cost Factor[15]	Adjustment Factor[16]	(H)							
Foundations and Support	0.08	1	(I)	$ 66,230.73	$ 296,735.31	$ 388,737.81	$ 370,361.52	$ 370,361.52	$ 93,382.13	$ 195,593.52
Erection and Handling	0.40	1	(J)	$ 331,153.66	$ 1,483,676.56	$ 1,943,689.04	$ 1,851,807.61	$ 1,851,807.58	$ 466,910.66	$ 977,967.59
Electrical	0.01	1	(K)	$ 8,278.84	$ 37,091.91	$ 48,592.23	$ 46,295.19	$ 46,295.19	$ 11,672.77	$ 24,449.19
Piping	0.30	1	(L)	$ 248,365.25	$ 1,112,757.42	$ 1,457,766.78	$ 1,388,855.71	$ 1,388,855.68	$ 350,183.00	$ 733,475.70
Insulation	0.01	1	(M)	$ 8,278.84	$ 37,091.91	$ 48,592.23	$ 46,295.19	$ 46,295.19	$ 11,672.77	$ 24,449.19
Painting	0.01	1	(N)	$ 8,278.84	$ 37,091.91	$ 48,592.23	$ 46,295.19	$ 46,295.19	$ 11,672.77	$ 24,449.19
Site Preparation costs[18]	10% of equipment cost		(O)	$ 21,568.38	$ 91,300.42	$ 122,274.26	$ 116,499.89	$ 116,499.89	$ 28,973.78	$ 59,909.32
Total Installation Cost	(Subtotal of I through O)		(P)	$ 692,154.55	$ 3,095,745.45	$ 4,058,244.56	$ 3,866,410.31	$ 3,866,410.24	$ 974,467.87	$ 2,040,293.70
Total Direct Costs	**(Base Price (H) + Installation Cost (P))**		**(Q)**	$ 1,520,038.71	$ 6,804,936.85	$ 8,917,467.15	$ 8,495,929.34	$ 8,495,929.19	$ 2,141,744.52	$ 4,485,212.69
Indirect Installation Cost										
	Average Cost Factor[15]	Adjustment Factor[16]	(H)							
Engineering/Supervision	0.10	1	(R)	$ 82,788.42	$ 370,919.14	$ 485,922.26	$ 462,951.90	$ 462,951.89	$ 116,727.67	$ 244,491.90
Construction/Field	0.10	1	(S)	$ 82,788.42	$ 370,919.14	$ 485,922.26	$ 462,951.90	$ 462,951.89	$ 116,727.67	$ 244,491.90
Contractor Fees	0.10	1	(T)	$ 82,788.42	$ 370,919.14	$ 485,922.26	$ 462,951.90	$ 462,951.89	$ 116,727.67	$ 244,491.90
Start-up	0.02	1	(U)	$ 16,557.68	$ 74,183.83	$ 97,184.45	$ 92,590.38	$ 92,590.38	$ 23,345.53	$ 48,898.38
Performance Test	0.01	1	(V)	$ 8,278.84	$ 37,091.91	$ 48,592.23	$ 46,295.19	$ 46,295.19	$ 11,672.77	$ 24,449.19
Model Study	0.00	1	(W)	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Contingencies	0.03	1	(X)	$ 24,836.52	$ 111,275.74	$ 145,776.68	$ 138,885.57	$ 138,885.57	$ 35,018.30	$ 73,347.57
Total Indirect Cost	**(Subtotal of R through X)**		**(Y)**	$ 298,038.30	$ 1,335,308.90	$ 1,749,320.13	$ 1,666,626.85	$ 1,666,626.82	$ 420,219.59	$ 880,170.83
Total Capital Costs	**(Direct Cost (Q) + Indirect Cost (Y))**		**(Z)**	$ 1,818,077.01	$ 8,140,245.76	$ 10,666,787.29	$ 10,162,556.20	$ 10,162,556.01	$ 2,561,964.12	$ 5,365,383.52

Table A-3: Blue Bird Body Company - Biotrickling Filter

Rule 702 Best Available Control Technology Cost Effectiveness Spreadsheet

					PB10	PB11	PB27	PB28	PB29	PB30	PB31
Direct Annualized Operating Costs											
Labor Cost Inputs											
	Average Labor Cost[19]	Operating Labor Factor[20]	Hours per Year								
Operating Labor[21]	30.00 $/hr	1.0	520	(AA)	$ 15,600.00	$ 15,600.00	$ 15,600.00	$ 15,600.00	$ 15,600.00	$ 15,600.00	$ 15,600.00
Supervisory Labor[22]	30.00 $/hr	1.0	26	(BB)	$ 780.00	$ 780.00	$ 780.00	$ 780.00	$ 780.00	$ 780.00	$ 780.00
Maintenance Labor[23]	30.00 $/hr	1.0	104	(CC)	$ 3,120.00	$ 3,120.00	$ 3,120.00	$ 3,120.00	$ 3,120.00	$ 3,120.00	$ 3,120.00
Maintenance Material Costs											
Maintenance Materials[17]	1% of total capital cost			(DD)	$ 18,180.77	$ 81,402.46	$ 106,667.87	$ 101,625.56	$ 101,625.56	$ 25,619.64	$ 53,653.84
Biofilter Media Costs											
Media[24]	Nutrients and bed cleaning			(EE)	$ 779.09	$ 2,712.96	$ 3,488.93	$ 3,328.74	$ 3,328.74	$ 1,007.19	$ 1,856.19
Utility Cost Inputs											
	Average Unit Cost[25,26]	Unit[27]	No. Hours per Year								
Electricity (Biofilter)	0.089 $/kWh		4,380	(FF)	$ 5,685.07	$ 19,796.56	$ 25,458.84	$ 24,289.98	$ 24,289.98	$ 7,349.52	$ 13,544.69
Water (Biofilter)	6.11 $/kgal		8,760	(FF)	$ 152.28	$ 530.28	$ 681.95	$ 650.64	$ 650.64	$ 196.87	$ 362.81
Indirect Annualized Operating Costs											
Overhead[28]	60% of O&M			(GG)	$ 23,075.92	$ 62,169.25	$ 77,794.08	$ 74,672.58	$ 74,672.58	$ 27,676.10	$ 45,006.01
Property Tax[28]	1% of Capital Costs (Z)			(HH)	$ 18,180.77	$ 81,402.46	$ 106,667.87	$ 101,625.56	$ 101,625.56	$ 25,619.64	$ 53,653.84
Insurance[28]	1% of Capital Costs (Z)			(II)	$ 18,180.77	$ 81,402.46	$ 106,667.87	$ 101,625.56	$ 101,625.56	$ 25,619.64	$ 53,653.84
Administration[28]	2% of Capital Costs (Z)			(JJ)	$ 36,361.54	$ 162,804.92	$ 213,335.75	$ 203,251.12	$ 203,251.12	$ 51,239.28	$ 107,307.67
Capital Recovery Cost Inputs											
	Average Life Expectancy[29]	Interest Rate[30]	Capital Recovery Factor[31]								
Equipment Cost Recovery	10 years	13.5%	0.188	(KK)	$ 341,774.80	$ 1,530,260.20	$ 2,005,217.11	$ 1,910,428.23	$ 1,910,428.19	$ 481,615.89	$ 1,008,622.23
Total Annualized Cost	**(Subtotal of AA-KK)**			**(LL)**	$ 481,871.01	$ 2,041,981.53	$ 2,665,480.27	$ 2,540,997.99	$ 2,540,997.94	$ 665,443.78	$ 1,357,161.11
BACT Cost Effectiveness	**Total Annualized Cost/Tons VOC Reduced**			**(MM)**	**26,389.4 $/ton**	**68,913.7 $/ton**	**31,796.3 $/ton**	**15,307.2 $/ton**	**20,409.6 $/ton**	**16,362.0 $/ton**	**17,211.9 $/ton**

Table A-4: Blue Bird Body Company - Catalytic Oxidizer

Best Available Control Technology Cost Effectiveness Analysis

Catalytic Oxidizer

		PB10	PB11	PB27	PB28	PB29	PB30	PB31
Catalytic Oxidizer Input Parameters								
Gas flowrate:[3]	[acfm]	48,000	384,000	584,000	540,000	540,000	73,640	204,000
Reference temperature:	[°F]	77	77	77	77	77	77	77
Inlet gas temperature:[4]	[°F]	77	77	77	77	77	77	77
Gas flowrate:	[scfm]	48,000	384,000	584,000	540,000	540,000	73,640	204,000
Inlet gas density:[5]	[lb/acf]	0.074	0.074	0.074	0.074	0.074	0.074	0.074
Primary heat recovery:	[fraction]	0.700	0.700	0.700	0.700	0.700	0.700	0.700
Waste gas heat content:[6]	[Btu/lb]	0.015	0.003	0.006	0.012	0.009	0.021	0.015
Waste gas heat capacity:[7]	[Btu/lb-°F]	0.248	0.248	0.248	0.248	0.248	0.248	0.248
Combustion temperature:	[°F]	750	750	750	750	750	750	750
Preheat Temperature:	[°F]	548	548	548	548	548	548	548
Fuel heat of combustion:[8]	[Btu/lb]	21,502	21,502	21,502	21,502	21,502	21,502	21,502
Fuel density:[8]	[lb/ft^3]	0.041	0.041	0.041	0.041	0.041	0.041	0.041
Catalytic Oxidizer Design Parameters								
Auxiliary Fuel Requirement:[9]	[lb/min]	0.37	2.97	4.51	4.17	4.17	0.57	1.58
Auxiliary Fuel Requirement:[9]	[scfm]	9.09	72.74	110.62	102.28	102.28	13.95	38.64
Total Gas Flowrate:	[scfm]	48,009	384,073	584,111	540,102	540,102	73,654	204,039
Reduced Flow Rate [scfm]		1,600	12,802	19,470	18,003	18,003	2,455	6,801
Catalyst Volume:[34]	[ft^3]	4.80	38.41	58.41	54.01	54.01	7.37	20.40
Waste Gas Capture System For Catalytic Oxidizer[10]								
Length of Ductwork:	[ft]	100	100	750	835	700	275	700
No. of Duct elbows:		8	8	8	8	8	8	8
No. of Damper/Louvers:		4	4	4	4	4	4	4
Duct diameter:[11]	[ft]	5.526	6.990	6.815	7.006	7.006	6.845	6.577
Pressure Loss:[12]	[w.c.]	0.718	0.702	1.024	1.052	0.988	0.789	1.014
Potential Emissions								
Potential VOC Emissions:[31]	[tpy]	22.00	35.70	101.00	200.00	150.00	49.00	95.00
90%)C Reduced with 98% efficiency:[33]	[tpy]	19.80	32.13	90.90	180.00	135.00	44.10	85.50
VOC Concentration and Heat of Combustion (Waste Gas) Calculations								
Molecular Weight of VOC (xylenes):	[lb/lb-mol]	106.16	106.16	106.16	106.16	106.16	106.16	106.16
Concentration of VOC by Weight:[35]	[ppmw]	1	0	0	1	0	1	1
Concentration of VOC by Volume:[36]	[ppmv]	0.21	0.04	0.08	0.17	0.13	0.31	0.22
Waste Gas O2 Content:	[%]	20.9	20.9	20.9	20.9	20.9	20.9	20.9
Lower Explosive Limit (LEL):	[%]	4.3	4.3	4.3	4.3	4.3	4.3	4.3
LEL of VOC/Air Mixture:	[%]	0.0005	0.0001	0.0002	0.0004	0.0003	0.0007	0.0005
Heat of Combustion of VOC:	[Btu/lb]	18,651	18,651	18,651	18,651	18,651	18,651	18,651
Heat of Combustion of Waste Gas:[37]	[Btu/lb]	0.015	0.003	0.006	0.012	0.009	0.021	0.015
Heat of Combustion of Waste Gas:	[Btu/scf]	0.001	0.000	0.000	0.001	0.001	0.002	0.001
BACT Cost Effectiveness (from Page 3)		**27,105.4 $/ton**	**88,886.7 $/ton**	**44,359.3 $/ton**	**21,009.7 $/ton**	**28,013.1 $/ton**	**17,166.3 $/ton**	**20,052.2 $/ton**

Table A-4: Blue Bird Body Company - Catalytic Oxidizer

Best Available Control Technology Cost Effectiveness Analysis

Catalytic Oxidizer

					PB10	PB11	PB27	PB28	PB29	PB30	PB31
Direct Costs											
Bureau of Labor Statistics - Producer Price Index - Capital Equipment											
Reference Year Cost Index- Equipment (Base year 1988):[1, 2, 13]				114.3							
Reference Year Cost Index- Capture System (Base year 1993):[1, 2, 13]				131.4							
Current Year - Producer Price Index (First Quarter 2013):[1, 2, 13]				163.9							
Purchase Equipment											
Basic Equipment Cost[13]	USEPA Cost Manual (1998 dollars)			(A)	$ 122,083.12	$ 385,295.08	$ 485,769.20	$ 465,187.06	$ 465,187.06	$ 154,663.34	$ 271,622.78
Basic Equipment Cost[1,13]	Munters Quote - Rotor Cocentrator			(A)	$ 612,200.40	$ 2,796,187.17	$ 3,636,480.02	$ 3,464,520.12	$ 3,464,520.04	$ 877,538.83	$ 1,845,825.77
Capture System Cost[14, 15, 16, 38]	USEPA Cost Manual (1993 dollars)			(B)	$ 21,095.01	$ 127,624.52	$ 201,102.02	$ 191,125.61	$ 191,125.61	$ 25,524.90	$ 73,856.85
Total Equipment Cost	(Control Device (A) + Capture System (B))			(C)	$ 755,378.54	$ 3,309,106.78	$ 4,323,351.25	$ 4,120,832.78	$ 4,120,832.71	$ 1,057,727.07	$ 2,191,305.39
	Average Cost Factor[17]	Adjustment Factor[18]	(C)								
Instrumentation/Controls	0.10	1	$755,379	(D)	$ 75,537.85	$ 330,910.68	$ 432,335.12	$ 412,083.28	$ 412,083.27	$ 105,772.71	$ 219,130.54
Freight	0.05	1	$755,379	(E)	$ 37,768.93	$ 165,455.34	$ 216,167.56	$ 206,041.64	$ 206,041.64	$ 52,886.35	$ 109,565.27
Taxes (exempt)	0.03	0	$755,379	(F)	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Base Price	(Subtotal of C through E)			(G)	$ 868,685.32	$ 3,805,472.79	$ 4,971,853.93	$ 4,738,957.70	$ 4,738,957.61	$ 1,216,386.13	$ 2,520,001.20
Installation Costs											
	Average Cost Factor[17]	Adjustment Factor[18]	(G)								
Foundations and Support	0.08	1	868,685	(H)	$ 69,494.83	$ 304,437.82	$ 397,748.31	$ 379,116.62	$ 379,116.61	$ 97,310.89	$ 201,600.10
Erection and Handling	0.14	1	868,685	(I)	$ 121,615.94	$ 532,766.19	$ 696,059.55	$ 663,454.08	$ 663,454.07	$ 170,294.06	$ 352,800.17
Electrical	0.04	1	868,685	(J)	$ 34,747.41	$ 152,218.91	$ 198,874.16	$ 189,558.31	$ 189,558.30	$ 48,655.45	$ 100,800.05
Piping	0.02	1	868,685	(K)	$ 17,373.71	$ 76,109.46	$ 99,437.08	$ 94,779.15	$ 94,779.15	$ 24,327.72	$ 50,400.02
Insulation	0.01	1	868,685	(L)	$ 8,686.85	$ 38,054.73	$ 49,718.54	$ 47,389.58	$ 47,389.58	$ 12,163.86	$ 25,200.01
Painting	0.01	1	868,685	(M)	$ 8,686.85	$ 38,054.73	$ 49,718.54	$ 47,389.58	$ 47,389.58	$ 12,163.86	$ 25,200.01
Site Preparation	No Estimate			(N)	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Facilities and Buildings	No Estimate			(O)	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Installation Cost	(Subtotal of H through O)			(P)	$ 260,605.60	$ 1,141,641.84	$ 1,491,556.18	$ 1,421,687.31	$ 1,421,687.28	$ 364,915.84	$ 756,000.36
Total Direct Costs	(Base Price (G) + Installation Cost (P))			(Q)	$ 1,129,290.92	$ 4,947,114.63	$ 6,463,410.11	$ 6,160,645.01	$ 6,160,644.90	$ 1,581,301.96	$ 3,276,001.56
Indirect Installation Cost											
	Average Cost Factor[17]	Adjustment Factor[18]	(G)								
Engineering/Supervision	0.05	1	868,685	(R)	$ 43,434.27	$ 190,273.64	$ 248,592.70	$ 236,947.88	$ 236,947.88	$ 60,819.31	$ 126,000.06
Construction/Field	0.10	1	868,685	(S)	$ 86,868.53	$ 380,547.28	$ 497,185.39	$ 473,895.77	$ 473,895.76	$ 121,638.61	$ 252,000.12
Contractor Fees	0.10	1	868,685	(T)	$ 86,868.53	$ 380,547.28	$ 497,185.39	$ 473,895.77	$ 473,895.76	$ 121,638.61	$ 252,000.12
Start-up	0.02	1	868,685	(U)	$ 17,373.71	$ 76,109.46	$ 99,437.08	$ 94,779.15	$ 94,779.15	$ 24,327.72	$ 50,400.02
Performance Test	0.01	1	868,685	(V)	$ 8,686.85	$ 38,054.73	$ 49,718.54	$ 47,389.58	$ 47,389.58	$ 12,163.86	$ 25,200.01
Model Study	0.00	1	868,685	(W)	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Contingencies	0.03	1	868,685	(X)	$ 26,060.56	$ 114,164.18	$ 149,155.62	$ 142,168.73	$ 142,168.73	$ 36,491.58	$ 75,600.04
Total Indirect Cost	(Subtotal of R through X)			(Y)	$ 269,292.45	$ 1,179,696.57	$ 1,541,274.72	$ 1,469,076.89	$ 1,469,076.86	$ 377,079.70	$ 781,200.37
Total Capital Costs	(Direct Cost (Q) + Indirect Cost (Y))			(Z)	$ 1,398,583.37	$ 6,126,811.20	$ 8,004,684.83	$ 7,629,721.89	$ 7,629,721.76	$ 1,958,381.66	$ 4,057,201.94

Table A-4: Blue Bird Body Company - Catalytic Oxidizer

Best Available Control Technology Cost Effectiveness Analysis

Catalytic Oxidizer

					PB10	PB11	PB27	PB28	PB29	PB30	PB31
Direct Annualized Operating Costs											
Labor Cost Inputs											
	Average Labor Cost[19]	Operating Labor Factor[20]	No. Shifts per Year[21]								
Operating Labor	30.00 $/hr	0.50	1,095	(AA)	$ 16,425.00	$ 16,425.00	$ 16,425.00	$ 16,425.00	$ 16,425.00	$ 16,425.00	$ 16,425.00
Supervisory Labor[22]	30.00 $/hr	0.075	1,095	(BB)	$ 2,463.75	$ 2,463.75	$ 2,463.75	$ 2,463.75	$ 2,463.75	$ 2,463.75	$ 2,463.75
Maintenance Labor[23]	30.00 $/hr	0.50	365	(CC)	$ 5,475.00	$ 5,475.00	$ 5,475.00	$ 5,475.00	$ 5,475.00	$ 5,475.00	$ 5,475.00
Maintenance Material Costs											
Maintenance Materials[24]	Assumed 100% of Mainenance Labor Cost			(DD)	$ 5,475.00	$ 5,475.00	$ 5,475.00	$ 5,475.00	$ 5,475.00	$ 5,475.00	$ 5,475.00
Catalyst Replacement Costs											
		Fraction Replaced/Yr									
Catalyst Replacement	650 $/ft3	1		(EE)	$ 3,120.59	$ 24,964.73	$ 37,967.19	$ 35,106.65	$ 35,106.65	$ 4,787.51	$ 13,262.51
Utility Cost Inputs											
	Average Unit Cost[25, 26]	No. Hours per Year									
Natural Gas[27]	6.74 $/mscf	8,760		(FF)	$ 32,204.77	$ 257,683.54	$ 391,878.60	$ 362,319.02	$ 362,335.19	$ 49,402.55	$ 136,869.78
Electricity[28]	0.089 $/kWh	8,760		(GG)	$ 145,976.25	$ 1,167,810.04	$ 1,776,044.42	$ 1,642,232.82	$ 1,642,232.84	$ 223,951.89	$ 620,399.06
Indirect Annualized Operating Costs											
Overhead[24]	60% of O&M			(HH)	$ 19,775.60	$ 32,882.09	$ 40,683.56	$ 38,967.24	$ 38,967.24	$ 20,775.75	$ 25,860.76
Property Tax[24]	1% of Capital Costs (Z)			(II)	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Insurance[24]	1% of Capital Costs (Z)			(JJ)	$ 13,985.83	$ 61,268.11	$ 80,046.85	$ 76,297.22	$ 76,297.22	$ 19,583.82	$ 40,572.02
Administration[24]	2% of Capital Costs (Z)			(KK)	$ 27,971.67	$ 122,536.22	$ 160,093.70	$ 152,594.44	$ 152,594.44	$ 39,167.63	$ 81,144.04
Capital Recovery Cost Inputs[29]											
	Average Life Expectancy	Interest Rate	Capital Recovery Factor[30]								
System Cost Recovery	10 years	13.5%	0.188	(LL)	$ 262,915.46	$ 1,151,760.72	$ 1,504,776.51	$ 1,434,288.36	$ 1,434,288.34	$ 368,150.25	$ 762,701.13
Catalyst Cost Recovery	5 years	13.5%	0.288	(MM)	$ 898.08	$ 7,184.63	$ 10,926.62	$ 10,103.38	$ 10,103.38	$ 1,377.80	$ 3,816.83
Total Annualized Cost	(Subtotal of AA-DD and FF-MM)			(NN)	$ 536,687.00	$ 2,855,928.82	$ 4,032,256.20	$ 3,781,747.88	$ 3,781,764.03	$ 757,035.96	$ 1,714,464.88
BACT Cost Effectiveness	Total Annualized Cost/Tons VOC Reduced			(OO)	**27,105.4 $/ton**	**88,886.7 $/ton**	**44,359.3 $/ton**	**21,009.7 $/ton**	**28,013.1 $/ton**	**17,166.3 $/ton**	**20,052.2 $/ton**

Table A-5: Blue Bird Body Company - Recuperative Thermal Oxidizer

Best Available Control Technology Cost Effectiveness Analysis

Recuperative Thermal Oxidizer

	PB10	PB11	PB27	PB28	PB29	PB30	PB31
Recuperative Thermal Oxidizer Input Parameters							
Gas flowrate:[3] [acfm]	48,000	384,000	584,000	540,000	540,000	73,640	204,000
Reference temperature: [°F]	77	77	77	77	77	77	77
Inlet gas temperature:[4] [°F]	77	77	77	77	77	77	77
Gas flowrate: [scfm]	48,000	384,000	584,000	540,000	540,000	73,640	204,000
Inlet gas density:[5] [lb/acf]	0.074	0.074	0.074	0.074	0.074	0.074	0.074
Primary heat recovery: [fraction]	0.700	0.700	0.700	0.700	0.700	0.700	0.700
Waste gas heat content:[6] [Btu/lb]	0.015	0.003	0.006	0.012	0.009	0.021	0.015
Waste gas heat capacity:[7] [Btu/lb-°F]	0.255	0.255	0.255	0.255	0.255	0.255	0.255
Combustion temperature: [°F]	1,600	1,600	1,600	1,600	1,600	1,600	1,600
Heat loss: [fraction]	0.100	0.100	0.100	0.100	0.100	0.100	0.100
Exit temperature: [°F]	534	533.90	533.90	533.90	533.90	533.90	533.90
Fuel heat of combustion:[8] [Btu/lb]	21,502	21,502	21,502	21,502	21,502	21,502	21,502
Fuel density:[8] [lb/ft^3]	0.041	0.041	0.041	0.041	0.041	0.041	0.041
Recuperative Thermal Oxidizer Design Parameters							
Auxiliary Fuel Requirement:[9] [lb/min]	0.86	6.88	10.47	9.68	9.68	1.32	3.66
Auxiliary Fuel Requirement:[9] [scfm]	21.09	168.72	256.59	237.25	237.25	32.35	89.62
Total Waste Gas Flowrate: [scfm]	48,021	384,169	584,257	540,237	540,237	73,672	204,090
Total Waste Gas Flowrate After Concentrator [scfm]	1,601	12,806	19,475	18,008	18,008	2,456	6,803
Waste Gas Capture System For Recuperative Thermal Oxidizer[10]							
Length of Ductwork: [ft]	100	100	750	835	700	275	700
No. of Duct elbows:	8	8	8	8	8	8	8
No. of Damper/Louvers:	4	4	4	4	4	4	4
Duct diameter:[11] [ft]	5.526	6.990	6.815	7.006	7.006	6.845	6.577
Pressure Loss:[12] [w.c.]	0.718	0.702	1.024	1.052	0.988	0.789	1.014
Potential Emissions							
Potential VOC Emissions:[31,32] [tpy]	22.00	35.70	101.00	200.00	150.00	49.00	95.00
90% C Reduced with 90% efficiency:[33] [tpy]	19.80	32.13	90.90	180.00	135.00	44.10	85.50
VOC Concentration and Heat of Combustion (Waste Gas) Calculations							
Molecular Weight of VOC (xylenes): [lb/lb-mol]	106.16	106.16	106.16	106.16	106.16	106.16	106.16
Concentration of VOC by Weight:[34] [ppmw]	1	0	0	1	0	1	1
Concentration of VOC by Volume:[35] [ppmv]	0.21	0.04	0.08	0.17	0.13	0.31	0.22
Waste Gas O2 Content: [%]	20.9	20.9	20.9	20.9	20.9	20.9	20.9
Lower Explosive Limit (LEL): [%]	4.3	4.3	4.3	4.3	4.3	4.3	4.3
LEL of VOC/Air Mixture: [%]	0.000	0.000	0.000	0.000	0.000	0.001	0.001
Heat of Combustion of VOC: [Btu/lb]	18,651	18,651	18,651	18,651	18,651	18,651	18,651
Heat of Combustion of Waste Gas:[36] [Btu/lb]	0.015	0.003	0.006	0.012	0.009	0.021	0.015
Heat of Combustion of Waste Gas: [Btu/scf]	0.001	0.000	0.000	0.001	0.001	0.002	0.001
BACT Cost Effectiveness (from Page 3)	**23,303.9 $/ton**	**62,186.7 $/ton**	**30,173.5 $/ton**	**14,408.2 $/ton**	**19,171.8 $/ton**	**14,118.7 $/ton**	**15,014.9 $/ton**

Table A-5: Blue Bird Body Company - Recuperative Thermal Oxidizer

Best Available Control Technology Cost Effectiveness Analysis | Recuperative Thermal Oxidizer

Direct Costs

Bureau of Labor Statistics - Producer Price Index - Capital Equipment

Reference Year Cost Index- Equipment (Base year 1988):[1, 2, 13]	114.3
Reference Year Cost Index- Capture System (Base year 1993):[1, 2, 13]	131.4
Current Year - Producer Price Index (First Quarter 2013):[1, 2, 13]	163.9

Purchase Equipment

			PB10	PB11	PB27	PB28	PB29	PB30	PB31
Basic Equipment Cost[13]	USEPA Cost Manual (1998 dollars)	(A)	$ 193,526.09	$ 325,470.79	$ 361,436.85	$ 354,427.70	$ 354,427.70	$ 215,381.13	$ 277,866.86
Basic Equipment Cost[1,13]	Munters Quote - Rotor Cocentrator	(A)	$ 612,200.40	$ 2,796,187.17	$ 3,636,480.02	$ 3,464,520.12	$ 3,464,520.04	$ 877,538.83	$ 1,845,825.77
Capture System Cost[14, 15, 16, 37]	USEPA Cost Manual (1993 dollars)	(B)	$ 21,095.01	$ 127,624.52	$ 201,102.02	$ 191,125.61	$ 191,125.61	$ 25,524.90	$ 73,856.85
Total Equipment Cost	(Basic Equipment (A) + Capture System (B))	(C)	$ 826,821.51	$ 3,249,282.49	$ 4,199,018.89	$ 4,010,073.42	$ 4,010,073.34	$ 1,118,444.86	$ 2,197,549.48

	Average Cost Factor[17]	Adjustment Factor[18]		PB10	PB11	PB27	PB28	PB29	PB30	PB31
Instrumentation/Controls	0.10	1	(D)	$ 82,682.15	$ 324,928.25	$ 419,901.89	$ 401,007.34	$ 401,007.33	$ 111,844.49	$ 219,754.95
Freight	0.05	1	(E)	$ 41,341.08	$ 162,464.12	$ 209,950.94	$ 200,503.67	$ 200,503.67	$ 55,922.24	$ 109,877.47
Taxes (exempt)	0.03	0	(F)	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Base Price	(Subtotal of C through E)		(G)	$ 950,844.73	$ 3,736,674.86	$ 4,828,871.73	$ 4,611,584.43	$ 4,611,584.35	$ 1,286,211.59	$ 2,527,181.90

Installation Costs

	Average Cost Factor[17]	Adjustment Factor[18]		PB10	PB11	PB27	PB28	PB29	PB30	PB31
Foundations and Support	0.08	1	(H)	$ 76,067.58	$ 298,933.99	$ 386,309.74	$ 368,926.75	$ 368,926.75	$ 102,896.93	$ 202,174.55
Erection and Handling	0.14	1	(I)	$ 133,118.26	$ 523,134.48	$ 676,042.04	$ 645,621.82	$ 645,621.81	$ 180,069.62	$ 353,805.47
Electrical	0.04	1	(J)	$ 38,033.79	$ 149,466.99	$ 193,154.87	$ 184,463.38	$ 184,463.37	$ 51,448.46	$ 101,087.28
Piping	0.02	1	(K)	$ 19,016.89	$ 74,733.50	$ 96,577.43	$ 92,231.69	$ 92,231.69	$ 25,724.23	$ 50,543.64
Insulation	0.01	1	(L)	$ 9,508.45	$ 37,366.75	$ 48,288.72	$ 46,115.84	$ 46,115.84	$ 12,862.12	$ 25,271.82
Painting	0.01	1	(M)	$ 9,508.45	$ 37,366.75	$ 48,288.72	$ 46,115.84	$ 46,115.84	$ 12,862.12	$ 25,271.82
Site Preparation		No Estimate	(N)	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Facilities and Buildings		No Estimate	(O)	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Installation Cost	(Subtotal of H through O)		(P)	$ 285,253.42	$ 1,121,002.46	$ 1,448,661.52	$ 1,383,475.33	$ 1,383,475.30	$ 385,863.48	$ 758,154.57
Total Direct Costs	(Base Price (G) + Installation Cost (P))		(Q)	$ 1,236,098.15	$ 4,857,677.32	$ 6,277,533.24	$ 5,995,059.76	$ 5,995,059.65	$ 1,672,075.07	$ 3,285,336.47

Indirect Installation Cost

	Average Cost Factor[17]	Adjustment Factor[18]		PB10	PB11	PB27	PB28	PB29	PB30	PB31
Engineering/Supervision	0.05	1	(R)	$ 47,542.24	$ 186,833.74	$ 241,443.59	$ 230,579.22	$ 230,579.22	$ 64,310.58	$ 126,359.09
Construction/Field	0.10	1	(S)	$ 95,084.47	$ 373,667.49	$ 482,887.17	$ 461,158.44	$ 461,158.43	$ 128,621.16	$ 252,718.19
Contractor Fees	0.10	1	(T)	$ 95,084.47	$ 373,667.49	$ 482,887.17	$ 461,158.44	$ 461,158.43	$ 128,621.16	$ 252,718.19
Start-up	0.02	1	(U)	$ 19,016.89	$ 74,733.50	$ 96,577.43	$ 92,231.69	$ 92,231.69	$ 25,724.23	$ 50,543.64
Performance Test	0.01	1	(V)	$ 9,508.45	$ 37,366.75	$ 48,288.72	$ 46,115.84	$ 46,115.84	$ 12,862.12	$ 25,271.82
Model Study	0.00	1	(W)	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Contingencies	0.03	1	(X)	$ 28,525.34	$ 112,100.25	$ 144,866.15	$ 138,347.53	$ 138,347.53	$ 38,586.35	$ 75,815.46
Total Indirect Cost	(Subtotal of R through X)		(Y)	$ 294,761.87	$ 1,158,369.21	$ 1,496,950.24	$ 1,429,591.17	$ 1,429,591.15	$ 398,725.59	$ 783,426.39
Total Capital Costs	(Direct Cost (Q) + Indirect Cost (Y))		(Z)	$ 1,530,860.02	$ 6,016,046.53	$ 7,774,483.48	$ 7,424,650.94	$ 7,424,650.80	$ 2,070,800.66	$ 4,068,762.86

Table A-5: Blue Bird Body Company - Recuperative Thermal Oxidizer

Best Available Control Technology Cost Effectiveness Analysis | Recuperative Thermal Oxidizer

					PB10	PB11	PB27	PB28	PB29	PB30	PB31
Direct Annualized Operating Costs											
Labor Cost Inputs											
	Average Labor Cost[19]	Operating Labor Factor[20]	No. Shifts per Year[21]								
Operating Labor	30.00 $/hr	0.50	1,095	(AA)	$ 16,425.00	$ 16,425.00	$ 16,425.00	$ 16,425.00	$ 16,425.00	$ 16,425.00	$ 16,425.00
Supervisory Labor[22]	30.00 $/hr	0.075	1,095	(BB)	$ 2,463.75	$ 2,463.75	$ 2,463.75	$ 2,463.75	$ 2,463.75	$ 2,463.75	$ 2,463.75
Maintenance Labor[23]	30.00 $/hr	0.50	365	(CC)	$ 5,475.00	$ 5,475.00	$ 5,475.00	$ 5,475.00	$ 5,475.00	$ 5,475.00	$ 5,475.00
Maintenance Material Costs											
Maintenance Materials[24]	Assumed 100% of Mainenance Labor Cost			(DD)	$ 5,475.00	$ 5,475.00	$ 5,475.00	$ 5,475.00	$ 5,475.00	$ 5,475.00	$ 5,475.00
Utility Cost Inputs											
	Average Unit Cost[25, 26]	No. Hours per Year									
Natural Gas[27]	6.74 $/mscf	8,760		(EE)	$ 74,705.99	$ 597,693.19	$ 908,976.67	$ 840,457.75	$ 840,473.87	$ 114,606.53	$ 317,499.99
Electricity[28]	0.089 $/kWh	8,760		(FF)	$ 5,262.21	$ 41,202.77	$ 91,316.15	$ 86,799.54	$ 81,497.16	$ 8,878.36	$ 31,590.38
Indirect Annualized Operating Costs											
Overhead[24]	60% of O&M			(GG)	$ 17,903.25	$ 17,903.25	$ 17,903.25	$ 17,903.25	$ 17,903.25	$ 17,903.25	$ 17,903.25
Property Tax[24]	1% of Capital Costs (Z)			(HH)	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Insurance[24]	1% of Capital Costs (Z)			(II)	$ 15,308.60	$ 60,160.47	$ 77,744.83	$ 74,246.51	$ 74,246.51	$ 20,708.01	$ 40,687.63
Administration[24]	2% of Capital Costs (Z)			(JJ)	$ 30,617.20	$ 120,320.93	$ 155,489.67	$ 148,493.02	$ 148,493.02	$ 41,416.01	$ 81,375.26
Capital Recovery Cost Inputs[29]											
	Average Life Expectancy	Working Capital Cost	Capital Recovery Factor[30]								
Capital Cost Recovery	10 years	13.5%	0.188	(KK)	$ 287,781.75	$ 1,130,938.41	$ 1,461,501.65	$ 1,395,737.69	$ 1,395,737.67	$ 389,283.56	$ 764,874.43
Total Annualized Cost	(Subtotal of AA through KK)			(LL)	$ 461,417.75	$ 1,998,057.76	$ 2,742,770.98	$ 2,593,476.51	$ 2,588,190.23	$ 622,634.47	$ 1,283,769.69
BACT Cost Effectiveness	Total Annualized Cost/Tons VOC Reduced			(MM)	**23,303.9 $/ton**	**62,186.7 $/ton**	**30,173.5 $/ton**	**14,408.2 $/ton**	**19,171.8 $/ton**	**14,118.7 $/ton**	**15,014.9 $/ton**

