Application to Modify Air Emissions Units and Request Title V Operating Permit Revision

New Gatsby Spas, Inc.
Facility ID No. 0570468

Prepared for:
New Gatsby Spas, Inc.
4408 Airport Road
Plant City, Florida 33567-1112

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1.0 Introduction

New Gatsby Spas, Inc. (Gatsby) operates a spa manufacturing facility at 4408 Airport Road, Plant City, Hillsborough County, Florida. The primary activity at Gatsby is fiberglass reinforced spa production (Standard Industrial Classification [SIC] Code 3088). Principal processes involved in spa manufacturing at the facility include vacuum forming of acrylic spa shells, fiberglass resin and foam application, PVC plumbing, solvent cleaning, mold preparation (tooling), woodworking, and additional activities and equipment necessary to support these activities.

1.1 Purpose for Permit Application

Gatsby plans to make modifications to achieve the full production capacity of the facility (approximately 48,750 spas per year). The facility is currently operating under Hillsborough County Environmental Protection Commission (EPC) Permit No. 0570468-005-AV, issued on 10/20/1998 and transferred by amendment from Gatsby Spas, Inc. to New Gatsby Spas, Inc. on 07/27/1999. The current operating permit is the facility's initial Title V air operating permit.

Since Gatsby is a Title V facility and plans to make modifications which will increase potential emissions of air pollutants, a permit to construct and a revision to the existing operating permit are required. This application constitutes Gatsby's request for a permit to modify air emissions units (construction permit) and subsequent revision of the facility's Title V operating permit. This application fulfills the requirements of:

- EPC Rule 1-3.21 (Permits Required),
- DEP Rule 62-4.210 F.A.C. (Construction Permits),
- DEP Rule 62-210.300 F.A.C. (Permits Required),
- DEP Rule 62-213.400 F.A.C. (Permits and Permit Revisions Required), and
- Permit No. 0570468-005-AV, Appendix TV-3, Title V Condition Nos.: 13 (Construction Permits), 18 (Permits Required), and 31 (Permits and Permit Revisions Required).

1.2 Application Contacts

The Contact Person for additional information about this permit application submittal is Eric Nemeth, Esq. of Edwards and Angell, LLP. Mr. Nemeth can be reached by telephone at (973) 376-7700.

1.3 Conclusions

The documentation provided in this permit application supports the conclusion that, by implementing federally-enforceable emissions limitations, the proposed modification project constitutes a minor modification to a minor source, as defined in the federal Prevention of Significant Deterioration (PSD) regulations and 62-212.400(2) F.A.C. Based on the specifications for the facility and estimated emission rates, Gatsby has demonstrated compliance with all applicable air regulatory requirements. No application fee is required for this application, since the facility already holds a Title V operating permit [62-4.050(4)(a)(2)].

1.4 Proposed Modification Project Description

Gatsby plans to install and operate one new bulk resin storage tank (8,700 gallons), three new resin mixing day tanks (1,800 gallons each), and one new mold preparation (tooling) resin spray booth. These modifications, along with non-process related building and warehouse space expansion, are designed to allow the facility to achieve its full operating potential (approximately 48,750 spas per year).

The bulk resin tank will provide the additional resin storage capacity necessary to achieve full production capacity. Also, the use of multiple bulk and mixing day tanks will allow Gatsby to explore the use of resins with varying styrene contents. This flexibility may be essential for complying with the anticipated Reinforced Plastic Composites Production NESHAP.

The existing mold preparation (tooling) resin spray application is performed within the spa production resin spray booths. Relocating this operation to a new booth is designed to eliminate potential bottlenecks from the existing configuration.

In addition to the modifications intended to increase facility capacity, the facility plans to replace an existing cyclone control device which controls particulate emissions from the woodworking operation with a baghouse that vents within the woodworking building. This project will allow the woodworking operation to be classified as an insignificant activity with respect to construction and operating permit requirements.

1.5 Organization

This submittal is organized into five (5) sections with additional appendices. The four main sections and appendices are as follows:

Section 1.0 (Introduction) provides background information on the Gatsby facility and the permit application and identifies the contact personnel. Section 1.0 also contains a description of the proposed construction project and the conclusions documented in the application. A summary of the permit application organization is provided.

Section 2.0 (Facility Site Information) contains information concerning the Gatsby facility's location and physical setting as well as the attainment classification of the area for designated criteria pollutants.

Section 3.0 (Emission Estimates) contains summary information on baseline and modified source emissions from the facility.

Section 4.0 (Regulatory Review) presents the results and conclusions of a detailed regulatory review for the proposed modification project.

Section 5.0 (Proposed Permit Conditions/Modifications) contains the proposed permit conditions for the project and facility modification revisions to existing Title V operating permit.

Appendix A (Permit Application Forms) contains the required Florida DEP application forms and supplemental attachments.

Appendix B (Emissions Calculations) contains detailed air emissions calculations and supporting documentation.

2.0 Site Information

Gatsby's facility is located at 4408 Airport Road, Plant City, Florida, near the Plant City Municipal Airport. The facility was originally constructed in the 1970's for mobile home production, purchased by Gatsby Spas, Inc. in 1992, and last modified in 1998 to its current configuration. The major components of the spa manufacturing process include vacuum forming acrylic spa shells, fiberglass resin and polyurethane foam application, PVC plumbing, solvent cleaning, mold preparation (tooling), and woodworking. Offices, warehouses, and maintenance areas are co-located with the main manufacturing operations. Areas surrounding the facility are a combination of industrial, commercial, and residential sites. Attachment A of Appendix A is an area map showing the facility's location. Attachment B of Appendix A contains a facility plot plan, providing the location of emissions sources at the facility. Provided in Attachment C of Appendix A is a flow diagram of the major processes at Gatsby.

The attainment status for Hillsborough County is as follows:

- Maintenance area for ozone;
- Maintenance area for particulate matter (circle centered at the intersection of U. S. 41 South and State Road 60 with radius of 12 kilometers);
- Maintenance area for lead (circle centered at UTM 364.0 km East and 3093.5 km North, zone 17, and radius of 5 kilometers);
- Unclassifiable for sulfur dioxide; and
- Attainment for all other criteria pollutants.

The Gatsby facility is located outside the air quality maintenance areas for particulate matter and lead, but within the air quality maintenance area for ozone.

3.0 Emission Estimates

Emission estimates for the proposed facility modification, as well as baseline potential emission rates for regulated air pollutants from the Gatsby facility were calculated to support the regulatory conclusions documented in this permit application. Section 3.1 provides the baseline (pre-project, current facility configuration) potential to emit emission estimates. Section 3.2 presents the modified facility potential to emit emission estimates.

3.1 Baseline Emissions

Baseline potential emissions are presented in Table 3.1. Baseline potential emissions of PSD-regulated pollutants from Gatsby are less than the 250 ton/yr PSD major source threshold. The Gatsby operations, are not one of the 28 listed source categories in the PSD regulations for which the major source threshold is 100 tons/yr, therefore, the facility is a minor source with respect to these regulations. Detailed calculations and documentation supporting the emission estimates prevented in this permit application are included in Appendix B.

Table 3.1 Gatsby Facility: Baseline Potential to Emit

Pollutant	Potential Emissions (tons/year)	PSD Regulated?	PSD Major Source?
VOC	79.0[a]	Yes	No
NO_x	0.25	Yes	
PM/PM_{10}	15.0	Yes	
SO_2	0.002	Yes	
CO	0.21	Yes	
Styrene	56.8[a]	No	
MEK	1.01	No	
DBP	1.16	No	
Total HAP	58.9[a]	No	

a Based on emissions limits in current Title V operating permit.

3.2 Modified Facility Emissions

Potential emissions of regulated pollutants from the proposed modified facility are presented in Table 3.2. Potential emissions for each pollutant affected by the proposed facility modification are each less than the 250 ton/yr major modification threshold for PSD, except for VOC. As discussed in Section 4.1, a PSD avoidance limit is proposed to limit the potential emissions from the facility modification to below the PSD major modification threshold for VOC. Detailed calculations and documentation supporting the emission estimates presented in this permit application are included in Appendix B.

Table 3.2 Gatsby Facility: Modified Facility Potential to Emit

Pollutant	Modified Facility Potential Emissions (tons/year)	PSD Regulated?	Modification Potential Emissions (tons/year)	PSD Major Modification?
VOC	336 / 328	Yes	257 / 249	No[a]
NO_x	0.25	Yes	0	
PM/PM_{10}	0.4	Yes	-14.6	
SO_2	0.002	Yes	0	
CO	0.21	Yes	0	
Styrene	236	No	N/A	
MEK	1.01	No	N/A	
DBP	1.16	No	N/A	
Total HAP	239	No	N/A	

a By applying a federally enforceable limit of 328 tons/yr VOC, the modification potential emissions will remain below the 250 ton/yr significance threshold.

3.3 Emissions Estimation Methods

The emission estimates detailed in Appendix B of this application were performed using the following methods:

- For resin and gelcoat application emissions: Fiberglass Reinforced Products (FRP) Model (Version 1.0)-derived emission factors;
- For miscellaneous material usage emissions: material balance;
- For bulk storage tanks: EPA TANKS (Version 4.0);
- For mixing storage tanks: diffusion calculation using mass transfer equations;
- For natural gas combustion: EPA AP-42 emission factors; and
- For woodworking operations: control device performance data.

The FRP Model (Version 1.0) was developed by U.S. EPA's Office of Research and Development, in collaboration with Research Triangle Institute, as a new standard model for estimating styrene emissions from fiber-reinforced plastics fabrication processes. This model uses a nine-variable approach to estimating the emission factors for styrene emissions from spray resin lay-up, hand resin lay-up, and spray gelcoat operations (lb styrene emitted/lb styrene available). This method has been used in this permit application in lieu of the emission factors in the current Title V permit.

The Gatsby Title V emission factors were selected (using statistical methods) from AP-42, EPA/RTI, NMMA, and CFA emissions data [basis: 04/13/1998 memo from Clair H. Fancy, Chief, Bureau of Air Regulation, Florida DEP]. In a 06/01/1998 memo, Howard L. Rhodes, Director, Division of Air Resources Management, Florida DEP, updated this guidance by specifying the following "interim" emission factors for reinforced plastics as summarized in Table 3.3.

Table 3.3 Reinforced Plastics Interim Emission Factors (% Available Styrene)

Operation	Styrene Content		
	35%	38%	42%
Resin Non-Spray Layup	13	15	16
Resin Spray Layup	19	25	30
Gel Coat	49	51	53

The styrene-based resins used at the Gatsby facility have a maximum styrene content of 45%; therefore, the interim resin layup emission factors provided by Florida DEP must be extrapolated for application to this facility. The extrapolated interim emission factors, as well as the current Title V permit emission factors and the FRP model-derived emission factors (see Appendix B), are summarized in Table 3.4 for comparison.

Table 3.4 Summary of Reinforced Plastics Emission Factors (% Available Styrene)

Operation	FRP Model	Title V Permit	Extrapolated Florida DEP Interim
Resin Non-Spray Layup	8.4	15.4	17.5
Resin Spray Layup	23.5/31.9/33.5[a]	25.9	35.0
Gel Coat	61	35	59.3

[a]Factors represent Stage I, Stage II, and Mold Preparation Spray Booths.

As illustrated in Table 3.4, there are variations between the emission factors provided by Florida DEP, those in the current operating permit, the CFA UEF factors, and those estimated by the FRP Model. The Florida DEP interim factors, CFA UEF factors, and factors used in the current facility operating permit are general factors (i.e., based on multiple data points for "similar" operations). The FRP Model takes into account facility specific variables (e.g., resin styrene content, application thickness, spray distance, etc.). Therefore, the factors developed using the FRP Model more accurately reflect the processes at Gatsby's Plant City facility.

4.0 Regulatory Review

This section documents a detailed regulatory review conducted in support of this permit application. All potentially applicable federal, state, and local air quality regulations were reviewed, and the necessary emission inventories were performed to assess regulatory applicability and determine compliance methodologies for the proposed modified facility. Section 4.1 provides a review of PSD applicability to the proposed facility modification. 112(g) Rule (Case-by-Case MACT) applicability to the project is summarized in Section 4.2. Section 4.3 provides a summary of other federal, state, and local regulations potentially applicable to the proposed project.

4.1 Prevention of Significant Deterioration

The PSD regulations are codified as 62-212.400 F.A.C. and adopted by EPC 1-3.50 (New Source Review). This regulation defines "major" source emission thresholds and "major" or "significant" emission increase thresholds for new construction, reconstruction, or modification.

The Gatsby facility is not categorized as one of the 28 listed source categories in Table 212.400-1 of 62-212.400 F.A.C.; therefore, the major source threshold of 250 tons/yr from 62-212.400(2)(d)(2)(a) applies for any PSD regulated air pollutant. As documented in Table 3.1 and Appendix B of this application, the Gatsby baseline (pre-project) potential emissions of PSD regulated pollutants are all below the 250 ton/yr major source threshold. The facility is a minor source with respect to these regulations.

For this source category, a major modification to a minor source, as defined in 62-212.400(2)(d)(3), is a modification that itself would constitute a new major facility (i.e., 250 tons/yr increase in any PSD regulated pollutant). As documented in Table 3.2 and Appendix B of this application, the potential emissions increases of PSD regulated pollutants resulting from the proposed modification project are below the major modification threshold, except for VOC. By applying a federally enforceable emissions limitation of 328 tons/yr VOC on the spa manufacturing operation, the potential emissions increase from the proposed construction project will remain below 250 tons/yr VOC. Therefore, with the implementation of a federally enforceable emissions limitation, the project constitutes a minor modification to a minor source with respect to PSD regulations and, as such, PSD review requirements do not apply to the project.

4.2 112(g) Case-by-Case MACT

The 112(g) rule, or case-by-case MACT (40 CFR 63.40-63.44) applies to newly constructed facilities or facilities undergoing a reconstruction of a major source of hazardous air pollutant (HAP) emissions (i.e., >10 tpy of any single listed HAP or >25 tpy of total HAPs). Reconstruction is defined:

> (§63.41) *Reconstruct a major source* means the replacement of components at an existing process or production unit that in and of itself emits or has that potential to emit 10 tons per year of any HAP or 25 tons per year of any combination of HAP whenever:
>
> (1) The fixed capital cost of the new components exceeds 50 percent of the fixed capital cost that would be required to construct a comparable process or production unit; and
>
> (2) It is technically and economically feasible for the reconstructed major source to meet the applicable maximum achievable control technology emission limitation for new sources established under this subpart.

Styrene, which is emitted from the Gatsby facility, is a HAP. As shown in Appendix B, the Gatsby facility is a major source of HAP, and the proposed modification project is expected to result in an emissions increase greater than 10 tons/yr of styrene and greater than 25 tons/yr of total HAP. The proposed facility modification does not include the introduction of a new primary process that operates independently from existing operations. Therefore, the proposed modification does not meet the definition of "construction." The cost of the proposed modification is estimated at $807,000, including non process-related paving and building construction, which is below 50 percent of the cost of constructing a new spa manufacturing process estimated at $2,110,100. Therefore, the proposed modification does not meet the definition of "reconstruction." Although potential styrene and total HAP emissions will increase as a result of the proposed facility modification, the 112(g), or Case-by-Case MACT, rule does not apply to this project.

Reinforced plastics composites manufacturing is a designated source category for EPA MACT rulemaking in the year 2000 bin. Gatsby will comply with any applicable requirements of this future MACT rule in accordance with the compliance schedule contained in the final promulgated rule.

4.3 Other Federal, State, and Local Regulations

An applicability and compliance review for other federal, state, and local regulations that specifically apply to the proposed modified facility are summarized in Table 4.1. The current and proposed modified facility are considered to be in compliance with all generally-applicable regulations (e.g., definitions, open burning, test methods); therefore, these regulations are not discussed in this section.

Table 4.1 Summary of Applicability and Compliance Review for Other Regulations

Citation	Title	Summary	Compliance Plan
Federal Regulations			
The facility is not subject to a New Source Performance Standard (as codified in 40 CFR Part 60 and adopted by 62-204.800) or National Emission Standard for Hazardous Air Pollutants (as codified in 40 CFR Parts 61 and 63 and adopted by 62-204.800). NESHAP for this facility's source category is scheduled for promulgation in year 2000.			
State of Florida (DEP) Regulations			
62-4.210 F.A.C	Construction Permits	Specifies the requirements of construction permit applications.	This permit application is intended to satisfy the requirements of this regulation.
62-210.300 F.A.C.	Permits Required	Specifies the construction and operating permit requirements for newly constructed or modified sources.	This permit application is intended to satisfy the requirements of this regulation.
62-213.400 F.A.C.	Permits and Permit Revisions Required	Specifies the operating permit requirements for major (Title V) sources.	This permit application is intended to satisfy the requirements of this regulation.
62-296.320(1) F.A.C. [also adopted by EPC 1-3.60]	General Pollutant Emission Limiting Standards – Part 1	Requires that facilities apply known and existing vapor emission control devices or systems deemed necessary and ordered by the Department for volatile organic compound/organic solvent emission storage and handling.	The proposed modified facility will continue to perform the operational practices required by Condition II.5 of the current operating permit: A) Maintain covers and lids on all containers when not in use; B) When possible and practical, use a cover for any open trough or basin of VOC so that it can be covered when not in use; C) Immediately attend to spills/waste as appropriate; D) Continue search for lower styrene-based resins or vapor suppressant resins.

Table 4.1 Summary of Applicability and Compliance Review for Other Regulations

Citation	Title	Summary	Compliance Plan
62-296.320(2) F.A.C.	General Pollutant Emission Limiting Standards – Part 2	Prohibits the discharge of air pollutants which cause or contribute to an objectionable odor.	Compliance with the the odor standard has not been determined. If subsequent investigation indicates non-compliance, mitigation procedures will be implemented.
62-296.320(4) F.A.C.	General Pollutant Emission Limiting Standards – Part 4	Requires compliance with process weight rate-based particulate emissions limits and a visible emissions standard of 20% opacity.	The proposed modified facility is expected to have minimal particulate emissions. Therefore, compliance with the particulate emissions limits and visible emissions standard is anticipated.
Hillsborough County (EPC) Regulations			
1-3.21	Permits Required	Specifies the construction and operating permit requirements for newly constructed or modified sources.	This permit application is intended to satisfy the requirements of this regulation.
1-3.22	Prohibitions	Prohibits construction or operation of sources which would result in air pollutant releases leading to or contributing to ambient air concentrations greater than NAAQS, discharge pollutants in excess of EPC standards, or discharge pollutants which causes or contributes to an objectionable odor.	The proposed modified facility is not expected to lead or contribute to ambient air concentrations greater than NAAQS or discharge pollutants in excess of EPC standards. Compliance with the odor standard has not been determined. If subsequent investigation indicates non-compliance, mitigation procedures will be implemented.

Table 4.1 Summary of Applicability and Compliance Review for Other Regulations

Citation	Title	Summary	Compliance Plan
1-3.23	Necessary Precautions	Requires that facilities apply known and existing vapor emission control devices or systems deemed necessary and ordered by the Department for volatile organic compound/organic solvent emission storage and handling.	The proposed modified facility will continue to perform the operational practices required by Condition II.5 of the current operating permit (see Rule 62-296.320(1) F.A.C.
1-3.62	Visible Emissions	Requires compliance with a visible emissions standard of 20% opacity.	The proposed modified facility is expected to have minimal particulate emissions. Therefore, compliance with the visible emissions standard is anticipated.