Table A-6: BACT Energy Impact Summary

	Utility Consumption			Energy Equivalents	
Emissions Unit	Water (gal/yr)[1]	Gas (mscf/yr)[1]	Electricity (kWh/yr)[1]	Total Energy Consumed (MMBtu/year)[2]	Total Energy Consumed (MMBtu/hr)[3]
Recuperative Thermal Oxidizer					
PB10	0	11,084	59,126	11,507	1.31
PB11	0	88,679	462,952	92,032	10.5
PB27	0	134,863	1,026,024	141,062	16.1
PB28	0	124,697	975,276	130,520	14.9
PB29	0	124,699	915,698	130,319	14.9
PB30	0	17,004	99,757	17,684	2.0
PB31	0	47,107	354,948	49,260	5.6
Regenerative Thermal Oxidizer[4]					
PB10	0	17	1,131,109	3,878	0.44
PB11	0	58	3,938,750	13,503	1.54
PB27	0	75	5,065,326	17,365	1.98
PB28	0	72	4,832,768	16,567	1.89
PB29	0	72	4,832,768	16,567	1.89
PB30	0	22	1,462,271	5,013	0.57
PB31	0	40	2,694,870	9,238	1.05
Catalytic Oxidizer					
PB10	0	4,778	1,640,183	10,472	1.20
PB11	0	38,232	13,121,461	83,780	9.6
PB27	0	58,142	19,955,555	127,413	14.5
PB28	0	53,757	18,452,054	117,809	13.4
PB29	0	53,759	18,452,054	117,811	13.4
PB30	0	7,330	2,516,313	16,065	1.8
PB31	0	20,307	6,970,776	44,504	5.1
Carbon Adsorber					
PB10	81,998	151	88,340	456	0.05
PB11	133,060	245	243,836	1,082	0.12
PB27	376,444	693	737,518	3,224	0.37
PB28	745,433	1,373	1,993,854	8,205	0.94
PB29	559,075	1,029	1,294,395	5,468	0.62
PB30	182,631	336	232,059	1,135	0.13
PB31	354,081	652	383,739	1,975	0.23
Biofilter					
PB10	24,928	0	63,877	218	0.02
PB11	347,212	0	222,433	759	0.09
PB27	223,262	0	286,054	976	0.11
PB28	426,023	0	272,921	931	0.11
PB29	426,023	0	272,921	931	0.11
PB30	32,226	0	82,579	282	0.03
PB31	59,390	0	152,187	519	0.06

Notes	
1	Per cost-effectiveness calculation sheets. Carbon adsorber utilities include cooling water usage, water and gas used for steam production.
2	Total Energy Consumed, MMBtu/yr = (Gas Consumption, Mscf/yr) / (1,000 MMscf/Mscf) * (1,020 MMBtu/MMscf) + (Electricity Consumption, kWh/year) * (3413 Btu-hr/kWh) / (10^6 Btu/MMBtu)
3	Total Energy Consumed, MMBtu/yr = (Total Energy Consumed, MMBtu/yr) / (8,760 hr/yr)
4	Energy Use for Regenerative Thermal Oxideizer from Munters quote, scaled using 6/10ths rule. Emergy Use (MMBtu/yr or kWh/yr = Hourly utility use (304 kW and 4.136 MMBtu/hr) * 8,760 hrs/yr

Table A-7: BAT Environmental Impact Summary

Unit/ Unit Combination	Gas Consumption (mscf/yr)[1]	Gas NO_x (tpy)[2]	Gas GHG (tpy CO_2e)[3]	VOC -> GHG (tpy CO_2e)[4]	Sum GHG (tpy CO_2e)[5]	Gas CO (tpy)[6]
Recuperative Thermal Oxidizer						
PB10	11,084	+ 0.55	669	71.5	+ 741	+ 0.47
PB11	88,679	+ 4.43	5,353	116.0	+ 5469	+ 3.72
PB27	134,863	+ 6.74	8,141	328.3	+ 8469	+ 5.66
PB28	124,697	+ 6.23	7,527	650.0	+ 8177	+ 5.24
PB29	124,699	+ 6.23	7,527	487.5	+ 8015	+ 5.24
PB30	17,004	+ 0.85	1,026	159.3	+ 1186	+ 0.71
PB31	47,107	+ 2.36	2,844	308.8	+ 3152	+ 1.98
Regenerative Thermal Oxidizer						
PB10	17	+ 0.00	1	71.5	+ 73	+ 0.00
PB11	58	+ 0.00	4	116.0	+ 120	+ 0.00
PB27	75	+ 0.00	5	328.3	+ 333	+ 0.00
PB28	72	+ 0.00	4	650.0	+ 654	+ 0.00
PB29	72	+ 0.00	4	487.5	+ 492	+ 0.00
PB30	22	+ 0.00	1	159.3	+ 161	+ 0.00
PB31	40	+ 0.00	2	308.8	+ 311	+ 0.00
Catalytic Oxidizer						
PB10	4,778	+ 0.24	288	71.5	+ 360	+ 0.20
PB11	38,232	+ 1.91	2,308	116.0	+ 2424	+ 1.61
PB27	58,142	+ 2.91	3,510	328.3	+ 3838	+ 2.44
PB28	53,757	+ 2.69	3,245	650.0	+ 3895	+ 2.26
PB29	53,759	+ 2.69	3,245	487.5	+ 3733	+ 2.26
PB30	7,330	+ 0.37	442	159.3	+ 602	+ 0.31
PB31	20,307	+ 1.02	1,226	308.8	+ 1535	+ 0.85
Carbon Adsorber						
PB10	151	+ 0.008	9	71.5	+ 81	+ 0.006
PB11	245	+ 0.012	15	116.0	+ 131	+ 0.010
PB27	693	+ 0.035	42	328.3	+ 370	+ 0.029
PB28	1,373	+ 0.069	83	650.0	+ 733	+ 0.058
PB29	1,029	+ 0.051	62	487.5	+ 550	+ 0.043
PB30	336	+ 0.017	20	159.3	+ 180	+ 0.014
PB31	652	+ 0.033	39	308.8	+ 348	+ 0.027
Biofilter						
PB10	0	0.00	0.0	71.5	+ 72	0.0
PB11	0	0.00	0.0	116.0	+ 116	0.0
PB27	0	0.00	0.0	328.3	+ 328	0.0
PB28	0	0.00	0.0	650.0	+ 650	0.0
PB29	0	0.00	0.0	487.5	+ 488	0.0
PB30	0	0.00	0.0	159.3	+ 159	0.0
PB31	0	0.00	0.0	308.8	+ 309	0.0

Notes

1	Per cost-effectiveness calculation sheets. Carbon adsorber utilities include cooling water usage, water and gas used for steam production.
2	Estimated NO_x emissions from natural gas combustion in control device calculated using AP-42 emission factor, 5th Edition, Table 1.4-1, NO_x emissions from small uncontrolled boilers. NO_x = (Gas Consumption, Mscf) * (1 MMscf/1000 Mscf) * (100 lb NO_x/MMscf) / (2,000 lb/ton)
3	Estimated greenhouse gas (GHG) emissions from natural gas combustion in control device calculated using AP-42 emission factors, 5th Edition, Table 1.4-2. Combined GHG Emission Factor, lb CO_2e/MMscf = (120,000 lb CO_2/MMscf) * (CO_2 GWP =1) + (2.2 lb N2O/MMscf) * (N_2O GWP=310) + (2.3 lb CH4/MMscf) * (CH_4 GWP=21) GHG Emissions, tpy CO_2e = (Gas Consumption, Mscf) * (1 MMscf/1000 Mscf) * (GHG EF=120,730 lb CO_2e/MMscf) / (2000 lb/ton)
4	CO_2 emissions from VOC destruction = (tons of VOC destroyed) * (8 mol CO_2/1 mol xylenes) * [(44.01 g/mol CO_2) / (106.16 g/mol ethanol)] CO_2 emissions from VOC destruction = (tons of VOC destroyed) * (3 mol CO2/1 mol isopropyl alcohol) * [(44.01 g/mol CO2) / / (60.1 g/mol isopropyl alcohol)] * (CO2 GWP =1)
5	Sum of CO_2 emissions from natural gas combustion and VOC destruction.
6	Estimated CO emissions from natural gas combustion in control device calculated using AP-42 emission factor, 5th Edition, Table 1.4-2. CO = (Gas Consumption, Mscf) * (1 MMscf/1000 Mscf) * (84 lb CO/MMscf) / (2000 lb/ton)

Table A-1: Blue Bird Body Company - Regenerative Thermal Oxidizer

Best Available Control Technology Cost Effectiveness Analysis

Footnotes

1 Base total capital investment reflects this date prior to cost escalation.

2 Bureau of Labor statistics for year and quarter shown. Base oxidizer cost has been escalated to this date.

3 Waste gas exhaust flow rate from emissions unit discharge to the atmostphere.

4 Inlet gas temperature based on facility data.

5 Based on Ideal Gas Equation at waste gas exhaust temperature assuming waste gas is principally air.

6 See footnote 35.

7 Heat capacity, c_p, of air at average control temperature; Thermodynamics 3rd Edition, Black and Hartley, 1996.

8 Auxiliary fuel is assumed to be natural gas (as methane). Please refer to Table 2.14 of EPA 452/B-02-001 Section 3.2.

9 Auxiliary fuel needed to sustain the combustion zone temperature of 1600 °F using the procedure specified in EPA 452/B-02-001.

10 Information pertaining to capture system were estimated from existing facility layout; waste gas stream is exhausted through stack extending to where the RTO would be installed.

11 Duct Diameter = 1.128 * ((waste gas flow rate/x)/u) ^0.5, where x = factor needed to bring diamters below 7 feet and u = minimum transport velocity of 2,000 ft/min for gases per Table 1.3 of USEPA Cost Manual, 6th Edition (Equation in Section 1.3.3).

12 Pressure Loss = 0.136 * ((1/duct diameter)^1.18) * ((u/1,000)^1.8) * (duct length/100)) for gases per Table 1.3 of USEPA Cost Manual, 6th Edition (Equation in Section 1.3.3).

13 RTO and Rotor Concentrator Costs from Munters estimate (2009)
Escalated capture system costs = (Price index current year) / (Price index of base year) * (220400+11.57*flow (scfm))
Cost correlations provided by the EPA are in 1999 dollars with cost escalation using Bureau of Labor Capital Equipment Price Index
http://data.bls.gov/cgi-bin/surveymost

14 Cost of straight ductwork = 2.03 * (12 * Duct diameter)^0.784) * (Length of ducting) * (Number of ducts required (x from footnote 11))
Cost based upon using Sheet-galv CS from Table 1.9 of USEPA cost manual.

15 Cost of elbows = 74.2 * (e^(0.0688 * Duct diameter * 12)) * (No. of elbows) * (Number of ducts required (x from footnote 11))
Cost based upon 304 SS from Table 1.10 of USEPA cost manual.

16 Cost of damper/louver = 45.5 * (e^(0.0597 * Duct diameter * 12)) * (No. of dampers) * (Number of ducts required (x from footnote 11))
Cost based upon galvanized CS insulated butterfly damper per Table 1.10 of US EPA cost manual, 6th Edition.

17 Average cost factors specified in EPA 452/B-02-001, Section 3.2, Chapter 2, Table 2.8.

18 No adjustment factor applied.

19 Annual cost inputs were derived from best available facility information.

20 Operating labor factor (total man-hours per shift) specified in EPA 452/B-02-001, Section 3.2, Chapter 2, Table 2.10.

21 No. of shifts per year = (8,760 hr/year) /(8 hrs/shift).

22 Supervisory labor operating factor determined as 15% of operating labor factor specified in EPA 452/B-02-001, Section 3.2, Chapter 2, Table 2.10.

23 Assumes preventative maintenance labor man-hours are allocated during one shift per day.

24 EPA 452/B-02-001, Section 3.2, Chapter 2, Table 2.10.

25 Mean of the latest 5 years (2008-2012) of annual average natural gas price data for industrial sector consumers in Georgia per US Dept. of Energy, Energy Information Administration; see http://tonto.eia.doe.gov/dnav/ng/ng_pri_sum_dcu_SGA_a.htm

26 Average Price of Electricity in 2010 in Georgia http://www.eia.gov/electricity/state/

27 Natural Gas and Electricity Estimation provided by Munters. Utility usage scaled based on 6/10ths rule for varying size systems

29 Average life expectancy for thermal incinerators specified in EPA 452/B-02-001, Section 3.2, Chapter 2, Table 2.10, footnote "c" is 10 years

30 Capital Recovery Factor = (1 + Interest Rate)^(Life Expectancy) / ((1 + Interest Rate)^D100-1)
Interest Rate (Working Capital Cost) Provided by Blue Bird Body Company

31 Potential Controlled emissions are 90% (system control efficiency) of Potential Uncontrolled Emissions

32 Total VOC reduced = 91.8% of Potential Emissions are concentrated in concentrator. 98% of Potential VOC emissions routed to RTO are controlled

33 Parts per million concentration by volume to weight conversion from AP-42 Appendix A.

34 Parts per million concentration by volume (ppmv) calculation is as follows:
(Potential emissions, tpy)*(2,000 lb/ton)/(8,760 hr/yr)*(0.73 ft^3-atm/lbmol-R^o)*(Inlet gas temperature, R^o)/
(Molecular weight, lb/lb-mol)/(Gas flowrate, acfm)/(60 min/hr)*(1,000,000 ppm)

35 Heat of combustion per pound of inlet waste gas developed from heat of combustion multiplied by concentration by weight (ppmw).

36 Cost of Canopy Hood (if Applicable) = 306*(Area of Opening (420 ft^2)^.506 Based on rectangular canopy hood (Table 1.8) and equation 1.40 from Section 2 Chapter 1 of the EPA Air Pollution Control Cost Manual

Table A-2: Blue Bird Body Company - Carbon Adsorber

Best Available Control Technology Cost Effectiveness Analysis

Footnotes

1 Base total capital investment reflects this date prior to cost escalation. Rotor cocentrator costing provided by Munters

2 Bureau of Labor statistics for year and quarter shown. Base oxidizer cost has been escalated to this date.

3 Actual waste gas exhaust flow rate discharged to the atmostphere.

4 Inlet gas temperature based on facility data.

5 The capacity factor was determined from Equation 1.11 of EPA 452/B-02-001 Section 3.1 for continously operated systems.

6 Source: I.I. El-Sharkawy, B.B. Saha, K. Kuwahara, S. Koyama, and K.C., NG, Adsorption Rate Measurements of Activated Carbon Fiber/Ethanol Pair for Adsorption Cooling System Application, White Paper, Figure 2, Ethanol Uptake on Activated Carbon with Time at Adsorption Temperature. Carbon equilibrium capacity based on 67% by mass at 27^{o}C. Typically, the carbon equilibrium capacity is based on application of the Freundlich isotherm function and partial pressure of the VOC in the gas stream. The Freundlich isotherm constants for ethanol were not available to apply this function.

7 Working capacity is 50% of equilibrium capacity. Please refer to Equation 1.15 of EPA 452/B-02-001 Section 3.1.

8 Adsorption time selected based on daily adsorption/desorption cycle.

9 Carbon mass required for each fixed bed determined from Equation 1.14 of EPA 452/B-02-001 Section 3.1 for continuously operating systems.

10 The superficial bed velocity was chosen to based on the guidance in Section 1.3.1.2 of EPA 452/B-02-001 Section 3.1

11 The vesel diameter was determined from Equation 1.21 of EPA 452/B-02-001 Section 3.1. The number of vessels was selected to keep vessel diameter under 12' to ensure that vessels can be shipped by truck.

12 The vesel length was determined from Equation 1.22 of EPA 452/B-02-001 Section 3.1 plus 2 feet clearance for gas distribution and disengagement.

13 The vesel surface area = (*p*) * (Vessel diameter, D) * (Vessel length, L) + 2 * (*p*/4) * (Vessel diameter, D))^2

14 Carbon bed thickness determined from Equation 1.14 of EPA 452/B-02-001 Section 3.1 for carbon density of 30 lb/ft^3.

15 Carbon bed and total system pressure drop determined from Equations 1.30 and 1.32 of EPA 452/B-02-001 Section 3.1

16 Duct Diameter = 1.128 * ((waste gas flow rate/x)/u) ^0.5, where x = factor needed to bring diamters below 7 feet and u = minimum transport velocity of 2,000 ft/min for gases per Table 1.3 of USEPA Cost Manual, 6th Edition (Equation in Section 1.3.3).

17 Pressure Loss = 0.136 * ((1/duct diameter)^1.18) * ((u/1,000)^1.8) * (duct length/100)) for gases per Table 1.3 of USEPA Cost Manual, 6th Edition (Equation in Section 1.3.3).

18 Information pertaining to capture system were estimated from existing facility roof layout.

19 Potential VOC emissions (tpy) specified as requested limits.

20 Potential VOC emissions from fuel combustion (tpy) of natural gas not included since the limits presented include these emissions.

21 100 percent capture, 91.8% of VOC concentrated by concentrator, and 98 percent destruction efficiency

22 Parts per million concentration by volume to weight conversion from AP-42 Appendix A.

23 Parts per million concentration by volume (ppmv) calculation is as follows: (Potential emissions, tpy) * (2,000 lb/ton) / (8,760 hr/yr) * (0.73 ft^3-atm/lbmol-R^o) * (Inlet gas temperature, R^o)/ (Molecular weight, lb/lb-mol) / (Gas flowrate, acfm) / (60 min/hr) * (1,000,000 ppm)

24 Source: EPA 452/B-02-001 Section 3.1 VOC Destruction Controls. Cost correlations range valid from 4,000 to 500,000 scfm. Escalated oxidizer costs = (Index for current year) / (Index Base Reference) * (5.82*(Waste gas flow rate)^-.133) * {($1/lb carbon) * (lbs carbon required) + (271*(Surface area)^0.778) * (Number of vessels)} Cost correlations provided by the EPA are in 1999 dollars with cost escalation using M & S (1999 = Base Year).

25 Cost of straight ductwork = 2.03 * (12 * Duct diameter)^0.784) * (Length of ducting) * (Number of ducts required (x from footnote 16)) Cost based upon using Sheet-galv CS from Table 1.9 of USEPA cost manual.

26 Cost of elbows = 74.2 * (e^(0.0688 * Duct diameter * 12)) * (No. of elbows) * (Number of ducts required (x from footnote 16)) Cost based upon 304 SS from Table 1.10 of USEPA cost manual.

27 Cost of damper/louver = 45.5 * (e^(0.0597 * Duct diameter * 12)) * (No. of dampers) * (Number of ducts required (x from footnote 16)) Cost based upon galvanized CS insulated butterfly damper per Table 1.10 of US EPA cost manual, 6th Edition.

28 Average cost factors specified in Table 1.3 of EPA 452/B-02-001 Section 3.1 for carbon adsorbers.

29 No adjustment factor applied.

30 Standard accounting practice is to account for in-house labor (when on loan to another department, etc.) at $70/hour total cost, inclusive of overhead, benefits, etc.

31 Operating labor factor (total man-hours per shift) specified in Table 1.6 of EPA 452/B-02-001 Section 3.1

32 No. of shifts per year = (8,760 hr/year) / (8 hrs/shift).

33 Supervisory labor operating factor determined as 15% of operating labor factor specified in Table 1.6 of EPA 452/B-02-001 Section 3.1

34 Assumes preventative maintenance labor of 1 hour per day for 365 hrs/year.

35 Carbon replacement cost based on Equation 1.36 of EPA 452/B-02-001 Section 3.1 with $1/lb carbon cost and replacement labor at $0.05/lb carbon replaced.

36 Steam cost is per US EPA Cost Manual, 6th Edition, Chapter 3.1, Section 1. Steam prices are based on 120% of the fuel cost (natural gas) and assuming 1 MMBtu/1000 lb steam. Average cost of natural gas per Mscf for industrial consumers in Kentucky 2004-2008, per US Dept. of Energy, Energy Information Admin.

37 Average Price of Electricity in 2010 in Georgia http://www.eia.gov/electricity/state/

38 Steam requirement estimated at 3.5 lb/lb VOC adsorbed. Please refer to Equation 1.28 of EPA452/B-02-001 Section 3.1 0.6 operating factor is incorporated to only reflect regeneration portion of desorption.

39 System and bed cooling/drying fan and cooling water pump power requirements determined from Equations 1.32, 1.33 and 1.34 of EPA 452/B-02-001 Section 3.1 for the calculated system pressure drop. Volumetric flow rate for the bed cooling/drying fan was determined at 100 cfm per pound of carbon with an operating factor of 0.4 for the number of hours per year. Horsepower is converted to kilowatts by multiplying by 0.746 kW/hp.

40 Cooling water requirements determined by multiplying steam requirement by 3.43 (eq 1.29 in cost manual). Cooling water cost is per Georgia current rates.

41 Average life expectancy for thermal incinerators specified in EPA 452/B-02-001, Section 3.1, Chapter 1

42 Capital Recovery Factor = (1+Interest Rate)^(Life Expectancy)/((1+Interest Rate)^D100-1) Interest Rate (Working Capital Cost) Provided by Blue Bird Body Company

43 Cost of Canopy Hood (if Applicable) = 306*(Area of Opening (420 ft^2)^.506 Based on rectangular canopy hood (Table 1.8) and equation 1.40 from Section 2 Chapter 1 of the EPA Air Pollution Control Cost Manual

44 Cost of solid waste disposal estimated to be 430 $/ton per EPA document "Cost and Economic Impact Analysis of the CESQG Rulemaking"

45 Duct System Energy Requirement = = 0.000117*(Waste gas exhaust flow)*(Total system pressure drop,in. w.c.)/0.6*(8760 hr/yr)*(Rate, $/kWh)

Table A-3: Blue Bird Body Company - Biotrickling Filter

Best Available Control Technology Cost Effectiveness Analysis

Footnotes

1 Exhaust flow rate from emissions unit discharge to the atmostphere. Flow rates adjusted by (x) due to ductwork sizing limitations
Cost of rotor concentrator provided by Munters

2 Inlet gas temperature based on facility data.

3 Based on Ideal Gas Equation at waste gas exhaust temperature assuming waste gas is principally air.

4 Fractional moisture content of inlet gas based on engineering estimate

5 Information pertaining to capture system was estimated considering currently availible space and logistics of the facility

6 Duct Diameter = 1.128 * ((waste gas flow rate/x)/u) ^0.5, where x = factor needed to bring diamters below 7 feet and
u = minimum transport velocity of 2,000 ft/min for gases per Table 1.3 of USEPA Cost Manual, 6th Edition (Equation in Section 1.3.3).

7 Pressure Loss = 0.136 * ((1 / duct diameter)^1.18) * ((u / 1,000)^1.8) * (duct length / 100)) for gases per
Table 1.3 of USEPA Cost Manual, 6th Edition (Equation in Section 1.3.3).

8 Potential VOC emissions (tpy) specified as per the proposed enforceable limit. Potential emissions adjusted by factor (y) from
footnote 1 to account for multiple systems in parallel

9 100 percent capture, 91.8 percent of VOC concentrated in rotor concentrator, and 90 percent destruction efficiency considered based
upon vendor data (MEGTEC)

10 Cost estimate based upon MEGTEC quote (from 2008) 14110-10013866 for biofilter controlling 24,338 scfm flow from a cereal dryer
Cost adjusted using "6/10th rule", Cost A = Cost B * (Capacity of A / Capacity of B)$^{0.6}$

11 Heat exchanger determined to be not required as air temperature estimated to remain 77 ºF throughout the ductwork to biofilter

12 Cost of straight ductwork = 6.29 * (12*Duct diameter)^1.23) * (Length of ducting) * (Number of ducts required (x from footnote 6))
Cost based upon using 3044 SS plate from Table 1.9 of USEPA Cost Manual.

13 Cost of straight ductwork = 2.03 * (12 * Duct diameter)^0.784) * (Length of ducting) * (Number of ducts required (x from footnote 6))
Cost based upon using Sheet-galv CS from Table 1.9 of USEPA cost manual.

14 Cost of elbows = 74.2 * (e^(0.0688 * Duct diameter * 12)) * (No. of elbows) * (Number of ducts required (x from footnote 6))
Cost based upon 304 SS from Table 1.10 of USEPA cost manual.

15 Cost of damper/louver = 45.5 * (e^(0.0597 * Duct diameter * 12)) * (No. of dampers) * (Number of ducts required (x from footnote 6))
Cost based upon galvanized CS insulated butterfly damper per Table 1.10 of US EPA cost manual, 6th Edition.

16 No adjustment factor applied.

17 Per USEPA - Region 5, maintenance materials should be 1% of the total capital cost.

18 Site preparation and building costs are assumed to be 10% of purchased equipment costs

19 Standard accounting practice is to account for in-house labor (when on loan to another
department, etc.) at $70/hour total cost, inclusive of overhead, benefits, etc.

20 Operating labor factor not applicable

21 Operating Labor is average of 10 hrs/week.

22 Supervisory labor hours are considered as 0.5 hr/week.

23 Maintenance labor is 2 hrs/week. Includes scheduled and unscheduled maintenance.

24 Cost estimate based upon MEGTEC quote (from 2008) 14110-10013866 for biofilter controlling 24,338 scfm flow from a cereal dryer
Cost adjusted using "6/10th rule", Cost A = Cost B * (Capacity of A / Capacity of B)$^{0.6}$

25 Cooling water cost is per 2012 water and sewer rates are average cost of water in Georgia

26 Average Price of Electricity in 2010 in Georgia http://www.eia.gov/electricity/state/

27 Utility/consumable demands are as specified in the MEGTEC bid and post-bid communications.

28 Average cost factors specified US EPA Air Pollution Control Cost Manual, 6th Edition
Average cost factors for packed tower absorber used as best esimate for biotrickling filter (Section 5.2, Ch. 1)

29 Equipment life based upon IRS CLADR for air pollution control devices - midpoint life

30 Interest Rate (Working Capital Cost) Provided by Blue Bird Body Company

31 Capital Recovery Factor = [(Interest Rate)*(1+Interest Rate)^(Life Expectancy)/[(1+Interest Rate)^(Life Expectancy)-1)]

32 Cost of Canopy Hood (if Applicable) = 306*(Area of Opening (420 ft^2)^.506 Based on rectangular canopy hood (Table 1.8) and
equation 1.40 from Section 2 Chapter 1 of the EPA Air Pollution Control Cost Manual

Table A-4: Blue Bird Body Company - Catalytic Oxidizer

Best Available Control Technology Cost Effectiveness Analysis

Footnotes

1 Base total capital investment reflects this date prior to Bureau of Labor escalation. Cost estimation for rotor concentrator provided by Munters

2 Bureau of Labor Capital Producer Price Index - Capital Equipment corresponding to the year and quarter shown. Base oxidizer cost has been escalated to this date.

3 Exhaust flow rate from emissions unit discharge to the atmostphere. Flow rates adjusted by (x) due to ductwork sizing limitations

4 Inlet gas temperature based on facility data.

5 Based on Ideal Gas Equation at waste gas exhaust temperature assuming waste gas is principally air.

6 See Footnote 37.

7 Heat capacity, c_p, of air at average control temperature; Thermodynamics 3rd Edition, Black and Hartley, 1996.

8 Auxiliary fuel is assumed to be natural gas (as methane). Please refer to Table 2.14 of EPA 452/B-02-001 Section 3.2.

9 Auxiliary fuel needed to sustain the combustion zone temperature of 750 °F using the procedure specified in EPA 452/B-02-001.

10 Information pertaining to capture system were estimated from existing facility layout

11 Duct Diameter = 1.128 * ((waste gas flow rate/x)/u) ^0.5, where x = factor needed to bring diamters below 7 feet and u = minimum transport velocity of 2,000 ft/min for gases per Table 1.3 of USEPA Cost Manual, 6th Edition (Equation in Section 1.3.3).

12 Pressure Loss = 0.136 * ((1 / duct diameter)^1.18) * ((u/1,000)^1.8) * (duct length / 100)) for gases per Table 1.3 of USEPA Cost Manual, 6th Edition (Equation in Section 1.3.3).

13 Source: Bureau of Labor Statistics - Producer Price Index - Capital Equipment
Escalated oxidizer costs = Index in 2013 / Index in 1994 * (1443 * (Waste gas flow rate)^0.5527).
Cost correlations provided by the EPA are in 1994 dollars
http://data.bls.gov/cgi-bin/surveymost

14 Cost of straight ductwork = 2.03 * (12 * Duct diameter)^0.784) * (Length of ducting) * (Number of ducts required (x from footnote 11))
Cost based upon using Sheet-galv CS from Table 1.9 of USEPA cost manual.

15 Cost of elbows = 74.2 * (e^(0.0688 * Duct diameter * 12)) * (No. of elbows) * (Number of ducts required (x from footnote 11))
Cost based upon 304 SS from Table 1.10 of USEPA cost manual.

16 Cost of damper/louver = 45.5 * (e^(0.0597 * Duct diameter * 12)) * (No. of dampers) * (Number of ducts required (x from footnote 11))
Cost based upon galvanized CS insulated butterfly damper per Table 1.10 of US EPA cost manual, 6th Edition.

17 Average cost factors specified in EPA 452/B-02-001, Section 3.2, Chapter 2, Table 2.8.

18 No adjustment factor applied.

19 Annual cost inputs were derived from best available facility information.

20 Operating labor factor (total man-hours per shift) specified in EPA 452/B-02-001, Section 3.2, Chapter 2, Table 2.10.

21 No. of shifts per year = (8,760 hr/year) / (8 hrs/shift).

22 Supervisory labor operating factor determined as 15% of operating labor factor specified in EPA 452/B-02-001, Section 3.2, Chapter 2, Table 2.10.

23 Assumes preventative maintenance labor man-hours are allocated during one shift per day.

24 EPA 452/B-02-001, Section 3.2, Chapter 2, Table 2.10.

25 Mean of the latest 5 years (2008-2012) of annual average natural gas price data for industrial sector consumers in Georgia per US Dept. of Energy, Energy Information Administration; see http://tonto.eia.doe.gov/dnav/ng/ng_pri_sum_dcu_SGA_a.htm

26 Average Price of Electricity in 2010 in Georgia http://www.eia.gov/electricity/state/

27 Natural Gas Cost = (Auxiliary fuel requirement)*(60 min/hr)*(8760 hr/yr)*(Rate, $/mscf)

28 Electricity Cost = 0.000117*(Waste gas exhaust flow)*(Total system pressure drop, in. w.c.)/0.6*(8760 hr/yr)*(Rate, $/kWh)

29 Average life expectancy for thermal incinerators specified in EPA 452/B-02-001, Section 3.2, Chapter 2, Table 2.10, footnote "c" is 10 years

30 Capital Recovery Factor = (1 + Interest Rate)^(Life Expectancy) / ((1 + Interest Rate)^D100-1)
Interest Rate (Working Capital Cost) Provided by Blue Bird Body Company

31 Potential VOC emissions (tpy) per requested VOC emission limit

32 VOC emissions from combustion included

33 100 percent capture, 91.8 percent VOC concentrated by rotor concentrator and 98 percent destruction efficiency considered.

34 Catalyst volume is determined by the following equation: Φ = (Waste Gas flow rate)/(catalyst volume)
Φ = space velocity, h-1 and waste gas flow is specified in feet^3/hour. Φ = 20,000 h-1, per Sec 2.4.1 Cost Manual
Therefore, catalyst volume = [(waste gas flow rate) * (60 min/hrs) * (460 + inlet temp) / (460 + ref temp)] / 20,000 h-1

35 Parts per million concentration by volume to weight conversion from AP-42 Appendix A.

36 Parts per million concentration by volume (ppmv) calculation is as follows:
(Potential emissions, tpy)*(2,000 lb/ton)/(8,760 hr/yr)*(0.73 ft^3-atm/lbmol-R^o)*(Inlet gas temperature, R^o)/
(Molecular weight, lb/lb-mol)/(Gas flowrate, acfm)/(60 min/hr)*(1,000,000 ppm)

37 Heat of combustion per pound of inlet waste gas developed from heat of combustion multiplied by concentration by weight (ppmw).

38 Cost of Canopy Hood (if Applicable) = 306*(Area of Opening (420 ft^2)^.506 Based on rectangular canopy hood (Table 1.8) and equation 1.40 from Section 2 Chapter 1 of the EPA Air Pollution Control Cost Manual

Table A-5: Blue Bird Body Company - Recuperative Thermal Oxidizer

Best Available Control Technology Cost Effectiveness Analysis

Footnotes

1 Base total capital investment reflects this date prior to cost escalation.

2 Bureau of Labor statistics for year and quarter shown. Base oxidizer cost has been escalated to this date.

3 Waste gas exhaust flow rate from emissions unit discharge to the atmostphere.

4 Inlet gas temperature based on facility data.

5 Based on Ideal Gas Equation at waste gas exhaust temperature assuming waste gas is principally air.

6 See footnote 36.

7 Heat capacity, c_p, of air at average control temperature; Thermodynamics 3rd Edition, Black and Hartley, 1996.

8 Auxiliary fuel is assumed to be natural gas (as methane). Please refer to Table 2.14 of EPA 452/B-02-001 Section 3.2.

9 Auxiliary fuel needed to sustain the combustion zone temperature of 1600 °F using the procedure specified in EPA 452/B-02-001.

10 Information pertaining to capture system were estimated from existing facility roof layout; waste gas stream is exhausted through stack extending to the roof where the RTO would be installed.

11 Duct Diameter = 1.128 * ((waste gas flow rate/x)/u) ^0.5, where x = factor needed to bring diamters below 7 feet and u = minimum transport velocity of 2,000 ft/min for gases per Table 1.3 of USEPA Cost Manual, 6th Edition (Equation in Section 1.3.3).

12 Pressure Loss = 0.136 * ((1/duct diameter)^1.18) * ((u/1,000)^1.8) * (duct length/100)) for gases per Table 1.3 of USEPA Cost Manual, 6th Edition (Equation in Section 1.3.3).

13 Source: EPA 452/B-02-001 Section 3.2 VOC Destruction Controls. Cost correlations range valid to 50,000 scfm.
Escalated oxidizer costs = (125.27/100) * (VAPCCI/100) * (21,342 * (Waste gas flow rate)^0.25).
Cost correlations provided by the EPA are in 1988 dollars with cost escalation using VAPCCI (1994 = 100). The EPA 1988 cost correlation is escalated to 1994 dollars (125.27/100) using the BLS Consumer Price Index calculator http://data.bls.gov/cgi-bin/cpicalc.pl.

14 Cost of straight ductwork = 6.29 * (12*Duct diameter)^1.23) * (Length of ducting) * (Number of ducts required (x from footnote 3))
Cost based upon using 3044 SS plate from Table 1.9 of USEPA Cost Manual.

15 Cost of elbows = 74.2 * (e^(0.0688*Duct diameter*12)) * (No. of elbows) * (Number of ducts required (x from footnote 3))
Cost based upon 304 SS from Table 1.10 of USEPA Cost Manual.

16 Cost of damper/louver = 45.5 * (e^(0.0597*Duct diameter*12)) * (No. of dampers) * (Number of ducts required (x from footnote 3))
Cost based upon galvanized CS insulated butterfly damper per Table 1.10 of US EPA Cost Manual, 6th Edition.

17 Average cost factors specified in EPA 452/B-02-001, Section 3.2, Chapter 2, Table 2.8.

18 No adjustment factor applied.

19 Annual cost inputs were derived from best available facility information.

20 Operating labor factor (total man-hours per shift) specified in EPA 452/B-02-001, Section 3.2, Chapter 2, Table 2.10.

21 No. of shifts per year = (8,760 hr/year) /(8 hrs/shift).

22 Supervisory labor operating factor determined as 15% of operating labor factor specified in EPA 452/B-02-001, Section 3.2, Chapter 2, Table 2.10.

23 Assumes preventative maintenance labor man-hours are allocated during one shift per day.

24 EPA 452/B-02-001, Section 3.2, Chapter 2, Table 2.10.

25 Mean of the latest 5 years (2008-2012) of annual average natural gas price data for industrial sector consumers in Georgia per US Dept. of Energy, Energy Information Administration; see http://tonto.eia.doe.gov/dnav/ng/ng_pri_sum_dcu_SGA_a.htm

26 Average Price of Electricity in 2010 in Georgia http://www.eia.gov/electricity/state/

27 Natural Gas Cost = (Auxiliary fuel requirement)*(60 min/hr)*(8760 hr/yr)*(Rate, $/mscf)

28 Electricity Cost = 0.000117*(Waste gas exhaust flow)*(Total system pressure drop, assumed 20 w.c.)/0.6*(8760 hr/yr)*(Rate, $/kWh)

29 Average life expectancy for thermal incinerators specified in EPA 452/B-02-001, Section 3.2, Chapter 2, Table 2.10, footnote "c" is 10 years

30 Capital Recovery Factor = (1 + Interest Rate)^(Life Expectancy) / ((1 + Interest Rate)^D100-1)
Interest Rate (Working Capital Cost) Provided by Blue Bird Body Company

31 Potential VOC emissions (tpy) per requested VOC emission limit

32 VOC emissions from combustion included

33 100 percent capture 91.8 percent conecentration efficiency and 98 percent destruction efficiency considered.

34 Parts per million concentration by volume to weight conversion from AP-42 Appendix A.

35 Parts per million concentration by volume (ppmv) calculation is as follows:
(Potential emissions, tpy)*(2,000 lb/ton)/(8,760 hr/yr)*(0.73 ft^3-atm/lbmol-R^o)*(Inlet gas temperature, R^o)/
(Molecular weight, lb/lb-mol)/(Gas flowrate, acfm)/(60 min/hr)*(1,000,000 ppm)

36 Heat of combustion per pound of inlet waste gas developed from heat of combustion multiplied by concentration by weight (ppmw).

37 Cost of Canopy Hood (if Applicable) = 306*(Area of Opening (420 ft^2)^.506 Based on rectangular canopy hood (Table 1.8) and equation 1.40 from Section 2 Chapter 1 of the EPA Air Pollution Control Cost Manual

Appendix A.2 to Attachment C

BACT Cost Effectiveness Calculations for Paint Booths PB10, PB11, and PB27-PB31 - Unconcentrated Flow

Table A-8: Blue Bird Body Company - Regenerative Thermal Oxidizer

Best Available Technology Cost Effectiveness Analysis

Regenerative Thermal Oxidizer

	PB10	PB11	PB27	PB28	PB29	PB30	PB31
Regenerative Thermal Oxidizer Input Parameters							
Gas flowrate:[3] [acfm]	48,000	96,000	97,333	90,000	90,000	73,640	102,000
Reference temperature: [°F]	77	77	77	77	77	77	77
Inlet gas temperature:[4] [°F]	77	77	77	77	77	77	77
Gas flowrate: [scfm]	48,000	96,000	97,333	90,000	90,000	73,640	102,000
Inlet gas density:[5] [lb/acf]	0.074	0.074	0.074	0.074	0.074	0.074	0.074
Primary heat recovery: [fraction]	0.950	0.950	0.950	0.950	0.950	0.950	0.950
Waste gas heat content:[6] [Btu/lb]	0.442	0.359	1.002	2.145	1.609	0.642	0.899
Waste gas heat capacity:[7] [Btu/lb-°F]	0.255	0.255	0.255	0.255	0.255	0.255	0.255
Combustion temperature: [°F]	1,800	1,800	1,800	1,800	1,800	1,800	1,800
Heat loss: [fraction]	0.015	0.015	0.015	0.015	0.015	0.015	0.015
Exhaust Gas Exit Temperature: [°F]	163	163	163	163	163	163	163
Fuel heat of combustion:[8] [Btu/lb]	21,502	21,502	21,502	21,502	21,502	21,502	21,502
Fuel density:[8] [lb/ft^3]	0.041	0.041	0.041	0.041	0.041	0.041	0.041
Regenerative Thermal Oxidizer Design Parameters							
Auxiliary Fuel Requirement:[9] [lb/min]	4.64	9.32	9.23	8.18	8.35	7.07	9.71
Auxiliary Fuel Requirement:[9] [scfm]	113.84	228.35	226.25	200.52	204.59	173.41	237.98
Total Waste Gas Flowrate: [scfm]	48,114	96,228	97,560	90,201	90,205	73,813	102,238
Waste Gas Capture System For Regenerative Thermal Oxidizer[10]							
Length of Ductwork: [ft]	100	100	750	835	700	275	700
No. of Duct elbows:	8	8	8	8	8	8	8
No. of Damper/Louvers:	4	4	4	4	4	4	4
Duct diameter:[11] [ft]	5.53	6.99	6.81	7.01	7.01	6.84	6.58
Pressure Loss:[12] [w.c.]	0.72	0.70	1.02	1.05	0.99	0.79	1.01
Potential Emissions							
Potential VOC Emissions:[31] [tpy]	22.00	35.70	101.00	200.00	150.00	49.00	95.00
Tons VOC Reduced with 98% efficiency:[32] [tpy]	21.56	34.99	98.98	196.00	147.00	48.02	93.10
VOC Concentration and Heat of Combustion (Waste Gas) Calculations							
Molecular Weight of VOC (xylenes): [lb/lb-mol]	106.16	106.16	106.16	106.16	106.16	106.16	106.16
Concentration of VOC by Weight:[33] [ppmw]	23.7	19.2	53.7	115.0	86.3	34.4	48.2
Concentration of VOC by Volume:[34] [ppmv]	6.4	5.2	14.6	31.2	23.4	9.3	13.1
Waste Gas O2 Content: [%]	20.9	20.9	20.9	20.9	20.9	20.9	20.9
Lower Explosive Limit (LEL): [%]	4.3	4.3	4.3	4.3	4.3	4.3	4.3
LEL of VOC/Air Mixture: [%]	0.015	0.012	0.034	0.073	0.054	0.022	0.030
Heat of Combustion of VOC: [Btu/lb]	18,651	18,651	18,651	18,651	18,651	18,651	18,651
Heat of Combustion of Waste Gas:[35] [Btu/lb]	0.442	0.359	1.002	2.145	1.609	0.642	0.899
Heat of Combustion of Waste Gas: [Btu/scf]	0.033	0.027	0.074	0.159	0.119	0.047	0.066
BAT Cost Effectiveness (from Page 3)	**46,718.9 $/ton**	**207,538.5 $/ton**	**110,112.4 $/ton**	**50,765.3 $/ton**	**68,277.3 $/ton**	**30,231.3 $/ton**	**41,194.0 $/ton**

Table A-8: Blue Bird Body Company - Regenerative Thermal Oxidizer

Best Available Technology Cost Effectiveness Analysis

Regenerative Thermal Oxidizer

Direct Costs

Bureau of Labor Statistics - Producer Price Index - Capital Equipment

Reference Date:[1, 13]	1999
Reference Year Cost Index (Base):[2]	137.6
Bureau of Labor Statistics Data (First Quarter 2013):[2]	163.86

Purchase Equipment

	Average Cost Factor[17]	Adjustment Factor[18]		PB10	PB11	PB27	PB28	PB29	PB30	PB31
Basic Equipment Cost[1,13]	USEPA Cost Manual, VAPCCI, and BLS CPI adjusted		(A)	$ 925,376.85	$ 6,353,204.86	$ 9,639,857.65	$ 9,031,496.43	$ 9,031,833.03	$ 1,279,466.87	$ 3,342,204.30
Capture System Cost[14, 15, 16]	USEPA Cost Manual		(B)	$ 21,095.01	$ 127,624.52	$ 201,102.02	$ 191,125.61	$ 191,125.61	$ 25,524.90	$ 73,856.85
Total Equipment Cost	(Control Device (A) + Capture System (B))		(C)	$ 946,471.87	$ 6,480,829.38	$ 9,840,959.67	$ 9,222,622.03	$ 9,222,958.63	$ 1,304,991.77	$ 3,416,061.15
Instrumentation/Controls	0.10	1	(D)	$ 94,647.19	$ 648,082.94	$ 984,095.97	$ 922,262.20	$ 922,295.86	$ 130,499.18	$ 341,606.11
Freight	0.05	1	(E)	$ 47,323.59	$ 324,041.47	$ 492,047.98	$ 461,131.10	$ 461,147.93	$ 65,249.59	$ 170,803.06
Taxes (exempt)	0.03	1	(F)	$ 28,394.16	$ 194,424.88	$ 295,228.79	$ 276,678.66	$ 276,688.76	$ 39,149.75	$ 102,481.83
Base Price	(Subtotal of C through E)		(G)	$ 1,116,836.80	$ 7,647,378.67	$ 11,612,332.42	$ 10,882,694.00	$ 10,883,091.19	$ 1,539,890.29	$ 4,030,952.15

Installation Costs

	Average Cost Factor[17]	Adjustment Factor[18]		PB10	PB11	PB27	PB28	PB29	PB30	PB31
Foundations and Support	0.08	1	(H)	$ 89,346.94	$ 611,790.29	$ 928,986.59	$ 870,615.52	$ 870,647.30	$ 123,191.22	$ 322,476.17
Erection and Handling	0.14	1	(I)	$ 156,357.15	$ 1,070,633.01	$ 1,625,726.54	$ 1,523,577.16	$ 1,523,632.77	$ 215,584.64	$ 564,333.30
Electrical	0.04	1	(J)	$ 44,673.47	$ 305,895.15	$ 464,493.30	$ 435,307.76	$ 435,323.65	$ 61,595.61	$ 161,238.09
Piping	0.02	1	(K)	$ 22,336.74	$ 152,947.57	$ 232,246.65	$ 217,653.88	$ 217,661.82	$ 30,797.81	$ 80,619.04
Insulation	0.01	1	(L)	$ 11,168.37	$ 76,473.79	$ 116,123.32	$ 108,826.94	$ 108,830.91	$ 15,398.90	$ 40,309.52
Painting	0.01	1	(M)	$ 11,168.37	$ 76,473.79	$ 116,123.32	$ 108,826.94	$ 108,830.91	$ 15,398.90	$ 40,309.52
Site Preparation	No Estimate		(N)	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Facilities and Buildings	No Estimate		(O)	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Installation Cost	(Subtotal of H through O)		(P)	$ 335,051.04	$ 2,294,213.60	$ 3,483,699.72	$ 3,264,808.20	$ 3,264,927.36	$ 461,967.09	$ 1,209,285.65
Total Direct Costs	(Base Price (G) + Installation Cost (P))		(Q)	$ 1,451,887.84	$ 9,941,592.28	$ 15,096,032.14	$ 14,147,502.20	$ 14,148,018.54	$ 2,001,857.38	$ 5,240,237.80

Indirect Installation Cost

	Average Cost Factor[17]	Adjustment Factor[18]		PB10	PB11	PB27	PB28	PB29	PB30	PB31
Engineering/Supervision	0.10	1	(R)	$ 111,683.68	$ 764,737.87	$ 1,161,233.24	$ 1,088,269.40	$ 1,088,309.12	$ 153,989.03	$ 403,095.22
Construction/Field	0.05	1	(S)	$ 55,841.84	$ 382,368.93	$ 580,616.62	$ 544,134.70	$ 544,154.56	$ 76,994.51	$ 201,547.61
Contractor Fees	0.10	1	(T)	$ 111,683.68	$ 764,737.87	$ 1,161,233.24	$ 1,088,269.40	$ 1,088,309.12	$ 153,989.03	$ 403,095.22
Start-up	0.02	1	(U)	$ 22,336.74	$ 152,947.57	$ 232,246.65	$ 217,653.88	$ 217,661.82	$ 30,797.81	$ 80,619.04
Performance Test	0.01	1	(V)	$ 11,168.37	$ 76,473.79	$ 116,123.32	$ 108,826.94	$ 108,830.91	$ 15,398.90	$ 40,309.52
Model Study	0.00	1	(W)	$ -	$ 1.00	$ 2.00	$ 3.00	$ 4.00	$ 5.00	$ 6.00
Contingencies	0.03	1	(X)	$ 33,505.10	$ 229,421.36	$ 348,369.97	$ 326,480.82	$ 326,492.74	$ 46,196.71	$ 120,928.56
Total Indirect Cost	(Subtotal of R through X)		(Y)	$ 346,219.41	$ 2,370,688.39	$ 3,599,825.05	$ 3,373,638.14	$ 3,373,762.27	$ 477,370.99	$ 1,249,601.17
Total Capital Costs	(Direct Cost (Q) + Indirect Cost (Y))		(Z)	$ 1,798,107.25	$ 12,312,280.66	$ 18,695,857.19	$ 17,521,140.34	$ 17,521,780.81	$ 2,479,228.37	$ 6,489,838.96

Table A-8: Blue Bird Body Company - Regenerative Thermal Oxidizer

Best Available Technology Cost Effectiveness Analysis

Regenerative Thermal Oxidizer

						PB10	PB11	PB27	PB28	PB29	PB30	PB31
Direct Annualized Operating Costs												
Labor Cost Inputs												
	Average Labor Cost[19]	Operating Labor Factor[20]	No. Shifts per Year[21]									
Operating Labor	30.00 $/hr	0.50	1,095	(AA)	$	16,425.00	$ 16,425.00	$ 16,425.00	$ 16,425.00	$ 16,425.00	$ 16,425.00	$ 16,425.00
Supervisory Labor[22]	30.00 $/hr	0.075	1,095	(BB)	$	2,463.75	$ 2,463.75	$ 2,463.75	$ 2,463.75	$ 2,463.75	$ 2,463.75	$ 2,463.75
Maintenance Labor[23]	30.00 $/hr	0.50	365	(CC)	$	5,475.00	$ 5,475.00	$ 5,475.00	$ 5,475.00	$ 5,475.00	$ 5,475.00	$ 5,475.00
Maintenance Material Costs												
Maintenance Materials[24]	Assumed 100% of Mainenance Labor Cost			(DD)	$	5,475.00	$ 5,475.00	$ 5,475.00	$ 5,475.00	$ 5,475.00	$ 5,475.00	$ 5,475.00
Utility Cost Inputs												
	Average Unit Cost[25, 26]	No. Hours per Year										
Natural Gas[27]	6.74 $/mscf	8,760		(EE)	$	403,276.87	$ 3,235,792.56	$ 4,808,932.03	$ 4,262,085.33	$ 4,348,630.03	$ 614,295.05	$ 1,686,088.14
Electricity[28]	0.089 $/kWh	8,760		(FF)	$	146,294.74	$ 1,170,366.17	$ 1,779,835.61	$ 1,645,580.02	$ 1,645,654.31	$ 224,436.74	$ 621,728.77
Indirect Annualized Operating Costs												
Overhead[24]	60% of O&M Cost			(GG)	$	17,903.25	$ 17,903.25	$ 17,903.25	$ 17,903.25	$ 17,903.25	$ 17,903.25	$ 17,903.25
Property Tax[24]	1% of Capital Costs (Z)			(HH)	$	17,981.07	$ 123,122.81	$ 186,958.57	$ 175,211.40	$ 175,217.81	$ 24,792.28	$ 64,898.39
Insurance[24]	1% of Capital Costs (Z)			(II)	$	17,981.07	$ 123,122.81	$ 186,958.57	$ 175,211.40	$ 175,217.81	$ 24,792.28	$ 64,898.39
Administration[24]	2% of Capital Costs (Z)			(JJ)	$	35,962.15	$ 246,245.61	$ 373,917.14	$ 350,422.81	$ 350,435.62	$ 49,584.57	$ 129,796.78
Capital Recovery Cost Inputs[29]												
	Average Life Expectancy	Interest Rate	Capital Recovery Factor[30]									
Capital Cost Recovery	10 years	13.5%	0.188	(KK)	$	338,020.75	$ 2,314,548.43	$ 3,514,577.69	$ 3,293,746.22	$ 3,293,866.62	$ 466,062.65	$ 1,220,005.21
Total Annualized Cost	(Subtotal of AA through KK)			(LL)	$	1,007,258.65	$ 7,260,940.39	$ 10,898,921.63	$ 9,949,999.19	$ 10,036,764.20	$ 1,451,705.58	$ 3,835,157.68
BAT Cost Effectiveness	Total Annualized Cost/Tons VOC Reduced			(MM)		**46,718.9 $/ton**	**207,538.5 $/ton**	**110,112.4 $/ton**	**50,765.3 $/ton**	**68,277.3 $/ton**	**30,231.3 $/ton**	**41,194.0 $/ton**

Table A-9: Blue Bird Body Company - Carbon Adsorber

Best Available Control Technology Cost Effectiveness Analysis | Fixed-bed Carbon Adsorber

	PB10	PB11	PB27	PB28	PB29	PB30	PB31
Fixed-bed Carbon Adsorber Input Parameters							
Gas flowrate:[3] [acfm]	48,000	384,000	584,000	540,000	540,000	73,640	204,000
Inlet gas temperature:[4] [°F]	77	77	77	77	77	77	77
Number of Adsorbing Vessels (N_a): [ ]	7	55	80	80	80	10	28
Number of Desorbing Vessels (N_d): [ ]	7	55	80	80	80	10	28
Capacity Factor (f):[5] [ ]	2	2	2	2.00	2	2	2
Carbon Equilibrium Capacity (w_e):[6] [lb VOC/lb C]	0.67	0.67	0.67	0.67	0.67	0.67	0.67
Working Capacity (w_c):[7] [lb VOC/lb C]	0.34	0.34	0.34	0.34	0.34	0.34	0.34
Adsorption Time (θ_a):[8] [hrs]	12	12	12	12	12	12	12
Desorption Time (θ_d):[8] [hrs]	6	6	6	6	6	6	6
Carbon Requirement for Continuous System (M_c):[9] [lb]	359.84	583.93	1,652.01	3,271.31	2,453.49	801.47	1,553.87
Superficial Bed Velocity (v_b):[10] [fpm]	65	65	65	65	65	65	65
Carbon Vessel Diameter (D):[11] [ft]	11.59	11.69	11.96	11.50	11.50	12.01	11.95
Carbon Vessel Length/Height (L):[12] [ft]	5.11	5.18	5.49	6.05	5.79	5.24	5.46
Carbon Vessel Surface Area (S):[13] [ft^2]	397.18	405.18	430.87	426.25	416.76	424.14	429.17
Carbon Bed Thickness (t_b):[14] [in]	1.36	2.17	5.88	12.60	9.45	2.83	5.55
Carbon Bed Pressure Drop (Δp_b):[15] [inH_2O]	0.80	1.28	3.47	7.42	5.57	1.67	3.27
Total System Pressure Drop (Δp_s):[15] [inH_2O]	1.80	2.28	4.47	8.42	6.57	2.67	4.27
Waste Gas Capture System For Fixed-bed Carbon Adsorber[18]							
Length of Ductwork: [ft]	100	100	750	835	700	275	700
No. of Duct elbows: [ ]	8	8	8	8	8	8	8
No. of Damper/Louvers: [ ]	4	4	4	4	4	4	4
Duct diameter:[16] [ft]	5.53	6.99	6.81	7.01	7.01	6.84	6.58
Pressure Loss:[17] [w.c.]	0.72	0.70	1.02	1.05	0.99	0.79	1.01
Potential Emissions							
Potential VOC Emissions:[19] [tpy]	22.00	35.70	101.00	200.00	150.00	49.00	95.00
Potential VOC Emissions from Fuel Combustion:[20] [tpy]	0	0	0	0	0	0	0
Tons VOC Reduced:[21] [tpy]	21.56	34.99	98.98	196.00	147.00	48.02	93.10
VOC Concentration and Heat of Combustion (Waste Gas) Calculations							
	Xylenes	Xylenes	Xylenes	Xylenes	Xylenes	Xylenes	Xylenes
Molecular Weight of VOC: [lb/lb-mol]	106.16	106.16	106.16	106.16	106.16	106.16	106.16
Inlet Concentration of VOC by Weight:[22] [ppmw]	24	5	9	19	14	34	24
Inlet Concentration of VOC by Volume:[23] [ppmv]	6	1	2	5	4	9	7
BAT Cost Effectiveness (from Page 3)	**21,239.1 $/ton**	**97,543.0 $/ton**	**68,089.5 $/ton**	**59,848.9 $/ton**	**60,133.9 $/ton**	**14,793.1 $/ton**	**24,999.7 $/ton**

Table A-9: Blue Bird Body Company - Carbon Adsorber

Best Available Control Technology Cost Effectiveness Analysis — Fixed-bed Carbon Adsorber

				PB10	PB11	PB27	PB28	PB29	PB30	PB31
Direct Costs										
Bureau of Labor Statistics - Producer Price Index - Capital Equipment										
Reference Date:[1, 13]			1999							
Reference Year Cost Index (Base):[2]			137.6							
Bureau of Labor Statistics Data (First Quarter 2013):[2]			163.9							
Purchase Equipment										
Absorber Vessel Cost[24]	EPA 452/B-02-001 + Bureau of Labor Escalation		(A)	$ 855,204.67	$ 6,803,327.57	$ 10,320,846.22	$ 10,345,232.04	$ 10,164,088.49	$ 1,274,185.43	$ 3,604,212.30
Capture System Cost[25, 26, 27]	USEPA Cost Manual		(B)	$ 21,095.01	$ 127,624.52	$ 201,102.02	$ 191,125.61	$ 191,125.61	$ 25,524.90	$ 73,856.85
Total Equipment Cost	(Control Device (A) + Capture System (B))		(C)	$ 876,299.69	$ 6,930,952.09	$ 10,521,948.24	$ 10,536,357.65	$ 10,355,214.09	$ 1,299,710.34	$ 3,678,069.15
	Average Cost Factor[28]	Adjustment Factor[29]								
Instrumentation/Controls	0.10	1	(D)	$ 87,629.97	$ 693,095.21	$ 1,052,194.82	$ 1,053,635.76	$ 1,035,521.41	$ 129,971.03	$ 367,806.91
Freight	0.05	1	(E)	$ 43,814.98	$ 346,547.60	$ 526,097.41	$ 526,817.88	$ 517,760.70	$ 64,985.52	$ 183,903.46
Taxes (unless exempt)	0.03	1	(F)	$ 26,288.99	$ 207,928.56	$ 315,658.45	$ 316,090.73	$ 310,656.42	$ 38,991.31	$ 110,342.07
Base Price	(Subtotal of C through E)		(G)	$ 1,034,033.63	$ 8,178,523.47	$ 12,415,898.92	$ 12,432,902.02	$ 12,219,152.63	$ 1,533,658.20	$ 4,340,121.59
Installation Costs										
	Average Cost Factor[28]	Adjustment Factor[29]								
Foundations and Support	0.08	1	(H)	$ 82,722.69	$ 654,281.88	$ 993,271.91	$ 994,632.16	$ 977,532.21	$ 122,692.66	$ 347,209.73
Erection and Handling	0.14	1	(I)	$ 144,764.71	$ 1,144,993.29	$ 1,738,225.85	$ 1,740,606.28	$ 1,710,681.37	$ 214,712.15	$ 607,617.02
Electrical	0.04	1	(J)	$ 41,361.35	$ 327,140.94	$ 496,635.96	$ 497,316.08	$ 488,766.11	$ 61,346.33	$ 173,604.86
Piping	0.02	1	(K)	$ 20,680.67	$ 163,570.47	$ 248,317.98	$ 248,658.04	$ 244,383.05	$ 30,673.16	$ 86,802.43
Insulation	0.01	1	(L)	$ 10,340.34	$ 81,785.23	$ 124,158.99	$ 124,329.02	$ 122,191.53	$ 15,336.58	$ 43,401.22
Painting	0.02	1	(M)	$ 20,680.67	$ 163,570.47	$ 248,317.98	$ 248,658.04	$ 244,383.05	$ 30,673.16	$ 86,802.43
Site Preparation	No Estimate		(N)	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Facilities and Buildings	No Estimate		(O)	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Installation Cost	(Subtotal of H through O)		(P)	$ 320,550.42	$ 2,535,342.28	$ 3,848,928.67	$ 3,854,199.63	$ 3,787,937.32	$ 475,434.04	$ 1,345,437.69
Total Direct Costs	(Base Price (G) + Installation Cost (P))		(Q)	$ 1,354,584.05	$ 10,713,865.75	$ 16,264,827.59	$ 16,287,101.65	$ 16,007,089.94	$ 2,009,092.24	$ 5,685,559.29
Indirect Installation Cost										
	Average Cost Factor[28]	Adjustment Factor[29]								
Engineering/Supervision	0.10	1	(R)	$ 103,403.36	$ 817,852.35	$ 1,241,589.89	$ 1,243,290.20	$ 1,221,915.26	$ 153,365.82	$ 434,012.16
Construction/Field	0.05	1	(S)	$ 51,701.68	$ 408,926.17	$ 620,794.95	$ 621,645.10	$ 610,957.63	$ 76,682.91	$ 217,006.08
Contractor Fees	0.10	1	(T)	$ 103,403.36	$ 817,852.35	$ 1,241,589.89	$ 1,243,290.20	$ 1,221,915.26	$ 153,365.82	$ 434,012.16
Start-up	0.02	1	(U)	$ 20,680.67	$ 163,570.47	$ 248,317.98	$ 248,658.04	$ 244,383.05	$ 30,673.16	$ 86,802.43
Performance Test	0.01	1	(V)	$ 10,340.34	$ 81,785.23	$ 124,158.99	$ 124,329.02	$ 122,191.53	$ 15,336.58	$ 43,401.22
Model Study	0.00	1	(W)	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Contingencies	0.03	1	(X)	$ 31,021.01	$ 245,355.70	$ 372,476.97	$ 372,987.06	$ 366,574.58	$ 46,009.75	$ 130,203.65
Total Indirect Cost	(Subtotal of R through X)		(Y)	$ 320,550.42	$ 2,535,342.28	$ 3,848,928.67	$ 3,854,199.63	$ 3,787,937.32	$ 475,434.04	$ 1,345,437.69
Total Capital Costs	(Direct Cost (Q) + Indirect Cost (Y))		(Z)	$ 1,675,134.48	$ 13,249,208.02	$ 20,113,756.25	$ 20,141,301.28	$ 19,795,027.26	$ 2,484,526.28	$ 7,030,996.98

Table A-9: Blue Bird Body Company - Carbon Adsorber

Best Available Control Technology Cost Effectiveness Analysis

Fixed-bed Carbon Adsorber

					PB10	PB11	PB27	PB28	PB29	PB30	PB31
Direct Annualized Operating Costs											
Labor Cost Inputs											
	Average Labor Cost[30]	Operating Labor Factor[31]	No. Shifts per Year[32]								
Operating Labor	30.00 $/hr	0.50	1,095	(AA)	$ 16,425.00	$ 16,425.00	$ 16,425.00	$ 16,425.00	$ 16,425.00	$ 16,425.00	$ 16,425.00
Supervisory Labor[33]	30.00 $/hr	0.075	1,095	(BB)	$ 2,463.75	$ 2,463.75	$ 2,463.75	$ 2,463.75	$ 2,463.75	$ 2,463.75	$ 2,463.75
Maintenance Labor[34]	30.00 $/hr	0.50	365	(CC)	$ 5,475.00	$ 5,475.00	$ 5,475.00	$ 5,475.00	$ 5,475.00	$ 5,475.00	$ 5,475.00
Maintenance Material Costs											
Maintenance Materials[34]	Assumed 100% of Mainenance Labor Cost			(DD)	$ 5,475.00	$ 5,475.00	$ 5,475.00	$ 5,475.00	$ 5,475.00	$ 5,475.00	$ 5,475.00
Carbon Replacement											
Carbon Replacement Cost[35]	Taxes, Freight, Carbon Cost, and Labor			(EE)	$ 406.62	$ 659.84	$ 1,866.78	$ 3,696.59	$ 2,772.44	$ 905.66	$ 1,755.88
Utility Cost Inputs											
	Average Unit Cost[36, 37]										
Steam[38]	8.09 $/klbs			(FF)	$ 1,245.55	$ 2,021.19	$ 5,718.22	$ 11,323.20	$ 8,492.40	$ 2,774.18	$ 5,378.52
System, Cool/Dry Fans[39]	0.089 $/kWh			(GG)	$ 25,903.13	$ 340,421.52	$ 2,095,247.05	$ 7,069,225.45	$ 4,262,835.33	$ 90,925.83	$ 666,563.66
Cooling Water[40]	6.11 $/kgal			(GG)	$ 387.85	$ 629.37	$ 1,780.58	$ 3,525.89	$ 2,644.42	$ 863.84	$ 1,674.80
Indirect Annualized Operating Costs											
Overhead[34]	60% of O&M Cost			(HH)	$ 18,147.22	$ 18,299.15	$ 19,023.32	$ 20,121.20	$ 19,566.71	$ 18,446.65	$ 18,956.78
Property Tax[34]	1% of Capital Costs (Z)			(II)	$ 16,751.34	$ 132,492.08	$ 201,137.56	$ 201,413.01	$ 197,950.27	$ 24,845.26	$ 70,309.97
Insurance[34]	1% of Capital Costs (Z)			(JJ)	$ 16,751.34	$ 132,492.08	$ 201,137.56	$ 201,413.01	$ 197,950.27	$ 24,845.26	$ 70,309.97
Administration[34]	2% of Capital Costs (Z)			(KK)	$ 33,502.69	$ 264,984.16	$ 402,275.13	$ 402,826.03	$ 395,900.55	$ 49,690.53	$ 140,619.94
Capital Recovery Cost Inputs[29]											
	Average Life Expectancy[41]	Interest Rate[42]	Capital Recovery Factor[42]								
Carbon Cost Recovery[35]	10 years	13.5%	0.188	(LL)	$ 76.44	$ 124.04	$ 350.93	$ 694.91	$ 521.18	$ 170.25	$ 330.08
System Cost Recovery	10 years	13.5%	0.188	(MM)	$ 314,903.47	$ 2,490,678.58	$ 3,781,124.25	$ 3,786,302.36	$ 3,721,207.35	$ 467,058.59	$ 1,321,735.88
Total Annualized Cost	(Subtotal of AA-DD and FF-NN)			(NN)	$ 457,914.42	$ 3,412,640.77	$ 6,739,500.11	$ 11,730,380.40	$ 8,839,679.67	$ 710,364.81	$ 2,327,474.22
BAT Cost Effectiveness	Total Annualized Cost/Tons VOC Reduced			(OO)	**21,239.1 $/ton**	**97,543.0 $/ton**	**68,089.5 $/ton**	**59,848.9 $/ton**	**60,133.9 $/ton**	**14,793.1 $/ton**	**24,999.7 $/ton**

Table A-10: Blue Bird Body Company - Biotrickling Filter

Rule 702 Best Available Control Technology Cost Effectiveness Spreadsheet

Biotrickling Filter

		PB10	PB11	PB27	PB28	PB29	PB30	PB31
Input Parameters								
Gas flowrate:[1]	[acfm]	48,000	96,000	97,333	108,000	108,000	73,640	102,000
Reference temperature:	[°F]	77	77	77	77	77	77	77
Inlet gas temperature:[2]	[°F]	77	77	77	77	77	77	77
Gas flowrate:	[scfm]	48,000	96,000	97,333	108,000	108,000	73,640	102,000
Inlet gas density:[3]	[lb/acf]	0.074	0.074	0.074	0.074	0.074	0.074	0.074
Fractional moisture content of inlet gas:[4]		0.10	0.10	0.10	0.10	0.10	0.10	0.10
Waste Gas Capture System For Biotrickling Filter								
Length of Ductwork:[5]	[ft]	100	100	750	835	700	275	700
No. of Duct elbows:		8	8	8	8	8	8	8
No. of Damper/Louvers:		4	4	4	4	4	4	4
Duct diameter:[6]	[ft]	5.53	6.99	6.81	7.01	7.01	6.84	6.58
Pressure Loss:[7]	[w.c.]	0.72	0.70	1.02	1.05	0.99	0.79	1.01
Potential Emissions								
Potential VOC Emissions	[tpy]	22.00	35.70	101.00	200.00	150.00	49.00	95.00
Tons VOC Reduced with 90% efficiency:[9]	[tpy]	19.80	32.13	90.90	180.00	135.00	44.10	85.50
BACT Cost Effectiveness (from Page 3)		**22,815.4 $/ton**	**80,322.5 $/ton**	**42,812.2 $/ton**	**19,234.1 $/ton**	**25,645.5 $/ton**	**13,014.5 $/ton**	**15,874.8 $/ton**

Table A-10: Blue Bird Body Company - Biotrickling Filter

Rule 702 Best Available Control Technology Cost Effectiveness Spreadsheet — Biotrickling Filter

Direct Costs

Bureau of Labor Statistics - Producer Price Index - Capital Equipment

Reference Date:[1, 13] 2008

Reference Year Cost Index (Base):[2] 153.8

Bureau of Labor Statistics Data (First Quarter 2013):[2] 163.86

			PB10	PB11	PB27	PB28	PB29	PB30	PB31
Purchase Equipment									
Biofilter[10]	Based upon MEGTEC Vendor Quote and 6/10th Rule	(A)	$ 666,515.05	$ 4,040,991.64	$ 6,111,860.44	$ 5,421,125.71	$ 5,421,125.71	$ 861,655.15	$ 2,095,343.94
Heat Exchanger[11]	None Required	(B)	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Capture System Cost[12,13,14]	USEPA Cost Manual	(C)	$ 21,095.01	$ 127,624.52	$ 201,102.02	$ 191,125.61	$ 191,125.61	$ 25,524.90	$ 73,856.85
Total Equipment Cost	(Control Device (A-B) + Capture System (C))	(D)	$ 687,610.07	$ 4,168,616.16	$ 6,312,962.47	$ 5,612,251.32	$ 5,612,251.32	$ 887,180.06	$ 2,169,200.78
	Average Cost Factor[15] / Adjustment Factor[16]	(D)							
Instrumentation/Controls	Included in MEGTEC Quote	(E)	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Freight	0.05 / 1	(F)	$ 34,380.50	$ 208,430.81	$ 315,648.12	$ 280,612.57	$ 280,612.57	$ 44,359.00	$ 108,460.04
Taxes (exempt)	0.03 / 0	(G)	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Base Price	(Subtotal of D through G)	(H)	$ 721,990.57	$ 4,377,046.97	$ 6,628,610.59	$ 5,892,863.88	$ 5,892,863.88	$ 931,539.06	$ 2,277,660.82
Installation Costs									
	Average Cost Factor[15] / Adjustment Factor[16]	(H)							
Foundations and Support	Included in MEGTEC Quote	(I)	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Erection and Handling	0.40 / 1	(J)	$ 288,796.23	$ 1,750,818.79	$ 2,651,444.24	$ 2,357,145.55	$ 2,357,145.55	$ 372,615.62	$ 911,064.33
Electrical	0.01 / 1	(K)	$ 7,219.91	$ 43,770.47	$ 66,286.11	$ 58,928.64	$ 58,928.64	$ 9,315.39	$ 22,776.61
Piping	0.30 / 1	(L)	$ 216,597.17	$ 1,313,114.09	$ 1,988,583.18	$ 1,767,859.16	$ 1,767,859.16	$ 279,461.72	$ 683,298.25
Insulation	0.01 / 1	(M)	$ 7,219.91	$ 43,770.47	$ 66,286.11	$ 58,928.64	$ 58,928.64	$ 9,315.39	$ 22,776.61
Painting	0.01 / 1	(N)	$ 7,219.91	$ 43,770.47	$ 66,286.11	$ 58,928.64	$ 58,928.64	$ 9,315.39	$ 22,776.61
Site Preparation costs[18]	10% of equipment cost	(O)	$ 72,199.06	$ 437,704.70	$ 662,861.06	$ 589,286.39	$ 589,286.39	$ 93,153.91	$ 227,766.08
Total Installation Cost	(Subtotal of I through O)	(P)	$ 599,252.17	$ 3,632,948.98	$ 5,501,746.79	$ 4,891,077.02	$ 4,891,077.02	$ 773,177.42	$ 1,890,458.48
Total Direct Costs	**(Base Price (H) + Installation Cost (P))**	**(Q)**	$ 1,321,242.75	$ 8,009,995.95	$ 12,130,357.38	$ 10,783,940.91	$ 10,783,940.91	$ 1,704,716.48	$ 4,168,119.31
Indirect Installation Cost									
	Average Cost Factor[15] / Adjustment Factor[16]	(H)							
Engineering/Supervision	0.10 / 1	(R)	$ 72,199.06	$ 437,704.70	$ 662,861.06	$ 589,286.39	$ 589,286.39	$ 93,153.91	$ 227,766.08
Construction/Field	0.10 / 1	(S)	$ 72,199.06	$ 437,704.70	$ 662,861.06	$ 589,286.39	$ 589,286.39	$ 93,153.91	$ 227,766.08
Contractor Fees	0.10 / 1	(T)	$ 72,199.06	$ 437,704.70	$ 662,861.06	$ 589,286.39	$ 589,286.39	$ 93,153.91	$ 227,766.08
Start-up	Included in MEGTEC Quote	(U)	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Performance Test	0.01 / 1	(V)	$ 7,219.91	$ 43,770.47	$ 66,286.11	$ 58,928.64	$ 58,928.64	$ 9,315.39	$ 22,776.61
Model Study	0.00 / 1	(W)	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Contingencies	0.03 / 1	(X)	$ 21,659.72	$ 131,311.41	$ 198,858.32	$ 176,785.92	$ 176,785.92	$ 27,946.17	$ 68,329.82
Total Indirect Cost	**(Subtotal of R through X)**	**(Y)**	$ 245,476.79	$ 1,488,195.97	$ 2,253,727.60	$ 2,003,573.72	$ 2,003,573.72	$ 316,723.28	$ 774,404.68
Total Capital Costs	**(Direct Cost (Q) + Indirect Cost (Y))**	**(Z)**	$ 1,566,719.54	$ 9,498,191.92	$ 14,384,084.98	$ 12,787,514.63	$ 12,787,514.63	$ 2,021,439.76	$ 4,942,523.99