Negative Declarations:

- Rule 62-296.511 F.A.C., Solvent Metal Cleaning, does not apply to the facility's cold cleaners, since the cold cleaners collectively emit VOC at rates below 15 lb/day and 3 lb/hr.
- Rule 62-296.570 F.A.C., Reasonably Available Control Technology (RACT) Requirement for Major VOC and NOx-Emitting Facilities, does not apply to the facility, since the facility does not reside in Broward, Dade, or Palm Counties and is not a major NOx-emitting facility.
- Rule EPC Chapter 1-3.61, Particulate Emissions [adopts Rule 62-296.700 F.A.C., Reasonably Available Control Technology (RACT) Particulate Matter, for all new and existing emission units], does not apply to the facility, since the facility's total maximum allowable emissions of particulate matter are less than 15 tons/yr and 5 lb/hr [62-296.700(2)(a)], and the facility is located more than 5 km outside the boundary of the particulate matter air quality maintenance area [62-296.700(2)(d)].

5.0 Proposed Permit Conditions / Revisions

To incorporate the requirements for the proposed facility modification, revisions to the current Title V operating permit will be required. It is also anticipated that the construction permit for this modification will include most of the same elements as the Title V permit. Therefore, the proposed permit conditions/revisions suggested in this section pertain to both the construction permit and current Title V operating permit. These proposed conditions/revisions are provided in the Section/ Subsection/Condition format of the Title V permit. The conditions/revisions are annotated as follows:

- Deletions – denoted by strike out (e.g., ~~strikeout~~);
- Additions – denoted by underline (e.g., underline); and
- Comments denoted by italics (e.g., *italics*).

Section I. Facility Information

Subsection A. Facility Description

Facility Description

Revise the Facility Description to clarify the facilities current configuration:

The spa manufacturing process includes forming of the mold and woodworking to make the outer shell. In the process, an acrylic sheet is clamped on a mold, heated by a natural gas catalytic oven, and vacuum formed to make the spa shell. Resin, fiberglass, and foam are then applied to the outer shell via spray layup. The facility currently has ~~two stage carousel spray booths with 20,000 cfm fans exhausting out 35 feet stacks. In time the facility is to install~~ three (3) spray booths, each equipped with a filter media, a fan rated at 10,000 acfm and a stack of approximately 35 feet high ~~as authorized in 0570468-004-AC~~. A high volume/low pressure hand held spray gun is used at each spray booth to minimize overspray and maximize transfer efficiency. Emissions from this spray operation, primarily styrene, are currently evacuated and exhausted through the stacks~~, each with 20,000 cfm flow~~ for better dispersion and odor control around the facility. Plumbing, cleaning, and frame fitting are done after the foam spray application.

Volatile organic compound (VOC) emissions generated from the usage of resins, cleanup solvents, PVC cements and polymerization initiators are controlled by a VOC emissions limitation~~s~~ with corresponding recordkeeping ~~placed on material usage~~ and by the use of reasonable precautions.

Particulate matter (PM) emissions generated from the woodworking and fiberglass cutting operations are controlled by control devices that are vented inside the building ~~a rebuilt cyclone and are exhausted outside. PM emission from fiberglass cutting are vacuumed into a filter bag inside the building.~~ These operations are insignificant activites and are not subject to PM-RACT because emissions are less than 5 lb/hr and 15 tons/yr.

Also included in this permit are miscellaneous unregulated/insignificant emissions units and/or activities.

Based on the initial Title V permit application received June 12, 1996, this facility is a major source of hazardous air pollutants (HAPs).

Subsection B. Summary of Emission Unit ID No(s). and Brief Description(s).

Emissions Unit Listing

Remove EU ID No. 002, Wood Working. This operation is now considered an insignificant activity, since it meets the criteria of 62-213.430(6)(b):

1. *Is not subject to a unit-specific applicable requirement;*
   The operation is only subject to generically-applicable rules.
2. *In combination with other insignificant activities would not cause the facility to exceed any major source thresholds; and*
   The facility's significant emission unit (spa production) causes the facility to be a major source.
3. *Would not emit or have the potential to emit:*
   a. *500 lb/yr or more of lead and lead compounds;*
   b. *1000 lb/yr or more of any HAP;*
   c. *2500 lb/yr or more of total HAP; or*
   d. *5.0 tons/yr or more of any other regulated pollutant.*
   Potential PM emissions from the woodworking operation are below 5.0 tons/yr.

Section II. Facility-wide Conditions.

Condition 6.A.

Replace the existing Condition 6.A. with the following text:

A) Ensure that all particulate control devices are properly operated and maintained.

This change meets the intent of the existing condition but more effectively applies to the control devices at the facility.

Section III. Emissions Unit(s) and Conditions.

Eliminate Subsection B entirely, since the woodworking operation is now an insignificant activity. Also, eliminate the Subsection organization, since only one emissions unit remains in this section.

Eliminate/update the note regarding adoption of conditions from the construction permit (which has since been rescinded).

Condition A.1.

Revise Condition A.1. as follows:

A.1. The maximum material usage in any 12 consecutive month period is limited as follows:
[Rule 62-4.160(2), 62-210.200 F.A.C. ~~and Air Construction Permit 0570468-004-AC~~]

	Material	Maximum Percent VOC By Weight for Each and Every Gallon Used		Usage (lbs.) for any 12 Consecutive Month Period
i.	Styrene Based Resins	~~45~~		~~965,000~~
	Method of Operation 1:			
	All Resin Applications:	45		3,949,400
	Method of Operation 2:			
	Production Spray Booth 1:	45		1,735,800
	Production Spray Booth 2:	35		3,223,600
	All Other Resin Applications:	45		186,000
ii.	Styrene Based Gelcoat	53	~~400~~	1,780
iii.	Styrene Monomer	100	~~3,000~~	11,800
iv.	Foam Coating (BASF Products)	Variable	~~82,000~~	416,000
v.	MEKP	3	~~19,200~~	82,600
vi.	Isopropanol	100	~~15,400~~	77,400
vii.	Adhesive Cement	100	~~9,000~~	5,400
viii.	Waterborne Stain	2	~~19,100~~	94,800

Condition A.2.

Revise Condition A.2. to include the new PSD avoidance limit and eliminate the HAP emissions limits:

A.2. The maximum allowable ~~hazardous air pollutant (HAP) and other~~ volatile organic compound (VOC) emissions that can be emitted from this facility in any consecutive 12 months are specified as follows:

Pollutant	Emissions (tons)
Total VOC/~~HAP~~	328.0/~~79.0~~

There does not appear to be a regulatory basis for this limit.

Condition A.4.

Revise Condition A.4 to represent the current and future configuration of the facility:
A.4. All spraying of fiberglass resin shall be done in the corresponding spray booth in the manufacturing building. The spray booth fans shall be operating during any fabrication and/or material usage containing styrene or other VOC material and remain in operation at least two hours after the last material has been applied.

Condition A.5.

Eliminate Condition A.5. entirely, since the catalytic oven is an insignificant activity.

Condition A.6.

Eliminate Condition A.6. entirely, since this condition has no regulatory or technical basis.

Condition A.7.

Eliminate Condition A.7. entirely, since this condition is obsolete.

Condition A.9.

Revise NOTE (1) of Condition A.9. to read:

NOTE (1): Emissions calculations shall be used to demonstrate compliance with the limits in Condition No. A.2. For the purpose of these calculations, the density, HAP content, and VOC content of the raw materials shall be determined from the Material Safety Data Sheet or Product Data Sheet. Emissions from gelcoat and resin shall be calculated using the best available emissions estimation models, emission factors, and/or emissions test results. This data is to be maintained with the monthly records required by Condition No. A.9. and shall be provided to the Division upon request.

Product	Process	Emission Factor
Resin	Hand Layup	15.4%
Resin	Spray Layup	25.9%
Gelcoat	N/A	35%
Styrene Monomer	Surface Cleaner	100%

Eliminate NOTE (2) of Condition A.9., since this note is no longer necessary.

Appendices

Revise all appendices to the permit to reflect the changes proposed in the permit body.

Appendix A

Permit Application Forms
and
Supplemental Attachments

Department of
Environmental Protection

DIVISION OF AIR RESOURCES MANAGEMENT

APPLICATION FOR AIR PERMIT - LONG FORM

I. APPLICATION INFORMATION

Identification of Facility Addressed in This Application

1. Facility Owner/Company Name : New Gatsby Spas, Inc.		
2. Site Name : New Gatsby Spas, Inc.		
3. Facility Identification Number : 0570468		[ ] Unknown
4. Facility Location : Plant City, Florida Street Address or Other Locator : 4408 Airport Road City : Plant City	County : Hillsborough	Zip Code : 33567-1112
5. Relocatable Facility? [ ] Yes [X] No		6. Existing Permitted Facility? [X] Yes [ ] No

Owner/Authorized Representative or Responsible Official

1. Name and Title of Owner/Authorized Representative or Responsible Official : Name : Kenneth W. Sorah Title : President/CEO
2. Owner or Authorized Representative or Responsible Official Mailing Address : Organization/Firm : New Gatsby Spas, Inc. Street Address : 4408 Airport Road City : Plant City State : FL Zip Code : 33567-1112
3. Owner/Authorized Representative or Responsible Official Telephone Numbers : Telephone : (813)754-4122 Fax : (813)752-5716
4. Owner/Authorized Representative or Responsible Official Statement : *I, the undersigned, am the owner or authorized representative* of the non-Title V source addressed in this Application for Air Permit or the responsible official, as defined in Rule 62-210.200, F.A.C., of the Title V source addressed in this application, whichever is applicable. I hereby certify, based on information and belief formed after reasonable inquiry, that the statements made in this application are true, accurate and complete and that, to the best of my knowledge, any estimates of emissions reported in this application are based upon reasonable techniques for calculating emissions. The air pollutant emissions units and air pollution control equipment described in this application will be operated and maintained so as to comply with all applicable standards for control of air pollutant emissions found in the statutes of the State of Florida and rules of the Department of Environmental Protection and revisions thereof. I understand that a permit, if granted by the Department, cannot be transferred without authorization from the Department, and I will promptly notify the Department upon sale or legal transfer of any permitted emissions units.* Kenneth W. Sorah 10/15/99 Signature Date

* Attach letter of authorization if not currently on file.

Scope of Application

Emissions Unit ID	Description of Emissions Unit	Permit Type
001	Spa Manufacturing Process	

Purpose of Application and Category

Category I : All Air Operation Permit Applications Subject to Processing Under Chapter 62-213, F.A.C.

This Application for Air Permit is submitted to obtain :

[ ] Initial air operation permit under Chapter 62-213, F.A.C., for an existing facility which is classified as a Title V source.

[ ] Initial air operation permit under Chapter 62-213, F.A.C., for a facility which, upon start up of one or more newly constructed or modified emissions units addressed in this application, would become classified as a Title V source.

Current construction permit number :

[ ] Air operation permit renewal under Chapter 62-213, F.A.C., for a Title V source.

Operation permit to be renewed :

[ ] Air operation permit revision for a Title V source to address one or more newly constructed or modified emissions units addressed in this application.

Current construction permit number :

Operation permit to be revised :

[X] Air operation permit revision or administrative correction for a Title V source to address one or more proposed new or modified emissions units and to be processed concurrently with the air construction permit application.

Operation permit to be revised/corrected :
0570468-005-AV

[ ] Air operation permit revision for a Title V source for reasons other than construction or modification of an emissions unit.

Operation permit to be revised :

Reason for revision :

Category II : All Air Operation Permit Applications Subject to Processing Under Rule 62-210.300(2)(b), F.A.C.

This Application for Air Permit is submitted to obtain :

[ ] Initial air operation permit under Rule 62-210.300(2)(b), F.A.C., for an existing facility seeking classification as a synthetic non-Title V source.

Current operation/construction permit number(s) :

[ ] Renewal air operation permit under Fule 62-210.300(2)(b), F.A.C., for a synthetic non-Title V source.

Operation permit to be renewed :

[ ] Air operation permit revision for a synthetic non-Title V source.

Operation permit to be revised :

Reason for revision :

Category III : All Air Construction Permit Applications for All Facilities and Emissions Units

This Application for Air Permit is submitted to obtain :

[**X**] Air construction permit to construct or modify one or more emissions units within a facility (including any facility classified as a Title V source).

Current operation permit number(s), if any :
0570468-005-AV

[ ] Air construction permit to make federally enforceable an assumed restriction on the potential emissions of one or more existing, permitted emissions units.

Current operation permit number(s) :

[ ] Air construction permit for one or more existing, but unpermitted, emissions units.

Application Processing Fee

Check one :

[ ] Attached - Amount : $0.00 [X] Not Applicable.

Construction/Modification Information

1. Description of Proposed Project or Alterations : The facility is proposing to reconfigure its operations to achieve the full production capacity of the facilit This includes installing one additional bulk resin storage tank, three additional resin mixing day tanks, an mold preparation ("tooling") resin spray booth. Revision of permitted emission factors is requested to reflect more accurate data. Revision of emission limits is requested to reflect the facility's true potential emissions.	
2. Projected or Actual Date of Commencement of Construction :	01-Feb-2000
3. Projected Date of Completion of Construction :	01-Mar-2000

Professional Engineer Certification

1. Professional Engineer Name : John M. Burke Registration Number : 46949	
2. Professional Engineer Mailing Address : Organization/Firm : Radian International Street Address : 1979 Lakeside Pkwy, Suite 800 City : Tucker	State : GA Zip Code : 30084
3. Professional Engineer Telephone Numbers : Telephone : (770)414-4522	Fax : (770)414-4919

4. Professional Engineer Statement :

I, the undersigned, hereby certify, except as particularly noted herein, that :*

(1) To the best of my knowledge, there is reasonable assurance that the air pollutant emissions unit(s) and the air pollutant control equipment described in this Application for Air Permit, when properly operated and maintained, will comply with all applicable standards for control of air pollutant emissions found in the Florida Statutes and rules of the Department of Environmental Protection; and

(2) To the best of my knowledge, any emission estimates reported or relied on in this application are true, accurate, and complete and are either based upon reasonable techniques available for calculating emissions or, for emission estimates of hazardous air pollutants not regulated for an emissions unit addressed in this application, based solely upon the materials, information and calculations submitted with this application.

If the purpose of this application is to obtain a Title V source air operation permit (check here [ ] if so), I further certify that each emissions unit described in this Application for Air Permit, when properly operated and maintained, will comply with the applicable requirements identified in this application to which the unit is subject, except those emissions units for which a compliance schedule is submitted with this application.

If the purpose of this application is to obtain an air construction permit for one or more proposed new or modified emissions units (check here [ ] if so), I further certify that the engineering features of each such emissions unit described in this application have been designed or examined by me or individuals under my direct supervision and found to be in conformity with sound engineering principles applicable to the control of emissions of the air pollutants characterized in this application.

If the purpose of this application is to obtain an initial air operation permit or operation permit revision for one or more newly constructed or modified emissions units (check here [ ] if so), I further certify that, with the exception of any changes detailed as part of this application, each such emissions has been constructed or modified in substantial accordance with the information given in the corresponding application for air construction permit and with all provisions contained in such permit.

Signature (seal) — 10-15-99 Date

* Attach any exception to certification statement.

Application Contact

1. Name and Title of Application Contact : Name : Eric Nemeth Title : Counsellors at Law
2. Application Contact Mailing Address : Organization/Firm : Edwards & Angell, LLP Street Address : 51 John F. Kennedy Parkway City : Short Hills State : NJ Zip Code : 07078-5006
3. Application Contact Telephone Numbers : Telephone : (973)376-7700 Fax : (973)376-3380

Application Comment

II. FACILITY INFORMATION

A. GENERAL FACILITY INFORMATION

Facility, Location, and Type

1. Facility UTM Coordinates :
   Zone : 17   East (km) : 385.40   North (km) : 3098.00

2. Facility Latitude/Longitude :
   Latitude (DD/MM/SS) : 28 1   Longitude (DD/MM/SS) : 82 9 39

3. Governmental Facility Code :	4. Facility Status Code :	5. Facility Major Group SIC Code :	6. Facility SIC(s) :
0	A	30	3088

7. Facility Comment :

II. FACILITY INFORMATION

A. GENERAL FACILITY INFORMATION

Facility Contact

1. Name and Title of Facility Contact :			
Mr. Dan Clements Engineering Manager			
2. Facility Contact Mailing Address :			
Organization/Firm :	New Gatsby Spas, Inc.		
Street Address :	4408 Airport Road		
City :	Plant City	State : FL	Zip Code : 33567-1112
3. Facility Contact Telephone Numbers :			
Telephone :	(813)754-4288	Fax :	(813)759-6000

Facility Regulatory Classifications

1. Small Business Stationary Source?	N
2. Title V Source?	Y
3. Synthetic Non-Title V Source?	N
4. Major Source of Pollutants Other than Hazardous Air Pollutants (HAPs)?	Y
5. Synthetic Minor Source of Pollutants Other than HAPs?	N
6. Major Source of Hazardous Air Pollutants (HAPs)?	Y
7. Synthetic Minor Source of HAPs?	N
8. One or More Emissions Units Subject to NSPS?	N
9. One or More Emission Units Subject to NESHAP?	N
10. Title V Source by EPA Designation?	N
11. Facility Regulatory Classifications Comment : The facility will potentially be subject to a MACT standard (40 CFR, Part 63) for reinforced plastic composites production (promulgation expected by year 2000).	

B. FACILITY REGULATIONS

Rule Applicability Analysis

B. FACILITY REGULATIONS

List of Applicable Regulations

62-210 F.A.C. Stationary Sources - General Requirements

62-213 F.A.C. Operation Permits for Major Sources of Air Pollution

62-296.320 F.A.C. General Pollutant Emission Limiting Standards

62-297.310 F.A.C. General Test Requirements

62-297.330 F.A.C. Applicable Test Procedures

62-297.340 F.A.C. Frequency of Compliance Tests

62-297.570 F.A.C. Test Reports

Chapter 1-1 General Rules. Rules of the Environmental Protection Commission of Hillsborough County.

Chapter 1-3 Air Pollution. Rules of the Environmental Protection Commission of Hillsborough County.

Chapter 1-4 Open Burning. Rules of the Environmental Protection Commission of Hillsborough County.

AC29-258630

62-4.210 F.A.C. Construction Permits

C. FACILITY POLLUTANTS

Facility Pollutant Information

1. Pollutant Emitted	2. Pollutant Classification
VOC	A
H163	A
H075	B
H120	B
HAPS	A

D. FACILITY POLLUTANT DETAIL INFORMATION

Facility Pollutant Information Pollutant 1

1. Pollutant Emitted : VOC		
2. Requested Emissions Cap :	(lbs/hour)	328.0000 (tons/year)
3. Basis for Emissions Cap Code : ESCPSD		
4. Facility Pollutant Comment :		

D. FACILITY POLLUTANT DETAIL INFORMATION

Facility Pollutant Information Pollutant 2

1. Pollutant Emitted : H163	
2. Requested Emissions Cap : (lbs/hour)	(tons/year)
3. Basis for Emissions Cap Code : OTHER	
4. Facility Pollutant Comment : Styrene. No emissions cap is requested for this pollutant.	

D. FACILITY POLLUTANT DETAIL INFORMATION

Facility Pollutant Information Pollutant 3

1. Pollutant Emitted : H075		
2. Requested Emissions Cap :	(lbs/hour)	(tons/year)
3. Basis for Emissions Cap Code :		
4. Facility Pollutant Comment : Dimethylphthalate. No emissions cap is requested for this pollutant.		

D. FACILITY POLLUTANT DETAIL INFORMATION

Facility Pollutant Information Pollutant 4

1. Pollutant Emitted : H120	
2. Requested Emissions Cap : (lbs/hour)	(tons/year)
3. Basis for Emissions Cap Code :	
4. Facility Pollutant Comment : Methyl ethyl ketone. No emissions cap is requested for this pollutant.	

D. FACILITY POLLUTANT DETAIL INFORMATION

Facility Pollutant Information Pollutant 5

1. Pollutant Emitted : HAPS		
2. Requested Emissions Cap :	(lbs/hour)	(tons/year)
3. Basis for Emissions Cap Code :		
4. Facility Pollutant Comment : Total Hazardous Air Pollutants. No emissions cap is requested for this pollutant.		

D. FACILITY SUPPLEMENTAL INFORMATION

Supplemental Requirements for All Applications

1. Area Map Showing Facility Location :	Attachment A
2. Facility Plot Plan :	Attachment B
3. Process Flow Diagram(s) :	Attachment C
4. Precautions to Prevent Emissions of Unconfined Particulate Matter :	Attachment D
5. Fugitive Emissions Identification :	Attachment E
6. Supplemental Information for Construction Permit Applica	NA

Additional Supplemental Requirements for Category I Applications Only

7. List of Proposed Exempt	Attachment F
8. List of Equipment/Activities Regulated under Title	NA
9. Alternative Methods of Operation :	NA
10. Alternative Modes of Operation (Emissions	NA
11. Identification of Additional Applicable	NA
12. Compliance Assurance Monitoring	NA
13. Risk Management Plan Verification :	NA
14. Compliance Report and Plan :	Attachment G
15. Compliance Certification (Hard-copy Requir	Attachment G

III. EMISSIONS UNIT INFORMATION

A. TYPE OF EMISSIONS UNIT
(Regulated and Unregulated Emissions Units)

Emissions Unit Information Section 1

Spa Manufacturing Process

Type of Emissions Unit Addressed in This Section

1. Regulated or Unregulated Emissions Unit? Check one :

[ ] The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.

[ ] The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.

2. Single Process, Group of Processes, or Fugitive Only? Check one :

[ ] This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).

[X] This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.

[ ] This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.

Emissions Unit Information Section 1

B. GENERAL EMISSIONS UNIT INFORMATION
(Regulated and Unregulated Emissions Units)

Emissions Unit Description and Status

<table>
<tr><td colspan="3">1. Description of Emissions Unit Addressed in This Section :

Spa Manufacturing Process</td></tr>
<tr><td colspan="3">2. Emissions Unit Identification Number : 001
[ ] No Corresponding ID [ ] Unknown</td></tr>
<tr><td>3. Emissions Unit Status Code : A</td><td>4. Acid Rain Unit?
[ ] Yes [X] No</td><td>5. Emissions Unit Major Group SIC Code : 30</td></tr>
<tr><td colspan="3">6. Emissions Unit Comment :

This emission unit comprises of all activities involved in the spa manufacturing process.</td></tr>
</table>

Emissions Unit Information Section 1

Spa Manufacturing Process

Emissions Unit Control Equipment 1

1. Description : None
2. Control Device or Method Code :

C. EMISSIONS UNIT DETAIL INFORMATION
(Regulated Emissions Units Only)

Emissions Unit Information Section 1

Spa Manufacturing Process

Emissions Unit Details

1. Initial Startup Date :
2. Long-term Reserve Shutdown Date :
3. Package Unit : Manufacturer : Model Number :
4. Generator Nameplate Rating : MW
5. Incinerator Information : Dwell Temperature : Degrees Fahrenheit Dwell Time : Seconds Incinerator Afterburner Temperature : Degrees Fahrenheit

Emissions Unit Operating Capacity

1. Maximum Heat Input Rate : mmBtu/hr
2. Maximum Incinerator Rate : lb/hr tons/day
3. Maximum Process or Throughput Rate :
4. Maximum Production Rate : 48750 Spas per year
5. Operating Capacity Comment : The maximum production rate is provided for informational purposes only. Production rate limitations are not requested in this application.

Emissions Unit Operating Schedule

Requested Maximum Operating Schedule : 24 hours/day 7 days/week 52 weeks/year 8,760 hours/year

D. EMISSIONS UNIT REGULATIONS
(Regulated Emissions Units Only)

Emissions Unit Information Section 1

Spa Manufacturing Process

Rule Applicability Analysis

Emissions Unit Information Section 1
Spa Manufacturing Process

List of Applicable Regulations

62-296.320 General Pollutant Emission Limiting Standards

AC29-258630

E. EMISSION POINT (STACK/VENT) INFORMATION

Emissions Unit Information Section 1

Spa Manufacturing Process

Emission Point Description and Type :

1. Identification of Point on Plot Plan or Flow Diagram :		
2. Emission Point Type Code : 3		
3. Descriptions of Emission Points Comprising this Emissions Unit : Four spray booth stacks and fugitive emissions sources.		
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common : Spa Manufacturing Process		
5. Discharge Type Code :	V	
6. Stack Height :	35	feet
7. Exit Diameter :	4.00	feet
8. Exit Temperature :	82	°F
9. Actual Volumetric Flow Rate :	10,000	acfm
10. Percent Water Vapor :		%
11. Maximum Dry Standard Flow Rate :		dscfm
12. Nonstack Emission Point Height :	15	feet
13. Emission Point UTM Coordinates : Zone : East (km) :	North (km) :	
14. Emission Point Comment :		

F. SEGMENT (PROCESS/FUEL) INFORMATION

Emissions Unit Information Section 1

Spa Manufacturing Process

Segment Description and Rate : Segment 1

1. Segment Description (Process/Fuel Type and Associated Operating Method/Mode) : Resin Application Operation Method 1	
2. Source Classification Code (SCC) : 31401504	
3. SCC Units : Tons Used	
4. Maximum Hourly Rate :	5. Maximum Annual Rate : 1,974.70
6. Estimated Annual Activity Factor :	
7. Maximum Percent Sulfur :	8. Maximum Percent Ash :
9. Million Btu per SCC Unit :	
10. Segment Comment : This alternative method of operation includes the use of resin in both production resin spray booths with maximum styrene content of 45 wt. % (non-vapor suppressed).	

F. SEGMENT (PROCESS/FUEL) INFORMATION

Emissions Unit Information Section 1

Spa Manufacturing Process

Segment Description and Rate : Segment 2

1. Segment Description (Process/Fuel Type and Associated Operating Method/Mode) : Resin Application Operation Method 2	
2. Source Classification Code (SCC) : 31401504	
3. SCC Units : Tons Used	
4. Maximum Hourly Rate :	5. Maximum Annual Rate : 2,572.79
6. Estimated Annual Activity Factor :	
7. Maximum Percent Sulfur :	8. Maximum Percent Ash :
9. Million Btu per SCC Unit :	
10. Segment Comment : This alternative method of operation includes the use of 45 wt. % styrene resin (non-vapor suppressed) in the Stage I booth and 35 wt. % styrene resin (tap or suppressed) in the Stage II booth.	

F. SEGMENT (PROCESS/FUEL) INFORMATION

Emissions Unit Information Section 1

Spa Manufacturing Process

Segment Description and Rate : Segment 3

1. Segment Description (Process/Fuel Type and Associated Operating Method/Mode) : Gelcoat Application	
2. Source Classification Code (SCC) : 31499999	
3. SCC Units : Tons Used	
4. Maximum Hourly Rate :	5. Maximum Annual Rate : 0.89
6. Estimated Annual Activity Factor :	
7. Maximum Percent Sulfur :	8. Maximum Percent Ash :
9. Million Btu per SCC Unit :	
10. Segment Comment :	

F. SEGMENT (PROCESS/FUEL) INFORMATION

Emissions Unit Information Section 1

Spa Manufacturing Process

Segment Description and Rate : Segment 4

1. Segment Description (Process/Fuel Type and Associated Operating Method/Mode) : MEKP	
2. Source Classification Code (SCC) : 31499999	
3. SCC Units : Tons Used	
4. Maximum Hourly Rate :	5. Maximum Annual Rate : 41.30
6. Estimated Annual Activity Factor :	
7. Maximum Percent Sulfur :	8. Maximum Percent Ash :
9. Million Btu per SCC Unit :	
10. Segment Comment :	

F. SEGMENT (PROCESS/FUEL) INFORMATION

Emissions Unit Information Section 1

Spa Manufacturing Process

Segment Description and Rate : Segment 5

1. Segment Description (Process/Fuel Type and Associated Operating Method/Mode) : Foam Coating	
2. Source Classification Code (SCC) : 31499999	
3. SCC Units : Tons Used	
4. Maximum Hourly Rate :	5. Maximum Annual Rate : 208.31
6. Estimated Annual Activity Factor :	
7. Maximum Percent Sulfur :	8. Maximum Percent Ash :
9. Million Btu per SCC Unit :	
10. Segment Comment :	

F. SEGMENT (PROCESS/FUEL) INFORMATION

Emissions Unit Information Section 1

Spa Manufacturing Process

Segment Description and Rate : Segment 6

1. Segment Description (Process/Fuel Type and Associated Operating Method/Mode) : Isopropanol	
2. Source Classification Code (SCC) : 31499999	
3. SCC Units : Tons Used	
4. Maximum Hourly Rate :	5. Maximum Annual Rate : 38.70
6. Estimated Annual Activity Factor :	
7. Maximum Percent Sulfur :	8. Maximum Percent Ash :
9. Million Btu per SCC Unit :	
10. Segment Comment :	

F. SEGMENT (PROCESS/FUEL) INFORMATION

Emissions Unit Information Section 1

Spa Manufacturing Process

Segment Description and Rate : Segment 7

1. Segment Description (Process/Fuel Type and Associated Operating Method/Mode) : PVC Cement	
2. Source Classification Code (SCC) : 31499999	
3. SCC Units : Tons Used	
4. Maximum Hourly Rate :	5. Maximum Annual Rate : 2.90
6. Estimated Annual Activity Factor :	
7. Maximum Percent Sulfur :	8. Maximum Percent Ash :
9. Million Btu per SCC Unit :	
10. Segment Comment :	

F. SEGMENT (PROCESS/FUEL) INFORMATION

Emissions Unit Information Section 1

Spa Manufacturing Process

Segment Description and Rate : Segment 8

1. Segment Description (Process/Fuel Type and Associated Operating Method/Mode) : Waterborne Stain	
2. Source Classification Code (SCC) : 31499999	
3. SCC Units : Tons Used	
4. Maximum Hourly Rate :	5. Maximum Annual Rate : 47.40
6. Estimated Annual Activity Factor :	
7. Maximum Percent Sulfur :	8. Maximum Percent Ash :
9. Million Btu per SCC Unit :	
10. Segment Comment :	

G. EMISSIONS UNIT POLLUTANTS
(Regulated and Unregulated Emissions Units)

Emissions Unit Information Section 1

Spa Manufacturing Process

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
1 - VOC			EL
2 - H163			WP
3 - H075			NS
4 - H120			NS
5 - HAPS			WP

H. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units Only - Emissions Limited Pollutants Only)

Emissions Unit Information Section 1

Spa Manufacturing Process

Pollutant Potential/Estimated Emissions : Pollutant 1

1. Pollutant Emitted : **VOC**		
2. Total Percent Efficiency of Control :	%	
3. Potential Emissions :	lb/hour	328.0000000 tons/year
4. Synthetically Limited? [X] Yes [ ] No		
5. Range of Estimated Fugitive/Other Emissions:	to	tons/year
6. Emissions Factor Reference : See Note	Units	
7. Emissions Method Code : 2		
8. Calculations of Emissions : See Appendix B		
9. Pollutant Potential/Estimated Emissions Comment : PSD Avoidance Emissions Limitation. NOTE: Emissions calculated using emission factors (FRP Model) and material balances.		

H. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units Only - Emissions Limited Pollutants Only)

Emissions Unit Information Section 1

Spa Manufacturing Process

Pollutant Potential/Estimated Emissions : Pollutant 2

1. Pollutant Emitted : **H163**		
2. Total Percent Efficiency of Control :	%	
3. Potential Emissions :	lb/hour	238.0000000 tons/year
4. Synthetically Limited? [ ] Yes [X] No		
5. Range of Estimated Fugitive/Other Emissions:	to	tons/year
6. Emissions Factor Reference : See Note	Units	
7. Emissions Method Code : 5		
8. Calculations of Emissions : See Appendix B		
9. Pollutant Potential/Estimated Emissions Comment : No emissions limitation requested. NOTE: Emissions calculated using emission factors (FRP Model) and material balances.		

H. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units Only - Emissions Limited Pollutants Only)

Emissions Unit Information Section 1

Spa Manufacturing Process

Pollutant Potential/Estimated Emissions : Pollutant 3

1. Pollutant Emitted : **H075**	
2. Total Percent Efficiency of Control : %	
3. Potential Emissions : lb/hour	1.1400000 tons/year
4. Synthetically Limited? [ ] Yes [X] No	
5. Range of Estimated Fugitive/Other Emissions: to	tons/year
6. Emissions Factor Units Reference : See Note	
7. Emissions Method Code : 2	
8. Calculations of Emissions : See Appendix B	
9. Pollutant Potential/Estimated Emissions Comment : No emissions limitation requested. NOTE: Emissions calculated using material balance.	

H. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units Only - Emissions Limited Pollutants Only)

Emissions Unit Information Section 1

Spa Manufacturing Process

Pollutant Potential/Estimated Emissions : Pollutant 4

1. Pollutant Emitted : **H120**		
2. Total Percent Efficiency of Control :	%	
3. Potential Emissions :	lb/hour	0.9930000 tons/year
4. Synthetically Limited? [ ] Yes [X] No		
5. Range of Estimated Fugitive/Other Emissions:	to	tons/year
6. Emissions Factor Reference : See Note	Units	
7. Emissions Method Code : 2		
8. Calculations of Emissions : See Appendix B		
9. Pollutant Potential/Estimated Emissions Comment : No emissions limitation requested. NOTE: Emissions calculated using material balance.		

H. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units Only - Emissions Limited Pollutants Only)

Emissions Unit Information Section 1

Spa Manufacturing Process

Pollutant Potential/Estimated Emissions : Pollutant 5

1. Pollutant Emitted : **HAPS**
2. Total Percent Efficiency of Control : %
3. Potential Emissions : lb/hour 240.0000000 tons/year
4. Synthetically Limited? [ ] Yes [X] No
5. Range of Estimated Fugitive/Other Emissions: to tons/year
6. Emissions Factor Units Reference : See Note
7. Emissions Method Code : 2
8. Calculations of Emissions : See Appendix B
9. Pollutant Potential/Estimated Emissions Comment : No emissions limitation requested. NOTE: Emissions calculated using emission factors (FRP Model) and material balances.

Emissions Unit Information Section 1

Spa Manufacturing Process

Pollutant Information Section 1

Allowable Emissions 1

1. Basis for Allowable Emissions Code :	ESCPSD			
2. Future Effective Date of Allowable Emissions :				
3. Requested Allowable Emissions and Units :	328.00	tons/yr		
4. Equivalent Allowable Emissions :		lb/hour	328.00	tons/year
5. Method of Compliance : See Note				
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) : NOTE: Record keeping of material usage, material VOC content, emission factors, and emissions.				

I. VISIBLE EMISSIONS INFORMATION
(Regulated Emissions Units Only)

Emissions Unit Information Section _____

<u>Visible Emissions Limitation :</u> Visible Emissions Limitation _____

1. Visible Emissions Subtype :
2. Basis for Allowable Opacity :
3. Requested Allowable Opacity : Normal Conditions : % Exceptional Conditions : % Maximum Period of Excess Opacity Allowed : min/hour
4. Method of Compliance :
5. Visible Emissions Comment :

J. CONTINUOUS MONITOR INFORMATION
(Regulated Emissions Units Only)

Emissions Unit Information Section

K. PREVENTION OF SIGNIFICANT DETERIORATION (PSD) INCREMENT TRACKING INFORMATION

Emissions Unit Information Section 1

Spa Manufacturing Process

PSD Increment Consumption Determination

1. Increment Consuming for Particulate Matter or Sulfur Dioxide?

[ ] The emissions unit is undergoing PSD review as part of this application, or has undergone PSD review previously, for particulate matter or sulfur dioxide. If so, emissions unit consumes increment.

[ ] The facility addressed in this application is classified as an EPA major source pursuant to paragraph (c) of the definition of "major source of air pollution" in Chapter 62-213, F.A.C., and the emissions unit addressed in this section commenced (or will commence) construction after January 6, 1975. If so, baseline emissions are zero, and emissions unit consumes increment.

[ ] The facility addressed in this application is classified as an EPA major source, and the emissions unit began initial operation after January 6, 1975, but before December 27, 1977. If so, baseline emissions are zero, and emissions unit consumes increment.

[X] For any facility, the emissions unit began (or will begin) initial operation after December 27, 1977. If so, baseline emissions are zero, and emissions unit consumes increment.

[ ] None of the above apply. If so, the baseline emissions of the emissions unit are nonzero. In such case, additional analysis, beyond the scope of this application, is needed to determine whether changes in emissions have occurred (or will occur) after the baseline date that may consume or expand increment.

2. Increment Consuming for Nitrogen Dioxide?

[ ] The emissions unit addressed in this section is undergoing PSD review as part of this application, or has undergone PSD review previously, for nitrogen dioxide. If so, emissions unit consumes increment.

[ ] The facility addressed in this application is classified as an EPA major source pursuant to paragraph (c) of the definition of "major source of air pollution" in Chapter 62-213, F.A.C., and the emissions unit addressed in this section commenced (or will commence) construction after February 8, 1988. If so, baseline emissions are zero, and emissions unit consumes increment.

[ ] The facility addressed in this application is classified as an EPA major source, and the emissions unit began initial operation after February 8, 1988, but before March 28, 1988. If so, baseline emissions are zero, and emissions unit consumes increment.

[**X**] For any facility, the emissions unit began (or will begin) initial operation after March 28, 1988. If so, baseline emissions are zero, and emissions unit consumes increment.

[ ] None of the above apply. If so, baseline emissions of the emissions unit are nonzero. In such case, additional analysis, beyond the scope of this application, is needed to determine whether changes in emissions have occurred (or will occur) after the baseline date that may consume or expand increment.

3. Increment Consuming/Expanding Code :		
PM :	SO2 :	NO2 :
4. Baseline Emissions :		
PM :	lb/hour	tons/year
SO2 :	lb/hour	tons/year
NO2 :		tons/year
5. PSD Comment :		
PM, SO2 or NOx are emitted below PSD significance thresholds.		

L. EMISSIONS UNIT SUPPLEMENTAL INFORMATION

Emissions Unit Information Section 1

Spa Manufacturing Process

Supplemental Requirements for All Applications

1. Process Flow Diagram :	Attachment C
2. Fuel Analysis or Specification :	NA
3. Detailed Description of Control Equipment :	NA
4. Description of Stack Sampling Facilities :	NA
5. Compliance Test Report :	NA
6. Procedures for Startup and Shutdown :	NA
7. Operation and Maintenance Plan :	NA
8. Supplemental Information for Construction Permit Application :	NA
9. Other Information Required by Rule or Statue :	NA

Additional Supplemental Requirements for Category I Applications Only

10. Alternative Methods of Operations :	Attachment H
11. Alterntive Modes of Operation (Emissions Trading) :	NA

12. Identification of Additional Applicable Requirements :	NA
13. Compliance Assurance Monitoring Plan :	NA

14. Acid Rain Application (Hard-copy Required) :

NA	Acid Rain Part - Phase II (Form No. 62-210.900(1)(a))
NA	Repowering Extension Plan (Form No. 62-210.900(1)(a)1.)
NA	New Unit Exemption (Form No. 62-210.900(1)(a)2.)
NA	Retired Unit Exemption (Form No. 62-210.900(1)(a)3.)

Appendix B

Emission Calculations

RADIAN INTERNATIONAL
A DAMES & MOORE GROUP COMPANY

CALCULATION SHEET

Calc. No. **Summary**

Prepared By: Jeremy Sagen Date: 10/15/1999 Reviewed By Tommy Sweat Date: 10/15/1999

Section I. General Information

Project: New Gatsby Spas, Inc. Air Pollutant Emissions Inventory Project No.: 803815.01

Subject: Summary of Air Pollutant Emissions from Gatsby Spa, Inc.