Table A-10: Blue Bird Body Company - Biotrickling Filter

Rule 702 Best Available Control Technology Cost Effectiveness Spreadsheet

Biotrickling Filter

					PB10	PB11	PB27	PB28	PB29	PB30	PB31
Direct Annualized Operating Costs											
Labor Cost Inputs											
	Average Labor Cost[19]	Operating Labor Factor[20]	Hours per Year								
Operating Labor[21]	30.00 $/hr	1.0	520	(AA)	$ 15,600.00	$ 15,600.00	$ 15,600.00	$ 15,600.00	$ 15,600.00	$ 15,600.00	$ 15,600.00
Supervisory Labor[22]	30.00 $/hr	1.0	26	(BB)	$ 780.00	$ 780.00	$ 780.00	$ 780.00	$ 780.00	$ 780.00	$ 780.00
Maintenance Labor[23]	30.00 $/hr	1.0	104	(CC)	$ 3,120.00	$ 3,120.00	$ 3,120.00	$ 3,120.00	$ 3,120.00	$ 3,120.00	$ 3,120.00
Maintenance Material Costs											
Maintenance Materials[17]	1% of total capital cost			(DD)	$ 15,667.20	$ 94,981.92	$ 143,840.85	$ 127,875.15	$ 127,875.15	$ 20,214.40	$ 49,425.24
Biofilter Media Costs											
Media[24]	Nutrients and bed cleaning			(EE)	$ 5,996.00	$ 36,352.93	$ 54,982.56	$ 48,768.68	$ 48,768.68	$ 7,751.49	$ 18,849.80
Utility Cost Inputs											
	Average Unit Cost[25,26]	Unit[27]	No. Hours per Year								
Electricity (Biofilter)	0.089 $/kWh		4,380	(FF)	$ 43,753.06	$ 265,268.92	$ 401,210.09	$ 355,867.15	$ 355,867.15	$ 56,562.93	$ 137,547.83
Water (Biofilter)	6.11 $/kgal		8,760	(FF)	$ 606.25	$ 3,675.61	$ 5,559.23	$ 4,930.95	$ 4,930.95	$ 783.75	$ 1,905.89
Indirect Annualized Operating Costs											
Overhead[28]	60% of O&M			(GG)	$ 24,697.92	$ 90,500.91	$ 130,994.04	$ 117,686.30	$ 117,686.30	$ 28,479.53	$ 52,665.03
Property Tax[28]	Exempt			(HH)	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Insurance[28]	1% of Capital Costs (Z)			(II)	$ 15,667.20	$ 94,981.92	$ 143,840.85	$ 127,875.15	$ 127,875.15	$ 20,214.40	$ 49,425.24
Administration[28]	2% of Capital Costs (Z)			(JJ)	$ 31,334.39	$ 189,963.84	$ 287,681.70	$ 255,750.29	$ 255,750.29	$ 40,428.80	$ 98,850.48
Capital Recovery Cost Inputs											
	Average Life Expectancy[29]	Interest Rate[30]	Capital Recovery Factor[31]								
Equipment Cost Recovery	10 years	13.5%	0.188	(KK)	$ 294,522.87	$ 1,785,536.40	$ 2,704,020.67	$ 2,403,886.23	$ 2,403,886.23	$ 380,004.35	$ 929,130.15
Total Annualized Cost	**(Subtotal of AA-KK)**			**(LL)**	$ 451,744.87	$ 2,580,762.45	$ 3,891,629.99	$ 3,462,139.89	$ 3,462,139.89	$ 573,939.63	$ 1,357,299.65
BACT Cost Effectiveness	**Total Annualized Cost/Tons VOC Reduced**			**(MM)**	**22,815.4 $/ton**	**80,322.5 $/ton**	**42,812.2 $/ton**	**19,234.1 $/ton**	**25,645.5 $/ton**	**13,014.5 $/ton**	**15,874.8 $/ton**

Table A-11: Blue Bird Body Company - Catalytic Oxidizer

Best Available Control Technology Cost Effectiveness Analysis

		PB10	PB11	PB27	PB28	PB29	PB30	PB31
Catalytic Oxidizer Input Parameters								
Gas flowrate:[3]	[acfm]	48,000	48,000	48,667	49,091	49,091	36,820	51,000
Reference temperature:	[°F]	77	77	77	77	77	77	77
Inlet gas temperature:[4]	[°F]	77	77	77	77	77	77	77
Gas flowrate:	[scfm]	48,000	48,000	48,667	49,091	49,091	36,820	51,000
Inlet gas density:[5]	[lb/acf]	0.074	0.074	0.074	0.074	0.074	0.074	0.074
Primary heat recovery:	[fraction]	0.700	0.700	0.700	0.700	0.700	0.700	0.700
Waste gas heat content:[6]	[Btu/lb]	0.442	0.718	2.004	3.933	2.950	1.285	1.798
Waste gas heat capacity:[7]	[Btu/lb-°F]	0.248	0.248	0.248	0.248	0.248	0.248	0.248
Combustion temperature:	[°F]	750	750	750	750	750	750	750
Preheat Temperature:	[°F]	548	548	548	548	548	548	548
Fuel heat of combustion:[8]	[Btu/lb]	21,502	21,502	21,502	21,502	21,502	21,502	21,502
Fuel density:[8]	[lb/ft^3]	0.041	0.041	0.041	0.041	0.041	0.041	0.041
Catalytic Oxidizer Design Parameters								
Auxiliary Fuel Requirement:[9]	[lb/min]	11.06	11.01	10.95	10.71	10.88	8.37	11.51
Auxiliary Fuel Requirement:[9]	[scfm]	270.98	269.85	268.27	262.55	266.66	205.22	282.03
Total Gas Flowrate:	[scfm]	48,271	48,270	48,935	49,353	49,358	37,025	51,282
Catalyst Volume:[34]	[ft^3]	144.81	144.81	146.80	148.06	148.07	111.08	153.85
Waste Gas Capture System For Catalytic Oxidizer[10]								
Length of Ductwork:	[ft]	100	100	750	835	700	275	700
No. of Duct elbows:		8	8	8	8	8	8	8
No. of Damper/Louvers:		4	4	4	4	4	4	4
Duct diameter:[11]	[ft]	5.53	6.99	6.81	7.01	7.01	6.84	6.58
Pressure Loss:[12]	[w.c.]	0.72	0.70	1.02	1.05	0.99	0.79	1.01
Potential Emissions								
Potential VOC Emissions:[31]	[tpy]	22.00	35.70	101.00	200.00	150.00	49.00	95.00
Tons VOC Reduced with 98% efficiency:[33]	[tpy]	21.56	34.99	98.98	196.00	147.00	48.02	93.10
VOC Concentration and Heat of Combustion (Waste Gas) Calculations								
Molecular Weight of VOC (xylenes):	[lb/lb-mol]	106.16	106.16	106.16	106.16	106.16	106.16	106.16
Concentration of VOC by Weight:[35]	[ppmw]	24	38	107	211	158	69	96
Concentration of VOC by Volume:[36]	[ppmv]	6	10	29	57	43	19	26
Waste Gas O2 Content:	[%]	20.9	20.9	20.9	20.9	20.9	20.9	20.9
Lower Explosive Limit (LEL):	[%]	4.3	4.3	4.3	4.3	4.3	4.3	4.3
LEL of VOC/Air Mixture:	[%]	0.015	0.024	0.068	0.133	0.100	0.043	0.061
Heat of Combustion of VOC:	[Btu/lb]	18,651	18,651	18,651	18,651	18,651	18,651	18,651
Heat of Combustion of Waste Gas:[37]	[Btu/lb]	0.442	0.718	2.004	3.933	2.950	1.285	1.798
Heat of Combustion of Waste Gas:	[Btu/scf]	0.033	0.053	0.148	0.291	0.218	0.095	0.133
BACT Cost Effectiveness (from Page 3)		**78,220.9 \$/ton**	**339,133.1 \$/ton**	**178,618.9 \$/ton**	**81,829.9 \$/ton**	**110,198.0 \$/ton**	**51,452.8 \$/ton**	**67,846.8 \$/ton**

Table A-11: Blue Bird Body Company - Catalytic Oxidizer

Best Available Control Technology Cost Effectiveness Analysis

Catalytic Oxidizer

					PB10	PB11	PB27	PB28	PB29	PB30	PB31
Direct Costs											
Bureau of Labor Statistics - Producer Price Index - Capital Equipment											
	Reference Date:[1, 13]			1994							
	Reference Year Cost Index (Base):[2]			134.1							
	Bureau of Labor Statistics Data (First Quarter 2013):[2]			163.9							
Purchase Equipment											
Basic Equipment Cost[13]	USEPA Cost Manual, VAPCCI, and BLS CPI			(A)	$ 856,704.18	$ 6,853,545.12	$ 10,358,366.84	$ 9,539,967.61	$ 9,540,406.60	$ 1,479,776.90	$ 3,543,360.45
Capture System Cost[14, 15, 16]	USEPA Cost Manual			(B)	$ 21,095.01	$ 127,624.52	$ 201,102.02	$ 191,125.61	$ 191,125.61	$ 25,524.90	$ 73,856.85
Total Equipment Cost	(Control Device (A) + Capture System (B))			(C)	$ 877,799.20	$ 6,981,169.64	$ 10,559,468.87	$ 9,731,093.22	$ 9,731,532.21	$ 1,505,301.81	$ 3,617,217.30
	Average Cost Factor[17]	Adjustment Factor[18]	(C)								
Instrumentation/Controls	0.10	1	$877,799	(D)	$ 87,779.92	$ 698,116.96	$ 1,055,946.89	$ 973,109.32	$ 973,153.22	$ 150,530.18	$ 361,721.73
Freight	0.05	1	$877,799	(E)	$ 43,889.96	$ 349,058.48	$ 527,973.44	$ 486,554.66	$ 486,576.61	$ 75,265.09	$ 180,860.87
Taxes (exempt)	0.03	0	$877,799	(F)	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Base Price	(Subtotal of C through E)			(G)	$ 1,009,469.08	$ 8,028,345.09	$ 12,143,389.20	$ 11,190,757.20	$ 11,191,262.04	$ 1,731,097.08	$ 4,159,799.90
Installation Costs											
	Average Cost Factor[17]	Adjustment Factor[18]	(G)								
Foundations and Support	0.08	1	1,009,469	(H)	$ 80,757.53	$ 642,267.61	$ 971,471.14	$ 895,260.58	$ 895,300.96	$ 138,487.77	$ 332,783.99
Erection and Handling	0.14	1	1,009,469	(I)	$ 141,325.67	$ 1,123,968.31	$ 1,700,074.49	$ 1,566,706.01	$ 1,566,776.69	$ 242,353.59	$ 582,371.99
Electrical	0.04	1	1,009,469	(J)	$ 40,378.76	$ 321,133.80	$ 485,735.57	$ 447,630.29	$ 447,650.48	$ 69,243.88	$ 166,392.00
Piping	0.02	1	1,009,469	(K)	$ 20,189.38	$ 160,566.90	$ 242,867.78	$ 223,815.14	$ 223,825.24	$ 34,621.94	$ 83,196.00
Insulation	0.01	1	1,009,469	(L)	$ 10,094.69	$ 80,283.45	$ 121,433.89	$ 111,907.57	$ 111,912.62	$ 17,310.97	$ 41,598.00
Painting	0.01	1	1,009,469	(M)	$ 10,094.69	$ 80,283.45	$ 121,433.89	$ 111,907.57	$ 111,912.62	$ 17,310.97	$ 41,598.00
Site Preparation	No Estimate			(N)	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Facilities and Buildings	No Estimate			(O)	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Installation Cost	(Subtotal of H through O)			(P)	$ 302,840.72	$ 2,408,503.53	$ 3,643,016.76	$ 3,357,227.16	$ 3,357,378.61	$ 519,329.12	$ 1,247,939.97
Total Direct Costs	(Base Price (G) + Installation Cost (P))			(Q)	$ 1,312,309.80	$ 10,436,848.61	$ 15,786,405.96	$ 14,547,984.37	$ 14,548,640.65	$ 2,250,426.20	$ 5,407,739.87
Indirect Installation Cost											
	Average Cost Factor[17]	Adjustment Factor[18]	(G)								
Engineering/Supervision	0.05	1	1,009,469	(R)	$ 50,473.45	$ 401,417.25	$ 607,169.46	$ 559,537.86	$ 559,563.10	$ 86,554.85	$ 207,989.99
Construction/Field	0.10	1	1,009,469	(S)	$ 100,946.91	$ 802,834.51	$ 1,214,338.92	$ 1,119,075.72	$ 1,119,126.20	$ 173,109.71	$ 415,979.99
Contractor Fees	0.10	1	1,009,469	(T)	$ 100,946.91	$ 802,834.51	$ 1,214,338.92	$ 1,119,075.72	$ 1,119,126.20	$ 173,109.71	$ 415,979.99
Start-up	0.02	1	1,009,469	(U)	$ 20,189.38	$ 160,566.90	$ 242,867.78	$ 223,815.14	$ 223,825.24	$ 34,621.94	$ 83,196.00
Performance Test	0.01	1	1,009,469	(V)	$ 10,094.69	$ 80,283.45	$ 121,433.89	$ 111,907.57	$ 111,912.62	$ 17,310.97	$ 41,598.00
Model Study	0.00	1	1,009,469	(W)	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Contingencies	0.03	1	1,009,469	(X)	$ 30,284.07	$ 240,850.35	$ 364,301.68	$ 335,722.72	$ 335,737.86	$ 51,932.91	$ 124,794.00
Total Indirect Cost	(Subtotal of R through X)			(Y)	$ 312,935.41	$ 2,488,786.98	$ 3,764,450.65	$ 3,469,134.73	$ 3,469,291.23	$ 536,640.09	$ 1,289,537.97
Total Capital Costs	(Direct Cost (Q) + Indirect Cost (Y))			(Z)	$ 1,625,245.22	$ 12,925,635.59	$ 19,550,856.61	$ 18,017,119.10	$ 18,017,931.88	$ 2,787,066.30	$ 6,697,277.84

Table A-11: Blue Bird Body Company - Catalytic Oxidizer

Best Available Control Technology Cost Effectiveness Analysis

Catalytic Oxidizer

					PB10	PB11	PB27	PB28	PB29	PB30	PB31
Direct Annualized Operating Costs											
Labor Cost Inputs											
	Average Labor Cost[19]	Operating Labor Factor[20]	No. Shifts per Year[21]								
Operating Labor	30.00 $/hr	0.50	1,095	(AA)	$ 16,425.00	$ 16,425.00	$ 16,425.00	$ 16,425.00	$ 16,425.00	$ 16,425.00	$ 16,425.00
Supervisory Labor[22]	30.00 $/hr	0.075	1,095	(BB)	$ 2,463.75	$ 2,463.75	$ 2,463.75	$ 2,463.75	$ 2,463.75	$ 2,463.75	$ 2,463.75
Maintenance Labor[23]	30.00 $/hr	0.50	365	(CC)	$ 5,475.00	$ 5,475.00	$ 5,475.00	$ 5,475.00	$ 5,475.00	$ 5,475.00	$ 5,475.00
Maintenance Material Costs											
Maintenance Materials[24]	Assumed 100% of Mainenance Labor Cost			(DD)	$ 5,475.00	$ 5,475.00	$ 5,475.00	$ 5,475.00	$ 5,475.00	$ 5,475.00	$ 5,475.00
Catalyst Replacement Costs											
		Fraction Replaced/Yr									
Catalyst Replacement	650 $/ft3	1		(EE)	$ 94,128.41	$ 94,126.21	$ 95,423.14	$ 96,239.24	$ 96,247.26	$ 72,199.18	$ 99,999.95
Utility Cost Inputs											
	Average Unit Cost[25, 26]	No. Hours per Year									
Natural Gas[27]	6.74 $/mscf	8,760		(FF)	$ 959,951.76	$ 7,647,706.42	$ 11,404,491.21	$ 10,231,029.96	$ 10,391,150.32	$ 1,454,021.50	$ 3,996,386.81
Electricity[28]	0.089 $/kWh	8,760		(GG)	$ 146,772.54	$ 1,174,152.96	$ 1,785,496.64	$ 1,650,703.22	$ 1,650,840.65	$ 225,157.49	$ 623,711.72
Indirect Annualized Operating Costs											
Overhead[24]	60% of O&M Costs			(HH)	$ 74,380.29	$ 74,378.98	$ 75,157.13	$ 75,646.80	$ 75,651.60	$ 61,222.76	$ 77,903.22
Property Tax[24]	1% of Capital Costs (Z)			(II)	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Insurance[24]	1% of Capital Costs (Z)			(JJ)	$ 16,252.45	$ 129,256.36	$ 195,508.57	$ 180,171.19	$ 180,179.32	$ 27,870.66	$ 66,972.78
Administration[24]	2% of Capital Costs (Z)			(KK)	$ 32,504.90	$ 258,512.71	$ 391,017.13	$ 360,342.38	$ 360,358.64	$ 55,741.33	$ 133,945.56
Capital Recovery Cost Inputs[29]											
	Average Life Expectancy	Interest Rate	Capital Recovery Factor[30]								
System Cost Recovery	10 years	14%	0.188	(LL)	$ 305,524.94	$ 2,429,851.17	$ 3,675,306.45	$ 3,386,983.77	$ 3,387,136.56	$ 523,932.17	$ 1,259,001.02
Catalyst Cost Recovery	5 years	14%	0.288	(MM)	$ 27,089.32	$ 27,088.69	$ 27,461.93	$ 27,696.80	$ 27,699.10	$ 20,778.28	$ 28,779.10
Total Annualized Cost	(Subtotal of AA-DD and FF-MM)			(NN)	$ 1,686,443.36	$ 11,864,912.25	$ 17,679,700.95	$ 16,038,652.11	$ 16,199,102.21	$ 2,470,762.13	$ 6,316,538.91
BACT Cost Effectiveness	Total Annualized Cost/Tons VOC Reduced			(OO)	**78,220.9 $/ton**	**339,133.1 $/ton**	**178,618.9 $/ton**	**81,829.9 $/ton**	**110,198.0 $/ton**	**51,452.8 $/ton**	**67,846.8 $/ton**

Table A-12: Blue Bird Body Company - Recuperative Thermal Oxidizer

Best Available Control Technology Cost Effectiveness Analysis — Recuperative Thermal Oxidizer

	PB10	PB11	PB27	PB28	PB29	PB30	PB31
Recuperative Thermal Oxidizer Input Parameters							
Gas flowrate:[3] [acfm]	48,000	48,000	48,667	49,091	49,091	36,820	51,000
Reference temperature: [^oF]	77	77	77	77	77	77	77
Inlet gas temperature:[4] [^oF]	77	77	77	77	77	77	77
Gas flowrate: [scfm]	48,000	48,000	48,667	49,091	49,091	36,820	51,000
Inlet gas density:[5] [lb/acf]	0.074	0.074	0.074	0.074	0.074	0.074	0.074
Primary heat recovery: [fraction]	0.700	0.700	0.700	0.700	0.700	0.700	0.700
Waste gas heat content:[6] [Btu/lb]	0.442	0.718	2.004	3.933	2.950	1.285	1.798
Waste gas heat capacity:[7] [Btu/lb-^oF]	0.255	0.255	0.255	0.255	0.255	0.255	0.255
Combustion temperature: [^oF]	1,600	1,600	1,600	1,600	1,600	1,600	1,600
Heat loss: [fraction]	0.100	0.100	0.100	0.100	0.100	0.100	0.100
Exit temperature: [^oF]	534	533.90	533.90	533.90	533.90	533.90	533.90
Fuel heat of combustion:[8] [Btu/lb]	21,502	21,502	21,502	21,502	21,502	21,502	21,502
Fuel density:[8] [lb/ft^3]	0.041	0.041	0.041	0.041	0.041	0.041	0.041
Recuperative Thermal Oxidizer Design Parameters							
Auxiliary Fuel Requirement:[9] [lb/min]	25.74	25.70	25.84	25.73	25.90	19.64	27.11
Auxiliary Fuel Requirement:[9] [scfm]	630.90	629.78	633.22	630.70	634.80	481.33	664.47
Total Waste Gas Flowrate: [scfm]	48,631	48,630	49,300	49,722	49,726	37,301	51,664
Waste Gas Capture System For Recuperative Thermal Oxidizer[10]							
Length of Ductwork: [ft]	100	100	750	835	700	275	700
No. of Duct elbows:	8	8	8	8	8	8	8
No. of Damper/Louvers:	4	4	4	4	4	4	4
Duct diameter:[11] [ft]	5.53	6.99	6.81	7.01	7.01	6.84	6.58
Pressure Loss:[12] [w.c.]	0.72	0.70	1.02	1.05	0.99	0.79	1.01
Potential Emissions							
Potential VOC Emissions:[31,32] [tpy]	22.00	35.70	101.00	200.00	150.00	49.00	95.00
Tons VOC Reduced with 98% efficiency:[33] [tpy]	21.56	34.99	98.98	196.00	147.00	48.02	93.10
VOC Concentration and Heat of Combustion (Waste Gas) Calculations							
Molecular Weight of VOC (xylenes): [lb/lb-mol]	106.16	106.16	106.16	106.16	106.16	106.16	106.16
Concentration of VOC by Weight:[34] [ppmw]	24	38	107	211	158	69	96
Concentration of VOC by Volume:[35] [ppmv]	6	10	29	57	43	19	26
Waste Gas O2 Content: [%]	20.9	20.9	20.9	20.9	20.9	20.9	20.9
Lower Explosive Limit (LEL): [%]	4.3	4.3	4.3	4.3	4.3	4.3	4.3
LEL of VOC/Air Mixture: [%]	0.015	0.024	0.068	0.133	0.100	0.043	0.061
Heat of Combustion of VOC: [Btu/lb]	18,651	18,651	18,651	18,651	18,651	18,651	18,651
Heat of Combustion of Waste Gas:[36] [Btu/lb]	0.442	0.718	2.004	3.933	2.950	1.285	1.798
Heat of Combustion of Waste Gas: [Btu/scf]	0.033	0.054	0.151	0.296	0.222	0.097	0.135
BAT Cost Effectiveness (from Page 3)	**121,982.8 $/ton**	**590,434.9 $/ton**	**430,715.0 $/ton**	**145,284.7 $/ton**	**194,799.9 $/ton**	**84,387.0 $/ton**	**117,040.4 $/ton**

Table A-12: Blue Bird Body Company - Recuperative Thermal Oxidizer

Best Available Control Technology Cost Effectiveness Analysis

Direct Costs

Bureau of Labor Statistics - Producer Price Index - Capital Equipment

Reference Date:[1, 13]	6/21/1905
Reference Year Cost Index (Base):[2]	137.60
Bureau of Labor Statistics Data (First Quarter 2013):[2]	163.86

Item	Average Cost Factor[17]	Adjustment Factor[18]	Ref	PB10	PB11	PB27	PB28	PB29	PB30	PB31
Purchase Equipment										
Basic Equipment Cost[13]	USEPA Cost Manual, VAPCCI, and BLS CPI		(A)	$ 472,786.21	$ 3,782,267.83	$ 34,157,076.19	$ 5,229,566.57	$ 5,229,674.26	$ 884,907.28	$ 1,919,971.11
Capture System Cost[14, 15, 16]	USEPA Cost Manual		(B)	$ 21,095.01	$ 127,624.52	$ 201,102.02	$ 191,125.61	$ 191,125.61	$ 25,524.90	$ 73,856.85
Total Equipment Cost	(Control Device (A) + Capture System (B))		(C)	$ 493,881.22	$ 3,909,892.35	$ 34,358,178.22	$ 5,420,692.18	$ 5,420,799.87	$ 910,432.19	$ 1,993,827.96
Instrumentation/Controls	0.10	1	(D)	$ 49,388.12	$ 390,989.24	$ 3,435,817.82	$ 542,069.22	$ 542,079.99	$ 91,043.22	$ 199,382.80
Freight	0.05	1	(E)	$ 24,694.06	$ 195,494.62	$ 1,717,908.91	$ 271,034.61	$ 271,039.99	$ 45,521.61	$ 99,691.40
Taxes (exempt)	0.03	0	(F)	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Base Price	(Subtotal of C through E)		(G)	$ 567,963.40	$ 4,496,376.20	$ 39,511,904.95	$ 6,233,796.00	$ 6,233,919.85	$ 1,046,997.02	$ 2,292,902.15
Installation Costs										
Foundations and Support	0.08	1	(H)	$ 45,437.07	$ 359,710.10	$ 3,160,952.40	$ 498,703.68	$ 498,713.59	$ 83,759.76	$ 183,432.17
Erection and Handling	0.14	1	(I)	$ 79,514.88	$ 629,492.67	$ 5,531,666.69	$ 872,731.44	$ 872,748.78	$ 146,579.58	$ 321,006.30
Electrical	0.04	1	(J)	$ 22,718.54	$ 179,855.05	$ 1,580,476.20	$ 249,351.84	$ 249,356.79	$ 41,879.88	$ 91,716.09
Piping	0.02	1	(K)	$ 11,359.27	$ 89,927.52	$ 790,238.10	$ 124,675.92	$ 124,678.40	$ 20,939.94	$ 45,858.04
Insulation	0.01	1	(L)	$ 5,679.63	$ 44,963.76	$ 395,119.05	$ 62,337.96	$ 62,339.20	$ 10,469.97	$ 22,929.02
Painting	0.01	1	(M)	$ 5,679.63	$ 44,963.76	$ 395,119.05	$ 62,337.96	$ 62,339.20	$ 10,469.97	$ 22,929.02
Site Preparation	No Estimate		(N)	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Facilities and Buildings	No Estimate		(O)	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Installation Cost	(Subtotal of H through O)		(P)	$ 170,389.02	$ 1,348,912.86	$ 11,853,571.49	$ 1,870,138.80	$ 1,870,175.96	$ 314,099.11	$ 687,870.65
Total Direct Costs	(Base Price (G) + Installation Cost (P))		(Q)	$ 738,352.43	$ 5,845,289.06	$ 51,365,476.44	$ 8,103,934.80	$ 8,104,095.81	$ 1,361,096.12	$ 2,980,772.80
Indirect Installation Cost										
Engineering/Supervision	0.05	1	(R)	$ 28,398.17	$ 224,818.81	$ 1,975,595.25	$ 311,689.80	$ 311,695.99	$ 52,349.85	$ 114,645.11
Construction/Field	0.10	1	(S)	$ 56,796.34	$ 449,637.62	$ 3,951,190.50	$ 623,379.60	$ 623,391.99	$ 104,699.70	$ 229,290.22
Contractor Fees	0.10	1	(T)	$ 56,796.34	$ 449,637.62	$ 3,951,190.50	$ 623,379.60	$ 623,391.99	$ 104,699.70	$ 229,290.22
Start-up	0.02	1	(U)	$ 11,359.27	$ 89,927.52	$ 790,238.10	$ 124,675.92	$ 124,678.40	$ 20,939.94	$ 45,858.04
Performance Test	0.01	1	(V)	$ 5,679.63	$ 44,963.76	$ 395,119.05	$ 62,337.96	$ 62,339.20	$ 10,469.97	$ 22,929.02
Model Study	0.00	1	(W)	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Contingencies	0.03	1	(X)	$ 17,038.90	$ 134,891.29	$ 1,185,357.15	$ 187,013.88	$ 187,017.60	$ 31,409.91	$ 68,787.06
Total Indirect Cost	(Subtotal of R through X)		(Y)	$ 176,068.66	$ 1,393,876.62	$ 12,248,690.53	$ 1,932,476.76	$ 1,932,515.15	$ 324,569.08	$ 710,799.67
Total Capital Costs	(Direct Cost (Q) + Indirect Cost (Y))		(Z)	$ 914,421.08	$ 7,239,165.69	$ 63,614,166.97	$ 10,036,411.56	$ 10,036,610.96	$ 1,685,665.20	$ 3,691,572.47

Table A-12: Blue Bird Body Company - Recuperative Thermal Oxidizer

Best Available Control Technology Cost Effectiveness Analysis — Recuperative Thermal Oxidizer

					PB10	PB11	PB27	PB28	PB29	PB30	PB31
Direct Annualized Operating Costs											
Labor Cost Inputs											
	Average Labor Cost[19]	Operating Labor Factor[20]	No. Shifts per Year[21]								
Operating Labor	30.00 $/hr	0.50	1,095	(AA)	$ 16,425.00	$ 16,425.00	$ 16,425.00	$ 16,425.00	$ 16,425.00	$ 16,425.00	$ 16,425.00
Supervisory Labor[22]	30.00 $/hr	0.075	1,095	(BB)	$ 2,463.75	$ 2,463.75	$ 2,463.75	$ 2,463.75	$ 2,463.75	$ 2,463.75	$ 2,463.75
Maintenance Labor[23]	30.00 $/hr	0.50	365	(CC)	$ 5,475.00	$ 5,475.00	$ 5,475.00	$ 5,475.00	$ 5,475.00	$ 5,475.00	$ 5,475.00
Maintenance Material Costs											
Maintenance Materials[24]	Assumed 100% of Mainenance Labor Cost			(DD)	$ 5,475.00	$ 5,475.00	$ 5,475.00	$ 5,475.00	$ 5,475.00	$ 5,475.00	$ 5,475.00
Utility Cost Inputs											
	Average Unit Cost[25, 26]	No. Hours per Year									
Natural Gas[27]	6.74 $/mscf	8,760		(EE)	$ 2,235,008.33	$ 17,848,261.19	$ 26,918,559.81	$ 24,577,236.47	$ 24,736,844.15	$ 3,410,230.69	$ 9,415,644.32
Electricity[28]	0.089 $/kWh	8,760		(FF)	$ 147,866.93	$ 1,182,908.18	$ 1,798,812.50	$ 1,663,016.69	$ 1,663,153.69	$ 226,836.52	$ 628,363.11
Indirect Annualized Operating Costs											
Overhead[24]	60% of O&M Costs			(GG)	$ 17,903.25	$ 17,903.25	$ 17,903.25	$ 17,903.25	$ 17,903.25	$ 17,903.25	$ 17,903.25
Property Tax[24]	1% of Capital Costs (Z)			(HH)	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Insurance[24]	1% of Capital Costs (Z)			(II)	$ 9,144.21	$ 72,391.66	$ 636,141.67	$ 100,364.12	$ 100,366.11	$ 16,856.65	$ 36,915.72
Administration[24]	2% of Capital Costs (Z)			(JJ)	$ 18,288.42	$ 144,783.31	$ 1,272,283.34	$ 200,728.23	$ 200,732.22	$ 33,713.30	$ 73,831.45
Capital Recovery Cost Inputs[29]											
	Average Life Expectancy	Interest Rate	Capital Recovery Factor[30]								
Capital Cost Recovery	10 years	14%	0.188	(KK)	$ 171,899.26	$ 1,360,868.88	$ 11,958,635.01	$ 1,886,714.68	$ 1,886,752.16	$ 316,883.11	$ 693,967.55
Total Annualized Cost	(Subtotal of AA through KK)			(LL)	$ 2,629,949.15	$ 20,656,955.22	$ 42,632,174.32	$ 28,475,802.19	$ 28,635,590.33	$ 4,052,262.27	$ 10,896,464.15
BAT Cost Effectiveness	Total Annualized Cost/Tons VOC Reduced			(MM)	**121,982.8 $/ton**	**590,434.9 $/ton**	**430,715.0 $/ton**	**145,284.7 $/ton**	**194,799.9 $/ton**	**84,387.0 $/ton**	**117,040.4 $/ton**

Table A-13: BACT Energy Impact Summary

	Utility Consumption			Energy Equivalents	
Emissions Unit	Water (gal/yr)[1]	Gas (mscf/yr)[1]	Electricity (kWh/yr)[1]	Total Energy Consumed (MMBtu/year)[2]	Total Energy Consumed (MMBtu/hr)[3]
Recouperative Thermal Oxidizer					
PB10	0	331,604	1,661,426	343,906	39.26
PB11	0	2,648,110	13,291,103	2,746,435	313.5
PB27	0	3,993,852	20,211,376	4,142,710	472.9
PB28	0	3,646,474	18,685,581	3,783,178	431.9
PB29	0	3,670,155	18,687,120	3,807,337	434.6
PB30	0	505,969	2,548,725	524,787	59.9
PB31	0	1,396,980	7,060,260	1,449,016	165.4
Regenerative Thermal Oxidizer					
PB10	0	59,833	1,643,761	66,640	7.61
PB11	0	480,088	13,150,182	534,571	61.02
PB27	0	713,491	19,998,153	796,015	90.87
PB28	0	632,357	18,489,663	708,109	80.83
PB29	0	645,197	18,490,498	721,209	82.33
PB30	0	91,142	2,521,761	101,571	11.59
PB31	0	250,161	6,985,716	279,007	31.85
Catalytic Oxidizer					
PB10	0	142,426	1,649,130	150,903	17.23
PB11	0	9,077,396	13,192,730	9,303,971	1,062.1
PB27	0	1,692,061	20,061,760	1,794,373	204.8
PB28	0	1,517,957	18,547,227	1,611,618	184.0
PB29	0	1,541,714	18,548,771	1,635,855	186.7
PB30	0	215,730	2,529,859	228,679	26.1
PB31	0	592,936	7,007,997	628,713	71.8
Carbon Adsorber					
PB10	81,998	151	291,046	1,147	0.13
PB11	133,060	245	3,824,961	13,304	1.52
PB27	376,444	693	23,542,102	81,056	9.25
PB28	745,433	1,373	79,429,499	272,493	31.11
PB29	559,075	1,029	47,897,026	164,523	18.78
PB30	182,631	336	1,021,638	3,830	0.44
PB31	354,081	652	7,489,479	26,227	2.99
Biofilter					
PB10	99,239	0	491,607	1,678	0.19
PB11	2,406,685	0	2,980,550	10,173	1.16
PB27	1,820,014	0	4,507,979	15,386	1.76
PB28	3,228,649	0	3,998,507	13,647	1.56
PB29	3,228,649	0	3,998,507	13,647	1.56
PB30	128,294	0	635,539	2,169	0.25
PB31	311,980	0	1,545,481	5,275	0.60

Notes	
1	Per cost-effectiveness calculation sheets. Carbon adsorber utilities include cooling water usage, water and gas used for steam production.
2	Total Energy Consumed, MMBtu/yr = (Gas Consumption, Mscf/yr) / (1,000 MMscf/Mscf) * (1,020 MMBtu/MMscf) + (Electricity Consumption, kWh/year) * (3413 Btu-hr/kWh) / (10^6 Btu/MMBtu)
3	Total Energy Consumed, MMBtu/yr = (Total Energy Consumed, MMBtu/yr) / (8,760 hr/yr)

Table A-14: BAT Environmental Impact Summary

Unit/ Unit Combination	Gas Consumption (mscf/yr)[1]	Gas NO_x (tpy)[2]	Gas GHG (tpy CO_2e)[3]	VOC -> GHG (tpy CO_2e)[4]	Sum GHG (tpy CO_2e)[5]	Gas CO (tpy)[6]
Recouperative Thermal Oxidizer						
PB10	331,604	+ 16.58	20,017	71.5	+ 20089	+ 13.93
PB11	2,648,110	+ 132.41	159,853	116.0	+ 159969	+ 111.22
PB27	3,993,852	+ 199.69	241,089	328.3	+ 241417	+ 167.74
PB28	3,646,474	+ 182.32	220,119	650.0	+ 220769	+ 153.15
PB29	3,670,155	+ 183.51	221,549	487.5	+ 222036	+ 154.15
PB30	505,969	+ 25.30	30,543	159.3	+ 30702	+ 21.25
PB31	1,396,980	+ 69.85	84,329	308.8	+ 84637	+ 58.67
Regenerative Thermal Oxidizer						
PB10	59,833	+ 2.99	3,612	71.5	+ 3683	+ 2.51
PB11	480,088	+ 24.00	28,981	116.0	+ 29097	+ 20.16
PB27	713,491	+ 35.67	43,070	328.3	+ 43398	+ 29.97
PB28	632,357	+ 31.62	38,172	650.0	+ 38822	+ 26.56
PB29	645,197	+ 32.26	38,947	487.5	+ 39435	+ 27.10
PB30	91,142	+ 4.56	5,502	159.3	+ 5661	+ 3.83
PB31	250,161	+ 12.51	15,101	308.8	+ 15410	+ 10.51
Catalytic Oxidizer						
PB10	142,426	+ 7.12	8,598	71.5	+ 8669	+ 5.98
PB11	9,077,396	+ 453.87	547,957	116.0	+ 548073	+ 381.25
PB27	1,692,061	+ 84.60	102,141	328.3	+ 102470	+ 71.07
PB28	1,517,957	+ 75.90	91,631	650.0	+ 92282	+ 63.75
PB29	1,541,714	+ 77.09	93,066	487.5	+ 93553	+ 64.75
PB30	215,730	+ 10.79	13,023	159.3	+ 13182	+ 9.06
PB31	592,936	+ 29.65	35,793	308.8	+ 36101	+ 24.90
Carbon Adsorber						
PB10	151	+ 0.008	9	71.5	+ 81	+ 0.006
PB11	245	+ 0.012	15	116.0	+ 131	+ 0.010
PB27	693	+ 0.035	42	328.3	+ 370	+ 0.029
PB28	1,373	+ 0.069	83	650.0	+ 733	+ 0.058
PB29	1,029	+ 0.051	62	487.5	+ 550	+ 0.043
PB30	336	+ 0.017	20	159.3	+ 180	+ 0.014
PB31	652	+ 0.033	39	308.8	+ 348	+ 0.027
Biofilter						
PB10	0	0.00	0.0	71.5	+ 72	0.0
PB11	0	0.00	0.0	116.0	+ 116	0.0
PB27	0	0.00	0.0	328.3	+ 328	0.0
PB28	0	0.00	0.0	650.0	+ 650	0.0
PB29	0	0.00	0.0	487.5	+ 488	0.0
PB30	0	0.00	0.0	159.3	+ 159	0.0
PB31	0	0.00	0.0	308.8	+ 309	0.0

Notes

1	Per cost-effectiveness calculation sheets. Carbon adsorber utilities include cooling water usage, water and gas used for steam production.
2	Estimated NO_x emissions from natural gas combustion in control device calculated using AP-42 emission factor, 5th Edition, Table 1.4-1, NO_x emissions from small uncontrolled boilers. NO_x = (Gas Consumption, Mscf) * (1 MMscf/1000 Mscf) * (100 lb NO_x/MMscf) / (2,000 lb/ton)
3	Estimated greenhouse gas (GHG) emissions from natural gas combustion in control device calculated using AP-42 emission factors, 5th Edition, Table 1.4-2. Combined GHG Emission Factor, lb CO_2e/MMscf = (120,000 lb CO_2/MMscf) * (CO_2 GWP =1) + (2.2 lb N2O/MMscf) * (N_2O GWP=310) + (2.3 lb CH4/MMscf) * (CH_4 GWP=21) GHG Emissions, tpy CO_2e = (Gas Consumption, Mscf) * (1 MMscf/1000 Mscf) * (GHG EF=120,730 lb CO_2e/MMscf) / (2000 lb/ton)
4	CO_2 emissions from VOC destruction = (tons of VOC destroyed) * (8 mol CO_2/1 mol xylenes) * [(44.01 g/mol CO_2) / (106.16 g/mol ethanol)] CO_2 emissions from VOC destruction = (tons of VOC destroyed) * (3 mol CO2/1 mol isopropyl alcohol) * [(44.01 g/mol CO2) / / (60.1 g/mol isopropyl alcohol)] * (CO2 GWP =1)
5	Sum of CO_2 emissions from natural gas combustion and VOC destruction.
6	Estimated CO emissions from natural gas combustion in control device calculated using AP-42 emission factor, 5th Edition, Table 1.4-2. CO = (Gas Consumption, Mscf) * (1 MMscf/1000 Mscf) * (84 lb CO/MMscf) / (2000 lb/ton)

Table A-8: Blue Bird Body Company - Regenerative Thermal Oxidizer

Best Available Control Technology Cost Effectiveness Analysis

Footnotes

1 Base total capital investment reflects this date prior to cost escalation.

2 Bureau of Labor statistics for year and quarter shown. Base oxidizer cost has been escalated to this date.

3 Waste gas exhaust flow rate from emissions unit discharge to the atmostphere. Waste gas stream adjusted by factor (y) to achieve flow range valid in cost manual.