Section II. Summary of Emissions

A. Presented below in Table II-1 are total facility-wide emissions using Method 1 (i.e., using resin with 45% styrene content in the Stage II spray booth. See Calculation Resin Appl.). The different potential emission categories are described as follows:

- Current potential emissions take into account the facility's current permitted emission limits.
- Future potential emissions are based on the potential process throughput and potential material usage of the post-modified facility.
- Limited potential emissions are estimated to keep the modified facility VOC emissions increase below the Prevention of Significant Deterioration (PSD) applicability threshold (i.e., 250 tpy). A potential facility-wide increase of 249 ton VOC/yr in addition the facility's current permitted VOC emission limit (i.e., 79 tpy) results in total facility-wide potential VOC emissions of 328 tpy. To achieve the limited potential VOC emissions of 328 tpy, resin usage and miscellaneous material usage are set to 98% of future potential usage (See Calculations ResinAppl. and Material Usage).

Table II-1. Summary of Annual Air Pollutant Emissions from Gatsby Spa, Inc. Using Resin Application Method 1

REQUESTED

	Emissions (tpy)			
Pollutant	Actual	Current Potential[a]	Future Potential	Limited Potential
Criteria Pollutants				
PM_{10}	0.121	15.0	0.354	0.354
SO_2	0.0005	0.0015	0.002	0.002
NO_x	0.086	0.250	0.250	0.250
CO	0.072	0.210	0.210	0.210
VOC	73.5	79.0	334	328
Hazardous Air Pollutants (HAP)				
Dimethyl Phthalate	0.255	1.16	1.16	1.14
MEK	0.222	1.01	1.013	0.993
Naphthalene	9.40E-05	4.28E-04	4.28E-04	4.20E-04
Styrene	53.3	56.8	242	238
Xylene	7.50E-05	7.50E-05	7.50E-05	7.35E-05
Total HAP	53.8	58.9	245	240

a Gatsby Spa, Inc. permitted emission limits are: 15.0 tpy PM, 79.0 tpy VOC, 56.8 tpy styrene, and 58.9 tpy total HAP (Permit No. 0570468-005-AV).

Section II. Summary of Emissions (continued)

B. Presented below in Table II-2 are total facility-wide emissions using Method 2 (i.e., using resin with 35% styrene content in the Stage II spray booth. See Calculation Resin Appl.). The different potential emission categories are described as follows:

- Current potential emissions take into account the facility's current permitted emission limits. These emissions are the same as current potential emissions estimated for Method 1.

- To achieve the limited potential VOC emissions of 328 tpy, resin usage in the Stage I and II spray booths are adjusted under the following constraints: the ratio of resin used in the Stage I booth to the resin used in the Stage II booth is 7:13; limited potential usage values for the tooling booth, gelcoating, hand layup, and material usage are held constant; and future potential usage values for the tanks and the natural-gas fired oven are held constant. (See Calculations ResinAppl.).

Table II-2. Summary of Annual Air Pollutant Emissions from Gatsby Spa, Inc. Using Resin Application Method 2

	Emissions	
Pollutant	Current Potential[a]	Limited Potential
Criteria Pollutants		
PM_{10}	15.0	0.354
SO_2	0.0015	0.002
NO_x	0.250	0.250
CO	0.210	0.210
VOC	79.0	328
Hazardous Air Pollutants (HAP)		
Dimethyl Phthalate	1.16	1.14
MEK	1.01	0.993
Naphthalene	4.28E-04	4.20E-04
Styrene	56.8	238
Xylene	7.50E-05	7.35E-05
Total HAP	58.9	240

a Gatsby Spa, Inc. permitted emission limits are: 15.0 tpy PM, 79.0 tpy VOC, 56.8 tpy styrene, and 58.9 tpy total HAP (Permit No. 0570468-005-AV).

C. Hourly PM emissions are presented below in Table II-3.

Table II-3. Summary of Hourly PM Emissions from Gatsby Spa, Inc.

	Emissions (lb/hr)		
Pollutant	Current Actuals	Current Potential[a]	Future Potential
PM_{10}	0.081	5.0	0.081

a Gatsby Spa, Inc. permitted emission limits are: 5.0 lb/hr PM (Permit No. 0570468-005-AV).

RADIAN INTERNATIONAL
A DAMES & MOORE GROUP COMPANY

CALCULATION SHEET

Calc. No. **ResinAppl**

Prepared By: Jeremy Sagen Date: 10/15/1999 Reviewed By: Tommy Sweat Date: 10/15/1999

Section I. General Information

Project: New Gatsby Spas, Inc. Air Pollutant Emissions Inventory Project No.: 803815.01

Subject: Styrene Emissions from Resin Application

Section II. Source Description

A. One of the first steps in spa manufacturing is creating the vacuum mold. The mold is made of wood and a vinyl ester blend resin applied in the tooling (mold prep) booth. The spa shell is then manufactured by forming an acrylic sheet onto the vacuum mold. Resin, fiberglass, and foam are then applied to the outer shell via spray layup. Gatsby Spa currently has two stage carousel spray booths with 10,000 cfm fans for resin application. Filter molds also are coated with resin in a hand layup application.

B. The purpose of this calculation is to estimate VOC and HAP emissions from resin application operations including two alternative methods of operation.

Section III. Data

Method 1

A. The United States Environmental Protection Agency (EPA), in collaboration with Research Triangle Institute, has developed a model for estimating styrene emissions from fiber-reinforced plastics fabrication processes. This model is called the FRP Model Version 1.0 (1998). Gatsby Spa resin application process parameters as needed for input values into the FRP Model are summarized below.

Table III-1. FRP Model Data and Usage Rate Data for Resin Application Processes[a]

Variable	Resin Sprayup Booths			Resin Hand Layup	Gelcoat Application
	Stage I	Stage II	Tooling Booth		
Model Data					
Styrene Content (wt. %)	45	45	45	45	53
Styrene Suppressant	N/A	N/A	N/A	N/A	N/A
Distance From Spray Gun to Mold (inches)	32	32	32	N/A	32
Dry Material Off Mold / Material Sprayed (%)	5	5	5	N/A	5
Thickness (mils)	93.75	218.75	1,000	125	30
Cup Gel Time (min)	12	12	12	18	20
Application Rate (lbs/min)	9.3	9.3	9.3	N/A	9
Air Temperature (°F)	72.3	72.3	72.3	72.3	72.3
Air Flow Velocity (ft/min)	142.9	142.9	142.9	35.6	35.6
Usage Data					
Styrene-based Resin Usage (lb/yr) - Actual	295,005	547,865	4,000	38,775	400
Styrene-based Resin[b] Usage (lb/yr) - Future Potential	1,344,065	2,496,114	13,200	176,662	1,822
Styrene-based Resin[c] Usage (lb/yr) - Limited Potential	1,317,184	2,446,192	12,936	173,129	1,786

a Data from Gatsby Spa Inc. personnel.
b See Data B.
c See Data C.

?
?

REQUEST

Section III. Data (continued)

B. Future potential resin usage is based on the unlimited potential process throughput of the post-modified facility. Future potential resin usage is estimated by multiplying the actual resin usage by the actual-to-potential ratio.

C. Limited potential resin usage values are 98 percent of future potential resin usage. Limited potential resin usage values are used to keep the facility VOC emission increase below the Prevention of Significant Deterioration (PSD) applicability threshold (i.e., 250 tpy). A potential facility-wide increase of 249 ton VOC/yr in addition the facility's current permitted VOC emission limit (i.e., 79 tpy) results in total facility-wide potential VOC emissions of 328 tpy. Limited potential material usage values are also 98 percent of future potential material usage values (See Calculation Material Usage)

Method 2

D. Gatsby Spa also has the capability to use a maximum 35% styrene content resin in the Stage II spray booth. This method estimates styrene emissions using this value in the FRP model. The model and usage data for the tooling booth, resin hand layup, and gelcoat applications are the same as the data for Method 1.

Table III-2. FRP Model Data and Usage Rate Data for Method 2 Analysis

	Resin Sprayup Booths	
Variable	Stage I	Stage II
Model Data		
Styrene Content (wt. %)	45	35
Styrene Suppressant (% Filler)	N/A	50
Distance From Spray Gun to Mold (inches)	32	32
Dry Material Off Mold / Material Sprayed (%)	5	5
Thickness (mils)	93.75	93.75
Cup Gel Time (min)	12	12
Application Rate (lbs/min)	9.3	9.3
Air Temperature (°F)	72.3	72.3
Air Flow Velocity (ft/min)	142.9	142.9
Usage Data		
Styrene-based Resin Usage (lb/yr) - Limited Potential	1,735,835	3,223,694

E. To achieve the limited potential VOC emissions of 328 tpy, resin usage in the Stage I and II spray booths are adjusted under the following constraints: the ratio of resin used in the Stage I booth to the resin used in the Stage II booth is 7:13; limited potential usage values for the tooling booth, gelcoating, hand layup, and material usage are held constant; and future potential usage values for the tanks and the natural-gas fired oven are held constant. (See Calculations ResinAppl.).

The limited potential resin usage values are adjusted until the total limited potential VOC emissions from both the Stage I and Stage II spray booths are equal to 224 (i.e., 222 tpy = 328 tpy - Limited Potential VOC Emissions from the Tooling Booth, Gel Coating, Hand Layup, and Material Usage - Future Potential Emissions from Tanks and the Oven).

Section III. Data (continued)

Actual-to-Potential Data

F. The actual-to-potential ratio for the Stage I and II sprayup booths, hand layup, and gelcoat application processes are calculated using the following data:

Table III-3. Actual-to-Potential Ratio Data[a]

Resin Application Process Parameter	Value
Actual Tub Production (tub/yr)	10,700
Potential Tub Production (tub/yr)	48,750

a Data from Gatsby Spa Inc. personnel.

Actual-to-Potential Ratio for Resin Application = 48,750 (potential tubs/yr) / 10,700 (actual tubs/yr)

= 4.56

G. The actual-to-potential ratio for the tooling (mold prep) booth: 3.3 (i.e. 33 potential molds/yr to 10 actual molds/yr).

Section IV. Assumptions

A. The Stage II booth dry material off mold per material sprayed value is assumed to be the same as the value for the Stage I booth.

B. The thickness of resin sprayed in the new spray booth is assumed to be 1,000 mils (i.e., 1 inch).

C. For the gelcoat application, the spray distance and air velocity values are assumed to be the same as the values for the sprayup booths and hand layup, respectively.

Section V. Approach

A. The EPA's FRP Model v1.0 and the data shown in Table III-1 were used to estimate emissions of styrene from the resin application processes presented in this calculation. Because this software is a peer-reviewed technical resource, a detailed manual calculation of the emission algorithms was not prepared. Complete documentation of the calculations performed in the FRP Model v1.0 program is presented in EPA's documentation for the ORD/RTI FRP Emission Model [Ref. A]. Output data from the FRP Model program consists of the percent of available styrene emitted. Table VI-1 summarizes the output data for each resin application process. Shown below is an example calculation of actual styrene emissions from the Stage I spray booth using Method 1.

Actual Styrene Emissions = Resin Usage (lb/yr) * Percent Available Styrene (%) * Percent Available Styrene Emitted (%)

= ?295,005 (lb resin/yr) * 0.45 (lb styrene/lb resin) * 0.319 (lb styrene emitted/lb styrene available) ? = 10700 Tubs SOURCE

= 42,348 lb styrene/yr {21.2 tpy} ?

Section V. Approach (continued)

B. An example calculation of future potential styrene emissions from the Stage I spray booth using Method 1 is shown as follows:

Future Potential Resin Usage = Actual Resin Usage (lb/yr) * Actual-to-Potential Ratio

= 295,005 (lb resin/yr) * 4.56

= 1,344,065 lb resin/yr

Future Potential Styrene Emissions = Future Potential Resin Usage (lb/yr) * Percent Available Styrene (%) * Percent Available Styrene Emitted (%)

= 1,344,065 lb resin/yr * 0.45 (lb styrene/lb resin) * 0.319 (lb styrene emitted/lb styrene available)

= 192,941 lb styrene/yr {96.5 tpy}

C. An example calculation of limited potential styrene emissions from the Stage I spray booth using Method 1 is shown as follows:

Limited Potential Resin Usage = Future Potential Resin Usage (lb/yr) * Percent Reduction

= 1,344,065 (lb resin/yr) * [1- 0.02] ?

= 1,317,184 lb resin/yr

Limited Potential Styrene Emissions = Limited Potential Resin Usage (lb/yr) * Percent Available Styrene (%) * Percent Available Styrene Emitted (%)

= 1,317,184 lb resin/yr * 0.45 (lb styrene/lb resin) * 0.319 (lb styrene emitted/lb styrene available)

= 189,082 lb styrene/yr {94.5 tpy}

Section VI. Results

Method 1

A. Summarized below in Table VI-1 is the output data from the FRP Model (percent available styrene emitted) and actual and potential emissions from resin application processes for operational method 1.

Table VI-1. Actual and Potential Styrene Emissions from Resin Application Processes as Calculated from FRP Model Emission Factors - Method 1

	FRP Emission Factor [Available Styrene Emitted (%)]	Emissions					
		Actual		Future Potential		Limited Potential	
		(lb/yr)	(tpy)	(lb/yr)	(tpy)	(lb/yr)	(tpy)
Stage I Booth	31.9	42,348	21.2	192,941	96.5	189,082	94.5
Stage II Booth	23.5	57,937	29.0	263,964	132	258,685	129
Tooling Booth	33.5	603	0.302	1,990	0.995	1,950	0.975
Resin Hand Layup	8.4	1,466	0.733	6,678	3.34	6,544	3.27
Gelcoat Application	61	129	0.065	589	0.295	577	0.289
Total		102,483	51.2	466,161	233	456,838	228

Method 2

B. Summarized below in Table VI-2 are limited potential emissions from resin application processes for operational method 2.

Table VI-2. Actual and Potential Styrene Emissions from Resin Application Processes as Calculated from FRP Model Emission Factors - Method 2

	FRP Emission Factor [Available Styrene Emitted (%)]	Limited Potential Emissions	
		(lb/yr)	(tpy)
Stage I Booth	31.9	249,179	125
Stage II Booth	17.6	198,580	99.3
Total for Stage I and II		447,759	224
Tooling Booth	33.5	1,950	0.975
Resin Hand Layup	8.4	6,544	3.27
Gelcoat Application	61	577	0.289
Total for all Applications		456,830	228

? lb/yr

Section VII. References

A. Summarized Background Information for the ORD Empirical Model to Predict Styrene Emissions from Fiber-Reinforced Plastics Fabrication Processes. U.S. Environmental Protection Agency.

B. Haberlein, Robert. Technical Discussion of the Unified Emission Factors for Open Molding of Composites. April 7, 1999.

CALCULATION SHEET

Calc. No. **MatUsage**

Prepared By: Jeremy Sagen Date: 10/15/1999 Reviewed By Tommy Sweat Date: 10/15/1999

Section I. General Information

Project: New Gatsby Spas, Inc. Air Pollutant Emissions Inventory Project No.: 803815.01

Subject: VOC and HAP Emissions from Miscellaneous Material Usage

Section II. Source Description

A. Gatsby Spa uses cleanup solvents, PVC cements, and polymerization initiators which emit volatile organic compounds (VOC) and hazardous air pollutants (HAP) due to evaporation. The purpose of this calculation is to estimate VOC and HAP emissions from material usage and property data.

Section III. Data

A. Material usage and property data is summarized below in Table III-1.

Table III-1. Gatsby Spa Material Usage and Property Data[a]

Material	Pollutant	Content (wt. %)	Usage (lb/hr) Actual	Future Potential[b]	Limited Potential[c]
MEKP Catalyst			18.504	84.306	82.619
	Dimethyl Phthalate[d]	2.76			
	MEK[e]	0.24			
	VOC	3			
BASF NPU 553377 Foam			46.655	212.564	208.312
	VOC	45			
Styrene Monomer			2.656	12.101	11.859
	Styrene	100			
	VOC	100			
Isopropanol			17.343	79.016	77.436
	VOC	100			
Immersion Cleaner and Cold Parts Clean			4	18.2	17.9
	Napthalene	4.70			
	VOC	84.8			
PVC Cement			1.300	5.923	5.804
	MEK	30.8			
	VOC	76.9			
Waterborne Stain			21.251	96.821	94.885
	VOC	2			
Screen Ink Thinner			5	22.8	22.3
	VOC	100			
VM&P Naptha			10	45.6	44.6
	VOC	100			
Mineral Spirits			20	91.1	89.3
	VOC	100			

Section III. Data (continued)

Table III-1. Gatsby Spa Material Usage and Property Data (continued)[a]

Material	Pollutant	Content (wt. %)	Usage (lb/hr) Actual	Future Potential[b]	Limited Potential[c]
Marbocote 75 CEE			75	75.0	73.5
	VOC	100			
Safety Kleen 105 Solvent			15	15.0	14.7
	Xylene	1			
	VOC	100			
Safety Kleen Premium Solvent			10	10.0	9.8
	VOC	100			

a Data from Gatsby Spa Inc. personnel.
b See Data B.
c See Data E.
d See Assumption A.
e See Assumption B.

B. Future potential material usage is based on the unlimited potential process throughput of the post-modified facility. Future potential material usage is estimated by multiplying the actual material usage by the actual-to-potential ratio.

C. Actual-to-Potential Ratio: 4.56 (See Calculation ResinAppl. for estimation of this ratio.)

D. For waterborne staining, Gastby Spa also performs out-source staining in addition to their own in-house staining. The actual-to-potential usage ratio for waterborne stain is equal to 4.55 plus the actual-to-potential ratio for the Wood Shop (i.e. 4.56 + 5 = 9.56). See Calculation Wood for calculation of the Wood Shop's actual-to-potential ratio. ?

E. Limited potential material usage values are 98 percent of future potential usage. Limited potential usage values are estimated to keep the facility VOC emission increase below the Prevention of Significant Deterioration (PSD) applicability threshold (i.e., 250 tpy). A potential facility-wide increase of 249 ton VOC/yr in addition the facility's current permitted VOC emission limit (i.e., 79 tpy) results in total facility-wide potential VOC emissions of 328 tpy. Limited potential resin usage value are also 98 percent of future potential resin usage (See Method 1 in Calculation ResinAppl.)

Section IV. Assumptions

A. MEKP Catalyst contains 69 wt% dimethyl phthalate (MSDS is provided as Attachment 1). However, since dimethyl phthalate has a low vapor pressure, it is assumed that only 4.0% of the available dimethyl phthalate is emitted [Ref. A]. Thus, the total weight percentage of dimethyl phthalate emitted is 2.76% (i.e. 0.69 * 0.04 = 0.0276). ?

B. Per MSDS, MEKP Catalyst contains 3 wt% of volatile material. Since 2.76 wt% of emitted compounds is comprised of dimethyl phthalate, it is assumed that the remaining 0.24 wt% emitted is methyl ethyl ketone (MEK). This is within the expected range of MEK present in MEKP Catalyst [Ref. A].

Prepared By: Jeremy Sagen Date: 10/15/1999 Reviewed By Tommy Sweat Date: 10/15/1999

Section V. Approach

A. Actual emissions are calculated using the actual usage of material and the weight fraction of pollutant. For example, actual VOC emissions from use of MEKP Catalyst are calculated as follows:

Actual Annual
VOC Emissions = MEKP Catalyst Usage (lb/yr) * VOC Weight Fraction

= 18,504 (lb/yr) * 0.03

= 555 lb/yr {0.277 tpy}

B. Future potential emissions are calculated using the actual-to-potential ratio and actual usage. Future potential VOC emissions from use of MEKP Catalyst are calculated as follows:

Future Potential MEKP
Catalyst Usage = Actual MEKP Catalyst Usage (lb/yr) * Actual-to-Potential Ratio

= 18,503 (lb/yr) * 4.56

= 84,306 lb/yr

Future Potential Annual
VOC Emissions = Future Potential MEKP Catalyst Usage * VOC Weight Fraction

= 84,306 (lb/yr) * 0.03

= 2,529 lb/yr {1.26 tpy}

C. Limited potential emissions are calculated using the future potential usage and percent usage reduction needed to fall below the PSD applicability threshold. Limited potential VOC emissions from use of MEKP Catalyst are calculated as follows:

Limited Potential MEKP
Catalyst Usage = Future Potential MEKP Catalyst Usage (lb/yr) * [1 - Percent Reduction]

= 84,306 (lb/yr) * [1 - 0.02]

= 82,619 lb/yr

Limited Potential Annual
VOC Emissions = Limited Potential MEKP Catalyst Usage * VOC Weight Fraction

= 82,619 (lb/yr) * 0.03

= 2,479 lb/yr {1.24 tpy}

Section VI. Results

A. Presented below in Table V-1 are actual and potential VOC and HAP emissions from material usage.

Table V-1. Actual and Potential VOC and HAP Emissions from Miscellaneous Material Usage

	Emissions					
	Actual		Future Potential		Limited Potential	
	(lb/yr)	(tpy)	(lb/yr)	(tpy)	(lb/yr)	(tpy)
Criteria Pollutants						
VOC	43,112	21.6	196,066	98.0	192,144	96.1
Hazardous Air Pollutants						
Dimethyl Phthalate	511	0.255	2,327	1.16	2,280	1.14
MEK	445	0.222	2,027	1.01	1,986	0.99
Napthalene	0.188	9.40E-05	0.857	4.28E-04	0.839	4.20E-04
Styrene	2,656	1.33	12,101	6.05	11,859	5.93
Xylene	0.150	7.50E-05	0.150	7.50E-05	0.147	7.35E-05
Total HAP	3,612	1.81	16,455	8.23	16,126	8.06

Section VII. References

A. Haberlein, R. Emission Factors for Liquid Organic Peroxide Catalysts used in the Open Molding of Composites. (provided as Attachment 2).

Attachment 1

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7 9049 D

WITCO MATERIAL SAFETY DATA SHEET

INT(R) PD-1 RED

Product Code: 260 0156

S NO: 1338-23-4

NFPA HAZARD RATING
4 - Extreme
3 - High
2 - Moderate
1 - Slight
0 - Insignificant

Fire: 2
Health: 3
Reactivity: 2
Special:

VISION AND LOCATION---SECTION I

vision: POLYMER ADDITIVES GROUP
cation: MARSHALL, TEXAS
P.O. BOX 1439, HWY 59 & BUSSEY RD, MARSHALL,TX, 75671
ergency Telephone Number: (903) 938-5141 or Chemtrec (800) 424-9300
ansportation Emergency: CHEMTREC 1-(800) 424-9300 (U.S. and Canada)

EMICAL AND PHYSICAL PROPERTIES---SECTION II

emical Name:
methyl ethyl ketone peroxide
ula: not applicable
rdous Decomposition Products:
carbon monoxide and carbon dioxide from burning.
compatibility (Keep away from):
strong acids, bases, promoters, accelerators, readily oxidizables, and metal salts.

kic and Hazardous Ingredients:	%	CAS #
methyl ethyl ketone peroxide (5.4% active oxygen max.)	22 +/-2	1338-23-4
dimethylphthalate	67 +/-2	131-11-3

rm: liquid   Odor: slightly pungent
pearance: clear   Color: red
ecific Gravity (water=1): 1.133
iling Point: no data available, decomposes over 68°C (155°F)
lting Point: not applicable
lubility in Water (by weight %): less than 1 at 25°C
latile (by weight %): less than 3
aporation Rate: not applicable
por Pressure (mm Hg at 20°C): not applicable
por Density (air=1): not applicable
(as is): no data available
ability: Product is stable when stored at recommended temperatures
scosity SUS at 100°F: 15 centistokes at 25°C (77°F)
her physical properties:
self accelerating decomposition temperature (SADT): 4 gal: 76°C (169°F)
1 gal: 79°C (175°F)

(Continued on next page)

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FIRE AND EXPLOSION DATA---SECTION III

Special Fire Fighting Procedures:
Fight fire with large amounts of water from a safe distance. Keep containers cool with water spray. After a fire, wait until material has cooled to room temperature before starting clean-up. Wear protective equipment to prevent smoke inhalation.

Unusual Fire and Explosion Hazards:
Potential explosion hazards. Once ignited, product will burn vigorously.

Flashpoint: (Method Used) Setaflash closed tester 85°C (185°F)

Flammable limits %: not applicable

Extinguishing agents:
Drychemical or Waterspray or Waterfog or CO_2 or Foam
Closed containers exposed to fire may be cooled with water.

HEALTH HAZARD DATA---SECTION IV

Permissible concentrations (air):
methyl ethyl ketone peroxide: 0.7 ppm, 5 mg/m^3 ceiling (OSHA); 0.2 ppm, 1.5 mg/m^3 ceiling (ACGIH)
dimethylphthalate: 5 mg/m^3 (OSHA/ACGIH)

Chronic effects of overexposure:
Specific symptoms and effects of over exposure not known, but will cause severe eye irritation; may cause blindness. Harmful if inhaled. Harmful or fatal if swallowed. Moderate skin irritant.

Acute toxicological properties:
for methyl ethyl ketone peroxide: acute oral LD_{50} = 1000-5000 mg/kg (rat); eye (rabbit) severe irritant/corrosive

Emergency First Aid Procedures:

Eyes: Immediately flush with large quantities of water on site for 20 to 30 minutes. Hold eyes open while flushing. Call a physician. Continue water flush up to one hour during transport to a medical facility.

Skin Contact: Wash with soap and water. If irritation occurs, see a physician.

Inhalation: Remove to fresh air. Consult a physician if discomfort persists.

If Swallowed: Administer large quantities of water if person is conscious. Never give anything by mouth to an unconscious person. Immediately contact a physician.

ROUTES OF ENTRY:
Inhalation, skin/eye contact, ingestion

SPECIAL PROTECTION INFORMATION---SECTION V

Ventilation Type Required (Local,mechanical,special):
Local if necessary to maintain allowable PEL(permissible exposure limit) or TLV(threshhold limit value)

Respiratory Protection (Specify type):
Use NIOSH/MSHA certified respirator with organic vapor cartridge if vapor

(Continued on next page)

(Section V continued)

concentration exceeds permissible exposure limit

Protective Gloves:
neoprene type

Eye Protection:
chemical safety goggles

Other Protective Equipment:
as required to protect against skin contact

HANDLING OF SPILLS OR LEAKS---SECTION VI

Procedures for Clean-Up:
Use appropriate protective clothing during clean-up.
Absorb spills with inert material such as perlite, vermiculite, or sand and then wet with water. Sweep up using non-sparking equipment and place in double polyethylene bags. Isolate leakers and contaminated containers to a safe place for disposal.

Waste Disposal:
Dispose of in accordance with all applicable federal, state and local regulations.
Dispose of waste at EPA-approved hazardous waste disposal facilities.

SPECIAL PRECAUTIONS---SECTION VII

Precautions to be taken in handling and storage:
Store in original containers away from promoters and combustible material. Keep away from acids, heat, sparks, flames and direct sunlight. Keep closed to avoid contamination. Isolated storage is desirable.

Maximum Storage Temperature: 38°C (100°F)

TRANSPORTATION DATA---SECTION VIII

D.O.T.: Regulated

U.S. D.O.T. Proper Shipping Name: Organic peroxide Type E, liquid (methyl ethyl ketone peroxides, =<40%), 5.2, UN 3107, PG II,
ERG 48, Hi-Point PD-1 Red

U.S. D.O.T. Hazard Class: Organic Peroxide

I.D. Number: UN 3107

Label(s) Required: Organic Peroxide

Reportable Quantity: not applicable

Freight Classification: Chemicals, NOI, N.F.M.C. Item 43940 Sub 2

Special Transportation Notes:
none

(Continued on next page)

ENVIRONMENTAL/SAFETY REGULATIONS---SECTION IX

Section 313 (Title III Superfund Amendment and Reauthorization Act):

This product contains the following chemical(s) subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372 (the corresponding CAS number and percent by weight are also provided):

dimethyl phthalate CAS# 131-11-3 67%

COMMENTS

Never mix any promoter or accelerator with product as very rapid or explosive decomposition could occur. Do not store with food or drink.

*** STATE RIGHT-TO-KNOW SUBSTANCES ***

CAS NUMBER	CHEMICAL NAME
131-11-3	Dimethyl phthalate
7722-84-1	Hydrogen peroxide
78-93-3	Methyl ethyl ketone
1338-23-4	Methyl ethyl ketone peroxide

ade Secret Registry Numbers: NJ 136411-5146P PA RTK Withheld

repared by: Roger N. Lewis
Title: R & D Director/Organic Peroxides
Original Date: Sent to:
Revision Date: 04/25/94
Supersedes : 09/30/93
Date Sent :

We believe the statements, technical information and recommendations contained herein are reliable, but they are given without warranty or guarantee of any kind, express or implied, and we assume no responsibility for any loss, damage, or expense, direct or consequential, arising out of their use.

Attachment 2

Engineering Environmental
Consulting Services

March 24, 1999

Emission Factors for Liquid Organic Peroxide Catalysts used in the Open Molding of Composites

Robert A. Haberlein, Ph.D., QEP

Introduction

Small quantities of highly reactive liquid organic peroxide solutions are used by the reinforced plastics industry to initiate the polymerization reaction (also referred to as "curing") in the resin or gelcoat material. These solutions are commonly called "catalysts," and are known by the commercial trade names Butanox™, Lupersol™, Thermacure™ or Hi-Point™. In order to start the curing reaction, enough catalyst solution is added to the resin or gelcoat material until about 1% to 2% of the material weight consists of catalyst. The catalyst solution is either sprayed together with the resin or gelcoat during spray lay-up (Mechanical), or a carefully measured amount of catalyst is stirred into a pail or bucket of resin for hand lay-up (Manual).

Most organic peroxide catalysts consist of a 30% to 47% solution of methyl ethyl ketone peroxide (MEKP) dissolved in dimethyl phthalate (DMP). The DMP acts as is a stabilizing agent to prevent the spontaneous detonation of the MEKP at room temperature. A trace amount of methyl ethyl ketone (MEK) may also be present as a contaminant byproduct left over from the manufacture of the MEKP.

MEKP

MEKP is a highly reactive, colorless liquid organic oxidizer, with a pungent burning odor, which has the following properties:

CAS registry number	1338-23-4
molecular formula	$CH_3COCH_2CH_3O_2$.
vapor pressure	less than 0.1 mm Hg at room temperature

Contrary to a popular misconception, MEKP does not decompose into MEK after being sprayed together with resin or gelcoat. Instead, the MEKP is immediately consumed by the resin to initiate the curing process, so no MEKP is released. If a trace amount of MEKP does not fully react with the resin or gelcoat, a small amount of acetic acid droplets may be formed due to reactions with moisture present in the air - but not MEK. Acetic acid droplets are neither a HAP nor a VOC. **Therefore, the normal usage of MEKP at reinforced plastics facilities will not result** in any measurable VOC or HAP emissions whatsoever.

DMP

DMP is a colorless, oily, viscous organic liquid with a faintly sweet, ester-like odor, which has the following properties:

CAS registry number	131-11-3
molecular formula	$C_{10}H_{10}O_4$
vapor pressure	less than 0.01 mm Hg at room temperature

DMP is both a VOC and a listed HAP. Fortunately, DMP has an extremely low vapor pressure resulting in practically no evaporation at room temperature. DMP vapor emissions from catalyst solutions are probably extremely small, but are still non-zero. The following five-step theoretical approach is employed to determine a reasonable non-zero emission factor for DMP:

1. According to the UEF model, a 50% styrene-content resin applied by spray gun will emit about 18.1% of the available styrene monomer before the resin cures. After curing, these emissions from the resin essentially stop.

2. DMP emissions will also emit a trace amount of vapor before the resin cures, and will follow the same general evaporation mechanisms as for the styrene monomer.

3. The ratio of vapor pressures for DMP to styrene is 0.01 mmHg ÷ 4.5 mmHg = 0.0022.

4. The evaporation rate for typical VOC species is proportional to the VOC vapor pressure.

5. Hence, the emission factor for DMP will be 0.0022 × 18.1% = **0.040% of available DMP by weight.**

Note that DMP emissions will be practically negligible at nearly all reinforced plastics facilities in the USA. For example, a plant using one million pounds of resin (which is a relatively large amount) would only emit the following amount of DMP vapor:

1,000,000 lb/yr resin × 1.5% catalyst × 60% DMP × 0.04% = **3.6 lb/yr DMP emissions**

This amount of DMP will be very small, so record-keeping and reporting requirements for DMP emissions from catalyst usage do not seem to be warranted.

MEK

MEK is another VOC and listed HAP, which may be a trace contaminant byproduct of the precursor chemical reactions employed to produce MEKP. However, the amount of contamination is reportedly very small - normally from about 50 ppm to a maximum of 1% by weight of MEK may be present in the raw MEKP feedstock used to make commercially-available catalyst formulations. Presumably, all of this trace amount of MEK will be released during the lamination process, because the MEK will neither react nor combine with the polyester resin during curing. However, as in the case of DMP emissions discussed above, these MEK emissions will be insignificant at nearly all reinforced plastics facilities in the USA. For example, a plant using one million pounds of resin would emit no more than the following amount of MEK vapor at a maximum contamination level of 1% MEK in the MEKP feedstock and assuming a 40% MEKP concentration in the catalyst:

1,000,000 lb/yr resin × 1.5% catalyst × 1% MEK × 40% MEKP = **60 lb/yr MEK emissions**

The actual emission of MEK would probably be lower, because most catalysts formulations use MEKP with much less than 1% MEK contamination. The actual MEK contamination in a specific catalyst formulation can be obtained from the catalyst supplier. The amount of MEK emissions will be so small that record-keeping and reporting requirements for MEK emissions from catalyst usage do not seem to be warranted.

The above information regarding MEKP, DMP, and MEK emissions may be confirmed by contacting Dr. Frank Long, a leading authority on organic peroxides, who works for the Norac Company, one of the two major manufacturers of catalyst materials for the reinforced plastics industry. Dr. Long may be reached at (626) 334-2908, or at info@norac.com. The information provided by Dr. Long can be verified by contacting Mr. Brice Milleville, another authority on MEKP catalysts, who works for Akzo Nobel, the second major manufacturer of MEKP catalysts. Mr. Milleville may be reached at (914) 674-5099, or by email at bryce.milleville@akzo-nobel.com.

RADIAN INTERNATIONAL
A DAMES & MOORE GROUP COMPANY

CALCULATION SHEET

Calc. No. **Oven**

Prepared By: Jeremy Sagen   Date: 10/15/1999   Reviewed By: Tommy Sweat   Date: 10/15/1999

Section I. General Information

Project: New Gatsby Spas, Inc. Air Pollutant Emissions Inventory   Project No.: 803815.01

Subject: Air Pollutant Emissions from a Natural Gas Fired Oven

Section II. Source Description

A. At Gatsby, an acrylic sheet is clamped onto a spa mold, heated by a catalytic natural gas oven (0.6 MMBtu/hr heat input), and vacuum formed to make the spa shell. This calculation will estimate criteria pollutant emissions from operation of the oven.

Section III. Data

A. The emission rates for criteria pollutants from the ovne have been estimated using emission factors presented in the U.S. Environmental Protection Agency's AP-42 [Ref. A]. These emission factors for criteria pollutants are presented in Table III-1.

Table III-1. Criteria Pollutant Emission Factors

Classification	Fuel Type	Emission Factor ($lb/10^6$ scf - Natural Gas)				
		PM_{10}[a]	SO_2[b]	NO_X	CO	VOC
Commercial (0.3 - 100 10^6 Btu/hr)	Natural Gas	7.6	0.6	100	84	5.5

a PM_{10} emisson factor is the summation of filterable and condensible PM emission factors for natural gas combustion, per AP-42 guidance [Ref. A].

b Based on average sulfur content of natural gas, 2000 $gr/10^6$ scf, per AP-42 guidance [Ref. A].

B. The heating value of natural gas: 1,050 Btu/scf [Ref. B].

C. Actual operating hours: 3,000 hr/yr
Potential operating hours: 8,760 hr/yr

Section IV. Approach

A. Emissions from the oven are estimated based on the oven's maximum heat input capacity, the heating value of natural gas, and the operating hours of the oven. An example calculation of potential PM emissions from the oven is shown below:

Potential Annual
PM Emissions = Maximum Heat Capacity (MMBtu/hr) * (10^6 Btu/MMBtu) / Heating Value (Btu/scf) * Emissions Factor ($lb/10^6$ scf) * 8760 (hr/yr)

= 0.6 (MMBtu/hr) * (10^6 Btu/MMBtu) / 1,050 (Btu/scf) * 7.6 ($lb/10^6$ scf) * 8,760 (hr/yr)

= 38.0 lb PM/yr {0.004 tpy}

Section V. Results

Potential Hourly
PM Emissions = Potential Annual PM Emission (lb/yr) / Potential Operating Hours (hr/yr)

= 38.0 (lb/yr) / 8,760 (hr/yr)

= 0.004 lb PM/hr

A. Summarized below in Table V-1 are actual and potential criteria pollutant emissions from operation of the natural gas fired oven.

Table V-1. Criteria Pollutant Emissions from Operation of the Natural Gas Fired Oven

	Actual Emissions[a]			Future Potential Emissions[a]		
Pollutant	(lb/hr)	(lb/yr)	(tpy)	(lb/hr)	(lb/yr)	(tpy)
PM_{10}	0.004	13.0	0.007	0.004	38.0	0.019
SO_2	N/A	1.03	0.0005	N/A	3.00	0.002
NO_x	N/A	171	0.086	N/A	501	0.250
CO	N/A	144	0.072	N/A	420	0.210
VOC	N/A	9.4	0.005	N/A	27.5	0.014

a The facility has permitted PM emission limits of 5.0 lb PM/hr and 15.0 lb PM/yr from all sources (Permit No. 0570468-005-AV). See Calculation Woodshop for PM emissions from the wood working operations.
N/A = Not Applicable.

Section VI. References

A. Supplement D, March, 1998. Revision to Section 1.4, AP-42, Compilation of Air Pollutant Emission Factors. Volume 1: Stationary, Point, and Area Sources. U.S. Environmental Protection Agency, Research Triangle Park, N.C.

B. AP-42, Compilation of Air Pollutant Emission Factors, Volume 1: Stationary, Point, and Area Sources. U.S. Environmental Protection Agency, Research Triangle Park, N.C. Fifth Edition, October, 1992, Appendix A.

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CALCULATION SHEET

Calc. No. **Woodshop**

Prepared By: Jeremy Sagen Date: 10/15/1999 Reviewed By Tommy Sweat Date: 10/15/1999

Section I. General Information

Project: New Gatsby Spas, Inc. Air Pollutant Emissions Inventory Project No.: 803815.01

Subject: PM Emissions From the Wood Shop

Section II. Source Description

A. The spa manufacturing operation includes woodworking to make the frame of the outer shell of the spa. Particulate matter (PM) emissions generated from the woodworking operations are controlled by a baghouse filtration unit that vents inside the building.

Section III. Data

A. Operational data for the Wood Shop is summarized below in Table III-1. Gatsby Spa performs in-sourcing woodworking operations for other spa manufacturing facilities as well as its own in-house woodworking operations.

Table III-1. Wood Shop Operation Parameters[a]

Variable	Value	
Actual Hours of Operation	3,000	(hr/yr)
Potential Hours of Operation	8,760	(hr/yr)
Exhaust Flow into Baghouse	9,000	(acfm)
Exit Grain Loading from Baghouse	0.00087	(gr/dscf)
Exhaust Tempature	72.3	°F

a Data from Gatsby Spa Inc. personnel.