4 Inlet gas temperature based on facility data.

5 Based on Ideal Gas Equation at waste gas exhaust temperature assuming waste gas is principally air.

6 See footnote 35.

7 Heat capacity, c_p, of air at average control temperature; Thermodynamics 3rd Edition, Black and Hartley, 1996.

8 Auxiliary fuel is assumed to be natural gas (as methane). Please refer to Table 2.14 of EPA 452/B-02-001 Section 3.2.

9 Auxiliary fuel needed to sustain the combustion zone temperature of 1600 °F using the procedure specified in EPA 452/B-02-001.

10 Information pertaining to capture system were estimated from existing facility layout; waste gas stream is exhausted through stack extending to where the RTO would be installed.

11 Duct Diameter = 1.128 * ((waste gas flow rate/x)/u) ^0.5, where x = factor needed to bring diamters below 7 feet and u = minimum transport velocity of 2,000 ft/min for gases per Table 1.3 of USEPA Cost Manual, 6th Edition (Equation in Section 1.3.3).

12 Pressure Loss = 0.136 * ((1/duct diameter)^1.18) * ((u/1,000)^1.8) * (duct length/100)) for gases per Table 1.3 of USEPA Cost Manual, 6th Edition (Equation in Section 1.3.3).

13 Source: EPA 452/B-02-001 Section 3.2 VOC Destruction Controls. Cost correlations range valid to 100,000 scfm.
Escalated oxidizer costs = (Price index current year) / (Price index of base year) * (220400+11.57*flow (scfm))
Cost correlations provided by the EPA are in 1999 dollars with cost escalation using Bureau of Labor Capital Equipment Price Index
http://data.bls.gov/cgi-bin/surveymost

14 Cost of straight ductwork = 6.29 * (12 * Duct diameter)^1.23) * (Length of ducting) * (Number of ducts required (x from footnote 11))
Cost based upon using 3044 SS plate from Table 1.9 of USEPA cost manual.

15 Cost of elbows = 74.2 * (e^(0.0688 * Duct diameter * 12)) * (No. of elbows) * (Number of ducts required (x from footnote 11))
Cost based upon 304 SS from Table 1.10 of USEPA cost manual.

16 Cost of damper/louver = 45.5 * (e^(0.0597 * Duct diameter * 12)) * (No. of dampers) * (Number of ducts required (x from footnote 11))
Cost based upon galvanized CS insulated butterfly damper per Table 1.10 of US EPA cost manual, 6th Edition.

17 Average cost factors specified in EPA 452/B-02-001, Section 3.2, Chapter 2, Table 2.8.

18 No adjustment factor applied.

19 Annual cost inputs were derived from best available facility information.

20 Operating labor factor (total man-hours per shift) specified in EPA 452/B-02-001, Section 3.2, Chapter 2, Table 2.10.

21 No. of shifts per year = (8,760 hr/year) /(8 hrs/shift).

22 Supervisory labor operating factor determined as 15% of operating labor factor specified in EPA 452/B-02-001, Section 3.2, Chapter 2, Table 2.10.

23 Assumes preventative maintenance labor man-hours are allocated during one shift per day.

24 EPA 452/B-02-001, Section 3.2, Chapter 2, Table 2.10.

25 Mean of the latest 5 years (2008-2012) of annual average natural gas price data for industrial sector consumers in Georgia per US Dept. of Energy, Energy Information Administration; see http://tonto.eia.doe.gov/dnav/ng/ng_pri_sum_dcu_SGA_a.htm

26 Average Price of Electricity in 2010 in Georgia http://www.eia.gov/electricity/state/

27 Natural Gas Cost = (Auxiliary fuel requirement)*(60 min/hr)*(8760 hr/yr)*(Rate, $/mscf)

28 Electricity Cost = 0.000117*(Waste gas exhaust flow)*(Total system pressure drop, assumed 20 w.c.)/0.6*(8760 hr/yr)*(Rate, $/kWh)

29 Average life expectancy for thermal incinerators specified in EPA 452/B-02-001, Section 3.2, Chapter 2, Table 2.10, footnote "c" is 10 years

30 Capital Recovery Factor = (1 + Interest Rate)^(Life Expectancy) / ((1 + Interest Rate)^D100-1)
Interest Rate is assumed to be 7%

31 Potential VOC emissions are proposed VOC emission limit of unit divided by factor (y) from footnote 3

32 Total VOC reduced = 98% of Potential VOC emissions

33 Parts per million concentration by volume to weight conversion from AP-42 Appendix A.

34 Parts per million concentration by volume (ppmv) calculation is as follows:
(Potential emissions, tpy)*(2,000 lb/ton)/(8,760 hr/yr)*(0.73 ft^3-atm/lbmol-R^o)*(Inlet gas temperature, R^o)/(Molecular weight, lb/lb-mol)/(Gas flowrate, acfm)/(60 min/hr)*(1,000,000 ppm)

35 Heat of combustion per pound of inlet waste gas developed from heat of combustion multiplied by concentration by weight (ppmw).

Table A-9: Blue Bird Body Company - Carbon Adsorber

Best Available Control Technology Cost Effectiveness Analysis

Footnotes

1	Base total capital investment reflects this date prior to cost escalation.
2	Bureau of Labor statistics for year and quarter shown. Base oxidizer cost has been escalated to this date.
3	Actual waste gas exhaust flow rate discharged to the atmostphere.
4	Inlet gas temperature based on facility data.
5	The capacity factor was determined from Equation 1.11 of EPA 452/B-02-001 Section 3.1 for continously operated systems.
6	Source: I.I. El-Sharkawy, B.B. Saha, K. Kuwahara, S. Koyama, and K.C., NG, Adsorption Rate Measurements of Activated Carbon Fiber/Ethanol Pair for Adsorption Cooling System Application, White Paper, Figure 2, Ethanol Uptake on Activated Carbon with Time at Adsorption Temperature. Carbon equilibrium capacity based on 67% by mass at 27^{o}C. Typically, the carbon equilibrium capacity is based on application of the Freundlich isotherm function and partial pressure of the VOC in the gas stream. The Freundlich isotherm constants for ethanol were not available to apply this function.
7	Working capacity is 50% of equilibrium capacity. Please refer to Equation 1.15 of EPA 452/B-02-001 Section 3.1.
8	Adsorption time selected based on daily adsorption/desorption cycle.
9	Carbon mass required for each fixed bed determined from Equation 1.14 of EPA 452/B-02-001 Section 3.1 for continuously operating systems.
10	The superficial bed velocity was chosen to based on the guidance in Section 1.3.1.2 of EPA 452/B-02-001 Section 3.1
11	The vesel diameter was determined from Equation 1.21 of EPA 452/B-02-001 Section 3.1. The number of vessels was selected to keep vessel diameter under 12' to ensure that vessels can be shipped by truck.
12	The vesel length was determined from Equation 1.22 of EPA 452/B-02-001 Section 3.1 plus 2 feet clearance for gas distribution and disengagement.
13	The vesel surface area = (*p*) * (Vessel diameter, D) * (Vessel length, L) + 2 * (*p*/4) * (Vessel diameter, D))^2
14	Carbon bed thickness determined from Equation 1.14 of EPA 452/B-02-001 Section 3.1 for carbon density of 30 lb/ft^3.
15	Carbon bed and total system pressure drop determined from Equations 1.30 and 1.32 of EPA 452/B-02-001 Section 3.1
16	Duct Diameter = 1.128 * ((waste gas flow rate/x)/u) ^0.5, where x = factor needed to bring diamters below 7 feet and u = minimum transport velocity of 2,000 ft/min for gases per Table 1.3 of USEPA Cost Manual, 6th Edition (Equation in Section 1.3.3).
17	Pressure Loss = 0.136 * ((1/duct diameter)^1.18) * ((u/1,000)^1.8) * (duct length/100)) for gases per Table 1.3 of USEPA Cost Manual, 6th Edition (Equation in Section 1.3.3).
18	Information pertaining to capture system were estimated from existing facility roof layout.
19	Potential VOC emissions (tpy) specified as requested limits.
20	Potential VOC emissions from fuel combustion (tpy) of natural gas not included since the limits presented include these emissions.
21	100 percent capture and 98 percent destruction efficiency considered based on USEPA Cost Manual.
22	Parts per million concentration by volume to weight conversion from AP-42 Appendix A.
23	Parts per million concentration by volume (ppmv) calculation is as follows: (Potential emissions, tpy) * (2,000 lb/ton) / (8,760 hr/yr) * (0.73 ft^3-atm/lbmol-R^o) * (Inlet gas temperature, R^o)/ (Molecular weight, lb/lb-mol) / (Gas flowrate, acfm) / (60 min/hr) * (1,000,000 ppm)
24	Source: EPA 452/B-02-001 Section 3.1 VOC Destruction Controls. Cost correlations range valid from 4,000 to 500,000 scfm. Escalated oxidizer costs = (Index for current year) / (Index Base Reference) * (5.82*(Waste gas flow rate)^-.133) * {($1/lb carbon) * (lbs carbon required) + (271*(Surface area)^0.778) * (Number of vessels)} Cost correlations provided by the EPA are in 1999 dollars with cost escalation using M & S (1999 = Base Year).
25	Cost of straight ductwork = 6.29 * (12*Duct diameter)^1.23) * (Length of ducting) * (Number of ducts required (x from footnote 11)) Cost based upon using 3044 SS plate from Table 1.9 of USEPA Cost Manual.
26	Cost of elbows = 74.2 * (e^(0.0688*Duct diameter*12)) * (No. of elbows) * (Number of ducts required (x from footnote 11)) Cost based upon 304 SS from Table 1.10 of USEPA Cost Manual.
27	Cost of damper/louver = 45.5 * (e^(0.0597*Duct diameter*12)) * (No. of dampers) * (Number of ducts required (x from footnote 11)) Cost based upon galvanized CS insulated butterfly damper per Table 1.10 of US EPA Cost Manual, 6th Edition.
28	Average cost factors specified in Table 1.3 of EPA 452/B-02-001 Section 3.1 for carbon adsorbers.
29	No adjustment factor applied.
30	Standard accounting practice is to account for in-house labor (when on loan to another department, etc.) at $70/hour total cost, inclusive of overhead, benefits, etc.
31	Operating labor factor (total man-hours per shift) specified in Table 1.6 of EPA 452/B-02-001 Section 3.1
32	No. of shifts per year = (8,760 hr/year) / (8 hrs/shift).
33	Supervisory labor operating factor determined as 15% of operating labor factor specified in Table 1.6 of EPA 452/B-02-001 Section 3.1
34	Assumes preventative maintenance labor of 1 hour per day for 365 hrs/year.
35	Carbon replacement cost based on Equation 1.36 of EPA 452/B-02-001 Section 3.1 with $1/lb carbon cost and replacement labor at $0.05/lb carbon replaced.
36	Steam cost is per US EPA Cost Manual, 6th Edition, Chapter 3.1, Section 1. Steam prices are based on 120% of the fuel cost (natural gas) and assuming 1 MMBtu/1000 lb steam. Average cost of natural gas per Mscf for industrial consumers in Kentucky 2004-2008, per US Dept. of Energy, Energy Information Admin.
37	Average Price of Electricity in 2010 in Georgia http://www.eia.gov/electricity/state/
38	Steam requirement estimated at 3.5 lb/lb VOC adsorbed. Please refer to Equation 1.28 of EPA452/B-02-001 Section 3.1 0.6 operating factor is incorporated to only reflect regeneration portion of desorption.
39	System and bed cooling/drying fan and cooling water pump power requirements determined from Equations 1.32, 1.33 and 1.34 of EPA 452/B-02-001 Section 3.1 for the calculated system pressure drop. Volumetric flow rate for the bed cooling/drying fan was determined at 100 cfm per pound of carbon with an operating factor of 0.4 for the number of hours per year. Horsepower is converted to kilowatts by multiplying by 0.746 kW/hp.
40	Cooling water requirements determined by multiplying steam requirement by 3.43. Cooling water cost is per Georgia current rates.
41	Average life expectancy for thermal incinerators specified in EPA 452/B-02-001, Section 3.1, Chapter 1
42	Capital Recovery Factor = (1+Interest Rate)^(Life Expectancy)/((1+Interest Rate)^D100-1) where Interest Rate is assumed to be 7%

Table A-10: Blue Bird Body Company - Biotrickling Filter

Best Available Control Technology Cost Effectiveness Analysis

Footnotes

1	Exhaust flow rate from emissions unit discharge to the atmostphere. Flow rates adjusted by (x) as biofilters are typically <100,000 cfm
2	Inlet gas temperature based on facility data.
3	Based on Ideal Gas Equation at waste gas exhaust temperature assuming waste gas is principally air.
4	Fractional moisture content of inlet gas based on engineering estimate
5	Information pertaining to capture system was estimated considering currently availible space and logistics of the facility
6	Duct Diameter = 1.128 * ((waste gas flow rate/x)/u) ^0.5, where x = factor needed to bring diamters below 7 feet and u = minimum transport velocity of 2,000 ft/min for gases per Table 1.3 of USEPA Cost Manual, 6th Edition (Equation in Section 1.3.3).
7	Pressure Loss = 0.136 * ((1 / duct diameter)^1.18) * ((u / 1,000)^1.8) * (duct length / 100)) for gases per Table 1.3 of USEPA Cost Manual, 6th Edition (Equation in Section 1.3.3).
8	Potential VOC emissions (tpy) specified as per the proposed enforceable limit. Potential emissions adjusted by factor (y) from footnote 1 to account for multiple systems in parallel
9	100 percent capture and 90 percent destruction efficiency considered based upon vendor data (MEGTEC).
10	Cost estimate based upon MEGTEC quote (from 2008) 14110-10013866 for biofilter controlling 24,338 scfm flow from a cereal dryer Cost adjusted using "6/10th rule", Cost A = Cost B * (Capacity of A / Capacity of B)$^{0.6}$
11	Heat exchanger determined to be not required as air temperature estimated to remain 77 ºF throughout the ductwork to biofilter
12	Cost of straight ductwork = 6.29 * (12*Duct diameter)^1.23) * (Length of ducting) * (Number of ducts required (x from footnote 6)) Cost based upon using 3044 SS plate from Table 1.9 of USEPA Cost Manual.
13	Cost of elbows = 74.2 * (e^(0.0688*Duct diameter*12)) * (No. of elbows) * (Number of ducts required (x from footnote 6)) Cost based upon 304 SS from Table 1.10 of USEPA Cost Manual.
14	Cost of damper/louver = 45.5 * (e^(0.0597*Duct diameter*12)) * (No. of dampers) * (Number of ducts required (x from footnote 6)) Cost based upon galvanized CS insulated butterfly damper per Table 1.10 of US EPA Cost Manual, 6th Edition.
15	Average cost factors specified US EPA Air Pollution Control Cost Manual, 6th Edition Average cost factors for packed tower absorber used as best esimate for biotrickling filter (Section 5.2, Ch. 1)
16	No adjustment factor applied.
17	Per USEPA - Region 5, maintenance materials should be 1% of the total capital cost.
18	Site preparation and building costs are assumed to be 10% of purchased equipment costs
19	Standard accounting practice is to account for in-house labor (when on loan to another department, etc.) at $70/hour total cost, inclusive of overhead, benefits, etc.
20	Operating labor factor not applicable
21	Operating Labor is average of 10 hrs/week.
22	Supervisory labor hours are considered as 0.5 hr/week.
23	Maintenance labor is 2 hrs/week. Includes scheduled and unscheduled maintenance.
24	Cost estimate based upon MEGTEC quote (from 2008) 14110-10013866 for biofilter controlling 24,338 scfm flow from a cereal dryer Cost adjusted using "6/10th rule", Cost A = Cost B * (Capacity of A / Capacity of B)$^{0.6}$
25	Cooling water cost is per 2012 water and sewer rates are average cost of water in Georgia
26	Average Price of Electricity in 2010 in Georgia http://www.eia.gov/electricity/state/
27	Utility/consumable demands are as specified in the MEGTEC bid and post-bid communications.
28	Average cost factors specified US EPA Air Pollution Control Cost Manual, 6th Edition Average cost factors for packed tower absorber used as best esimate for biotrickling filter (Section 5.2, Ch. 1)
29	Equipment life based upon IRS CLADR for air pollution control devices - midpoint life
30	Interest Rate is assumed to be 7%
31	Capital Recovery Factor = [(Interest Rate)*(1+Interest Rate)^(Life Expectancy)/[(1+Interest Rate)^(Life Expectancy)-1)]

Table A-11: Blue Bird Body Company - Catalytic Oxidizer

Best Available Control Technology Cost Effectiveness Analysis

Footnotes

1 Base total capital investment reflects this date prior to Bureau of Labor escalation.

2 Bureau of Labor Capital Producer Price Index - Capital Equipment corresponding to the year and quarter shown. Base oxidizer cost has been escalated to this date.

3 Exhaust flow rate from emissions unit discharge to the atmostphere. Flow rates adjusted by (x) as catalytic oxidizers are typically <50,000 cfm

4 Inlet gas temperature based on facility data.

5 Based on Ideal Gas Equation at waste gas exhaust temperature assuming waste gas is principally air.

6 See Footnote 37.

7 Heat capacity, c_p, of air at average control temperature; Thermodynamics 3rd Edition, Black and Hartley, 1996.

8 Auxiliary fuel is assumed to be natural gas (as methane). Please refer to Table 2.14 of EPA 452/B-02-001 Section 3.2.

9 Auxiliary fuel needed to sustain the combustion zone temperature of 750 °F using the procedure specified in EPA 452/B-02-001.

10 Information pertaining to capture system were estimated from existing facility layout

11 Duct Diameter = 1.128 * ((waste gas flow rate/x)/u) ^0.5, where x = factor needed to bring diamters below 7 feet and u = minimum transport velocity of 2,000 ft/min for gases per Table 1.3 of USEPA Cost Manual, 6th Edition (Equation in Section 1.3.3).

12 Pressure Loss = 0.136 * ((1 / duct diameter)^1.18) * ((u/1,000)^1.8) * (duct length / 100)) for gases per Table 1.3 of USEPA Cost Manual, 6th Edition (Equation in Section 1.3.3).

13 Source: Bureau of Labor Statistics - Producer Price Index - Capital Equipment
Escalated oxidizer costs = (125.27 / 100) * (VAPCCI / 100) * (1443 * (Waste gas flow rate)^0.5527).
Cost correlations provided by the EPA are in 1994 dollars
http://data.bls.gov/cgi-bin/surveymost

14 Cost of straight ductwork = 6.29 * (12*Duct diameter)^1.23) * (Length of ducting) * (Number of ducts required (x from footnote 3))
Cost based upon using 3044 SS plate from Table 1.9 of USEPA Cost Manual.

15 Cost of elbows = 74.2 * (e^(0.0688*Duct diameter*12)) * (No. of elbows) * (Number of ducts required (x from footnote 3))
Cost based upon 304 SS from Table 1.10 of USEPA Cost Manual.

16 Cost of damper/louver = 45.5 * (e^(0.0597*Duct diameter*12)) * (No. of dampers) * (Number of ducts required (x from footnote 3))
Cost based upon galvanized CS insulated butterfly damper per Table 1.10 of US EPA Cost Manual, 6th Edition.

17 Average cost factors specified in EPA 452/B-02-001, Section 3.2, Chapter 2, Table 2.8.

18 No adjustment factor applied.

19 Annual cost inputs were derived from best available facility information.

20 Operating labor factor (total man-hours per shift) specified in EPA 452/B-02-001, Section 3.2, Chapter 2, Table 2.10.

21 No. of shifts per year = (8,760 hr/year) / (8 hrs/shift).

22 Supervisory labor operating factor determined as 15% of operating labor factor specified in EPA 452/B-02-001, Section 3.2, Chapter 2, Table 2.10.

23 Assumes preventative maintenance labor man-hours are allocated during one shift per day.

24 EPA 452/B-02-001, Section 3.2, Chapter 2, Table 2.10.

25 Mean of the latest 5 years (2008-2012) of annual average natural gas price data for industrial sector consumers in Georgia per US Dept. of Energy, Energy Information Administration; see http://tonto.eia.doe.gov/dnav/ng/ng_pri_sum_dcu_SGA_a.htm

26 Average Price of Electricity in 2010 in Georgia http://www.eia.gov/electricity/state/

27 Natural Gas Cost = (Auxiliary fuel requirement)*(60 min/hr)*(8760 hr/yr)*(Rate, $/mscf)

28 Electricity Cost = 0.000117*(Waste gas exhaust flow)*(Total system pressure drop, assumed 20 w.c.)/0.6*(8760 hr/yr)*(Rate, $/kWh)

29 Average life expectancy for thermal incinerators specified in EPA 452/B-02-001, Section 3.2, Chapter 2, Table 2.10, footnote "c" is 10 years

30 Capital Recovery Factor = (1 + Interest Rate)^(Life Expectancy) / ((1 + Interest Rate)^D100-1)

31 Potential VOC emissions (tpy) per requested VOC emission limit

32 VOC emissions from combustion included

33 100 percent capture and 98 percent destruction efficiency considered.

34 Catalyst volume is determined by the following equation: Φ = (Waste Gas flow rate)/(catalyst volume)
Φ = space velocity, h-1 and waste gas flow is specified in feet^3/hour. Φ = 20,000 h-1, per Sec 2.4.1 Cost Manual
Therefore, catalyst volume = [(waste gas flow rate) * (60 min/hrs) * (460 + inlet temp) / (460 + ref temp)] / 20,000 h-1

35 Parts per million concentration by volume to weight conversion from AP-42 Appendix A.

36 Parts per million concentration by volume (ppmv) calculation is as follows:
(Potential emissions, tpy)*(2,000 lb/ton)/(8,760 hr/yr)*(0.73 ft^3-atm/lbmol-R^o)*(Inlet gas temperature, R^o)/
(Molecular weight, lb/lb-mol)/(Gas flowrate, acfm)/(60 min/hr)*(1,000,000 ppm)

37 Heat of combustion per pound of inlet waste gas developed from heat of combustion multiplied by concentration by weight (ppmw).

Table A-12: Blue Bird Body Company - Recuperative Thermal Oxidizer

Best Available Control Technology Cost Effectiveness Analysis

Footnotes

1 Base total capital investment reflects this date prior to cost escalation.

2 Bureau of Labor statistics for year and quarter shown. Base oxidizer cost has been escalated to this date.

3 Exhaust flow rate from emissions unit discharge to the atmostphere. Flow rates adjusted by (x) as recuperative oxidizers are <50,000 cfm

4 Inlet gas temperature based on facility data.

5 Based on Ideal Gas Equation at waste gas exhaust temperature assuming waste gas is principally air.

6 See footnote 36.

7 Heat capacity, c_p, of air at average control temperature; Thermodynamics 3rd Edition, Black and Hartley, 1996.

8 Auxiliary fuel is assumed to be natural gas (as methane). Please refer to Table 2.14 of EPA 452/B-02-001 Section 3.2.

9 Auxiliary fuel needed to sustain the combustion zone temperature of 1600 °F using the procedure specified in EPA 452/B-02-001.

10 Information pertaining to capture system were estimated from existing facility roof layout; waste gas stream is exhausted through stack extending to the roof where the RTO would be installed.

11 Duct Diameter = 1.128 * (waste gas flow rate/u) ^0.5, where u = minimum transport velocity of 2,000 ft/min for gases per Table 1.3 of USEPA Cost Manual, 6th Edition (Equation in Section 1.3.3).

12 Pressure Loss = 0.136 * ((1/duct diameter)^1.18) * ((u/1,000)^1.8) * (duct length/100)) for gases per Table 1.3 of USEPA Cost Manual, 6th Edition (Equation in Section 1.3.3).

13 Source: EPA 452/B-02-001 Section 3.2 VOC Destruction Controls. Cost correlations range valid to 50,000 scfm.
Escalated oxidizer costs = (125.27/100) * (VAPCCI/100) * (21,342 * (Waste gas flow rate)^0.25).
Cost correlations provided by the EPA are in 1988 dollars with cost escalation using VAPCCI (1994 = 100). The EPA 1988 cost correlation is escalated to 1994 dollars (125.27/100) using the BLS Consumer Price Index calculator http://data.bls.gov/cgi-bin/cpicalc.pl.

14 Cost of straight ductwork = 6.29 * (12*Duct diameter)^1.23) * (Length of ducting) * (Number of ducts required (x from footnote 3))
Cost based upon using 3044 SS plate from Table 1.9 of USEPA Cost Manual.

15 Cost of elbows = 74.2 * (e^(0.0688*Duct diameter*12)) * (No. of elbows) * (Number of ducts required (x from footnote 3))
Cost based upon 304 SS from Table 1.10 of USEPA Cost Manual.

16 Cost of damper/louver = 45.5 * (e^(0.0597*Duct diameter*12)) * (No. of dampers) * (Number of ducts required (x from footnote 3))
Cost based upon galvanized CS insulated butterfly damper per Table 1.10 of US EPA Cost Manual, 6th Edition.

17 Average cost factors specified in EPA 452/B-02-001, Section 3.2, Chapter 2, Table 2.8.

18 No adjustment factor applied.

19 Annual cost inputs were derived from best available facility information.

20 Operating labor factor (total man-hours per shift) specified in EPA 452/B-02-001, Section 3.2, Chapter 2, Table 2.10.

21 No. of shifts per year = (8,760 hr/year) /(8 hrs/shift).

22 Supervisory labor operating factor determined as 15% of operating labor factor specified in EPA 452/B-02-001, Section 3.2, Chapter 2, Table 2.10.

23 Assumes preventative maintenance labor man-hours are allocated during one shift per day.

24 EPA 452/B-02-001, Section 3.2, Chapter 2, Table 2.10.

25 Mean of the latest 5 years (2008-2012) of annual average natural gas price data for industrial sector consumers in Georgia per US Dept. of Energy, Energy Information Administration; see http://tonto.eia.doe.gov/dnav/ng/ng_pri_sum_dcu_SGA_a.htm

26 Average Price of Electricity in 2010 in Georgia http://www.eia.gov/electricity/state/

27 Natural Gas Cost = (Auxiliary fuel requirement)*(60 min/hr)*(8760 hr/yr)*(Rate, $/mscf)

28 Electricity Cost = 0.000117*(Waste gas exhaust flow)*(Total system pressure drop, assumed 20 w.c.)/0.6*(8760 hr/yr)*(Rate, $/kWh)

29 Average life expectancy for thermal incinerators specified in EPA 452/B-02-001, Section 3.2, Chapter 2, Table 2.10, footnote "c" is 10 years

30 Capital Recovery Factor = (1 + Interest Rate)^(Life Expectancy) / ((1 + Interest Rate)^D100-1)

31 Potential VOC emissions (tpy) per requested VOC emission limit

32 VOC emissions from combustion included

33 100 percent capture and 98 percent destruction efficiency considered.

34 Parts per million concentration by volume to weight conversion from AP-42 Appendix A.

35 Parts per million concentration by volume (ppmv) calculation is as follows:
(Potential emissions, tpy)*(2,000 lb/ton)/(8,760 hr/yr)*(0.73 ft^3-atm/lbmol-R^o)*(Inlet gas temperature, R^o)/(Molecular weight, lb/lb-mol)/(Gas flowrate, acfm)/(60 min/hr)*(1,000,000 ppm)

36 Heat of combustion per pound of inlet waste gas developed from heat of combustion multiplied by concentration by weight (ppmw).

Table A-15 Blue Bird BACT Cost Effectiveness Summary

Unit	Suggested Limit Scenario VOC (tpy)[1]	Regenerative T. Oxidizer ($/ton)	Regenerative T. Oxidizer with Rotor Concentrator ($/ton)	Carbon Adsorber ($/ton)	Carbon Adsorber Rotor Concentrator ($/ton)	Catalytic Oxidizer ($/ton)	Catalytic Oxidizer Rotor Concentrator ($/ton)	Biotrickling Filter ($/ton)	Biotrickling Filter Rotor Concentrator ($/ton)	Recuperative Oxidizer ($/ton)	Recuperative Oxidizer Rotor Concentrator ($/ton)
PB10	22.00	$46,719	$31,182	$21,239	$19,899	$78,221	$27,105	$22,815	$26,389	$121,983	$23,304
PB11	35.70	$207,538	$73,514	$97,543	$48,790	$339,133	$88,887	$80,323	$68,914	$590,435	$62,187
PB27	101.00	$110,112	$33,443	$68,090	$24,614	$178,619	$44,359	$42,812	$31,796	$430,715	$30,173
PB28	200.00	$50,765	$16,124	$59,849	$14,103	$81,830	$21,010	$19,234	$15,307	$145,285	$14,408
PB29	150.00	$68,277	$21,498	$60,134	$17,303	$110,198	$28,013	$25,645	$20,410	$194,800	$19,172
PB30	49.00	$30,231	$20,350	$14,793	$13,076	$51,453	$17,166	$13,015	$16,362	$84,387	$14,119
PB31	95.00	$41,194	$19,010	$25,000	$13,340	$67,847	$20,052	$15,875	$17,212	$117,040	$15,015

Appendix B to Attachment C

Canopy Fume Hood Design for PB27 and PB31

Appendix B to Attachment C: Flow Rate Calculations for VOC Capture System
Blue Bird Body Company - Fort Valley, Georgia

The following calculations were used to design an effective capture system controlling the VOC emissions from the cleaning operations associated with the Undercoat Booth (PB27), Black and Primer Paint Booth (PB28), Yellow Paint Booth, (PB29), and the White Paint Booth (PB31) derived for purposes of the BACT cost analyses in Appendix A to Attachment C. It should be noted that cleaning solvent use in each of the touchup booths is minimal and is vented through each touch up booth's stacks.

As cleaning solvents are used on each vehicle prior to entering each paint booth, an additional capture system is required to effectively control the VOC emissions resulting from cleaning operations in each these booths. Additionally, the process flow for cleaning operations prior to application on the undercoat occurs in three different areas near the booth, three fume hoods will be required to be added to PB27 in order to effectively capture the emissions resulting from these cleaning activities.

The most appropriate VOC capture system is considered to be a canopy hood with a capture efficiency of 100 percent. The facility would achieve this by maintaining an area of negative pressure within the region where each cleaning operation occur. The hoods must be sufficiently large enough to maintain this negative pressure and capture emissions from all points on the bus. Additionally, the hood must provide ample clearance for coating of the roof of each bus.

As large school buses are 40'x8' the facility calculates a fume hood measuring 42'x10' would be the most effective size to control all emissions and allow for workspace on all sides of the bus. Additionally, the hood should be at least 5 feet away from the roof of the bus to allow for proper workspace clearance.

The flow rate for the VOC capture system is based upon the canopy hood design equation as specified in Table 1.1 (page 1-23), Chapter 1 “Hoods, Ductworks, and Stacks” of the EPA Air Pollution Control Cost Manual[1]. The equation is as follows:

$$Q = 1.4*P*X*U_c$$

Where,

Q = flow rate drawn into hood (acfm)
P = perimeter of source (ft)
X = distance from the hood to the source (ft)
U_c = hood capture velocity (ft/min)

P = 104 ft
X = 5 feet
U_c = 200 ft/min (based upon Table 1.2, page 25 of Chapter 1, for canopy hood)

$Q = 1.4*(104\ ft)*(5\ ft)*(200\ ft/min)$
$Q = 116{,}480\ ft^3/min$

For purposes of the BACT cost analyses presented in Appendix A to Attachment C, Tables A-1 through A-5, the addition of a fume hood to capture the VOC emissions from cleaning operations

[1] US EPA, Air Pollution Control Cost Manual, Section 2 Generic Equipment and Devices, Chapter 1 Hoods, Ductwork, and Stacks, July 2002.

will increase the existing flow rate of each paint booth. The flow rates required to capture VOC emissions from cleaning operations are summarized in Table B-1:

Table B-1: Controlled flow rates for PB27, PB28, PB29, and PB31

Paint Booth ID	Existing Flow Rate (acfm)	Canopy Hood Flow Rate (acfm)	Number of Hoods Required	Total Flow Rate[1] (acfm)
PB27	116,000	156,000	3	584,000
PB28	384,000	156,000	1	540,000
PB29	384,000	156,000	1	540,000
PB31	48,000	156,000	1	204,000

[1] Total Flow Rate, acfm = (Existing Flow Rate, acfm) + (Canopy Hood Flow Rate, acfm) * (Number of Hoods Required)

Attachment D

Toxic Impact Assessment

INTRODUCTION

The purpose of this document is to demonstrate the Blue Bird Body Company - Fort Valley, Georgia facility's compliance with Georgia Environmental Protection Division's (EPD) policy regarding emissions of toxic air pollutants (TAP). Compliance will be demonstrated with the EPD *Guideline for Ambient Impact Assessment of Toxic Air Pollutants*, dated June 21, 1998 ("the Guideline"). The facility emits several TAPs as a result of metal coating operations, as well as fuel combustion. This toxic impact assessment is being provided to demonstrate that potential toxic emissions from the facility will not result in an ambient air concentration that exceeds the level that is considered acceptable by the State of Georgia.

1.0 PROCESS DESCRIPTION

Blue Bird Body Company fabricates body components to light duty vehicles. Chassis and engine parts are brought to the facility via truck and railcar where they are assembled and finished at the facility.

Blue Bird Body Company uses several different TAP containing materials during vehicle cleaning and painting operations including cleaners, undercoating, primers, accelerators, and paints. During production activities, the volatile fraction of these coatings is emitted into the atmosphere. Many of the VOC emitted by these coatings are TAPs.

The facility primarily produces fleets of school busses, and thus utilizes a few select paints and coatings for the majority of vehicles produced at the facility. The facility operates four primary paint booths dedicated to undercoating, yellow paint, white paint, and black paint with three additional paint booths applying various touch ups and decals to the vehicles. As the facility primarily produces school bus fleets, paint usage is consistent over time and it is assumed that the TAP content of the paints primarily used in each booth is representative of TAP emissions at the facility (see emission calculations in Attachment B). TAP emissions from natural gas combustion have not been included as these emissions are considered minimal for this facility

2.0 COMPLIANCE DETERMINATION: AMBIENT AIR CONCENTRATIONS

Compliance with EPD toxics guidelines is demonstrated when the potential emissions of a toxic air pollutant result in a predicted ambient impact, or maximum ground level concentration (MGLC), that is less than the acceptable ambient concentration (AAC) determined for that pollutant. For existing stationary sources, the toxics review shall include all existing and proposed new process equipment emitting the same toxic air pollutant. The AAC for a pollutant is derived from pollutant toxicity data determined from the following:

(a) Inhalation Reference Concentrations (RfC) or Risk Based Air Concentrations (RBAC) given in the Integrated Risk Information System (IRIS) database; or
(b) OSHA Permissible Exposure Limits (PEL) given in Tables Z-1 and Z-2 of 29 CFR Part 1910, Subpart Z; or
(c) ACGIH Threshold Limit Values (TLV) given in the American Conference of Governmental and Industrial Hygienists, *Threshold Limit Values for*

Chemical Substances and Physical Agents and Biological Exposure Indices, 1993-1994 Edition; or

(d) NIOSH Recommended Exposure Limits (REL) given in the National Institute for Occupational Safety and Health Pocket Guide to Chemical Hazards

For a TAP, the AAC is determined on a priority schedule, in which toxicity data determined from 2.0(a) has the highest priority and that determined from 2.0(d) has the lowest priority. Table 2-1 below lists each toxic chemical and the corresponding toxicity data from the databases discussed above.

Table 2-1: Summary of Chemicals

Chemical	CAS Number	IRIS[1] (mg/m^3)	OSHA[2] (mg/m^3)	NIOSH[2] (mg/m^3)
Methyl Methacrylate	80-62-6	0.7		
Refined solvent naphtha	8032-32-4			1,800 (15 min)
				350
Solvent Naphtha Light Distillate[3]	64742-89-8			
Stoddard solvent	8052-41-3		2,900	
acetone	67-64-1		2,400	
toluene	108-88-3	5		
2-Butanone	78-93-3	5		
n-Heptane	142-82-5		2,000	
Ethyl alcohol	64-17-5		1,900	
Propylene glycol monomethyl ether	107-98-2	2		
n-Butyl acetate	123-86-4		710	
2-Butoxyethanol	111-76-2	1.6		
Methyl (n-amyl) ketone	110-43-0		465	
Ethyl benzene	100-41-4	1		
n-Butyl alcohol	71-36-3		300	
tert-Butyl alcohol	75-65-0		300	
Isobutyl alcohol	78-83-1		300	
Cumene	98-82-8	0.4		
1,2,4-Trimethylbenzene	95-63-6			125
Xylenes	1330-20-7	0.1		
Acetic acid	64-19-7		25	

[1] IRIS values are based on annual averages. No RBAC values exist for the above TAPs
[2] OSHA and NIOSH are 8-hr Averaging Periods Unless Noted.
[3] OSHA No, IRIS, OSHA, ACGIH, or NIOSH standard, chemical analyzed with alternate standard. See Table 2-2

The ACCs of each TAP have been derived from the data in Table 2-1. For TAPs that have IRIS data, the IRIS concentration is used as the AAC concentration. Data obtained from OSHA and NIOSH have been adjusted for potential public exposure in excess of occupational exposure per Section III.3. For TAPs with 24-hr AACs, TWA values adjustments were done using the following equation. Acute (15-minute) standards are not adjusted based on emission timeframe.

$$Value\ adjusted\ for\ continual\ \exp osure\ over\ averaging\ period = 8hr\ average\left(\frac{40}{x}\right)$$

Where x = number of hours per week emissions occur (168)

In addition, the data had a safety factor applied per Section III.3 of the Georgia Toxics Guidelines using the following equation:

$$AAC = \frac{Time\ Adjusted\ Value}{Safety\ Factor}$$

The safety factor used to adjust TWA's for pollutants which are not known human carcinogens was 100. Known carcinogen TWA's were adjusted by a safety factor of 300 (all TAPs considered are not confirmed carcinogens). Acute irritants (15-minute averages) were adjusted with a safety factor of 10 per Georgia Toxic Guidelines.

Table 2-2: Summary of AACs for Toxics

Chemical	CAS Number	Averaging Period	AAC (mg/m^3)	Toxicity Standard Basis for AAC
Refined solvent naphtha	8032-32-4	15-min	180	15-min NIOSH
		24-hr	0.83	8-hr NIOSH
Stoddard solvent	8052-41-3	24-hr	6.90	8-hr OSHA
Solvent Naphtha Light Distillate	64742-89-8	24-hr	3,500	MDEQ Screening Level[1]
acetone	67-64-1	24-hr	5.71	8-hr OSHA
toluene	108-88-3	Annual	5.00	Annual-IRIS
2-Butanone	78-93-3	Annual	5.00	Annual-IRIS
n-Heptane	142-82-5	24-hr	4.76	8-hr OSHA
Ethyl Alcohol	64-17-5	24-hr	4.52	8-hr OSHA
tert-Butyl acetate	540-88-5	24-hr	2.26	8-hr OSHA
Propylene glycol monomethyl ether	107-98-2	Annual	2.00	Annual-IRIS
n-Butyl acetate	123-86-4	24-hr	1.69	8-hr OSHA
2-Butoxyethanol	111-76-2	Annual	1.60	Annual-IRIS
Methyl (n-amyl) ketone	110-43-0	24-hr	1.11	8-hr OSHA
Ethyl benzene	100-41-4	Annual	1.00	Annual-IRIS
n-Butyl alcohol	71-36-3	24-hr	0.71	8-hr OSHA
tert-Butyl alcohol	75-65-0	24-hr	0.71	8-hr OSHA
Isobutyl alcohol	78-83-1	24-hr	0.71	8-hr OSHA
Methyl Methacrylate	80-62-6	Annual	0.7	Annual-IRIS
Cumene	98-82-8	Annual	0.40	Annual-IRIS
1,2,4-Trimethylbenzene	95-63-6	24-hr	0.30	8-hr NIOSH
Xylenes	1330-20-7	Annual	0.10	Annual-IRIS
Acetic acid	64-19-7	24-hr	0.060	8-hr OSHA

[1] Based on Michigan Department of Environmental Quality Initial Threshold Screening Level

In addition to the TAPs identified in Tables 2-1 and 2-2, the facility has the potential to emit several substances with no toxicity data available in the IRIS, OSHA, ACGIH, or NIOSH databases. These substances are provided in Table 3-1. As there was no available toxicity data for these substances, no further analysis will be performed unless required by EPD.

Table 2-3: Emitted Substances With No Available Toxicity Data

Chemical Name	CAS Number
Acetylacetone	123-54-6
Naphtha (petroleum),hydrotreated heavy	64742-48-9
Propylene glycol monomethyl ether acetate	108-65-6
Solvent naphtha(petroleum), light arom.	64742-95-6
2-(2H-Benzotriazol-2-yl)-4,6-ditertpentylphenol	25973-55-1
pentyl propanoate	624-54-4
2-methoxypropyl acetate	70657-70-4
Ketones	71808-49-6
dimethyl glutarate	1119-40-0
trimethylbenzene	25551-13-7
Ethyl 3-ethoxypropionate	763-69-9
1-Methyl-2-pyrrolidone	872-50-4
Naphtha (petroleum) light alkylate	64741-66-8

Due to the potential emission rates and small AACs for several of the emitted TAPs, the facility has determined the best approach for analyzing potential TAP emissions is to create a refined dispersion model which predicts the potential impact of each TAP on the surrounding air as the facility will not pass assessment using SCREEN3.

3.0 REFINED MODELING: ISC3 ASSESSMENT

Section II.1.B of the Guideline requires the use of the USEPA Industrial Source Complex (ISC3) dispersion model to determine the maximum short-term (time periods of 24 hours or less) and annual ground level concentrations of a pollutant being emitted. 15-minute averages are calculated by multiplying 1-hr results by 1.32 per the Georgia Toxics Guidelines. ISC3 is a computer solution to the Gaussian plume dispersion model and is used to determine pollutant concentrations at the plume centerline and at the ground level downwind of the release points.

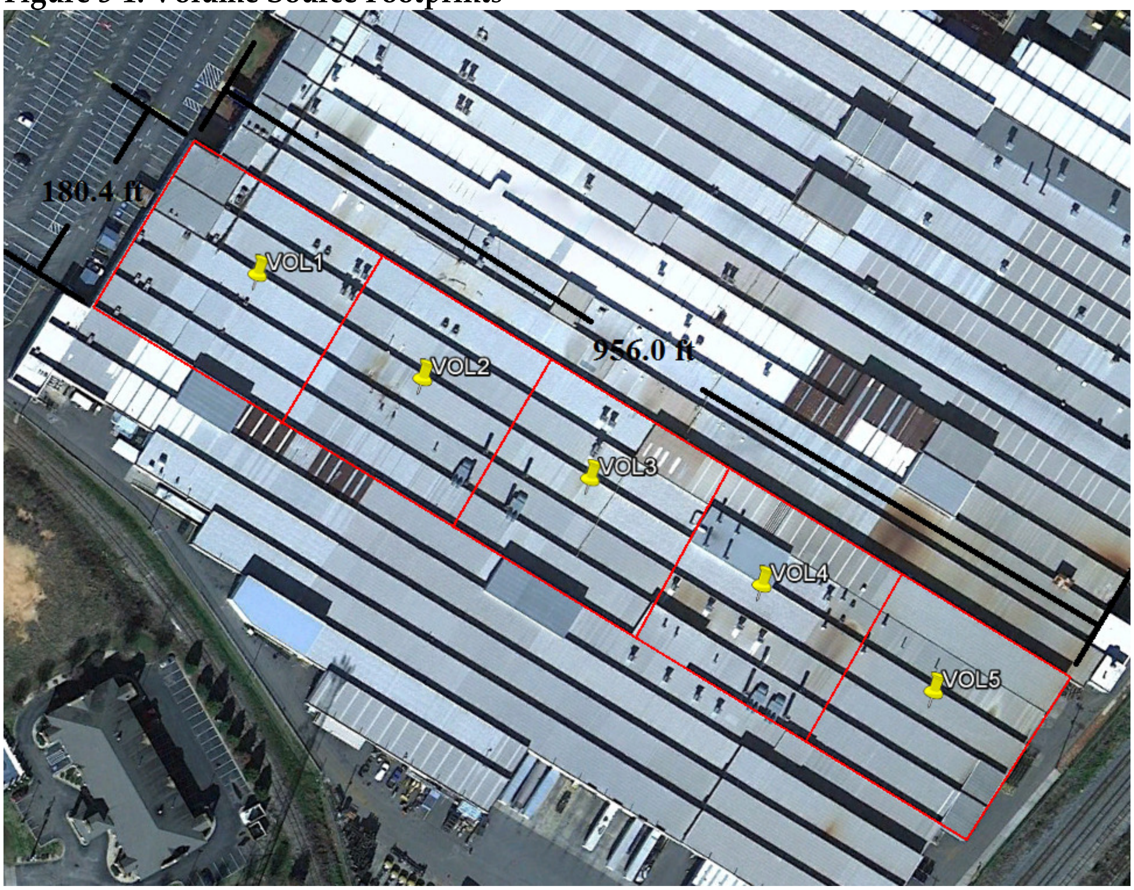
The emission rate for each chemical is calculated in Attachment B, Tables 6-22. The emission rates are the calculated potential to emit from each stack as if the facility were to run at maximum design rate for 8,760 hours per year. A stack profile summary, including the emission rates of each TAP from each stack is provided in Table D-1 (attached). All stacks except TU05-TU08 are vertically aligned with unobstructed flow. Therefore, emissions from these stacks were modeled using the actual, unadjusted flow rate and velocity of each stack. Stacks TU05-TU08 discharge horizontally and were adjusted to have an exit velocity of 0.001 m/s in the dispersion model. The effective diameter of the horizontal stacks was adjusted by the following equation to maintain the flowrate and buoyancy of the stack emissions:

$$(\text{Modified diameter, m}) = 31.6 * (\text{existing diameter, m}) * (\text{existing velocity, m/s})^{0.5}$$

Details regarding the parameters used for the volume sources can be seen in Table 1 of this attachment, as well as in Figure 3-4. Additionally, TAP emissions due to the combustion of natural gas in the bake ovens are considered to be minimal and are not considered in this analysis.

The TAP emissions associated with the cleaning activities in PB27, PB28, PB29, and PB31 do not occur within the booths, but just outside of each booth. Therefore, emissions from these cleaning activities have been modeled as five volume sources equally spaced in the coating application area of the plant as seen in Figure 3-1, below:

Figure 3-1: Volume Source Footprints



For multiple volume sources, the north-south and east-west dimensions for each volume must be the same. Therefore, the building length (956.0 ft) was divided by the building width (180.4 ft) to determine the number of volume sources required (5).The length of each volume source (239.0 ft. ft) was then averaged with the width of each volume source (180.4 ft) to calculate an effective volume width (209.5 ft) so that the north-south and east-west dimensions of each volume source are equal. Per the Users Guide for the Industrial Source Complex (ISC3) - Dispersion Models (Volume II), the release height (10.5 ft) was calculated to be half of the average roof height (21 ft). The lateral dimension (48.7 ft) for each volume source was calculated to be the effective volume width divided by 4.3; the vertical dimension (9.77 ft) for each volume source were calculated to be the average roof height divided by 2.15

Cleaning activities associated with the touchup booths (PB10, PB11, and PB30) occur within the booths themselves and are emitted through each booth's stacks as point source emissions. Details regarding the modeled volume source parameters are provided in Table D-1 (attached).

The modeling protocol used to determine the maximum ground level concentrations of each TAP is as follows:

(a) The Regulatory Default Mode was selected
(b) The maximum toxic pollutant emissions rate, expressed as a one-hour average, was used.
(c) The option for flagpole receptors was not used.
(d) Dispersion coefficients were selected based on the Auer Land Use Procedure; rural dispersion coefficients shall be used since well over 50% of the area surrounding the facility is primarily undeveloped rural land. (see below)
(e) Consideration was given to both simple and complex terrain.
(f) Receptor and source elevations were determined by AERMAP from the United States Geological Society (USGS) 30-meter (1 arc-second) Digital Elevation Models (DEM) imported into the dispersion model.
(g) Downwash analysis was not employed as not requested by EPD.
(h) ISC meteorological data was obtained from EPD for the appropriate surface and upper air stations (Macon and Waycross, respectively) for the years 1984-1988.
(i) Figure 2 provides a facility satellite photograph with the fenced boundary line indicated.
(j) A Cartesian receptor grid of no less than 100 meter density was placed around the boundary and extended from the facility to a distance of 2,000 meters.

Classification of land use in the immediate area surrounding a facility is important in determining the appropriate dispersion coefficients to select for a particular modeling application. The selection of either rural or urban dispersion coefficients for a specific application should follow one of the two procedures. These include a land use classification procedure or a population based procedure to determine whether the area is primarily urban or rural.

The land use within the total area circumscribed by a 3 km radius circle (28.3 km2) about the facility was classified using the meteorological land use typing scheme proposed by Auer. If land use types I1 (Heavy Industrial), I2 (Light Industrial), C1 (Commercial), R2 (Residential; Small Lot Single Family & Duplex), and R3 (Residential; Multi-Family) account for 50 percent or more of the circumscribed area, urban dispersion coefficients should be used; otherwise, rural dispersion coefficients are appropriate. Figure 3-2 presents an aerial image of the 2006 United States Geological Survey (USGS) National Land Cover Dataset (NLCD2006).

After close inspection of the USGS NLCD92 land use data, the predominant land use type in the area surrounding the Blue Bird facility can be characterized as Developed, Open Space; Cultivated Crops; and Mixed Forrest. The Developed, Open Space use type is defined as areas with a mixture of some constructed materials, but mostly vegetation in the form of lawn grasses. Impervious surfaces account for less than 20% of total cover. These areas most commonly include large-lot single-family housing units, parks, golf courses, and vegetation planted in developed settings for recreation, erosion control, or aesthetic purposes. Because the area around the facility had this use in addition to mixed forest and agricultural land, rural dispersion coefficients were selected.

Figure 3-2: Land Use Map (NLCD2006)

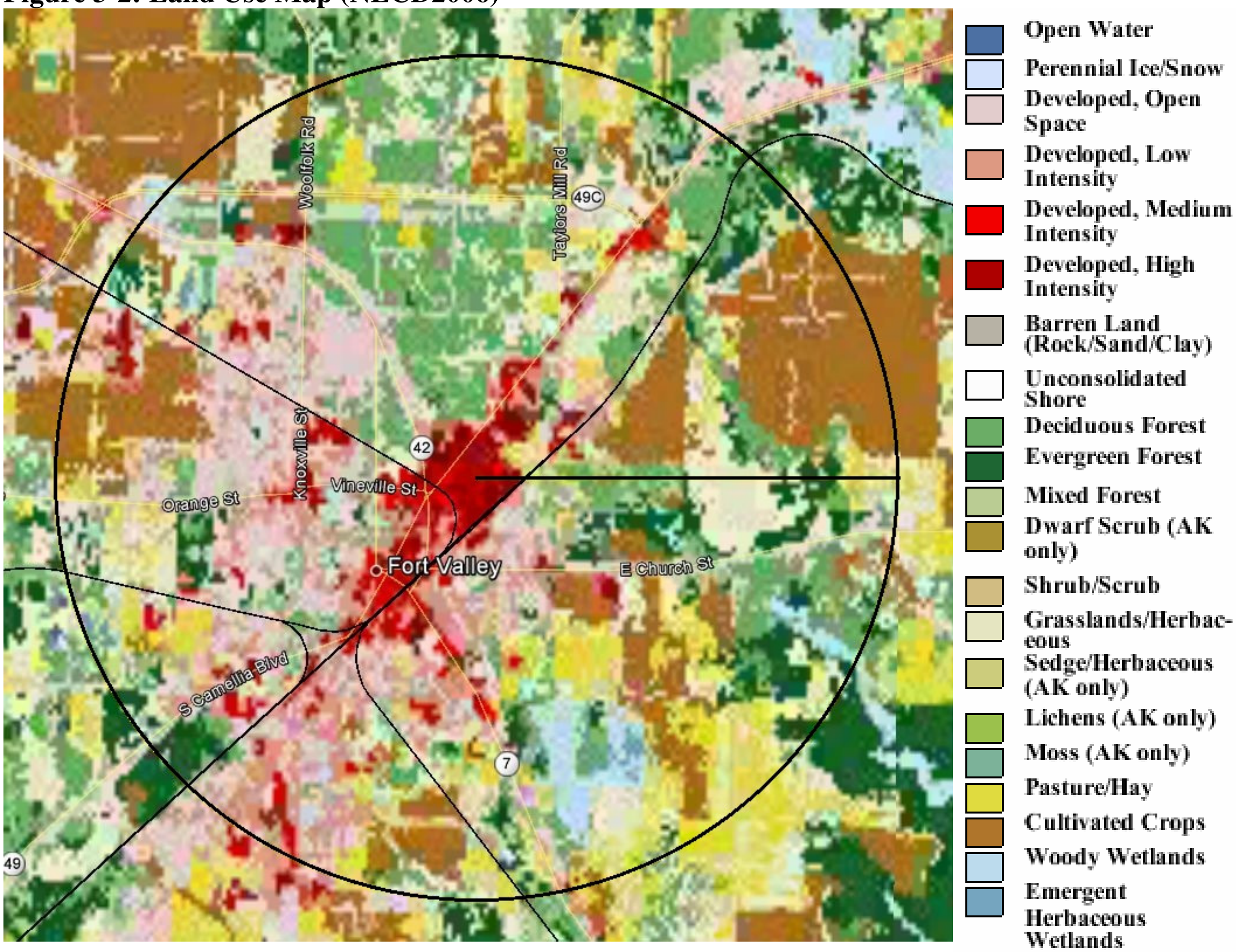


Figure 3-3: Facility Property and Fence line

A detailed table of stack data input into the model is given in attached Table 1. The ISCST3 facility/stack layout is shown below in Figure 3-4, and results of the refined model are shown in Table 3-1. The locations and parameters for each stack are included in Table 1 (attached). Building information is summarized in Table 2 (attached). Refined modeling demonstrates that the potential TAP emissions from the facility do not exceed the predetermined acceptable ambient concentration (AAC) for any pollutant.

Figure 3-4: Refined (ISC3) Facility/Stack Layout

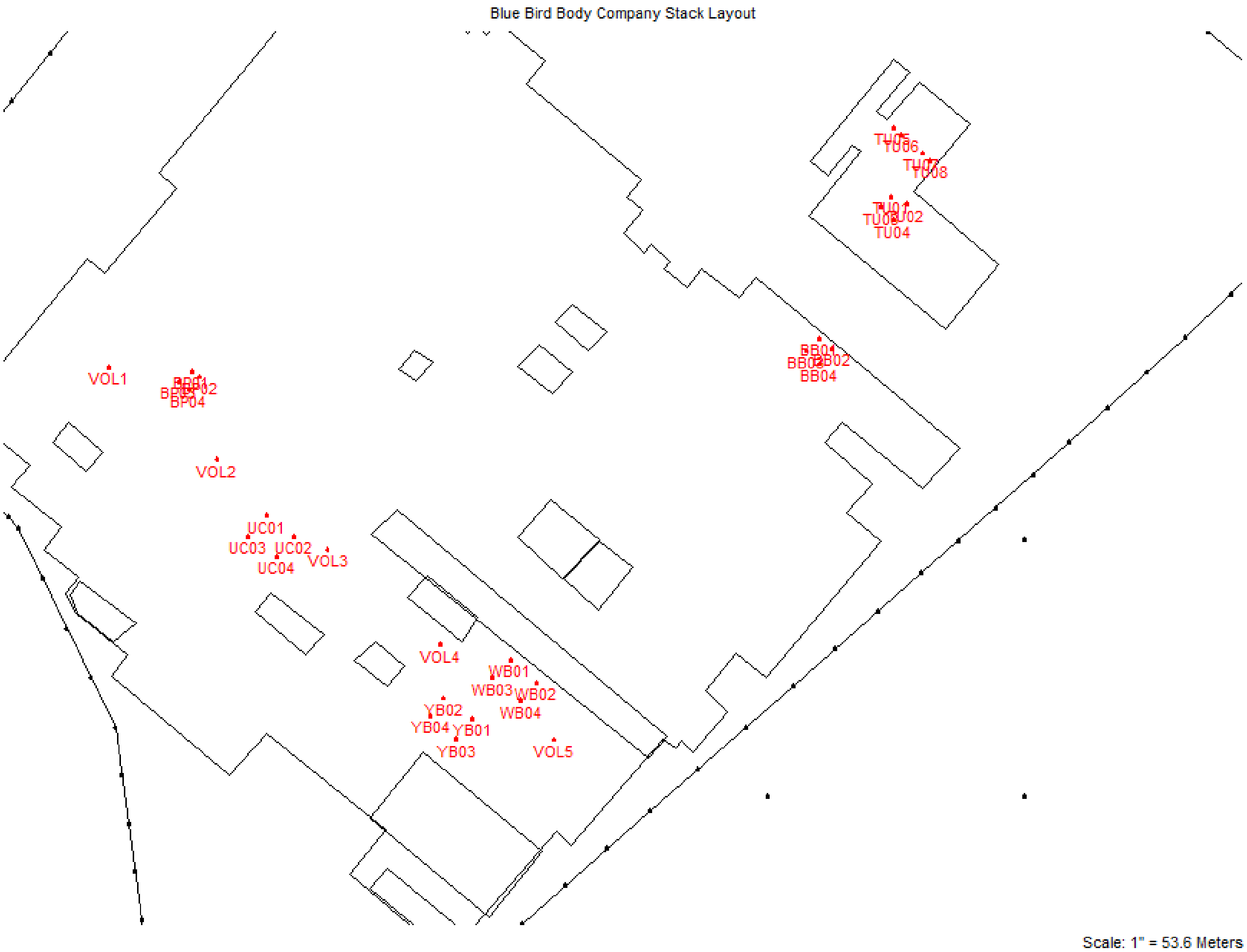


Table 3-1: Refined (ISC3) Modeling Results

Pollutant	CAS #	Averaging Period[1]	Maximum Modeled Concentration (µg/m³)	AAC (µg/m³)	In Compliance?
Refined solvent naphtha	8032-32-4	15-min	1.32	180,000	Yes
		24-hr	5.13	830	Yes
Stoddard solvent	8052-41-3	24-hr	0.35	6,900	Yes
Solvent Naphtha Light Distillate	64742-89-8	24-hr	2,563	3,500	Yes
Acetone	67-64-1	24-hr	5,153	5,710	Yes
Toluene	108-88-3	Annual	0.044	5,000	Yes
2-Butanone	78-93-3	Annual	1.49	5,000	Yes
n-Heptane	142-82-5	24-hr	1.63	4,760	Yes
Ethyl Alcohol	64-17-5	24-hr	0.14	5,250	Yes
tert-Butyl acetate	540-88-5	24-hr	24.35	2,260	Yes
Propylene glycol monomethyl ether	107-98-2	Annual	0.15	2,000	Yes
n-Butyl acetate	123-86-4	24-hr	47.89	1,690	Yes
2-Butoxyethanol	111-76-2	Annual	0.91	1,600	Yes
Methyl (n-amyl) ketone	110-43-0	24-hr	9.36	1,110	Yes
Ethyl benzene	100-41-4	Annual	2.11	1,000	Yes
n-Butyl alcohol	71-36-3	24-hr	1.07	710	Yes
tert-Butyl alcohol	75-65-0	24-hr	0.046	710	Yes
Isobutyl alcohol	78-83-1	24-hr	0.42	710	Yes
Methyl Methacrylate	80-62-6	Annual	0.017	700	Yes
Cumene	98-82-8	Annual	0.021	400	Yes
1,2,4-Trimethylbenzene	95-63-6	24-hr	14.27	300	Yes
Xylenes	1330-20-7	Annual	11.63	100	Yes
Acetic acid	64-19-7	24-hr	0.088	60	Yes

[1] ISC3 Dispersion Model Calculated 1-hr, 24-hr, and annual averages. 15-minute Averages = 1-hr Average * 1.32

Table 1: Facility Stack Profile

Emission Unit ID	Emission Unit Description	Stack ID	Easting - X (m)	Northing - Y (m)	Stack Height (ft)	Stack Diameter (ft)	Velocity (ft/s)	Airflow (acfm)	Discharge Orientation[1] (H/V/R)	Modified Exit Velocity[2] (m/s)	Effective Diameter[3] (m)	Exit Temperature (ºF)
PB10	All American Touch Up Booth	TU01	229,745	3,606,135	40	4	50.00	12,000	V	---	---	77
		TU02	229,751	3,606,132	40	4	50.00	12,000	V	---	---	77
		TU03	229,741	3,606,131	40	4	50.00	12,000	V	---	---	77
		TU04	229,746	3,606,126	40	4	50.00	12,000	V	---	---	77
PB27	Undercoat	UC01	229,502	3,606,011	35	4	120.83	29,000	V	---	---	77
		UC02	229,513	3,606,003	35	4	120.83	29,000	V	---	---	77
		UC03	229,495	3,606,003	35	4	120.83	29,000	V	---	---	77
		UC04	229,506	3,605,995	35	4	120.83	29,000	V	---	---	77
PB28	Black and Primer	BP01	229,582	3,605,932	35	4	400.00	96,000	V	---	---	77
		BP02	229,571	3,605,940	35	4	400.00	96,000	V	---	---	77
		BP03	229,576	3,605,924	35	4	400.00	96,000	V	---	---	77
		BP04	229,566	3,605,933	35	4	400.00	96,000	V	---	---	77
PB29	Yellow	YB01	229,473	3,606,067	35	4	400.00	96,000	V	---	---	77
		YB02	229,476	3,606,065	35	4	400.00	96,000	V	---	---	77
		YB03	229,468	3,606,063	35	4	400.00	96,000	V	---	---	77
		YB04	229,472	3,606,060	35	4	400.00	96,000	V	---	---	77
PB31	White Booth	WB01	229,597	3,605,955	25	4	50.00	12,000	V	---	---	77
		WB02	229,607	3,605,946	25	4	50.00	12,000	V	---	---	77
		WB03	229,590	3,605,948	25	4	50.00	12,000	V	---	---	77
		WB04	229,601	3,605,939	25	4	50.00	12,000	V	---	---	77
PB30	BBCV Touch Up	BB01	229,717	3,606,080	25	4	76.71	18,410	V	---	---	77
		BB02	229,722	3,606,076	25	4	76.71	18,410	V	---	---	77
		BB03	229,712	3,606,075	25	4	76.71	18,410	V	---	---	77
		BB04	229,717	3,606,070	25	4	76.71	18,410	V	---	---	77
PB11	Overflow Touch Up booth	TU05	229,766	3,606,151	24	4	400.00	96,000	H	0.001	425	77
		TU06	229,766	3,606,151	24	4	400.00	96,000	H	0.001	425	77
		TU07	229,766	3,606,151	24	4	400.00	96,000	H	0.001	425	77
		TU08	229,766	3,606,151	24	4	400.00	96,000	H	0.001	425	77
B006	Black and Primer Oven	BO06	---	---	32	4	---	6,000	V	---	---	100
		B016	---	---	32	4	---	6,000	V	---	---	100
B007	Yellow Oven	BO07	---	---	32	4	---	6,000	V	---	---	75
		BO17	---	---	32	4	---	6,000	V	---	---	75
B008	White Oven 1	B008	---	---	25	4	---	2,500	V	---	---	75
		BO18	---	---	25	4	---	2,500	V	---	---	75
B009	White Oven 2	B009	---	---	25	4	---	2,500	V	---	---	100
		BO19	---	---	25	4	---	2,500	V	---	---	100

TAP Emission Rates (lb/hr)

Stack ID	Xylene 1330-20-7	Ethyl Benzene 100-41-4	Toluene 108-88-3	Cumene 98-82-8	2-Butanone 78-93-3	n-Butyl Acetate 123-86-4	1,2,4-Trimethyl benzene 95-63-6	Acetone 67-64-1	Ethyl Alcohol 64-17-5	Stoddard Solvent 8052-41-3	Tert-Butyl Acetate 540-88-5	n-Butyl Alcohol 71-36-3	Methyl (n-amyl) ketone 110-43-0	Isobutyl alcohol 78-83-1	n-Heptane 142-82-5	Refined Solvent Naphtha 8032-32-4	Propylene Glycol Monomethyl Ether 107-98-2	Methyl methacrylate 80-62-6	Acetic Acid 64-19-7	Tert-Butyl Alcohol 75-65-0	2-Butoxyethanol 111-76-2
TU01	1.18	0.21	0.014	0.0000	0.00	0.38	0.0088	0.0032	0.0047	0.000	0.000	0.015	0.077	0.014	0.054	0.044	0.000	0.000	0.000	0.000	0.00
TU02	1.18	0.21	0.014	0.0000	0.00	0.38	0.0088	0.0032	0.0047	0.000	0.000	0.015	0.077	0.014	0.054	0.044	0.000	0.000	0.000	0.000	0.00
TU03	1.18	0.21	0.014	0.0000	0.00	0.38	0.0088	0.0032	0.0047	0.000	0.000	0.015	0.077	0.014	0.054	0.044	0.000	0.000	0.000	0.000	0.00
TU04	1.18	0.21	0.014	0.0000	0.00	0.38	0.0088	0.0032	0.0047	0.000	0.000	0.015	0.077	0.014	0.054	0.044	0.000	0.000	0.000	0.000	0.00
UC01	0.00	0.00	0.00	0.0000	0.00	0.00	0.0000	0.0000	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.81
UC02	0.00	0.00	0.00	0.0000	0.00	0.00	0.0000	0.0000	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.81
UC03	0.00	0.00	0.00	0.0000	0.00	0.00	0.0000	0.0000	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.81
UC04	0.00	0.00	0.00	0.0000	0.00	0.00	0.0000	0.0000	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.81
BP01	0.068	0.0092	0.035	0.0000	0.00	1.63	0.0378	0.0138	0.0203	0.000	2.393	0.271	0.497	0.061	0.231	0.187	0.580	0.000	0.024	0.012	0.00
BP02	0.068	0.0092	0.035	0.0000	0.00	1.63	0.0378	0.0138	0.0203	0.000	2.393	0.271	0.497	0.061	0.231	0.187	0.580	0.000	0.024	0.012	0.00
BP03	0.068	0.0092	0.035	0.0000	0.00	1.63	0.0378	0.0138	0.0203	0.000	2.393	0.271	0.497	0.061	0.231	0.187	0.580	0.000	0.024	0.012	0.00
BP04	0.068	0.0092	0.035	0.0000	0.00	1.63	0.0378	0.0138	0.0203	0.000	2.393	0.271	0.497	0.061	0.231	0.187	0.580	0.000	0.024	0.012	0.00
YB01	0.023	0.000	0.000	0.0122	0.00	0.75	0.2346	0.5048	0.0000	0.000	0.399	0.000	0.118	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
YB02	0.023	0.000	0.000	0.0122	0.00	0.75	0.2346	0.5048	0.0000	0.000	0.399	0.000	0.118	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
YB03	0.023	0.000	0.000	0.0122	0.00	0.75	0.2346	0.5048	0.0000	0.000	0.399	0.000	0.118	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
YB04	0.023	0.000	0.000	0.0122	0.00	0.75	0.2346	0.5048	0.0000	0.000	0.399	0.000	0.118	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
WB01	3.16	0.55	0.00	0.0000	0.99	0.58	0.0000	0.0000	0.0000	0.016	0.399	0.034	0.348	0.000	0.000	0.000	0.097	0.011	0.004	0.0021	0.52
WB02	3.16	0.55	0.00	0.0000	0.99	0.58	0.0000	0.0000	0.0000	0.016	0.399	0.034	0.348	0.000	0.000	0.000	0.097	0.011	0.0040	0.0021	0.52
WB03	3.16	0.55	0.00	0.0000	0.99	0.58	0.0000	0.0000	0.0000	0.016	0.399	0.034	0.348	0.000	0.000	0.000	0.097	0.011	0.0040	0.0021	0.52
WB04	3.16	0.55	0.00	0.0000	0.99	0.58	0.0000	0.0000	0.0000	0.016	0.399	0.034	0.348	0.000	0.000	0.000	0.097	0.011	0.0040	0.0021	0.52
BB01	1.18	0.21	0.014	0.0000	0.00	0.38	0.0088	0.0032	0.0047	0.000	0.000	0.015	0.077	0.014	0.054	0.044	0.000	0.000	0.000	0.000	0.00
BB02	1.18	0.21	0.014	0.0000	0.00	0.38	0.0088	0.0032	0.0047	0.000	0.000	0.015	0.077	0.014	0.054	0.044	0.000	0.000	0.000	0.000	0.00
BB03	1.18	0.21	0.014	0.0000	0.00	0.38	0.0088	0.0032	0.0047	0.000	0.000	0.015	0.077	0.014	0.054	0.044	0.000	0.000	0.000	0.000	0.00
BB04	1.18	0.21	0.014	0.0000	0.00	0.38	0.0088	0.0032	0.0047	0.000	0.000	0.015	0.077	0.014	0.054	0.044	0.000	0.000	0.000	0.000	0.00
TU05	0.71	0.13	0.003	0.0016	0.00	0.10	0.0305	0.0656	0.0000	0.000	0.052	0.000	0.015	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
TU06	0.71	0.13	0.003	0.0016	0.00	0.10	0.0305	0.0656	0.0000	0.000	0.052	0.000	0.015	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
TU07	0.71	0.13	0.003	0.0016	0.00	0.10	0.0305	0.0656	0.0000	0.000	0.052	0.000	0.015	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
TU08	0.71	0.13	0.003	0.0016	0.00	0.10	0.0305	0.0656	0.0000	0.000	0.052	0.000	0.015	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
BO06	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
B016	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BO07	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BO17	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
B008	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BO18	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
B009	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BO19	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Notes

1. H/V/C = Horizontal, Vertical, or Raincap
2. The exit velocity for capped stacks is set to 0.001 m/s in accordance with the GAEPD modeling guidance as well as the USEPA Screening Procedures for Estimating the Air Quality Impact of Stationary Sources, Revised
3. Modified stack diameters are determined via the method laid out in Attachment D of the application, where the modified diameter (m) = 31.6 * (existing diameter, m) * (existing velocity, m/s)^0.5

Volume Source

Volume Source ID	Easting - X (m)	Northing - Y (m)	Release Height[1] (ft)	Initial Horizontal Dimension[2] (ft)	Initial Vertical Dimension[3] (ft)	TAPs[4] (lb/hr) 67-64-1	TAPs[4] (lb/hr) 64742-89-8
VOL1	229,444	3,606,067	10.5	48.60	9.77	14.94	7.43
VOL2	229,486	3,606,031	10.5	48.60	9.77	14.94	7.43
VOL3	229,529	3,605,996	10.5	48.60	9.77	14.94	7.43
VOL4	229,573	3,605,959	10.5	48.60	9.77	14.94	7.43
VOL5	229,617	3,605,922	10.5	48.60	9.77	14.94	7.43

Notes

1. Release Height, ft = Average height of Building (21 ft) / 2 (Center of volume above the ground)
2. Initial Horizontal Dimension per Page 3-20 of the User's Guide for the AMS/EPA
Initial Horizontal Dimension, ft = (Width of coating application area of facility, (180.4 ft)) / 4.3
3. Initial Vertical Dimension per Page 3-20 of the User's Guide for the AMS/EPA
Initial Vertical Dimension, ft = (Average Height of coating application area of facility, (21 ft)) / 2.15
4. TAP emission rates are potential hourly emissions from Cleaning Solvent Use in PB27, PB28, PB29, and PB31 as calculated in Tables 7 and 8. Emissions are evenly divided between each volume source.
Xylene emission rates are based upon the annual xylene emission limit of 120 tpy (scaled assuming 120 tpy results from constant emissions) from cleaning solvent use in PB 27, PB28, PB29, and PB31 evenly divided between each volume source.