Section IV. Assumptions

A. The flow into the baghouse is assumed to be 2% water by weight.

Section V. Results

A. Actual controlled PM emissions are calculated using the the exit grain loading factor, the hours of operation, and the flow rate into the baghouse.

Actual Controlled
PM Emissions = Exit Grain Loading Factor (gr/dscf) * Flow Rate (acfm) / (1 - 0.02 wt.% water) * (25 °C / 22.4 °C)
Actual Operating Hours (hr/yr) * 60 (min/hr) / 7,000 (gr/lb)

= 0.00087 (gr/dscf) * 9,000 (acfm) / 0.98 * (25oC / 22.4oC) * 3,000 (hr/yr) * 60 (min/hr) / 7,000 (gr/lb)

= 229 lb PM/yr {0.114 tpy}

Section V. Results (continued)

Hourly Actual
PM Emissions = Actual Annual Controlled PM Emissions (lb/yr) / Actual Hours of Operation (hr/yr)

= 229 (lb/yr) / 3,000 (hr/yr)

= 0.076 lb PM/hr

B. Current potential controlled PM emissions are limited by the facility's permit (No. 05700468-005-AV) to 5.0 lb/hr and 15.0 tpy. This includes PM emissions from the natural gas-fired oven (see Calculation Oven).

C. Future potential controlled PM emissions from the baghouse filtration unit are calculated using the potential hours of operation rather than the current hours of operation.

Potential Controlled
PM Emissions = Actual Controlled PM Emissions (lb/yr) * Potential Operating Hours (hr/yr) / Actual Operating Hours (lb/yr)

= 229 (lb/yr) * 8,760 (hr/yr) / 3,000 (hr/yr)

= 670 lb PM/yr {0.335 tpy}

Hourly Potential
PM Emissions = Potential Annual Controlled PM Emissions (lb/yr) / Potential Hours of Operation (hr/yr)

= 670 (lb/yr) / 8,760 (hr/yr)

= 0.076 lb PM/hr

Section VI. References

A. Alley, F.C. and Cooper, C. David. Air Pollution Control. A Design Approach. Waveland Press, Inc. 1990. Figure 3.1, page 83.

B. AP-42, Compilation of Air Pollutant Emission Factors, Volume 1: Stationary, Point, and Area Sources. U.S. Environmental Protection Agency, Research Triangle Park, N.C. Supplement A, September, 1996, Appendix B2.

RADIAN INTERNATIONAL
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CALCULATION SHEET

Calc. No. **Tanks**

Prepared By: Jeremy Sagen Date: 10/15/1999 Reviewed By Tommy Sweat Date: 10/15/1999

Section I. General Information

Project: New Gatsby Spas, Inc. Air Pollutant Emissions Inventory Project No.: 803815.01

Subject: Styrene Emissions from Bulk Storage and Mixing Tanks

Section II. Source Description

A. Gatsby Spa operates three vertical aboveground resin storage tanks and four mixing tanks. The purpose of this calculation is to determine styrene emissions from these sources.

Section III. Data

Storage Tanks

A. The Tampa facility has three vertical fixed-roof storage tanks for storing styrene-based resin. Table III-1 summarizes the physical characteristics and throughput rates of each tank.

Table III-1. Storage Tank Characteristics

Variable	Value
Tank Nos. 1 and 2	
Working Capacity (gals.)	8,000
Height (ft)	15
Diameter (ft)	10
Actual Throughput (lb/yr)[a]	286,849
Tank No. 3	
Working Capacity (gals.)	8,700
Height (ft)	15.83
Diameter (ft)	10.25
Actual Throughput (lb/yr)[a]	311,948

a See Assumption A.

B. Meteorological data (i.e., monthly solar insulation values and 10-meter mean wind speed data, and temperature data) for Tampa, Florida were used for the facility.

C. The maximum styrene content of resins stored in the tanks is 45 wt.%.

D. The density of styrene: 7.45 lb/gal [Ref. A]

Mixing Tanks

E. Resins are stored and blended with fillers in four mixing tanks. This calculation uses styrene property data, physical equipment parameters, and the stagnant gas film diffusion model to estimate emissions from this process. Styrene and equipment parameters needed for this model are summarized below in Table III-2.

Prepared By: Jeremy Sagen Date: 10/15/1999 Reviewed By Tommy Sweat Date: 10/15/1999

Section III. Data (continued)

Table III-2. Mixing Tank Parameters and Styrene Properties

Variable	Value
Styrene Properties	
Molecular Weight	104.2
Vapor Pressure[a]	4.5 mmHg
Equipment Parameters	
Surface Area	64 ft^2
Actual Operating Time	3,000 hr/yr
Diffusion Path Length	0.5 ft
Average Temperature[b]	72.3 °F

a From resin MSDS. See Attachment 1.
b This average temperature is the same value as used in the TANKS v4.0 program for Tampa.

Actual-to-Potential Ratio

F. The actual-to-potential ratio is 4.56. See Calculation ResinAppl for estimation of this ratio.

Section IV. Assumptions

A. The following method is used to calculate throughput for storage tanks: The amount of resin throughput for each storage tank is estimated using the capacity of each tank, the total capacity for all tanks, and the total actual throughput of resin (i.e. 885,645 gal/yr):

$$\text{Throughput}_{A,F}\ (\text{gal/yr}) = \frac{\text{Capacity}_i\ (\text{gal})}{\sum_i^n \text{Capacity}_i\ (\text{gal})} \times \text{Throughput}\ (\text{gal/yr})$$

Where

i = Tank i

B. The TANKS v4.0 default values were used for the storage tank's shell and roof condition and color.

C. It is assumed that the stagnant air film extends 6 inches above the surface area of the resin and that convective mass transfer does not occur within 6 inches of the surface. The rate of diffusion through the stagnant film is the limiting factor in the diffusion / convection system.

D. For calculating emissions from the mixing tanks, it is assumed that the mixing tanks contain all resin (i.e. no filler products). This is a conservative estimate since the fillers contain no VOCs or HAP.

E. It is assumed that the MSDS styrene vapor pressure is valid at the average temperature of the facility.

Section V. Approach

Storage Tanks

A. Since only the liquid styrene fraction of the resin is being used to estimate emissions from the resin storage tanks, the total tank resin throughput must be decreased to reflect the throughput of just the liquid component. The actual and potential liquid throughputs for Tank No. 1 are calculated as follows:

Actual Liquid Throughput = Total Resin Throughput (lb resin/yr) * Weight Fraction Styrene (lb styrene/lb resin) / Density of Styrene (lb styrene/gal styrene)

= 286,849 (lb resin/yr) * 0.45 (lb styrene/lb resin) / 7.45 (lb styrene/gal styrene)

= 17,326 gal styrene/yr

Potential Liquid Throughput = 17,326 (gal styrene/yr) * 4.56

= 78,941 gal styrene/yr

B. The Environmental Protection Agency's (EPA) TANKS v4.0 [Ref. B] and the data shown in Table III-1 were used to estimate emissions of VOC from the storage tanks presented in this calculation. Because this software is a peer-reviewed technical resource, a detailed manual calculation of the fixed-roof tank emission algorithms was not prepared. Complete documentation of the calculations performed in the TANKS v4.0 program is presented in EPA's AP-42 document [Ref. C]. Output data from the TANKS v4.0 program for each tank configuration are presented in Attachment 2. Section VI presents a summary of the styrene emissions from each tank based on the input data presented in Table III-1.

Mixing Tanks

C. Resins are stored and blended with fillers in four mixing tanks. This calculation uses styrene property data, physical equipment parameters, and the stagnant gas film diffusion model to estimate emissions from this process. To calculate the diffusion coefficient of styrene in air, the Fuller, Schettler, and Giddings relation is used [Ref. D].

$$D_{AB} = \frac{10^{-3} T^{1.75} \left[(M_A + M_B)/M_A M_B\right]^{1/2}}{P\left[\left(\sum v\right)_A^{1/3} + \left(\sum v\right)_B^{1/3}\right]^2}$$

where

D_{AB} = Diffusion Coefficient (cm^2/s)
T = Temperature (Kelvin)
M_A = Molecular weight of styrene
M_B = Molecular weight of air
P = Pressure (atm)
v = Atomic diffusion volume (18.74 for styrene and 20.1 for air) [Ref. D]

D_{AB} = $0.001 * (22.4°C + 273)^{1.75} * [(104.2 + 29) / (104.2 * 29)]^{1/2} /$
$[(1 \text{ atm}) * [(18.74)^{1/3} + (20.1)^{1/3}]^2]$

= $0.153\ cm^2/s$

CALCULATION SHEET

Calc. No. **Tanks**

Prepared By: Jeremy Sagen Date: 10/15/1999 Reviewed By Tommy Sweat Date: 10/15/1999

Section V. Approach (continued)

D. To estimate the molar flux of styrene in air, the stagnant film model [Ref. E] is used as follows:

$$N = \frac{D_{AB}}{RT}\left(\frac{p(A1) - p(A2)}{L}\right)$$

where

N	=	Molar flux (mol/cm^2 s)
D_{AB}	=	Diffusion coefficient (cm^2/s)
R	=	Universal gas constant (62.36 L mmHg/mol K)
T	=	Temperature (K)
p(A1)	=	Partial pressure of styrene in stagnant film (mmHg)
p(A2)	=	Partial pressure of styrene above stagnant film (assumed = 0)
L	=	Path length for diffusion (cm)

N = 0.153 (cm^2/s) / 62.36 (L mmHg / mol K) / (22.4°C + 273) (K) * 4.5 (mmHg) / 0.5 (ft) / 30.48 (cm/ft) / 1000 (cm^3/L)

= 2.45E-09 mol/cm^2 s

E. To estimate actual styrene emissions, the molar flux of styrene, the surface area of the tanks, and the hours of tank operation are used as follows:

Actual Styrene Emissions = Styrene Molar Flux (mol/cm^2 s) * Molecular Weight of Styrene (g/mole) * Surface Area per Tank (ft^2/tank) * Number of Tanks (tank) * Hours of Operation (hr/yr) * 3,600 (s/hr) * 929 (cm^2/ft^2) * (2.205 lb/1000 g)

= 2.45E-09 (mol/cm^2 s) * 104.2 (g/mol) * 64 (ft^2/tank) * 4 tanks * 3,000 (hr/yr) 3,600 (s/hr) * 929 (cm^2/ft^2) * (2.205 lb/1000 g)

= 1,447 lb/yr {0.724 tpy}

Section VI. Results

A. Actual and potential styrene emissions are summarized in Table VI-1.

Table VI-1. Actual and Potential Styrene Emissions from Resin Storage and Mixing Tanks

	Actual		Future Potential	
	(lb/yr)	(tpy)	(lb/yr)	(tpy)
Storage Tank Nos. 1 and 2	5.07	0.003	23.1	0.012
Storage Tank No. 3	5.51	0.003	25.1	0.013
Mixing Tanks	1,447	0.723	6,591	3.30
Total	1,457	0.729	6,640	3.32

Section VII. References

A. Lewis, Richard J. Hawleys Condensed Chemical Dictionary. Van Nostrand Reinhold Company. 1993.

B. TANKS v4.0 User's Guide, U.S. Environmental Protection Agency.

C. AP-42, Compilation of Air Pollutant Emission Factors, Volume 1: Stationary and Area Sources, U.S. Environmental Protection Agency, Research Triangle Park, N.C., Fifth Edition, October 1995, Sections 7.0 and 7.1.

D. Green, D and Perry, R. Perry's Chemical Engineers' Handbook. Sixth Edition. McGraw-Hill, Inc. 1984. p. 3-285.

E. Greenkorn, R.A. and Kessler, D.P. Transfer Operations. McGraw Hill, Inc. 1979. pp. 452-455.

Attachment 1

BEST AVAILABLE COPY

MATERIAL SAFETY DATA SHEET

Distributed by: GLS Corporation
Composites Materials Division
1750 N. Kingsbury St.
Chicago, IL 60614
(312) 664-3500

Manufacturer: Alpha/Owens Corning Corporation
4620 N. Galloway Road
Lakeland, FL 33809
(813) 858-4431

Product: ALTEK 415-12 (ALTEK 52-415-12)

Revision: APRIL 18, 1989

National Paint and Coatings Association Hazardous Material Identification System:

HEALTH HAZARD	2
FLAMMABILITY HAZARD	3
REACTIVITY HAZARD	2
PERSONAL PROTECTION	I

SECTION I. MATERIAL IDENTIFICATION

TRADE/MATERIAL NAME: ALTEK 415-12 (ALTEK 52-415-12)
DESCRIPTION: DIACID/GLYCOL CONDENSATE
CAS: MIXTURE TRADE SECRET REGISTER: N/A
CHEMICAL NAME: UNSATURATED POLYESTER RESIN

SECTION II. INGREDIENTS AND HAZARDS

INGREDIENT NAME:	CAS NUMBER:	PERCENT*:	EXPOSURE LIMITS:
STYRENE	100-42-5	45	50 PPM TWA; 100 PPM STEL

SARA 313 INFORMATION: THIS PRODUCT CONTAINS THE ABOVE SUBSTANCE WHICH IS SUBJECT TO THE REPORTING REQUIREMENTS OF SECTION 313 OF TITLE III OF THE SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 AND 40 CFR PART 372.

* WEIGHT PERCENT

SECTION III. PHYSICAL DATA

APPEARANCE AND ODOR: VISCOUS LIQUID WITH A SWEET PUNGENT ODOR.

BOILING POINT:	293 DEG. F	EVAPORATION RATE:	3.1
VAPOR PRESSURE:	<4.5 mmHg	SPECIFIC GRAVITY:	(H2O=1) 1.0-1.1
WATER SOLUBILITY (%):	VERY SLIGHT	MELTING POINT:	N/A
VAPOR DENSITY (AIR=1):	3.6		

SECTION IV. FIRE AND EXPLOSION DATA

FLASH POINT (METHOD):	LIMITS%:	AUTOIGNITION TEMP:
88 - 92 DEG. F (CC)	LEL - 1.1	914 DEG. F
	UEL - 6.1	

NFPA FLAMMABLE/COMBUSTIBLE LIQUID CLASSIFICATION: 1C
NFPA FIRE HAZARD SYMBOL CODES: FLAMMABILITY: 3 HEALTH: 2 REACTIVITY: 2
EXTINGUISHING MEDIA: WATER FOG, DRY CHEMICAL, FOAM OR CO2 SPECIAL: NONE

UNUSUAL FIRE OR EXPLOSION HAZARDS: AT ELEVATED TEMPERATURES, SUCH AS IN A FIRE CONDITION, POLYMERIZATION MAY TAKE PLACE RESULTING IN VIOLENT RUPTURE OF CLOSED CONTAINERS. WEAR PROTECTIVE PRESSURE APPARATUS, EYE PROTECTION, AND KEEP VAPORS AWAY FROM POSSIBLE IGNITION SOURCES.

SPECIAL FIRE-FIGHTING PROCEDURES: IF ELECTRICAL EQUIPMENT IS INVOLVED, THE USE OF FOAM SHOULD BE AVOIDED. HANDLING EQUIPMENT SHOULD BE COOLED BY WATER STREAM IF EXPOSED TO FIRE.

SECTION V. REACTIVITY DATA

MATERIAL IS STABLE. HAZARDOUS POLYMERIZATION MAY OCCUR.

CHEMICAL INCOMPATIBILITIES: ACIDS, OXIDIZING AGENTS, FREE RADICAL INITIATORS SUCH AS PEROXIDES, AND METALLIC HALIDES AND SOAPS.

CONDITIONS TO AVOID: SUNLIGHT, OPEN FLAMES, CONTAMINATION, AND PROLONGED STORAGE ABOVE 75 DEG. F.

HAZARDOUS DECOMPOSITION PRODUCTS: CARBON MONOXIDE, CARBON DIOXIDE, AND LOW MOLECULAR WEIGHT HYDROCARBONS.

SECTION VI. HEALTH HAZARD INFORMATION

THIS PRODUCT IS CONSIDERED A POSSIBLE CARCINOGEN BY IARC.*

SUMMARY OF RISKS: CAUSES IRRITATION TO THROAT, EYES, SKIN AND NOSE. HARMFUL IF INHALED.

MEDICAL CONDITIONS WHICH MAY BE AGGRAVATED BY CONTACT: MAY AGGRAVATE PRE-EXISTING RESPIRATORY AND SKIN DISORDERS.

TARGET ORGANS: CNS, RESPIRATORY SYSTEM, LUNGS, EYES AND SKIN.

PRIMARY ROUTES OF ENTRY: INHALATION, INGESTION, CONTACT.

ACUTE EFFECTS: MAY IRRITATE EYES, NOSE, THROAT, AND SKIN.

CHRONIC EFFECTS: MAY CAUSE VICTIM TO FEEL DRUGGED, SLEEPY OR BECOME UNCONSCIOUS. REPEATED SKIN CONTACT MAY CAUSE RASH. MAY AFFECT THE BRAIN OR NERVOUS SYSTEM, CAUSING DIZZINESS, HEADACHE OR NAUSEA. REPORTS HAVE ASSOCIATED REPEATED AND PROLONGED OCCUPATIONAL OVEREXPOSURE TO SOLVENTS WITH PERMANENT BRAIN AND NERVOUS SYSTEM DAMAGE. INTENTIONAL MISUSE BY DELIBERATELY CONCENTRATING AND INHALING THE CONTENTS MAY BE HARMFUL OR FATAL.

SIGNS AND SYMPTOMS OF OVEREXPOSURE:
- EYE CONTACT: CAUSES IRRITATION TO THE EYES.
- SKIN CONTACT: MAY CAUSE IRRITATION TO THE SKIN.
- INHALATION: MAY IRRITATE EYES, NOSE AND THROAT. MAY FEEL DRUGGED, SLEEPY, OR UNCONSCIOUS.
- INGESTION: MAY CAUSE VICTIM TO BECOME WEAK AND UNSTEADY.

FIRST AID:
- EYE CONTACT: IMMEDIATELY FLUSH WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES. GET PROMPT MEDICAL ATTENTION. (CONTACT LENSES SHOULD NOT BE WORN WHILE WORKING WITH THIS MATERIAL.)
- SKIN CONTACT: WASH EXPOSED SKIN WITH SOAP AND WATER. GET MEDICAL ATTENTION IF IRRITATION DEVELOPS. REMOVE CONTAMINATED CLOTHING, SHOES, AND THOROUGHLY CLEAN BEFORE REUSE.
- INHALATION: MOVE EXPOSED PERSON(S) TO FRESH AIR. GET MEDICAL ATTENTION.
- INGESTION: DO NOT INDUCE VOMITING. CALL PHYSICIAN IMMEDIATELY.

* FOR HAZARD COMMUNICATION PURPOSES UNDER OHSA STANDARD 29 CFR PART 1910.1200, STYRENE IS LISTED AS A POSSIBLE CARCINOGEN BY IARC. NEITHER THE DATA FROM VARIOUS LONG-TERM ANIMAL STUDIES NOR FROM EPIDEMIOLOGY OF WORKERS EXPOSED TO STYRENE PROVIDE AN ADEQUATE BASIS TO CONCLUDE THAT STYRENE IS CARCINOGENIC.

SECTION VII. SPILL, LEAK AND DISPOSAL PROCEDURES

SPILL/LEAK PROCEDURES: REMOVE ALL SOURCES OF IGNITION. VENTILATE AREA. PREVENT MATERIAL FROM ENTERING DRAINS. ABSORBENT SHOULD BE VERMICULITE, DRY SAND OR EARTH.
SMALL SPILL: SOAK UP WITH ABSORBENT AND SCOOP INTO DRUMS.
LARGE SPILL: DIKE AND PUMP INTO DRUMS.