Table 2: Blue Bird Building Information

Building Reference	Base Elevation (m)	Tier Height (m)	Number of Corners	Corner (X)	Corner (Y)
1	155.45	8.67	5		
1-1				229,411.0	3,605,774.9
1-2				229,413.8	3,605,767.4
1-3				229,427.7	3,605,756.5
1-4				229,436.3	3,605,763.4
1-5				229,414.8	3,605,779.8
2	155.45	8.24	4		
2-1				229,403.9	3,605,833.7
2-2				229,416.9	3,605,822.9
2-3				229,423.8	3,605,830.0
2-4				229,410.2	3,605,841.5
3	155.10	8.21	4		
3-1				229,482.7	3,605,768.1
3-2				229,502.3	3,605,751.0
3-3				229,509.4	3,605,759.1
3-4				229,489.2	3,605,775.1
4	154.59	7.95	4		
4-1				229,521.3	3,605,749.1
4-2				229,534.2	3,605,739.0
4-3				229,541.0	3,605,746.6
4-4				229,529.5	3,605,756.3
5	155.27	7.99	4		
5-1				229,527.3	3,605,687.8
5-2				229,573.9	3,605,649.3
5-3				229,594.6	3,605,674.5
5-4				229,548.0	3,605,713.0
6	155.38	7.91	4		
6-1				229,527.4	3,605,660.0
6-2				229,558.7	3,605,634.1
6-3				229,566.4	3,605,641.5
6-4				229,534.1	3,605,667.9
7	153.80	6.97	4		
7-1				229,541.9	3,605,773.5
7-2				229,562.9	3,605,756.4
7-3				229,569.5	3,605,765.6
7-4				229,549.7	3,605,781.8
8	153.58	7.82	4		
8-1				229,528.3	3,605,797.9
8-2				229,635.7	3,605,710.9
8-3				229,643.0	3,605,719.4
8-4				229,538.2	3,605,807.3
9	153.00	8.61	4		
9-1				229,602.8	3,605,780.7
9-2				229,615.9	3,605,768.6
9-3				229,629.5	3,605,785.0
9-4				229,617.0	3,605,795.2

Building Reference	Base Elevation (m)	Tier Height (m)	Number of Corners	Corner (X)	Corner (Y)
10	152.84	8.48	4		
10-1				229,585.0	3,605,797.2
10-2				229,602.3	3,605,781.0
10-3				229,616.7	3,605,796.0
10-4				229,598.0	3,605,811.3
11	152.52	7.12	4		
11-1				229,538.7	3,605,862.0
11-2				229,545.5	3,605,857.6
11-3				229,551.9	3,605,865.0
11-4				229,544.7	3,605,869.4
12	151.17	7.97	4		
12-1				229,584.7	3,605,863.4
12-2				229,598.6	3,605,852.8
12-3				229,606.0	3,605,861.0
12-4				229,593.3	3,605,871.9
13	150.50	8.75	4		
13-1				229,599.7	3,605,880.6
13-2				229,612.0	3,605,869.6
13-3				229,619.3	3,605,876.9
13-4				229,606.3	3,605,887.4
14	155.45	4.57	4		
14-1				229,441.9	3,605,591.3
14-2				229,471.0	3,605,556.9
14-3				229,529.5	3,605,605.5
14-4				229,498.6	3,605,640.2
15	144.23	5.99	14		
15-1				229,708.8	3,606,001.4
15-2				229,714.0	3,606,007.7
15-3				229,719.7	3,606,003.2
15-4				229,722.5	3,606,006.7
15-5				229,724.6	3,606,005.0
15-6				229,730.3	3,606,011.5
15-7				229,707.0	3,606,031.2
15-8				229,708.4	3,606,032.9
15-9				229,703.1	3,606,037.1
15-10				229,692.9	3,606,025.4
15-11				229,689.6	3,606,027.9
15-12				229,691.8	3,606,030.6
15-13				229,686.1	3,606,034.4
15-14				229,678.9	3,606,025.2
16	146.63	4.57	14		
16-1				229,771.7	3,605,903.2
16-2				229,738.9	3,605,931.3
16-3				229,760.5	3,605,957.7
16-4				229,741.0	3,605,973.8
16-5				229,728.2	3,605,959.2
16-6				229,724.6	3,605,962.5
16-7				229,737.4	3,605,977.8
16-8				229,731.1	3,605,982.9
16-9				229,699.0	3,605,943.3
16-10				229,705.2	3,605,937.9
16-11				229,715.1	3,605,949.6
16-12				229,718.1	3,605,947.0

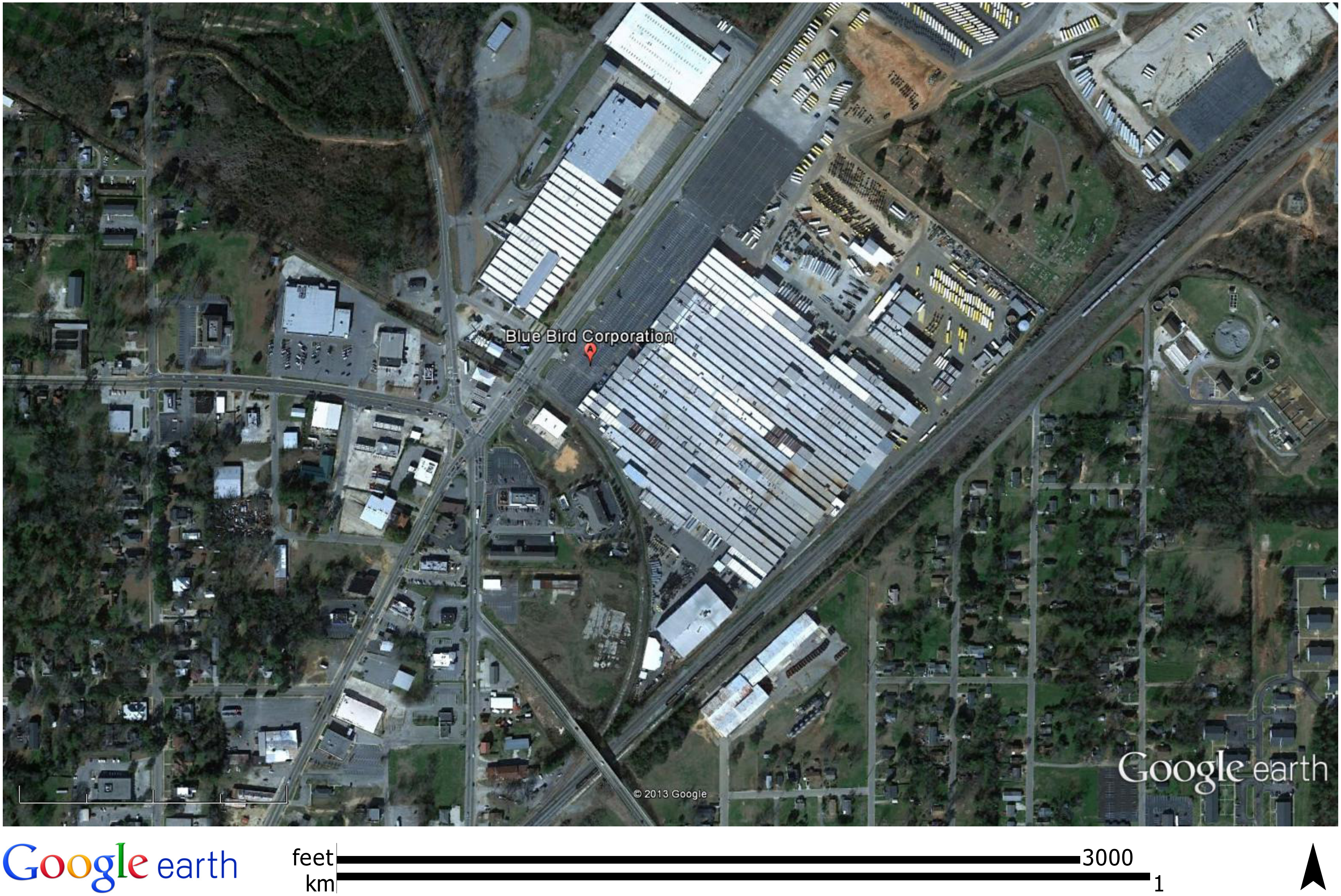
Building Reference	Base Elevation (m)	Tier Height (m)	Number of Corners	Corner (X)	Corner (Y)
16-13				229,698.1	3,605,921.9
16-14				229,751.1	3,605,877.9
17	154.50	5.85	59		
17-1				229,600.0	3,605,682.6
17-2				229,605.6	3,605,677.1
17-3				229,641.0	3,605,718.6
17-4				229,646.0	3,605,714.8
17-5				229,648.5	3,605,718.0
17-6				229,653.2	3,605,713.0
17-7				229,666.4	3,605,729.1
17-8				229,657.9	3,605,737.2
17-9				229,669.6	3,605,751.9
17-10				229,681.6	3,605,742.3
17-11				229,726.3	3,605,795.4
17-12				229,712.4	3,605,806.6
17-13				229,722.5	3,605,817.7
17-14				229,704.5	3,605,833.7
17-15				229,711.1	3,605,841.5
17-16				229,742.3	3,605,816.1
17-17				229,756.7	3,605,831.7
17-18				229,677.5	3,605,897.9
17-19				229,671.1	3,605,889.9
17-20				229,656.5	3,605,901.5
17-21				229,650.6	3,605,894.2
17-22				229,641.6	3,605,901.3
17-23				229,644.1	3,605,904.3
17-24				229,636.6	3,605,910.6
17-25				229,634.2	3,605,907.7
17-26				229,626.2	3,605,915.2
17-27				229,633.4	3,605,924.3
17-28				229,627.3	3,605,929.5
17-29				229,633.0	3,605,936.2
17-30				229,588.2	3,605,973.2
17-31				229,595.5	3,605,982.0
17-32				229,577.0	3,605,997.5
17-33				229,572.9	3,605,992.5
17-34				229,568.2	3,605,996.3
17-35				229,565.5	3,605,993.0
17-36				229,520.3	3,606,028.9
17-37				229,445.2	3,605,938.6
17-38				229,452.3	3,605,932.8
17-39				229,424.3	3,605,899.7
17-40				229,417.2	3,605,905.3
17-41				229,381.6	3,605,861.6
17-42				229,374.5	3,605,867.7
17-43				229,356.6	3,605,845.6
17-44				229,364.0	3,605,839.9
17-45				229,369.4	3,605,846.0
17-46				229,395.2	3,605,824.6
17-47				229,388.0	3,605,816.4
17-48				229,407.4	3,605,800.7
17-49				229,400.5	3,605,792.2
17-50				229,414.3	3,605,781.2

Blue Bird Body Company
PSD Application

Building Reference	Base Elevation (m)	Tier Height (m)	Number of Corners	Corner (X)	Corner (Y)
17-51				229,409.2	3,605,775.1
17-52				229,413.3	3,605,767.4
17-53				229,433.4	3,605,751.0
17-54				229,426.8	3,605,743.0
17-55				229,473.0	3,605,704.6
17-56				229,487.5	3,605,720.8
17-57				229,533.3	3,605,683.3
17-58				229,519.6	3,605,666.0
17-59				229,557.8	3,605,633.3

Attachment E

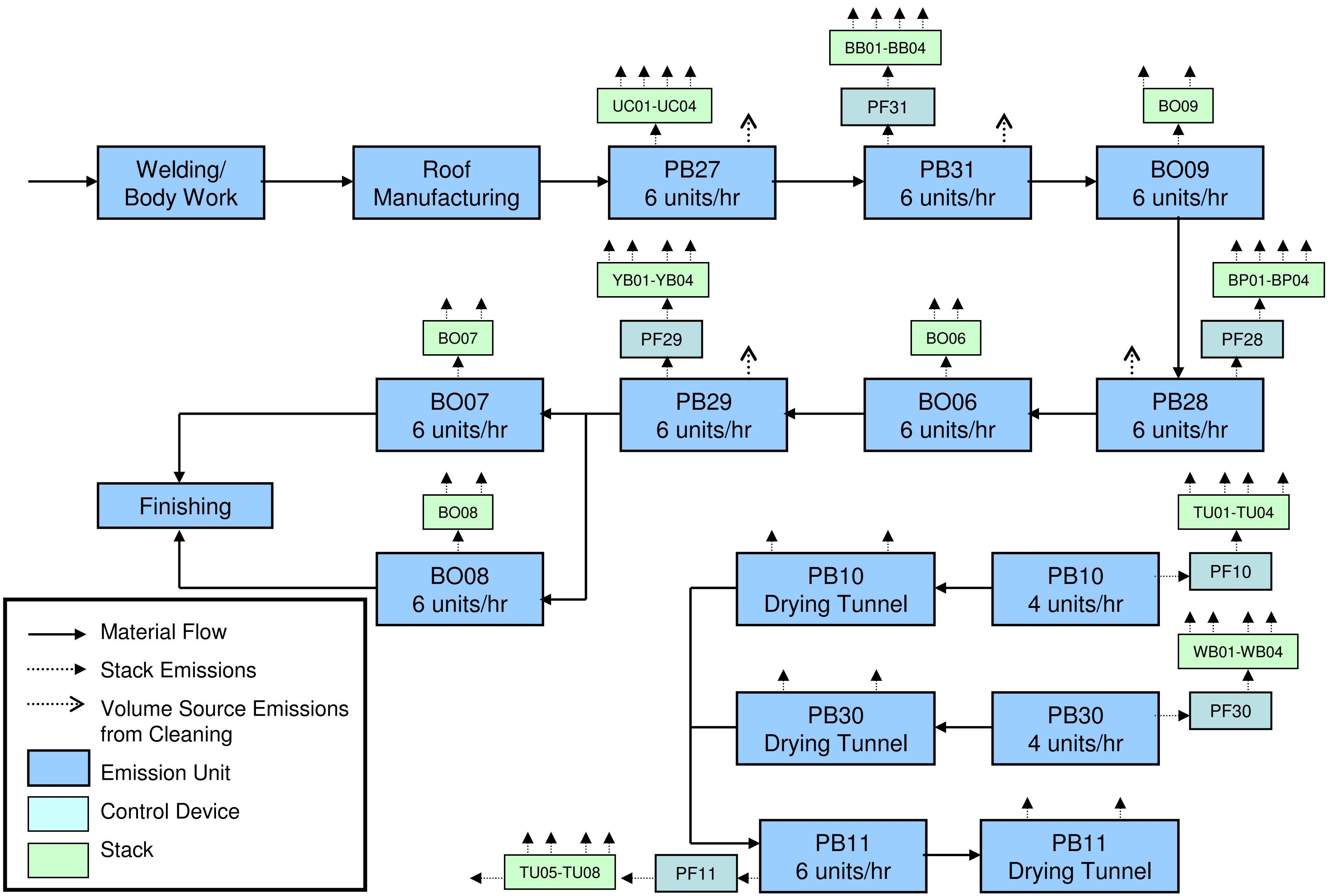
Facility Map and Process Flow Diagram


Blue Bird Corporation
© 2013 Google
Google earth
feet 3000
km 1

Blue Bird Body Corporation - Property Map

Blue Bird Body Company - Stack Locations

Blue Bird Body Company
Process Flow Diagram



Attachment F

Proposed PSD Permit Language

Part 70 Operating Permit Amendment

Permit Number: **3713-225-0001-V-05-1** **Effective Date:** **XXXX XX, XXXX**

Facility Name: **Blue Bird Body Company**

Facility Address: 402 Blue Bird Blvd.
Fort Valley, Georgia 31030, Peach County

Mailing Address: Post Office Box 937
Fort Valley, Georgia 31030

Parent/Holding Company: School Bus Holdings, Inc.

Facility AIRS Number: 04-13-225-00001

In accordance with the provisions of the Georgia Air Quality Act, O.C.G.A. Section 12-9-1, et seq and the Georgia Rules for Air Quality Control, Chapter 391-3-1, adopted pursuant to and in effect under the Act, the Permittee described above is issued a Part 70 Permit for:

> Removal of the PSD avoidance limitation present in Condition No. 2.1.1. This permit includes conditions that specify the requirements of 40 CFR 52.21(j) (Best Available Control Technology).

This permit amendment shall also serve as a final amendment to the Part 70 Permit unless objected to by the U.S. EPA or withdrawn by the Division. The Division will issue a letter when this Operating Permit amendment is finalized.

This Permit Amendment is conditioned upon compliance with all provisions of The Georgia Air Quality Act, O.C.G.A. Section 12-9-1, et seq, the Rules, Chapter 391-3-1, adopted and in effect under that Act, or any other condition of this Permit Amendment and Permit No.4911-087-0053-V-01-0. Unless modified or revoked, this Permit Amendment expires simultaneously with Part 70 Permit No. 4911-087-0053-V-01-0.

This Permit Amendment may be subject to revocation, suspension, modification or amendment by the Director for cause including evidence of noncompliance with any of the above; or for any misrepresentation made in Application No. TV-XXXXX dated XXXX XX,XXXX; any other applications upon which this Permit Amendment or Permit No. 3713-225-0001-V-05-1 are based; supporting data entered therein or attached thereto; or any subsequent submittal or supporting data; or for any alterations affecting the emissions from this source.

This Permit Amendment is further subject to and conditioned upon the terms, conditions, limitations, standards, or schedules contained in or specified on the attached **6**, which pages are a part of this Permit Amendment, and which hereby become part of Permit No. 3713-225-0001-V-05-0.

[Signed]

Director
Environmental Protection Division

Table of Contents

PART 1.0 FACILITY DESCRIPTION

1.3 Overall Facility Process Description

The facility is requesting the removal of the PSD avoidance limits for facility-wide Voc emissions. Condition No. 2.1.1 will be deleted, and Condition Nos. 6.1.7 and 6.2.5 will be modified to delete the references to the facility-wide 250 tpy VOC limit.

The removal of the VOC limitation in Condition No. 2.1.1 will trigger a major modification to the facility under the "Prevention of Significant Deterioration (PSD)" regulations (40 CFR 52.21). Per the PSD regulations VOC emitting units have gone through a technology review to determine the Best Available Control Technology (BACT) and the limits in this permit represent BACT. The facility has submitted a PSD application for the above emission units that include the required modeling and a BACT review.

PART 2.0 REQUIREMENTS PERTAINING TO THE ENTIRE FACILITY

2.1 Facility Wide Emission Caps and Operating Limits

2.1.1 *Deleted*

2.3 Facility Wide SIP Rule Standards

New Permit Conditions

2.3.1 At all times, including periods of startup, shutdown, and malfunction, the Permittee shall maintain and operate this source, including associated air pollution control equipment, in a manner consistent with good air pollution control practice for minimizing emissions. Determination of whether acceptable operating and maintenance procedures are being used will be based on information available to the Division which may include, but is not limited to, monitoring results, opacity observations, review of operating and maintenance procedures, and inspection or surveillance of the source.
[391-3-1-.02(2)(a)10]

2.3.2 The Permittee shall not build, erect, install or use any article, machine, equipment or process the use of which conceals an emission, which would otherwise constitute a violation of an applicable emission standard. Such concealment includes, but is not limited to, the use of gaseous diluents to achieve compliance with an opacity standard or with a standard that is based on the concentration of a pollutant in the gases discharged into the atmosphere.
[391-3-1-.03(2)(c)]

2.1.3 The Permittee shall submit a Georgia Air Quality Permit application to the Division prior to the commencement of any modification, as defined in 391-3-1-.01(pp), which may result in air pollution and which is not exempt under 391-3-1-.03(6). Such application shall be submitted sufficiently in advance of any critical date involved to allow adequate time for review, discussion, or revision of plans, if necessary. The application shall include, but not be limited to, information describing the precise nature of the change, modifications to any emission control system, production capacity and pollutant emission rates of the plant before and after the change, and the anticipated completion date of the change.
[391-3-1-.03(1) through (8)]

2.3.4 Unless otherwise specified, all records required to be maintained by this Permit shall be recorded in a permanent form suitable for inspection and submission to the Division and shall be retained for at least five (5) years following the date of entry.
[391-3-1-.03(2)(c)]

2.3.5 In cases where conditions of this Permit conflict with each other for any particular source or operation, the most stringent condition shall prevail.
[391-3-1-.02(2)(a)2]

2.3.6 At any time that the Division determines that additional control of emissions from the facility may reasonably be needed to provide for the continued protection of public health,

safety and welfare, the Division reserves the right to amend the provisions of this Permit pursuant to the Division's authority as established in the Georgia Air Quality Act and the rules adopted pursuant to that Act.
[391-3-1-.03(3)(a)]

2.3.7 This Permit is not transferable by the Permittee. Future owners and operators shall obtain a new Permit from the Director.
[391-3-1-.03(4)]

2.3.8 If any of the emission standards or requirements in this permit is revised by EPA or the Division after the issuance of this permit, the Permittee shall comply with the revised standard(s) or requirement(s) on and after its effective date.

PART 3.0 REQUIREMENTS FOR EMISSION UNITS

Note: Except where an applicable requirement specifically states otherwise, the averaging times of any of the Emissions Limitations or Standards included in this permit are tied to or based on the run time(s) specified for the applicable reference test method(s) or procedures required for demonstrating compliance.

3.1 Emission Units Associated with this Permit Amendment

Emission Units		Specific Limitations/Requirements		Air Pollution Control Devices	
ID No.	Description	Applicable Requirements/Standards	Corresponding Permit Conditions	ID No.	Description
BO06	Black and Primer Bake Oven	40 CFR 63 Subpart MMMM 391-3-1-.02(2)(b) 391-3-1-.02(2)(d) 391-3-1-.02(2)(e) 391-3-1-.02(2)(g) 40 CFR 52.21(j)	3.2.1, 3.3.1 thru 3.3.4, 3.4.1 thru 3.4.7, 3.5.2, 5.2.2, 6.2.1 thru 6.2.17	N/A	None
BO07	Yellow Booth Bake Oven	40 CFR 63 Subpart MMMM 391-3-1-.02(2)(b) 391-3-1-.02(2)(d) 391-3-1-.02(2)(e) 391-3-1-.02(2)(g) 40 CFR 52.21(j)	3.2.1, 3.3.1 thru 3.3.4, 3.4.1 thru 3.4.7, 3.5.2, 5.2.2, 6.2.1 thru 6.2.17	N/A	None
BO08	White Booth Bake Oven 1	40 CFR 63 Subpart MMMM 391-3-1-.02(2)(b) 391-3-1-.02(2)(d) 391-3-1-.02(2)(e) 391-3-1-.02(2)(g) 40 CFR 52.21(j)	3.2.1, 3.3.1 thru 3.3.4, 3.4.1 thru 3.4.7, 3.5.2, 5.2.2, 6.2.1 thru 6.2.17	N/A	None
BO09	White Booth Bake Oven 2	40 CFR 63 Subpart MMMM 391-3-1-.02(2)(b) 391-3-1-.02(2)(d) 391-3-1-.02(2)(e) 391-3-1-.02(2)(g) 40 CFR 52.21(j)	3.2.1, 3.3.1 thru 3.3.4, 3.4.1 thru 3.4.7, 3.5.2, 5.2.2, 6.2.1 thru 6.2.17	N/A	None
PB10	All American Touchup Booth	40 CFR 63 Subpart MMMM 391-3-1-.02(2)(b) 391-3-1-.02(2)(e) 391-3-1-.02(2)(ii) 40 CFR 52.21(j)	3.2.2, 3.3.1 thru 3.3.4, 3.4.1 thru 3.4.4, 3.5.1, 3.5.2, 5.2.1, 5.2.2, 6.2.1 thru 6.2.17	PF10	Dry Paint Filter
PB11	Overflow Paint Booth	40 CFR 63 Subpart MMMM 391-3-1-.02(2)(b) 391-3-1-.02(2)(e) 391-3-1-.02(2)(ii) 40 CFR 52.21(j)	3.2.2, 3.3.1 thru 3.3.4, 3.4.1 thru 3.4.4, 3.5.1, 3.5.2, 5.2.1, 5.2.2, 6.2.1 thru 6.2.17	PF11	Dry Paint Filter
PB27	Undercoat Booth	40 CFR 63 Subpart MMMM 391-3-1-.02(2)(b) 391-3-1-.02(2)(e) 391-3-1-.02(2)(ii) 40 CFR 52.21(j)	3.2.2, 3.3.1 thru 3.3.4, 3.4.1 thru 3.4.4, 3.5.1, 3.5.2, 5.2.1, 5.2.2, 6.2.1 thru 6.2.17	N/A	None
PB28	Black and Primer Paint Booth	40 CFR 63 Subpart MMMM 391-3-1-.02(2)(b) 391-3-1-.02(2)(e) 391-3-1-.02(2)(ii) 40 CFR 52.21(j)	3.2.2, 3.3.1 thru 3.3.4, 3.4.1 thru 3.4.4, 3.5.1, 3.5.2, 5.2.1, 5.2.2, 6.2.1 thru 6.2.17	PF28	Dry Paint Filter
PB29	Yellow Paint Booth	40 CFR 63 Subpart MMMM 391-3-1-.02(2)(b) 391-3-1-.02(2)(e) 391-3-1-.02(2)(ii) 40 CFR 52.21(j)	3.2.2, 3.3.1 thru 3.3.4, 3.4.1 thru 3.4.4, 3.5.1, 3.5.2, 5.2.1, 5.2.2, 6.2.1 thru 6.2.17	PF29	Dry Paint Filter

Emission Units		Specific Limitations/Requirements		Air Pollution Control Devices	
ID No.	**Description**	**Applicable Requirements/Standards**	**Corresponding Permit Conditions**	**ID No.**	**Description**
PB30	BBCV Touch Up Booth	40 CFR 63 Subpart MMMM 391-3-1-.02(2)(b) 391-3-1-.02(2)(e) 391-3-1-.02(2)(ii) 40 CFR 52.21(j)	3.2.2, 3.3.1 thru 3.3.4, 3.4.1 thru 3.4.4, 3.5.1, 3.5.2, 5.2.1, 5.2.2, 6.2.1 thru 6.2.17	PF30	Dry Paint Filter
PB31	White Paint Booth	40 CFR 63 Subpart MMMM 391-3-1-.02(2)(b) 391-3-1-.02(2)(e) 391-3-1-.02(2)(ii) 40 CFR 52.21(j)	3.2.2, 3.3.1 thru 3.3.4, 3.4.1 thru 3.4.4, 3.5.1, 3.5.2, 5.2.1, 5.2.2, 6.2.1 thru 6.2.17	PF31	Dry Paint Filter

* Generally applicable requirements contained in this permit may also apply to emission units listed above. The lists of applicable requirements/standards and corresponding permit conditions are intended as a compliance tool and may not be definitive.

3.3 Equipment Federal Rule Standards

New Permit Conditions

<u>*Best Available Control Technology*</u>

3.3.5 The Permittee shall use Good combustion practices and the exclusive use of natural gas in Emission Unit ID Nos. BO06, BO07, BO08, and BO09. The Permittee shall develop written operation, inspection, and maintenance procedures and work practice plans with regards to this condition. These procedures and plans shall be developed and implemented to ensure the satisfaction of the applicable operating requirements in this condition. All inspections and maintenance activities shall be recorded in a permanent form suitable for inspection and submission to the Division.
[40 CFR 52.21(j) – PSD/BACT]

3.3.6 The Permittee shall not discharge or cause the discharge into the atmosphere from spray booth operations at the facility, VOC emissions in excess of the following during any twelve consecutive months:
[40 CFR 52.21 – PSD/BACT]

Emission Unit ID No.	VOC BACT Emission Limits (tons/12-month rolling total)
PB10	22.0
PB11	35.7
PB27	101.0
PB28	200.0
PB29	150.0
PB30	49.00
PB31	95.00

PART 6.0 RECORD KEEPING AND REPORTING REQUIREMENTS

6.1 General Record Keeping and Reporting Requirements

Modified Permit Condition

6.1.7 For the purpose of reporting excess emissions, exceedances or excursions in the report required in Condition 6.1.4, the following excess emissions, exceedances, and excursions shall be reported:
[391-3-1-.02(6)(b)1, 40 CFR 70.6(a)(3)(iii) 391-3-1-.02(2)(a)8., and 391-3-1-.02(2)(ii)]

a. Excess emissions: (means for the purpose of this Condition and Condition 6.1.4, any condition that is detected by monitoring or record keeping which is specifically defined, or stated to be, excess emissions by an applicable requirement)

i. None required to be reported in accordance with Condition 6.1.4.

b. Exceedances: (means for the purpose of this Condition and Condition 6.1.4, any condition that is detected by monitoring or record keeping that provides data in terms of an emission limitation or standard and that indicates that emissions (or opacity) do not meet the applicable emission limitation or standard consistent with the averaging period specified for averaging the results of the monitoring)

i. *Removed*

ii. For miscellaneous metal parts surface coating lines/booths, any period during which the average VOC emissions from all the coating lines/booths exceed the applicable limit(s) specified in Rule 391-3-1-.02(2)(ii).

iii. The use of any coating in Emission Units ID Nos. PB10, PB11, PB27, PB28, PB29, PB30 and PB31 that has a VOC content exceeding the limits specified in Condition No. 3.4.1.

iv. Exceedances of 40 CFR 63 Subpart MMMM are reported via Condition 6.2.6.

v. *Exceedances of VOC BACT emission limits specified in Condition 6.2.5.*

c. Excursions: (means for the purpose of this Condition and Condition 6.1.4, any departure from an indicator range or value established for monitoring consistent with any averaging period specified for averaging the results of the monitoring)

i. Any instance of failure to follow the dry paint filter monitoring and/or replacement requirements as set forth in Conditions 3.5.1 and 5.2.1.

d. In addition to the excess emissions, exceedances and excursions specified above, the following should also be included with the report required in Condition 6.1.4:

i. Any instance of failure to comply with work practice standards in Condition 3.5.2 as indicated by inspections required by Condition 5.2.2;

6.2 Specific Record Keeping and Reporting Requirements

Modified Permit Condition

6.2.3 The Permittee shall maintain monthly usage records of all VOC materials utilized for the entire facility at this site. The records shall include the total weight of each material used, *paint booth in which material was used*, the VOC, solids and/or water content of each material, as required for the determination of appropriate VOC emission rates to demonstrate compliance with the applicable VOC emission limits in this permit. The Permittee may subtract from the monthly usage the VOC content of any material disposed as containerized waste provided that the total weight, VOC content (expressed as a weight percentage), and documentation of the method for determining the VOC content of any such waste be included as part of the record. All calculations used to determine material usages should be kept as part of the monthly record and/or daily record. These records shall be kept available for inspection or submittal for five (5) years from the date of record. [391-3-1-.02(6)(b)1. & 391-3-1.03(2)(c)]

6.2.4 The Permittee shall use the records required in Condition 6.2.3 to calculate combined total monthly VOC emissions *for each paint booth (Emission Unit ID Nos. PB10, PB11, PB27, PB28, PB29, PB30, and PB31).* All demonstration calculations used in the calculations shall be kept as part of the records required in this condition.

$$VOC_i = \sum_{i=1}^{n} (Content_i)(Quantity_i)/(2{,}000 lbs / ton)$$

Where,

VOC_i = Monthly VOC Emissions per Paint Booth i, tons/month
$Content_i$ = VOC Content of VOC-containing material i, lb/gal
$Quantity_i$ = Quantity of VOC-containing material i used in paint booth for the month, gal
n = number of material used

6.2.5 The Permittee shall use monthly VOC emission records required in Condition 6.2.4 to determine the total VOC emissions from *each paint booth (Emission Unit ID Nos. PB10, PB11, PB27, PB28, PB29, PB30, and PB31)* for each twelve consecutive month period. Each combined 12 month total shall be included in the quarterly report specified in Condition 6.1.4. The Permittee shall notify the Division in writing if the 12-month rolling total VOC emissions for *each paint booth* equal or exceeds *80% of the emission limits specified in Condition 3.2.2 as shown below*.

Emission Unit ID No.	Monthly VOC Emissions (tpm)
PB10	1.83
PB11	2.98
PB27	8.42
PB28	16.67
PB29	12.50
PB30	4.08
PB31	7.92

This notification shall be postmarked by the fifteenth day of the following month and shall include an explanation of how the Permittee intends to maintain compliance with the emission limit in Condition *3.3.6*. In addition, the Permittee shall report such instance(s) in accordance with Condition 6.1.7d. This report shall include an explanation(s) of what action(s) the Permittee has taken accordingly to maintain compliance with the applicable emission limit(s) in Condition *3.3.6*. The Permittee shall notify the Division in writing if the 12-month rolling total VOC emissions from any paint booth exceeds the following:

Emission Unit ID No.	VOC BACT Emission Limits (tons/12-month rolling total)
PB10	22.0
PB11	35.7
PB27	101.0
PB28	200.0
PB29	150.0
PB30	49.00
PB31	95.00

This notification shall be postmarked by the fifteenth day of the following month and shall include an explanation of how the Permittee intends to attain compliance with the emission limit in Condition 3.3.6. In addition, the Permittee shall report such instance(s) as exceedance(s) in accordance with Condition 6.1.7.
[391-3-1-.02(6)(b)1. & 391-3-1.03(2)(c)]

Attachment G

Electronic Files/Modeling Files

Attachment H

MSDS of Coatings and Cleaners Used

PPG INDUSTRIES, INC.

Environmental Data Sheet

Tuesday, May 1, 2012

updated to show EIMS 6/4/12 summer blend prom

Customer: Blue Bird Body Company Fax Number: (478) 822-2453
402 Blue Bird Blvd. Fort Valley GA 31030
Contact: Pam Mason Phone: (478) 822-2079

Summer Blend
1002 9362

PRODUCT: HSU907616C SBY w/F3360+GXA 3.5/1 Blended RTS

MSDS 0571

PRODUCT PHYSICAL CHARACTERISTICS:

	Weight	Volume
WEIGHT PER GALLON:		9.53 lbs/gal
DENSITY OF ORGANIC SOLVENT BLEND:		7.44 lbs/gal
NON-VOLATILE:	60.01 %	48.77 %
VOLATILE:	39.99 %	51.23 %
PERCENT OF WATER:	0.05 %	0.06 %
PERCENT OF EXEMPTS:	8.13 %	11.32 %

VOC INFORMATION:

VOC/GAL LESS WATER (LESS EXEMPTS):	3.40 lbs/gal	407.32 g/ltr
ACTUAL VOC/GAL (WITH WATER WITH EXEMPTS):	3.00 lbs/gal	359.40 g/ltr
VOC PER GALLON OF SOLIDS:	6.15 lbs/gal	736.77 g/ltr
VOC PER POUND OF SOLIDS:	0.53 lb/lb	

VOLATILE COMPOSITION: PERCENT OF TOTAL FORMULA:

CAS #	Composition	Weight	Volume
108-65-6	1-METHOXY-2-PROPYL ACETATE	13.63	16.18
123-86-4	N-BUTYL ACETATE	6.78	8.80
67-64-1	ACETONE	4.54	6.58
64742-95-6	SOLVENT NAPHTHA (PETROLEUM), LIGHT	4.02	5.27
540-88-5	TERT-BUTYL ACETATE	3.59	4.74
95-63-6	1,2,4-TRIMETHYLBENZENE	2.11	2.77
123-54-6	PENTANE-2;4-DIONE / ACETYLACETONE	1.26	1.47
71808-49-6	KETONES, C11	1.23	1.67
110-43-0	HEPTAN-2-ONE	1.06	1.49
64742-48-9	NAPHTHA (PETROLEUM); HYDROTREATED H	0.24	0.34
1330-20-7	XYLENES	0.21	0.28
25551-13-7	TRIMETHYLBENZENE	0.14	0.18
70657-70-4	2-METHOXY-1-PROPYL ACETATE	0.14	0.17
98-82-8	CUMENE	0.11	0.15
1119-40-0	DIMETHYL GLUTARATE	0.11	0.12

PPG INDUSTRIES, INC.