WASTE MANAGEMENT/DISPOSAL: DISPOSE OF ACCORDING TO LOCAL, STATE AND FEDERAL REGULATIONS.

SECTION VIII. SPECIAL PROTECTION INFORMATION

PERSONAL PROTECTIVE EQUIPMENT:
GOGGLES: USE CHEMICAL GOGGLES.
GLOVES: USE GLOVES OF RUBBER OR OTHER RESISTANT MATERIAL.
RESPIRATOR: CHEMICAL CARTRIDGE RESPIRATOR WITH NIOSH/OSHA APPROVED ORGANIC VAPOR CARTRIDGE TO 400 PPM. AT EXPOSURES ABOVE 400 PPM USE AN SCBA.
OTHER: USE CHEMICAL RESISTANT APRONS OR COATS TO AVOID SKIN CONTACT.

WORKPLACE CONSIDERATIONS:
VENTILATION: LOCAL EXHAUST IS PREFERRED. MECHANICAL VENTILATION IS ACCEPTABLE. USE EXPLOSION PROOF EQUIPMENT.
SAFETY STATIONS: SAFETY SHOWERS AND EYE WASH STATIONS ARE RECOMMENDED.
CONTAMINATED EQUIPMENT: CLEAN CONTAMINATED EQUIPMENT WITH AN APPROPRIATE SOLVENT PRIOR TO STORAGE.

SECTION IX. SPECIAL PRECAUTIONS

STORAGE SEGREGATION: STORE IN A COOL DRY PLACE AWAY FROM INCOMPATIBLE MATERIALS.

SPECIAL HANDLING/STORAGE: STORE IN AN AREA BELOW 75 DEG. F. AND OUT OF DIRECT SUNLIGHT. KEEP AWAY FROM HEAT, SPARK AND SMOKING AREAS. EMPTY CONTAINERS MAY BE HAZARDOUS.

ENGINEERING CONTROLS: EQUIPMENT SHOULD BE GROUNDED DURING TRANSFER AND NON-SPARKING PUMPS SHOULD BE USED.

OTHER PRECAUTIONS: DO NOT TRANSFER TO UNLABELED BOTTLES OR CONTAINERS.

DOT CLASS:	UN REGISTER:	DATA SOURCE CODE(S):
FLAMMABLE LIQUID	UN-1866	#1

THE ALPHA/OWENS CORNING CORPORATION HAS MADE EVERY EFFORT TO ENSURE THE ACCURACY OF THE FOREGOING INFORMATION. NO WARRANTIES OF ACCURACY ARE MADE; HOWEVER, AS TO CHEMICAL OR PHYSICAL CHANGES THAT MAY OCCUR IN THE TRANSPORTATION, STORAGE, OR USE OF THIS MATERIAL AFTER IT LEAVES ALPHA/OWENS CORNING'S CONTROL.

Attachment 2

TANKS 4.0
Emissions Report - Detail Format
Tank Identification and Physical Characteristics

Identification	
User Identification:	Resin Tank No. 3 - Actual
City:	Tampa
State:	Florida
Company:	Gatsby Spa, Inc.
Type of Tank:	Vertical Fixed Roof Tank
Description:	
Tank Dimensions	
Shell Height (ft):	15.83
Diameter Height (ft):	10.25
Liquid Height (ft):	14.09
Avg. Liquid Height (ft):	14.09
Volume (gallons):	8,700.00
Turnovers:	2.17
Net Throughput (gal/yr):	18,844.00
Is Tank Heated (y/n):	N
Paint Characteristics	
Shell Color/Shade:	White/White
Shell Condition:	Good
Roof Color/Shade:	White/White
Roof Condition:	Good
Roof Characteristics	
Type:	
Height (ft):	0.00
Breather Vent Settings	
Vacuum Settings (psig):	-0.03
Pressure Settings (psig):	0.03

Meteorological Data used in Emissions Calculations: Tampa, Florida (Avg Atmospheric Pressure = 14.76 psia)

TANKS 4.0
Emissions Report - Detail Format
Liquid Contents of Storage Tank

Mixture/Component	Month	Daily Liquid Surf. Temperatures (deg F) Avg.	Min.	Max.	Liquid Bulk Temp. (deg F)	Vapor Pressures (psia) Avg.	Min.	Max.	Vapor Mol. Weight	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Styrene	Jan	68.24	63.46	73.03	72.33	0.0954	0.0810	0.1119	104.1500			104.15	Option 1: A=7.14, B=1574.51, C=224.09
Styrene	Feb	69.27	64.20	74.35	72.33	0.0987	0.0831	0.1169	104.1500			104.15	Option 1: A=7.14, B=1574.51, C=224.09
Styrene	Mar	71.95	66.42	77.48	72.33	0.1080	0.0896	0.1294	104.1500			104.15	Option 1: A=7.14, B=1574.51, C=224.09
Styrene	Apr	74.49	68.39	80.59	72.33	0.1174	0.0959	0.1431	104.1500			104.15	Option 1: A=7.14, B=1574.51, C=224.09
Styrene	May	77.27	71.31	83.24	72.33	0.1286	0.1057	0.1556	104.1500			104.15	Option 1: A=7.14, B=1574.51, C=224.09
Styrene	Jun	78.83	73.54	84.11	72.33	0.1352	0.1138	0.1600	104.1500			104.15	Option 1: A=7.14, B=1574.51, C=224.09
Styrene	Jul	79.22	74.20	84.23	72.33	0.1369	0.1163	0.1606	104.1500			104.15	Option 1: A=7.14, B=1574.51, C=224.09
Styrene	Aug	79.07	74.18	83.96	72.33	0.1363	0.1162	0.1592	104.1500			104.15	Option 1: A=7.14, B=1574.51, C=224.09
Styrene	Sep	78.18	73.42	82.94	72.33	0.1324	0.1134	0.1542	104.1500			104.15	Option 1: A=7.14, B=1574.51, C=224.09
Styrene	Oct	75.29	70.17	80.40	72.33	0.1205	0.1018	0.1422	104.1500			104.15	Option 1: A=7.14, B=1574.51, C=224.09
Styrene	Nov	71.70	66.67	76.74	72.33	0.1071	0.0904	0.1264	104.1500			104.15	Option 1: A=7.14, B=1574.51, C=224.09
Styrene	Dec	69.18	64.46	73.90	72.33	0.0984	0.0838	0.1152	104.1500			104.15	Option 1: A=7.14, B=1574.51, C=224.09

TANKS 4.0
Emissions Report - Detail Format
Detail Calculations (AP-42)

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Standing Losses (lb):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vapor Space Volume (cu ft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vapor Density (lb/cu ft):	0.0018	0.0018	0.0020	0.0021	0.0023	0.0024	0.0025	0.0025	0.0024	0.0022	0.0020	0.0018
Vapor Space Expansion Factor:	0.0343	0.0366	0.0402	0.0448	0.0438	0.0383	0.0362	0.0351	0.0341	0.0369	0.0363	0.0337
Vented Vapor Saturation Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Tank Vapor Space Volume												
Vapor Space Volume (cu ft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tank Diameter (ft):	10.2500	10.2500	10.2500	10.2500	10.2500	10.2500	10.2500	10.2500	10.2500	10.2500	10.2500	10.2500
Vapor Space Outage (ft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tank Shell Height (ft):	15.8300	15.8300	15.8300	15.8300	15.8300	15.8300	15.8300	15.8300	15.8300	15.8300	15.8300	15.8300
Average Liquid Height (ft):	14.0945	14.0945	14.0945	14.0945	14.0945	14.0945	14.0945	14.0945	14.0945	14.0945	14.0945	14.0945
Roof Outage (ft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Roof Outage (*Roof*)												
Roof Outage (ft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Dome Radius (ft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Shell Radius (ft):	5.1250	5.1250	5.1250	5.1250	5.1250	5.1250	5.1250	5.1250	5.1250	5.1250	5.1250	5.1250
Vapor Density												
Vapor Density (lb/cu ft):	0.0018	0.0018	0.0020	0.0021	0.0023	0.0024	0.0025	0.0025	0.0024	0.0022	0.0020	0.0018
Vapor Molecular Weight (lb/lb-mole):	104.1500	104.1500	104.1500	104.1500	104.1500	104.1500	104.1500	104.1500	104.1500	104.1500	104.1500	104.1500
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0954	0.0987	0.1080	0.1174	0.1286	0.1352	0.1369	0.1363	0.1324	0.1205	0.1071	0.0984
Daily Avg. Liquid Surface Temp. (deg. R):	527.9123	528.9448	531.6176	534.1607	536.9427	538.4978	538.8854	538.7379	537.8524	534.9576	531.3724	528.8476
Daily Average Ambient Temp. (deg. F):	59.9000	61.5000	66.5500	71.2500	77.3500	81.2000	82.3500	82.3500	80.9000	74.7500	67.4500	62.2000
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731
Liquid Bulk Temperature (deg. R):	532.0025	532.0025	532.0025	532.0025	532.0025	532.0025	532.0025	532.0025	532.0025	532.0025	532.0025	532.0025
Tank Paint Solar Absorptance. (Shell):	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700
Tank Paint Solar Absorptance. (Roof):	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700
Daily Total Solar Insulation Factor (Btu/sqft day):	1,027.6375	1,272.2527	1,607.9244	1,961.6804	2,034.6525	1,931.2225	1,843.0214	1,733.2460	1,548.9121	1,408.3615	1,130.4330	970.5289
Vapor Space Expansion Factor												
Vapor Space Expansion Factor:	0.0343	0.0366	0.0402	0.0448	0.0438	0.0383	0.0362	0.0351	0.0341	0.0369	0.0363	0.0337
Daily Vapor Temperature Range (deg. R):	19.1476	20.3119	22.1257	24.3856	23.8689	21.1446	20.0768	19.5543	19.0368	20.4558	20.1409	18.8757
Daily Vapor Pressure Range (psia):	0.0309	0.0338	0.0398	0.0472	0.0499	0.0462	0.0443	0.0430	0.0408	0.0404	0.0360	0.0313
Breather Vent Press. Setting Range(psia):	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0954	0.0987	0.1080	0.1174	0.1286	0.1352	0.1369	0.1363	0.1324	0.1205	0.1071	0.0984
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.0810	0.0831	0.0896	0.0959	0.1057	0.1138	0.1163	0.1162	0.1134	0.1018	0.0904	0.0838
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.1119	0.1169	0.1294	0.1431	0.1556	0.1600	0.1606	0.1592	0.1542	0.1422	0.1264	0.1152
Daily Avg. Liquid Surface Temp. (deg R):	527.9123	528.9448	531.6176	534.1607	536.9427	538.4978	538.8854	538.7379	537.8524	534.9576	531.3724	528.8476
Daily Min. Liquid Surface Temp. (deg R):	523.1254	523.8669	526.0862	528.0643	530.9755	533.2117	533.8662	533.8494	533.0932	529.8437	526.3372	524.1287
Daily Max. Liquid Surface Temp. (deg R):	532.6992	534.0228	537.1491	540.2571	542.9100	543.7840	543.9046	543.6265	542.6116	540.0716	536.4076	533.5665
Daily Ambient Temp. Range (deg. R):	19.8000	19.8000	20.1000	20.9000	19.7000	16.6000	15.7000	15.7000	16.2000	19.1000	20.5000	19.8000
Vented Vapor Saturation Factor												
Vented Vapor Saturation Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0954	0.0987	0.1080	0.1174	0.1286	0.1352	0.1369	0.1363	0.1324	0.1205	0.1071	0.0984
Vapor Space Outage (ft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

TANKS 4.0
Emissions Report - Detail Format
Detail Calculations (AP-42)- (Continued)

Working Losses (lb):	0.3714	0.3845	0.4204	0.4573	0.5007	0.5265	0.5331	0.5306	0.5157	0.4694	0.4170	0.3833
Vapor Molecular Weight (lb/lb-mole):	104.1500	104.1500	104.1500	104.1500	104.1500	104.1500	104.1500	104.1500	104.1500	104.1500	104.1500	104.1500
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0954	0.0987	0.1080	0.1174	0.1286	0.1352	0.1369	0.1363	0.1324	0.1205	0.1071	0.0984
Net Throughput (gal/mo.):	1,570.3333	1,570.3333	1,570.3333	1,570.3333	1,570.3333	1,570.3333	1,570.3333	1,570.3333	1,570.3333	1,570.3333	1,570.3333	1,570.3333
Number of Turnovers:	2.1660	2.1660	2.1660	2.1660	2.1660	2.1660	2.1660	2.1660	2.1660	2.1660	2.1660	2.1660
Turnover Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Maximum Liquid Volume (cuft):	8,700.0000	8,700.0000	8,700.0000	8,700.0000	8,700.0000	8,700.0000	8,700.0000	8,700.0000	8,700.0000	8,700.0000	8,700.0000	8,700.0000
Maximum Liquid Height (ft):	14.0945	14.0945	14.0945	14.0945	14.0945	14.0945	14.0945	14.0945	14.0945	14.0945	14.0945	14.0945
Tank Diameter (ft):	10.2500	10.2500	10.2500	10.2500	10.2500	10.2500	10.2500	10.2500	10.2500	10.2500	10.2500	10.2500
Working Loss Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total Losses (lb):	0.3714	0.3845	0.4204	0.4573	0.5007	0.5265	0.5331	0.5306	0.5157	0.4694	0.4170	0.3833

TANKS 4.0
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: January , February , March , April , May , June , July , August , September , October , November , December

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Styrene	5.51	0.00	5.51

TANKS 4.0
Emissions Report - Detail Format
Tank Identification and Physical Characteristics

Identification	
User Identification:	Resin Tank No. 3 - Potential
City:	Tampa
State:	Florida
Company:	Gatsby Spa, Inc.
Type of Tank:	Vertical Fixed Roof Tank
Description:	
Tank Dimensions	
Shell Height (ft):	15.83
Diameter Height (ft):	10.25
Liquid Height (ft):	14.09
Avg. Liquid Height (ft):	14.09
Volume (gallons):	8,700.00
Turnovers:	9.88
Net Throughput (gal/yr):	85,921.00
Is Tank Heated (y/n):	N
Paint Characteristics	
Shell Color/Shade:	White/White
Shell Condition:	Good
Roof Color/Shade:	White/White
Roof Condition:	Good
Roof Characteristics	
Type:	
Height (ft):	0.00
Breather Vent Settings	
Vacuum Settings (psig):	-0.03
Pressure Settings (psig):	0.03

Meteorological Data used in Emissions Calculations: Tampa, Florida (Avg Atmospheric Pressure = 14.76 psia)

TANKS 4.0
Emissions Report - Detail Format
Liquid Contents of Storage Tank

Mixture/Component	Month	Daily Liquid Surf. Temperatures (deg F) Avg.	Min.	Max.	Liquid Bulk Temp. (deg F)	Vapor Pressures (psia) Avg.	Min.	Max.	Vapor Mol. Weight	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Styrene	Jan	68.24	63.46	73.03	72.33	0.0954	0.0810	0.1119	104.1500			104.15	Option 1: A=7.14, B=1574.51, C=224.09
Styrene	Feb	69.27	64.20	74.35	72.33	0.0987	0.0831	0.1169	104.1500			104.15	Option 1: A=7.14, B=1574.51, C=224.09
Styrene	Mar	71.95	66.42	77.48	72.33	0.1080	0.0896	0.1294	104.1500			104.15	Option 1: A=7.14, B=1574.51, C=224.09
Styrene	Apr	74.49	68.39	80.59	72.33	0.1174	0.0959	0.1431	104.1500			104.15	Option 1: A=7.14, B=1574.51, C=224.09
Styrene	May	77.27	71.31	83.24	72.33	0.1286	0.1057	0.1556	104.1500			104.15	Option 1: A=7.14, B=1574.51, C=224.09
Styrene	Jun	78.83	73.54	84.11	72.33	0.1352	0.1138	0.1600	104.1500			104.15	Option 1: A=7.14, B=1574.51, C=224.09
Styrene	Jul	79.22	74.20	84.23	72.33	0.1369	0.1163	0.1606	104.1500			104.15	Option 1: A=7.14, B=1574.51, C=224 09
Styrene	Aug	79.07	74.18	83.96	72.33	0.1363	0.1162	0.1592	104.1500			104.15	Option 1: A=7.14, B=1574.51, C=224.09
Styrene	Sep	78.18	73.42	82.94	72.33	0.1324	0.1134	0.1542	104.1500			104.15	Option 1: A=7.14, B=1574.51, C=224 09
Styrene	Oct	75.29	70.17	80.40	72.33	0.1205	0.1018	0.1422	104.1500			104.15	Option 1: A=7.14, B=1574.51, C=224 09
Styrene	Nov	71.70	66.67	76.74	72.33	0.1071	0.0904	0.1264	104.1500			104.15	Option 1: A=7.14, B=1574.51, C=224 09
Styrene	Dec	69.18	64.46	73.90	72.33	0.0984	0.0838	0.1152	104.1500			104.15	Option 1: A=7.14, B=1574.51, C=224.09

TANKS 4.0
Emissions Report - Detail Format
Detail Calculations (AP-42)

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Standing Losses (lb):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vapor Space Volume (cu ft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vapor Density (lb/cu ft):	0.0018	0.0018	0.0020	0.0021	0.0023	0.0024	0.0025	0.0025	0.0024	0.0022	0.0020	0.0018
Vapor Space Expansion Factor:	0.0343	0.0366	0.0402	0.0448	0.0438	0.0383	0.0362	0.0351	0.0341	0.0369	0.0363	0.0337
Vented Vapor Saturation Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Tank Vapor Space Volume												
Vapor Space Volume (cu ft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tank Diameter (ft):	10.2500	10.2500	10.2500	10.2500	10.2500	10.2500	10.2500	10.2500	10.2500	10.2500	10.2500	10.2500
Vapor Space Outage (ft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tank Shell Height (ft):	15.8300	15.8300	15.8300	15.8300	15.8300	15.8300	15.8300	15.8300	15.8300	15.8300	15.8300	15.8300
Average Liquid Height (ft):	14.0945	14.0945	14.0945	14.0945	14.0945	14.0945	14.0945	14.0945	14.0945	14.0945	14.0945	14.0945
Roof Outage (ft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Roof Outage (Roof)												
Roof Outage (ft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Dome Radius (ft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Shell Radius (ft):	5.1250	5.1250	5.1250	5.1250	5.1250	5.1250	5.1250	5.1250	5.1250	5.1250	5.1250	5.1250
Vapor Density												
Vapor Density (lb/cu ft):	0.0018	0.0018	0.0020	0.0021	0.0023	0.0024	0.0025	0.0025	0.0024	0.0022	0.0020	0.0018
Vapor Molecular Weight (lb/lb-mole):	104.1500	104.1500	104.1500	104.1500	104.1500	104.1500	104.1500	104.1500	104.1500	104.1500	104.1500	104.1500
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0954	0.0987	0.1080	0.1174	0.1286	0.1352	0.1369	0.1363	0.1324	0.1205	0.1071	0.0984
Daily Avg. Liquid Surface Temp. (deg. R):	527.9123	528.9448	531.6176	534.1607	536.9427	538.4978	538.8854	538.7379	537.8524	534.9576	531.3724	528.8476
Daily Average Ambient Temp. (deg. F):	59.9000	61.5000	66.5500	71.2500	77.3500	81.2000	82.3500	82.3500	80.9000	74.7500	67.4500	62.2000
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731
Liquid Bulk Temperature (deg. R):	532.0025	532.0025	532.0025	532.0025	532.0025	532.0025	532.0025	532.0025	532.0025	532.0025	532.0025	532.0025
Tank Paint Solar Absorptance. (Shell):	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700
Tank Paint Solar Absorptance. (Roof):	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700
Daily Total Solar Insulation Factor (Btu/sqft day):	1,027.6375	1,272.2527	1,607.9244	1,961.6804	2,034.6525	1,931.2225	1,843.0214	1,733.2460	1,548.9121	1,408.3615	1,130.4330	970.5289
Vapor Space Expansion Factor												
Vapor Space Expansion Factor:	0.0343	0.0366	0.0402	0.0448	0.0438	0.0383	0.0362	0.0351	0.0341	0.0369	0.0363	0.0337
Daily Vapor Temperature Range (deg. R):	19.1476	20.3119	22.1257	24.3856	23.8689	21.1446	20.0768	19.5543	19.0368	20.4558	20.1409	18.8757
Daily Vapor Pressure Range (psia):	0.0309	0.0338	0.0398	0.0472	0.0499	0.0462	0.0443	0.0430	0.0408	0.0404	0.0360	0.0313
Breather Vent Press. Setting Range(psia):	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0954	0.0987	0.1080	0.1174	0.1286	0.1352	0.1369	0.1363	0.1324	0.1205	0.1071	0.0984
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.0810	0.0831	0.0896	0.0959	0.1057	0.1138	0.1163	0.1162	0.1134	0.1018	0.0904	0.0838
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.1119	0.1169	0.1294	0.1431	0.1556	0.1600	0.1606	0.1592	0.1542	0.1422	0.1264	0.1152
Daily Avg. Liquid Surface Temp. (deg R):	527.9123	528.9448	531.6176	534.1607	536.9427	538.4978	538.8854	538.7379	537.8524	534.9576	531.3724	528.8476
Daily Min. Liquid Surface Temp. (deg R):	523.1254	523.8669	526.0862	528.0643	530.9755	533.2117	533.8662	533.8494	533.0932	529.8437	526.3372	524.1287
Daily Max. Liquid Surface Temp. (deg R):	532.6992	534.0228	537.1491	540.2571	542.9100	543.7840	543.9046	543.6265	542.6116	540.0716	536.4076	533.5665
Daily Ambient Temp. Range (deg. R):	19.8000	19.8000	20.1000	20.9000	19.7000	16.6000	15.7000	15.7000	16.2000	19.1000	20.5000	19.8000
Vented Vapor Saturation Factor												
Vented Vapor Saturation Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0954	0.0987	0.1080	0.1174	0.1286	0.1352	0.1369	0.1363	0.1324	0.1205	0.1071	0.0984
Vapor Space Outage (ft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