Environmental Data Sheet

Tuesday, May 1, 2012

PRODUCT: HSU907616C SBY w/F3360+GXA 3.5/1 Blended RTS

REGULATORY INFORMATION BASED ON 1 GALLONS SUPPLIED:

CAS #	Composition	LBS	KGS	HAPS
*******	ANTIMONY COMPOUNDS	0.93	0.42	Yes
*******	CHROMIUM COMPOUNDS	0.93	0.42	Yes
EXEMPT VOC, t-BUTYL ACETATE				
540-88-5	t-BUTYL ACETATE	0.34		

POUND OF ORGANIC HAPS PER GALLON OF PRODUCT: 0.000
PERCENT OF ORGANIC HAPS (VHAP): 0.00 %

DISCLAIMER

This Environmental Data Sheet is not intended to replace the product's Material Safety Data Sheet.

The data contained in this Environmental Data Sheet is based on information provided to PPG by its suppliers and PPG's knowledge of PPG product formulations. PPG makes no representation or warranty regarding the accuracy of supplier furnished information or that this information or data will not change.

The information in this Environmental Data Sheet is not intended to and does not create legal rights or obligations. This information is provided for the sole use of PPG customers and is not for disclosure to competitors of PPG. PPG customers have an independent obligation to determine proper use of the information and that their use of the information is consistent with federal, state and local laws, rules and regulations.

Trace constituents present at levels less than 0.01 LBS or KLGS are not included in the Regulatory Information section of this Environmental Data Sheet. Volatile HAPS present at levels less than 0.1% by weight for carcinogens and 1.0% for non-carcinogens will not be shown or will be indicated by a "No" in the Regulatory Section (under HAPS) of this Environmental Data Sheet.

Trace volatiles present at levels less than 0.1% by weight are not included in the Volatile Section of this Environmental Data Sheet.

Chemical compounds generated as a result of the curing process of this coating are not included on this Environmental Data Sheet.

The USEPA listing of VOC exempt compounds [40CFR51.000(s)] is used in calculating VOC values. Under USEPA regulation 40CFR51.000(s), **t-butyl acetate** is a not a VOC for purposes of VOC emissions limitations or VOC content requirements. It is a VOC for purposes of all recordkeeping, emissions reporting, photochemical dispersion modeling and inventory requirements.

ASHLAND
SAFETY DATA SHEET

BB # 2013217

Revision Date: 02/20/2007
Print Date: 3/12/2007
MSDS Number: R0014122
Version: 1.2

VM&P NAPHTHA 70885

Chuck Cooper 614 790 1588

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

Ashland	Regulatory Information Number	1-800-325-3751
P.O. Box 2219	Telephone	614-790-3333
Columbus, OH 43216	Emergency telephone number	1-800-ASHLAND (1-800-274-5263)

Product name	VM&P NAPHTHA
Product code	70885
Product Use Description	No data

ccooper @ ashland.

2. HAZARDS IDENTIFICATION

614 393 6 ~~~~

Emergency Overview

Appearance: liquid, hydrocarbon-like, Mild hydrocarbon odor, colourless

WARNING! Flammable Liquid, Moderate skin irritant, Moderate eye irritant.

Potential Health Effects

Routes of exposure

Inhalation, Skin absorption, Skin contact, Eye Contact, Ingestion

Eye contact

May cause mild eye irritation. Symptoms include stinging, tearing, and redness. Additional symptoms of eye exposure may include: blurred vision

Skin contact

Can cause skin irritation. Prolonged or repeated contact may dry the skin. Symptoms may include redness, burning, and drying and cracking of skin, burns and other skin damage. May cause mild skin irritation. Prolonged or repeated contact may dry the skin. Symptoms may include redness, burning, drying and cracking of skin, and skin burns. Additional symptoms of skin contact may include: skin blistering Passage of this material into the body through the skin is possible, but it is unlikely that this would result in harmful effects during safe handling and use.

Ingestion

Swallowing small amounts of this material during normal handling is not likely to cause harmful effects. Swallowing large amounts may be harmful. This material can get into the lungs during swallowing or vomiting. This results in lung inflammation and other lung injury.

Inhalation

Breathing of vapor or mist is possible. Breathing small amounts of this material during normal handling is not likely to cause harmful effects. Breathing large amounts may be harmful. Symptoms are not expected at air concentrations below the recommended exposure limits, if applicable (see Section 8.).

Aggravated Medical Condition

Preexisting disorders of the following organs (or organ systems) may be aggravated by exposure to this material:, skin, lung (for example, asthma-like conditions), kidney, auditory system, Individuals with preexisting heart disorders maybe more susceptible to arrhythmias (irregular heartbeats) if exposed to high concentrations of this material.

Symptoms

Signs and symptoms of exposure to this material through breathing, swallowing, and/or passage of the material through the skin may include:, redness of the face and neck, stomach or intestinal upset (nausea, vomiting, diarrhea), irritation (nose, throat, airways), central nervous system depression (dizziness, drowsiness, weakness, fatigue, nausea, headache, unconsciousness), central nervous system excitation (giddiness, liveliness, light-headed feeling) followed by central nervous system depression (dizziness, drowsiness, weakness, fatigue, nausea, headache, unconsciousness) and other central nervous system effects, effects on memory, respiratory depression (slowing of the breathing rate), shortness of breath, loss of coordination, confusion, irregular heartbeat, coma

Target Organs

Exposure to this material (or a component) has been found to cause kidney damage in male rats. The mechanism by which this toxicity occurs is specific to the male rat and the kidney effects are not expected to occur in humans., Overexposure to this material (or its components) has been suggested as a cause of the following effects in laboratory animals:, mild, reversible liver effects, kidney damage, effects on hearing

Carcinogenicity

Based on the available information, this material cannot be classified with regard to carcinogenicity., This material is not listed as a carcinogen by the International Agency for Research on Cancer (IARC), the National Toxicology Program (NTP), or the Occupational Safety and Health Administration (OSHA).

Reproductive hazard.

This material (or a component) may be harmful to the human fetus based on positive test results with laboratory animals., Based on the available information, risk to the fetus from maternal exposure to this material cannot be assessed.

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VM&P NAPHTHA 70885

Other information
No data

3. COMPOSITION/INFORMATION ON INGREDIENTS

Components	CAS-No.	Concentration
SOLVENT NAPHTHA (PETROLEUM), LIGHT ALIPHATIC	64742-89-8	<=100%

4. FIRST AID MEASURES

Eyes

If symptoms develop, move individual away from exposure and into fresh air. Flush eyes gently with water while holding eyelids apart. If symptoms persist or there is any visual difficulty, seek medical attention.

Skin

Remove contaminated clothing. Flush exposed area with large amounts of water. If skin is damaged, seek immediate medical attention. If skin is not damaged and symptoms persist, seek medical attention. Launder clothing before reuse. Remove contaminated clothing. Wash exposed area with soap and water. If symptoms persist, seek medical attention. Launder clothing before reuse.

Ingestion

Seek medical attention. If individual is drowsy or unconscious, do not give anything by mouth; place individual on the left side with the head down. Contact a physician, medical facility, or poison control center for advice about whether to induce vomiting. If possible, do not leave individual unattended.

Inhalation

If symptoms develop, move individual away from exposure and into fresh air. If symptoms persist, seek medical attention. If breathing is difficult, administer oxygen. Keep person warm and quiet; seek immediate medical attention.

Notes to physician

Hazards: Inhalation of high concentrations of this material, as could occur in enclosed spaces or during deliberate abuse, may be associated with cardiac arrhythmias. Sympathomimetic drugs may initiate cardiac arrhythmias in persons exposed to this material. This material is an aspiration hazard. Potential danger from aspiration must be weighed against possible oral toxicity (See Section 2 - Swallowing) when deciding whether to induce vomiting.

Treatment: No information available.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media

dry chemical, carbon dioxide (CO_2), foam

Hazardous combustion products

May form:, carbon dioxide and carbon monoxide, various hydrocarbons

Precautions for fire-fighting

Material is volatile and readily gives off vapors which may travel along the ground or be moved by ventilation and ignited by pilot lights, flames, sparks, heaters, smoking, electric motors, static discharge or other ignition sources at locations near the material handling point. Wear full firefighting turn-out gear (full Bunker gear), and respiratory protection (SCBA).

Flammability Class for Flammable Liquids

Flammable Liquid Class IBFlammable Liquid Class IB

6. ACCIDENTAL RELEASE MEASURES

Personal precautions

For personal protection see section 8. Eliminate all ignition sources (flares, flames including pilot lights, electrical sparks). Persons not wearing protective equipment should be excluded from area of spill until clean-up has been completed. Stop spill at source. Prevent from entering drains, sewers, streams or other bodies of water. Prevent from spreading. If runoff occurs, notify authorities as required. Pump or vacuum transfer spilled product to clean containers for recovery. Absorb unrecoverable product. Transfer contaminated absorbent, soil and other materials to containers for disposal.

Environmental precautions

Prevent run-off to sewers, streams or other bodies of water. If run-off occurs, notify proper authorities as required, that a spill has occurred.

Methods for cleaning up

Absorb liquid on vermiculite, floor absorbent or other absorbent material.

7. HANDLING AND STORAGE

Handling

Containers of this material may be hazardous when emptied. Since emptied containers retain product residues (vapor, liquid, and/or solid), all hazard precautions given in the data sheet must be observed. Avoid prolonged or frequently repeated skin contact with this material. Skin contact can be minimized by wearing impervious protective gloves. As with all products of this nature, good personal hygiene is essential. Hands and other exposed areas should be washed thoroughly with soap and water after contact, especially before eating and/or smoking. Regular laundering of contaminated clothing is essential to reduce indirect skin contact with this material. Static ignition hazard can result from handling and use. Electrically bond and ground all containers, personnel and equipment before transfer or use of material. Special precautions may be necessary to dissipate static electricity for non-conductive containers. Use proper bonding and grounding during product transfer as described in National Fire Protection Association document NFPA 77.

Storage

Do not store near extreme heat, open flame, or sources of ignition.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure Guidelines

General advice

These recommendations provide general guidance for handling this product. Personal protective equipment should be selected for individual applications and should consider factors which affect exposure potential, such as handling practices, chemical concentrations and ventilation. It is ultimately the responsibility of the employer to follow regulatory guidelines established by local authorities.

Exposure controls

Provide sufficient mechanical (general and/or local exhaust) ventilation to maintain exposure below TLV(s).

Eye protection

Chemical splash goggles in compliance with OSHA regulations are advised; however, OSHA regulations also permit other type safety glasses. Consult your safety representative

Skin and body protection

Wear resistant gloves (consult your safety equipment supplier).
To prevent repeated or prolonged skin contact, wear impervious clothing and boots.

Respiratory protection

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Revision Date: 02/20/2007
Print Date: 3/12/2007
MSDS Number: R0014122
Version: 1.2

VM&P NAPHTHA 70885

If workplace exposure limit(s) of product or any component is exceeded (see exposure guidelines), a NIOSH-approved air supplied respirator is advised in absence of proper environmental control. OSHA regulations also permit other NIOSH respirators (negative pressure type) under specified conditions (see your industrial hygienist). Engineering or administrative controls should be implemented to reduce exposure.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state	liquid
Form	No data
Colour	colourless, clear
Odour	hydrocarbon-likeMild hydrocarbon odor
Boiling point/range	262.5 °F / 128.1 °C@ 760.000000 mmHg
pH	No data
Flash point	19.99 °F / -6.67 °C Tag closed cup
Evaporation rate	3.5 N-Butyl Acetate
Explosion limits	1.3 %(V) 8.0 %(V)
Vapour pressure	170.00 mmHg @ 100.00 °F / 37.78 °C
Vapour density	3.65
Density	0.752 g/cm3 @ 60.00 °F / 15.56 °C 6.19 lb/gal @ 61 °F / 16 °C
Solubility	negligible in water
Partition coefficient (n-octanol/water)	No data
Autoignition temperature	450 °F / 232 °C

10. STABILITY AND REACTIVITY

Stability
Stable

Conditions to avoid
None known.

Incompatible products
Avoid contact with:, strong oxidizing agents

Hazardous decomposition products
May form:, carbon dioxide and carbon monoxide, various hydrocarbons

Hazardous reactions

Product will not undergo hazardous polymerization.

Thermal decomposition
No data

11. TOXICOLOGICAL INFORMATION

Acute oral toxicity

SOLVENT NAPHTHA (PETROLEUM), LIGHT ALIPHATIC	LD 50 Rat: 8,000 mg/kg

Acute inhalation toxicity

SOLVENT NAPHTHA (PETROLEUM), LIGHT ALIPHATIC	LC 50 Rat: 3400 ppm, 4 h

Acute dermal toxicity

SOLVENT NAPHTHA (PETROLEUM), LIGHT ALIPHATIC	LD 50 Rat: 4,000 mg/kg

12. ECOLOGICAL INFORMATION

Aquatic toxicity

Acute and Prolonged Toxicity to Fish
No data

Acute Toxicity to Aquatic Invertebrates
No data

Environmental fate and pathways
No data

13. DISPOSAL CONSIDERATIONS

Waste disposal methods

Dispose of in accordance with all applicable local, state and federal regulations. Do not discharge effluent containing this product into lakes, streams, ponds or estuaries, oceans, or other waters unless in accordance with the requirements of a National Pollutant Discharge Elimination System (NPDES) permit, and the permitting authority has been notified in writing prior to discharge. Do not discharge effluent containing this product to sewer systems without previously notifying the local sewage treatment plant authority. For guidance, contact your State Water Board or Regional Office of the EPA. For assistance with your waste management needs - including disposal, recycling and waste stream reduction, contact Ashland Distribution Company, IC&S Environmental Services Group at 800-637-7922.

14. TRANSPORT INFORMATION

IMDG:
UN1268, PETROLEUM DISTILLATES, N.O.S. (ALIPHATIC PETROLEUM DISTILLATES,) 3, II
IATA_P:
UN1268, Petroleum distillates, n.o.s. (ALIPHATIC PETROLEUM DISTILLATES,) 3, II
IATA_C:
UN1268, Petroleum distillates, n.o.s. (ALIPHATIC PETROLEUM DISTILLATES,) 3, II
CFR_ROAD:
UN1268, Petroleum distillates, n.o.s. (ALIPHATIC PETROLEUM DISTILLATES,) 3, II
CFR_RAIL:
UN1268, Petroleum distillates, n.o.s. (ALIPHATIC PETROLEUM DISTILLATES,) 3, II
CFR_INWTR:
UN1268, Petroleum distillates, n.o.s. (ALIPHATIC PETROLEUM DISTILLATES,) 3, II
IMDG_INWTR:
UN1268, PETROLEUM DISTILLATES, N.O.S. (ALIPHATIC PETROLEUM DISTILLATES,) 3, II
IMDG_ROAD:
UN1268, PETROLEUM DISTILLATES, N.O.S. (ALIPHATIC PETROLEUM DISTILLATES,) 3, II
IMDG_RAIL:
UN1268, PETROLEUM DISTILLATES, N.O.S. (ALIPHATIC PETROLEUM DISTILLATES,) 3, II

Dangerous goods descriptions may not reflect package size, quantity, end-use or region-specific exceptions that can be applied to shipments. Consult shipping documents for material-specific descriptions.

15. REGULATORY INFORMATION

California Prop. 65

This product does not contain any chemicals known to State of California to cause cancer, birth defects or any other harm.

Additional regulations

US. High Production Volume Chemicals

US. TSCA IUR 2006, Partially Exempt Petroleum Process Streams (40 CFR 710.46(b)(1))

OECD. Program to investigate the potential hazards of high production volume further work.

OECD. Program to investigate the potential hazards of high production volume further work.

SARA 313 Component(s)

OSHA Hazards Flammable Liquid
Moderate skin irritant
Moderate eye irritant

	Health	Flammability	Reactivity	Other
HMIS	1	3	0	
NFPA	1	3	0	

16. OTHER INFORMATION

The information accumulated herein is believed to be accurate but is not warranted to be whether originating with the company or not. Recipients are advised to confirm in advance of need that the information is current, applicable, and suitable to their circumstances.

This MSDS has been prepared by Ashland's Environmental Health and Safety Department (1-800-325-3751).

✓ 2/2012

PPG INDUSTRIES, INC.

Environmental Data Sheet

Monday, January 31, 2011

1002351/
MSDS
0537

Customer: Blue Bird Body Company
402 Blue Bird Blvd.
Fort Valley GA 31030
Fax Number: (478) 822-2453
Contact: Cleveland Hobbs
Phone: (478) 822-2079

EIMS

PRODUCT: GXM71137 SPECTRACRON SEP PRIMER AC

PRODUCT PHYSICAL CHARACTERISTICS:

WEIGHT PER GALLON:		11.57 lbs/gal
DENSITY OF ORGANIC SOLVENT BLEND:		7.26 lbs/gal
	Weight	Volume
NON-VOLATILE:	56.25 %	30.34 %
VOLATILE:	43.75 %	69.66 %
PERCENT OF WATER:	0.16 %	0.22 %
PERCENT OF EXEMPTS:	28.73 %	46.05 %

VOC INFORMATION:

VOC/GAL LESS WATER (LESS EXEMPTS):	3.15 lbs/gal	377.37 g/ltr
ACTUAL VOC/GAL (WITH WATER WITH EXEMPTS):	1.67 lbs/gal	200.07 g/ltr
VOC PER GALLON OF SOLIDS:	5.50 lbs/gal	658.90 g/ltr
VOC PER POUND OF SOLIDS:	0.26 lb/lb	

VOLATILE COMPOSITION: PERCENT OF TOTAL FORMULA:

CAS #	Composition	Weight	Volume
540-88-5	TERT-BUTYL ACETATE	28.73	46.05
107-98-2	PROPYLENE GLYCOL MONOMETHYL ETHER	6.96	10.52
71-36-3	1-BUTANOL	2.48	4.25
763-69-9	ETHYL-3-ETHOXYPROPIONATE	2.03	2.96
110-43-0	HEPTAN-2-ONE	1.97	3.35
1330-20-7	XYLENES	0.49	0.78
64-19-7	ACETIC ACID	0.29	0.47
7732-18-5	WATER	0.16	0.26
75-65-0	TERT-BUTYL ALCOHOL / 2-METHYLPROPAN-2-O	0.15	0.23
100-41-4	ETHYLBENZENE	0.11	0.18

PPG INDUSTRIES, INC.

Environmental Data Sheet

Monday, January 31, 2011

PRODUCT: GXM71137 SPECTRACRON SEP PRIMER AC

REGULATORY INFORMATION BASED ON 100 GALLONS DEFAULT:

CAS #	Composition	LBS	KGS	HAPS

100-41-4	ETHYLBENZENE	1.27	0.58	Yes
EXEMPT VOC, t-BUTYL ACETATE				
540-88-5	t-BUTYL ACETATE	332.41		

POUND OF ORGANIC HAPS PER POUND OF SOLIDS: 0.002
POUND OF ORGANIC HAPS PER GALLON OF SOLIDS: 0.043
POUND OF ORGANIC HAPS PER GALLON OF PRODUCT: 0.013
PERCENT OF ORGANIC HAPS (VHAP): 0.11 %

DISCLAIMER

This Environmental Data Sheet is not intended to replace the product's Material Safety Data Sheet.

The data contained in this Environmental Data Sheet is based on information provided to PPG by its suppliers and PPG's knowledge of PPG product formulations. PPG makes no representation or warranty regarding the accuracy of supplier furnished information or that this information or data will not change.

The information in this Environmental Data Sheet is not intended to and does not create legal rights or obligations. This information is provided for the sole use of PPG customers and is not for disclosure to competitors of PPG. PPG customers have an independent obligation to determine proper use of the information and that their use of the information is consistent with federal, state and local laws, rules and regulations.

Trace constituents present at levels less than 0.01 LBS or KLGS are not included in the Regulatory Information section of this Environmental Data Sheet. Volatile HAPS present at levels less than 0.1% by weight for carcinogens and 1.0% for non-carcinogens will not be shown or will be indicated by a "No" in the Regulatory Section (under HAPS) of this Environmental Data Sheet.

Trace volatiles present at levels less than 0.1% by weight are not included in the Volatile Section of this Environmental Data Sheet.

Chemical compounds generated as a result of the curing process of this coating are not included on this Environmental Data Sheet.

The USEPA listing of VOC exempt compounds [40CFR51.000(s)] is used in calculating VOC values. Under USEPA regulation 40CFR51.000(s), **t-butyl acetate** is a not a VOC for purposes of VOC emissions limitations or VOC content requirements. It is a VOC for purposes of all recordkeeping, emissions reporting, photochemical dispersion modeling and inventory requirements.

PPG INDUSTRIES, INC.

Environmental Data Sheet

Thursday, March 22, 2007

PRODUCT: GXS65745 SPECTRACLEAN PURGE

PRODUCT PHYSICAL CHARACTERISTICS:

	Weight	Volume
WEIGHT PER GALLON:		6.64 lbs/gal
DENSITY OF ORGANIC SOLVENT BLEND:		6.64 lbs/gal
NON-VOLATILE:	0.00 %	0.00 %
VOLATILE:	100.00 %	100.00 %
PERCENT OF WATER:	0.00 %	0.00 %
PERCENT OF EXEMPTS:	75.00 %	75.68 %

VOC INFORMATION:

ACTUAL VOC/GAL (WITH WATER WITH EXEMPTS): 1.66 lbs/gal

Product is not photochemically reactive as per SCAQMD rule 102
SOLVENT BLEND COMPOSITION PER CLASSIFICATION: I = 0 II = 0 III = 0 IV = 0

PRODUCT: GXS65745 SPECTRACLEAN PURGE

REGULATORY INFORMATION BASED ON 100 GALLONS DEFAULT:

CAS #	Composition	LBS	KGS	HAPS	SARA
872-50-4	N-METHYL-2-PYRROLIDONE	13.28	6.02	No	Yes

POUND OF ORGANIC HAPS PER GALLON OF PRODUCT: 0.000
PERCENT OF ORGANIC HAPS (VHAP): 0.00 %

DISCLAIMER

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Trace constituents present at levels less than 0.01 LBS or KLGS are not included in the Regulatory Information section of this Environmental Data Sheet. Volatile HAPS present at levels less than 0.1% by weight for carcinogens and 1.0% for non-

PPG INDUSTRIES, INC.

Environmental Data Sheet

Thursday, March 22, 2007

PRODUCT: GXS65745 SPECTRACLEAN PURGE

PRODUCT PHYSICAL CHARACTERISTICS:

	Weight	Volume
WEIGHT PER GALLON:		6.64 lbs/gal
DENSITY OF ORGANIC SOLVENT BLEND:		6.64 lbs/gal
NON-VOLATILE:	0.00 %	0.00 %
VOLATILE:	100.00 %	100.00 %
PERCENT OF WATER:	0.00 %	0.00 %
PERCENT OF EXEMPTS:	75.00 %	75.68 %

VOC INFORMATION:

ACTUAL VOC/GAL (WITH WATER WITH EXEMPTS): 1.66 lbs/gal

Product is not photochemically reactive as per SCAQMD rule 102
SOLVENT BLEND COMPOSITION PER CLASSIFICATION: I = 0 II = 0 III = 0 IV = 0

PRODUCT: GXS65745 SPECTRACLEAN PURGE

REGULATORY INFORMATION BASED ON 100 GALLONS DEFAULT:

CAS #	Composition	LBS	KGS	HAPS	SARA
872-50-4	N-METHYL-2-PYRROLIDONE	13.28	6.02	No	Yes

POUND OF ORGANIC HAPS PER GALLON OF PRODUCT: 0.000
PERCENT OF ORGANIC HAPS (VHAP): 0.00 %

DISCLAIMER

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0087171
Seat Frame Bldg
little usage

PPG INDUSTRIES, INC.

Environmental Data Sheet

Tuesday, August 17, 2004

Customer: Blue Bird Body
Contact: Dave Whelan

PRODUCT: SAC62000 MED GLOSS BLACK SPECTRACRON SAC

PRODUCT PHYSICAL CHARACTERISTICS:

	Weight	Volume
WEIGHT PER GALLON:		8.48 lbs/gal
DENSITY OF ORGANIC SOLVENT BLEND:		6.99 lbs/gal
NON-VOLATILE:	67.36 %	60.46 %
VOLATILE:	32.64 %	39.54 %
PERCENT OF WATER:	0.17 %	0.17 %
PERCENT OF EXEMPTS:	0.15 %	0.19 %

VOC INFORMATION:

VOC/GAL LESS WATER (LESS EXEMPTS):	2.76 lbs/gal	330.65 g/ltr
ACTUAL VOC/GAL (WITH WATER WITH EXEMPTS):	2.76 lbs/gal	330.65 g/ltr
VOC PER GALLON OF SOLIDS:	4.57 lbs/gal	547.49 g/ltr
VOC PER POUND OF SOLIDS:	0.48 lb/lb	

VOLATILE COMPOSITION: PERCENT OF TOTAL FORMULA:

CAS #	Composition	Weight	Volume
123-86-4	N-BUTYL ACETATE	17.72	20.47
110-43-0	METHYL (N-AMYL) KETONE	3.61	4.50
142-82-5	N-HEPTANE	2.51	3.65
8032-32-4	V.M. AND P. NAPHTHA	2.03	2.74
108-65-6	1-METHOXY-2-PROPYL ACETATE	1.85	1.96
64741-66-8	PETROLEUM DISTILLATES	1.20	1.69
64742-95-6	AROMATIC NAPHTHA	0.81	0.94
71-36-3	N-BUTYL ALCOHOL	0.70	0.88
78-83-1	ISOBUTYL ALCOHOL	0.66	0.84
95-63-6	1,2,4-TRIMETHYL BENZENE	0.41	0.47
108-88-3	TOLUENE	0.38	0.45
1330-20-7	XYLENES	0.30	0.35
64-17-5	ETHYL ALCOHOL	0.22	0.29
7732-18-5	WATER	0.17	0.18
67-64-1	ACETONE	0.15	0.19

PPG Industries, Inc.

Environmental Data Sheet

Monday, February 04, 2013

Customer: PPG Strongsville
19699 Progress Drive
Strongsville, OH 44149
USA
Shannon Squires / Daphne Zarefoss

Product: CFX437 HD WAX AND GREASE REMOVER

Rename For DX436

PRODUCT PHYSICAL CHARACTERISTICS:

WEIGHT PER GALLON:		6.94 lb/gal
DENSITY OF ORGANIC SOLVENT BLEND:		6.94 lb/gal
	Weight	Volume
NON-VOLATILE:	0.00%	0.00%
VOLATILE:	100.00%	100.00%
PERCENT OF WATER:	0.00%	0.00%
PERCENT OF EXEMPTS:	0.00%	0.00%

VOC INFORMATION:

VOC/GAL LESS WATER (LESS EXEMPTS):	6.94 lb/gal	831.83 g/L
ACTUAL VOC/GAL (WITH WATER WITH EXEMPTS):	6.94 lb/gal	831.83 g/L
VOC PER GALLON OF SOLIDS:	-- lb/gal	-- g/L
VOC PER POUND OF SOLIDS:	-- lb/lb	

Product is photochemically reactive as per SCAQMD rule 102

VOLATILE COMPOSITION: PERCENT OF TOTAL FORMULA:

Component	Name	Weight	Volume
1330-20-7	XYLENES	56.59	54.68
64742-48-9	NAPHTHA (PETROLEUM); HYDROTREATED HEAVY	33.09	35.67
100-41-4	ETHYLBENZENE	10.04	9.28
108-88-3	TOLUENE	0.27	0.26

REGULATORY INFORMATION BASED ON 100 GALLONS DEFAULT

Component	Name	lb	kg	HAPS	SARA
100-41-4	ETHYLBENZENE	69.67	31.60	Yes	Yes
1330-20-7	XYLENES	392.88	178.21	Yes	Yes

POUND OF ORGANIC HAPS PER POUND OF SOLIDS:
POUND OF ORGANIC HAPS PER GALLON OF SOLIDS:
POUND OF ORGANIC HAPS PER GALLON OF PRODUCT: 4.63
PERCENT OF ORGANIC HAPS (VHAP): 66.70%

DISCLAIMER

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Trace constituents present at levels less than 0.01 lb or kg are not included in the Regulatory Information section of this Environmental Data Sheet. Volatile HAPS present at levels less than 0.1% by weight for carcinogens and 1.0% for non-carcinogens will not be shown or will be indicated by a "No" in the Regulatory Section (under HAPS) of this Environmental Data Sheet.

Trace volatiles present at levels less than 0.1% by weight are not included in the Volatile Section of this Environmental Data Sheet.

Chemical compounds generated as a result of the curing process of this coating are not included on this Environmental Data Sheet.

The USEPA listing of VOC exempt compounds [40CFR51.000(s)] is used in calculating VOC values.

Environmental Data Sheet
Monday, November 15, 2004

Customer: Blue Bird Body Company
402 Blue Bird Blvd.
Fort Valley GA 31030
Fax Number: (478) 822-2453
Contact: Cleveland Hobbs
Phone: (478) 822-2079

0081220
MSDS0183

PRODUCT: DX39 DELTA ACCELERATOR

PRODUCT PHYSICAL CHARACTERISTICS:

	Weight	Volume	
WEIGHT PER GALLON:		8.15 lbs/gal	
DENSITY OF ORGANIC SOLVENT BLEND:		8.14 lbs/gal	
NON-VOLATILE:	1.68 %	1.57 %	C
VOLATILE:	98.32 %	98.43 %	D
PERCENT OF WATER:	0.00 %	0.00 %	E
PERCENT OF EXEMPTS:	0.00 %	0.00 %	

VOC INFORMATION:

VOC/GAL LESS WATER (LESS EXEMPTS):	F	8.01 lbs/gal	959.60 g/ltr
ACTUAL VOC/GAL (WITH WATER WITH EXEMPTS):		8.01 lbs/gal	959.60 g/ltr
VOC PER GALLON OF SOLIDS:		510.19 lbs/gal	61,120.76 g/ltr
VOC PER POUND OF SOLIDS:		58.52 lb/lb	

VOLATILE COMPOSITION: PERCENT OF TOTAL FORMULA:

CAS #	Composition	Weight	Volume
123-54-6	ACETYLACETONE	98.31	98.45

PPG INDUSTRIES, INC.

Environmental Data Sheet
Monday, November 15, 2004

PRODUCT: DX39 DELTA ACCELERATOR

NO REGULATORY DATA TO REPORT FOR THIS PRODUCT

POUND OF ORGANIC HAPS PER GALLON OF PRODUCT: 0.000

DISCLAIMER

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PPG INDUSTRIES, INC.

Environmental Data Sheet

Monday, December 14, 2009

IL D0099940
MSDS 0298

Customer: TrueFinish

PRODUCT: Q1255-3580 ASTRO WHITE INTERIOR ALKY

PRODUCT PHYSICAL CHARACTERISTICS:

	Weight	Volume
WEIGHT PER GALLON:		9.29 lbs/gal
DENSITY OF ORGANIC SOLVENT BLEND:		7.26 lbs/gal
NON-VOLATILE:	50.70 %	36.95 %
VOLATILE:	49.30 %	63.05 %
PERCENT OF WATER:	0.14 %	0.16 %
PERCENT OF EXEMPTS:	0.00 %	0.00 %

VOC INFORMATION:

VOC/GAL LESS WATER (LESS EXEMPTS):	4.57 lbs/gal	547.49 g/ltr
ACTUAL VOC/GAL (WITH WATER WITH EXEMPTS):	4.57 lbs/gal	547.49 g/ltr
VOC PER GALLON OF SOLIDS:	12.37 lbs/gal	1,481.93 g/ltr
VOC PER POUND OF SOLIDS:	0.97 lb/lb	

VOLATILE COMPOSITION: PERCENT OF TOTAL FORMULA:

CAS #	Composition	Weight	Volume
1330-20-7	XYLENES	23.60	30.37
78-93-3	METHYL ETHYL KETONE	7.39	10.23
108-65-6	1-METHOXY-2-PROPYL ACETATE	6.19	7.16
100-41-4	ETHYL BENZENE	4.10	5.28
111-76-2	2-BUTOXY ETHANOL	3.86	4.77
123-86-4	N-BUTYL ACETATE	3.53	4.46
7732-18-5	WATER	0.14	0.15
70657-70-4	2-METHOXY-1-PROPYL ACETATE	0.12	0.14
8052-41-3	NAPHTHA	0.12	0.17
64742-48-9	NAPHTHA	0.10	0.15

PPG INDUSTRIES, INC.

Environmental Data Sheet

Monday, December 14, 2009

PRODUCT: Q1255-3580 ASTRO WHITE INTERIOR ALKY

REGULATORY INFORMATION BASED ON 100 GALLONS DEFAULT:

CAS #	Composition	LBS	KGS	HAPS	SARA
100-41-4	ETHYL BENZENE	38.09	17.28	Yes	Yes
1330-20-7	XYLENES	219.24	99.45	Yes	Yes
*******	GLYCOL ETHERS (SARA REGULATED)	35.87	16.27	No	Yes

POUND OF ORGANIC HAPS PER POUND OF SOLIDS: 0.546

POUND OF ORGANIC HAPS PER GALLON OF SOLIDS: 6.963
POUND OF ORGANIC HAPS PER GALLON OF PRODUCT: 2.573
PERCENT OF ORGANIC HAPS (VHAP): 27.70 %

DISCLAIMER

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Trace constituents present at levels less than 0.01 LBS or KLGS are not included in the Regulatory Information section of this Environmental Data Sheet. Volatile HAPS present at levels less than 0.1% by weight for carcinogens and 1.0% for non-carcinogens will not be shown or will be indicated by a "No" in the Regulatory Section (under HAPS) of this Environmental Data Sheet.

Trace volatiles present at levels less than 0.1% by weight are not included in the Volatile Section of this Environmental Data Sheet.

Chemical compounds generated as a result of the curing process of this coating are not included on this Environmental Data Sheet.

The USEPA listing of VOC exempt compounds [40CFR51.000(s)] is used in calculating VOC values.

Attachment I

Title V Certification

4244 International Parkway
Suite 120
Atlanta, Georgia 30354-3906
404-363-7000

Certifications and Signatures

Facility Name: **Blue Bird Body Company**

Project Name: **2013 PSD Application**

AIRS Number: **132250001**

Submittal File Name: **132250001_20130628.mdb**

COMPUTER DISK VIRUS EXAMINATION CERTIFICATION:
I certify that, to the best of my knowledge, the completed electronic application disk has been inspected and found free of any known viruses.

Signature:________ Date: 08-07-13

Name (print): Michael Susky

Offical Title: Project Engineer II

SOFTWARE USAGE CERTIFICATION:
I certify that the software used to complete the Georgia Title V application was used as provided by the Georgia Environmental Protection Division, Air Protection Branch and was unaltered in any way. I understand that the submission of a Title V (Part 70) application completed using any altered version of the provided software constitutes the submission of an incomplete application and that such action may be subject to enforcement by the Georgia Air Protection Branch and/or the US EPA.

CERTIFICATION OF COMPLIANCE:
Except as stated on the Compliance Plan For a Non-Compliant Emission Unit or Group form of this application, I hereby certify that this facility is in compliance with all applicable requirements effective as of the date of this certification and will continue to comply with such requirements. For applicable requirements promulgated as of the date of this certification, that will become effective during the permit term, I further certify that, except as stated on the Compliance Plan For a Non-Compliant Emission Unit or Group form of this application, this facility will comply with such requirements and will continue to comply with such requirements.

I certify under penalty of law that I have personally examined, and am familiar with, the statements and information submitted in this application and all of its attachments. Based on my inquiry of those individuals with primary responsibility for obtaining the information, I certify that the statements and information are, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false statements and information or omitting required statements and information, including the possibility of fine or imprisonment.

Unless otherwise required by the Director, compliance certifications will be submitted to the Director at least annually.

SIGNATURE OF RESPONSIBLE OFFICIAL:

Signature:________ Date: 8-6-13

Name (print): Dave Whelan

Offical Title: Senior Vice President of Manufacturing and Quality

Address: 402 Blue Bird Boulevard
Fort Valley, Georgia 31030

Notary Public Certification of Responsible Official's Signature:

Signature of Notary Public: Debbie T. Reid

DEBBIE T. REID
NOTARY PUBLIC
MY COMMISSION EXPIRES MAY 30TH, 2015
TAYLOR COUNTY, GEORGIA