TANKS 4.0
Emissions Report - Detail Format
Detail Calculations (AP-42)- (Continued)

Working Losses (lb):	1.6933	1.7533	1.9170	2.0849	2.2830	2.4007	2.4308	2.4193	2.3512	2.1401	1.9015	1.7475
Vapor Molecular Weight (lb/lb-mole):	104.1500	104.1500	104.1500	104.1500	104.1500	104.1500	104.1500	104.1500	104.1500	104.1500	104.1500	104.1500
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0954	0.0987	0.1080	0.1174	0.1286	0.1352	0.1369	0.1363	0.1324	0.1205	0.1071	0.0984
Net Throughput (gal/mo.):	7,160.0833	7,160.0833	7,160.0833	7,160.0833	7,160.0833	7,160.0833	7,160.0833	7,160.0833	7,160.0833	7,160.0833	7,160.0833	7,160.0833
Number of Turnovers:	9.8760	9.8760	9.8760	9.8760	9.8760	9.8760	9.8760	9.8760	9.8760	9.8760	9.8760	9.8760
Turnover Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Maximum Liquid Volume (cuft):	8,700.0000	8,700.0000	8,700.0000	8,700.0000	8,700.0000	8,700.0000	8,700.0000	8,700.0000	8,700.0000	8,700.0000	8,700.0000	8,700.0000
Maximum Liquid Height (ft):	14.0945	14.0945	14.0945	14.0945	14.0945	14.0945	14.0945	14.0945	14.0945	14.0945	14.0945	14.0945
Tank Diameter (ft):	10.2500	10.2500	10.2500	10.2500	10.2500	10.2500	10.2500	10.2500	10.2500	10.2500	10.2500	10.2500
Working Loss Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total Losses (lb):	1.6933	1.7533	1.9170	2.0849	2.2830	2.4007	2.4308	2.4193	2.3512	2.1401	1.9015	1.7475

TANKS 4.0
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: January , February , March , April , May , June , July , August , September , October , November , December

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Styrene	25.12	0.00	25.12

TANKS 4.0
Emissions Report - Detail Format
Tank Identification and Physical Characteristics

Identification

User Identification:	Resin Tank Nos. 1 and 2 - Actual
City:	Tampa
State:	Florida
Company:	New Gatsby Spa, Inc.
Type of Tank:	Vertical Fixed Roof Tank
Description:	

Tank Dimensions

Shell Height (ft):	15.00
Diameter Height (ft):	10.00
Liquid Height (ft):	13.62
Avg. Liquid Height (ft):	13.62
Volume (gallons):	8,000.00
Turnovers:	2.17
Net Throughput (gal/yr):	17,328.00
Is Tank Heated (y/n):	N

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition:	Good
Roof Color/Shade:	White/White
Roof Condition:	Good

Roof Characteristics

Type:	
Height (ft):	0.00

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig):	0.03

Meteorological Data used in Emissions Calculations: Tampa, Florida (Avg Atmospheric Pressure = 14.76 psia)

TANKS 4.0
Emissions Report - Detail Format
Liquid Contents of Storage Tank

Mixture/Component	Month	Daily Liquid Surf. Temperatures (deg F) Avg.	Min.	Max.	Liquid Bulk Temp. (deg F)	Vapor Pressures (psia) Avg.	Min.	Max.	Vapor Mol. Weight	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Styrene	Jan	68.24	63.46	73.03	72.33	0.0954	0.0810	0.1119	104.1500			104.15	Option 1: A=7.14, B=1574.51, C=224.09
Styrene	Feb	69.27	64.20	74.35	72.33	0.0987	0.0831	0.1169	104.1500			104.15	Option 1: A=7.14, B=1574.51, C=224.09
Styrene	Mar	71.95	66.42	77.48	72.33	0.1080	0.0896	0.1294	104.1500			104.15	Option 1: A=7.14, B=1574.51, C=224.09
Styrene	Apr	74.49	68.39	80.59	72.33	0.1174	0.0959	0.1431	104.1500			104.15	Option 1: A=7.14, B=1574.51, C=224.09
Styrene	May	77.27	71.31	83.24	72.33	0.1286	0.1057	0.1556	104.1500			104.15	Option 1: A=7.14, B=1574.51, C=224.09
Styrene	Jun	78.83	73.54	84.11	72.33	0.1352	0.1138	0.1600	104.1500			104.15	Option 1: A=7.14, B=1574.51, C=224.09
Styrene	Jul	79.22	74.20	84.23	72.33	0.1369	0.1163	0.1606	104.1500			104.15	Option 1: A=7.14, B=1574.51, C=224.09
Styrene	Aug	79.07	74.18	83.96	72.33	0.1363	0.1162	0.1592	104.1500			104.15	Option 1: A=7.14, B=1574.51, C=224.09
Styrene	Sep	78.18	73.42	82.94	72.33	0.1324	0.1134	0.1542	104.1500			104.15	Option 1: A=7.14, B=1574.51, C=224.09
Styrene	Oct	75.29	70.17	80.40	72.33	0.1205	0.1018	0.1422	104.1500			104.15	Option 1: A=7.14, B=1574.51, C=224.09
Styrene	Nov	71.70	66.67	76.74	72.33	0.1071	0.0904	0.1264	104.1500			104.15	Option 1: A=7.14, B=1574.51, C=224.09
Styrene	Dec	69.18	64.46	73.90	72.33	0.0984	0.0838	0.1152	104.1500			104.15	Option 1: A=7.14, B=1574.51, C=224.09

TANKS 4.0
Emissions Report - Detail Format
Detail Calculations (AP-42)

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Standing Losses (lb):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vapor Space Volume (cu ft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vapor Density (lb/cu ft):	0.0018	0.0018	0.0020	0.0021	0.0023	0.0024	0.0025	0.0025	0.0024	0.0022	0.0020	0.0018
Vapor Space Expansion Factor:	0.0343	0.0366	0.0402	0.0448	0.0438	0.0383	0.0362	0.0351	0.0341	0.0369	0.0363	0.0337
Vented Vapor Saturation Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Tank Vapor Space Volume												
Vapor Space Volume (cu ft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tank Diameter (ft):	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000
Vapor Space Outage (ft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tank Shell Height (ft):	15.0000	15.0000	15.0000	15.0000	15.0000	15.0000	15.0000	15.0000	15.0000	15.0000	15.0000	15.0000
Average Liquid Height (ft):	13.6200	13.6200	13.6200	13.6200	13.6200	13.6200	13.6200	13.6200	13.6200	13.6200	13.6200	13.6200
Roof Outage (ft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Roof Outage (Roof)												
Roof Outage (ft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Dome Radius (ft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Shell Radius (ft):	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
Vapor Density												
Vapor Density (lb/cu ft):	0.0018	0.0018	0.0020	0.0021	0.0023	0.0024	0.0025	0.0025	0.0024	0.0022	0.0020	0.0018
Vapor Molecular Weight (lb/lb-mole):	104.1500	104.1500	104.1500	104.1500	104.1500	104.1500	104.1500	104.1500	104.1500	104.1500	104.1500	104.1500
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0954	0.0987	0.1080	0.1174	0.1286	0.1352	0.1369	0.1363	0.1324	0.1205	0.1071	0.0984
Daily Avg. Liquid Surface Temp. (deg. R):	527.9123	528.9448	531.6176	534.1607	536.9427	538.4978	538.8854	538.7379	537.8524	534.9576	531.3724	528.8476
Daily Average Ambient Temp. (deg. F):	59.9000	61.5000	66.5500	71.2500	77.3500	81.2000	82.3500	82.3500	80.9000	74.7500	67.4500	62.2000
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731
Liquid Bulk Temperature (deg. R):	532.0025	532.0025	532.0025	532.0025	532.0025	532.0025	532.0025	532.0025	532.0025	532.0025	532.0025	532.0025
Tank Paint Solar Absorptance. (Shell):	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700
Tank Paint Solar Absorptance. (Roof):	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700
Daily Total Solar Insulation Factor (Btu/sqft day):	1,027.6375	1,272.2527	1,607.9244	1,961.6804	2,034.6525	1,931.2225	1,843.0214	1,733.2460	1,548.9121	1,408.3615	1,130.4330	970.5289
Vapor Space Expansion Factor												
Vapor Space Expansion Factor:	0.0343	0.0366	0.0402	0.0448	0.0438	0.0383	0.0362	0.0351	0.0341	0.0369	0.0363	0.0337
Daily Vapor Temperature Range (deg. R):	19.1476	20.3119	22.1257	24.3856	23.8689	21.1446	20.0768	19.5543	19.0368	20.4558	20.1409	18.8757
Daily Vapor Pressure Range (psia):	0.0309	0.0338	0.0398	0.0472	0.0499	0.0462	0.0443	0.0430	0.0408	0.0404	0.0360	0.0313
Breather Vent Press. Setting Range(psia):	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0954	0.0987	0.1080	0.1174	0.1286	0.1352	0.1369	0.1363	0.1324	0.1205	0.1071	0.0984
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.0810	0.0831	0.0896	0.0959	0.1057	0.1138	0.1163	0.1162	0.1134	0.1018	0.0904	0.0838
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.1119	0.1169	0.1294	0.1431	0.1556	0.1600	0.1606	0.1592	0.1542	0.1422	0.1264	0.1152
Daily Avg. Liquid Surface Temp. (deg R):	527.9123	528.9448	531.6176	534.1607	536.9427	538.4978	538.8854	538.7379	537.8524	534.9576	531.3724	528.8476
Daily Min. Liquid Surface Temp. (deg R):	523.1254	523.8669	526.0862	528.0643	530.9755	533.2117	533.8662	533.8494	533.0932	529.8437	526.3372	524.1287
Daily Max. Liquid Surface Temp. (deg R):	532.6992	534.0228	537.1491	540.2571	542.9100	543.7840	543.9046	543.6265	542.6116	540.0716	536.4076	533.5665
Daily Ambient Temp. Range (deg. R):	19.8000	19.8000	20.1000	20.9000	19.7000	16.6000	15.7000	15.7000	16.2000	19.1000	20.5000	19.8000
Vented Vapor Saturation Factor												
Vented Vapor Saturation Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0954	0.0987	0.1080	0.1174	0.1286	0.1352	0.1369	0.1363	0.1324	0.1205	0.1071	0.0984
Vapor Space Outage (ft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

TANKS 4.0
Emissions Report - Detail Format
Detail Calculations (AP-42)- (Continued)

Working Losses (lb):	0.3415	0.3536	0.3866	0.4205	0.4604	0.4841	0.4902	0.4879	0.4742	0.4316	0.3835	0 3524
Vapor Molecular Weight (lb/lb-mole):	104.1500	104.1500	104.1500	104.1500	104.1500	104.1500	104.1500	104.1500	104.1500	104.1500	104.1500	104 1500
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0954	0.0987	0.1080	0.1174	0.1286	0.1352	0.1369	0.1363	0.1324	0.1205	0.1071	0.0984
Net Throughput (gal/mo.):	1,444.0000	1,444.0000	1,444.0000	1,444.0000	1,444.0000	1,444.0000	1,444.0000	1,444.0000	1,444.0000	1,444.0000	1,444.0000	1,444.0000
Number of Turnovers:	2.1660	2.1660	2.1660	2.1660	2.1660	2.1660	2.1660	2.1660	2.1660	2.1660	2.1660	2.1660
Turnover Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Maximum Liquid Volume (cuft):	8,000.0000	8,000.0000	8,000.0000	8,000.0000	8,000.0000	8,000.0000	8,000.0000	8,000.0000	8,000.0000	8,000.0000	8,000.0000	8,000.0000
Maximum Liquid Height (ft):	13.6200	13.6200	13.6200	13.6200	13.6200	13.6200	13.6200	13.6200	13.6200	13.6200	13.6200	13.6200
Tank Diameter (ft):	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000
Working Loss Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total Losses (lb):	0.3415	0.3536	0.3866	0.4205	0.4604	0.4841	0.4902	0.4879	0.4742	0.4316	0.3835	0 3524

TANKS 4.0
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: January , February , March , April , May , June , July , August , September , October , November , December

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Styrene	5.07	0.00	5.07

TANKS 4.0
Emissions Report - Detail Format
Tank Identification and Physical Characteristics

Identification

User Identification:	Resin Tank Nos. 1 and 2 - Potential
City:	Tampa
State:	Florida
Company:	New Gatsby Spa, Inc.
Type of Tank:	Vertical Fixed Roof Tank
Description:	

Tank Dimensions

Shell Height (ft):	15.00
Diameter Height (ft):	10.00
Liquid Height (ft):	13.62
Avg. Liquid Height (ft):	13.62
Volume (gallons):	8,002.03
Turnovers:	9.87
Net Throughput (gal/yr):	78,941.00
Is Tank Heated (y/n):	N

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition:	Good
Roof Color/Shade:	White/White
Roof Condition:	Good

Roof Characteristics

Type:	
Height (ft):	0.00

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig):	0.03

Meteorological Data used in Emissions Calculations: Tampa, Florida (Avg Atmospheric Pressure = 14.76 psia)

TANKS 4.0
Emissions Report - Detail Format
Liquid Contents of Storage Tank

Mixture/Component	Month	Daily Liquid Surf. Temperatures (deg F) Avg.	Min.	Max.	Liquid Bulk Temp. (deg F)	Vapor Pressures (psia) Avg.	Min.	Max.	Vapor Mol. Weight	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Styrene	Jan	68.24	63.46	73.03	72.33	0.0954	0.0810	0.1119	104.1500			104.15	Option 1: A=7.14, B=1574.51, C=224 09
Styrene	Feb	69.27	64.20	74.35	72.33	0.0987	0.0831	0.1169	104.1500			104.15	Option 1: A=7.14, B=1574.51, C=224.09
Styrene	Mar	71.95	66.42	77.48	72.33	0.1080	0.0896	0.1294	104.1500			104.15	Option 1: A=7.14, B=1574.51, C=224.09
Styrene	Apr	74.49	68.39	80.59	72.33	0.1174	0.0959	0.1431	104.1500			104.15	Option 1: A=7.14, B=1574 51, C=224 09
Styrene	May	77.27	71.31	83.24	72.33	0.1286	0.1057	0.1556	104.1500			104.15	Option 1: A=7.14, B=1574 51, C=224 09
Styrene	Jun	78.83	73.54	84.11	72.33	0.1352	0.1138	0.1600	104.1500			104.15	Option 1: A=7.14, B=1574.51, C=224 09
Styrene	Jul	79.22	74.20	84.23	72.33	0.1369	0.1163	0.1606	104.1500			104.15	Option 1: A=7.14, B=1574.51, C=224.09
Styrene	Aug	79.07	74.18	83.96	72.33	0.1363	0.1162	0.1592	104.1500			104.15	Option 1: A=7.14, B=1574.51, C=224.09
Styrene	Sep	78.18	73.42	82.94	72.33	0.1324	0.1134	0.1542	104.1500			104.15	Option 1: A=7.14, B=1574.51, C=224.09
Styrene	Oct	75.29	70.17	80.40	72.33	0.1205	0.1018	0.1422	104.1500			104.15	Option 1: A=7.14, B=1574.51, C=224.09
Styrene	Nov	71.70	66.67	76.74	72.33	0.1071	0.0904	0.1264	104.1500			104.15	Option 1: A=7.14, B=1574.51, C=224 09
Styrene	Dec	69.18	64.46	73.90	72.33	0.0984	0.0838	0.1152	104.1500			104.15	Option 1: A=7.14, B=1574.51, C=224 09

TANKS 4.0
Emissions Report - Detail Format
Detail Calculations (AP-42)

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Standing Losses (lb):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vapor Space Volume (cu ft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vapor Density (lb/cu ft):	0.0018	0.0018	0.0020	0.0021	0.0023	0.0024	0.0025	0.0025	0.0024	0.0022	0.0020	0.0018
Vapor Space Expansion Factor:	0.0343	0.0366	0.0402	0.0448	0.0438	0.0383	0.0362	0.0351	0.0341	0.0369	0.0363	0.0337
Vented Vapor Saturation Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Tank Vapor Space Volume												
Vapor Space Volume (cu ft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tank Diameter (ft):	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000
Vapor Space Outage (ft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tank Shell Height (ft):	15.0000	15.0000	15.0000	15.0000	15.0000	15.0000	15.0000	15.0000	15.0000	15.0000	15.0000	15.0000
Average Liquid Height (ft):	13.6200	13.6200	13.6200	13.6200	13.6200	13.6200	13.6200	13.6200	13.6200	13.6200	13.6200	13.6200
Roof Outage (ft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Roof Outage (Roof)												
Roof Outage (ft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Dome Radius (ft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Shell Radius (ft):	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
Vapor Density												
Vapor Density (lb/cu ft):	0.0018	0.0018	0.0020	0.0021	0.0023	0.0024	0.0025	0.0025	0.0024	0.0022	0.0020	0.0018
Vapor Molecular Weight (lb/lb-mole):	104.1500	104.1500	104.1500	104.1500	104.1500	104.1500	104.1500	104.1500	104.1500	104.1500	104.1500	104.1500
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0954	0.0987	0.1080	0.1174	0.1286	0.1352	0.1369	0.1363	0.1324	0.1205	0.1071	0.0984
Daily Avg. Liquid Surface Temp. (deg. R):	527.9123	528.9448	531.6176	534.1607	536.9427	538.4978	538.8854	538.7379	537.8524	534.9576	531.3724	528.8476
Daily Average Ambient Temp. (deg. F):	59.9000	61.5000	66.5500	71.2500	77.3500	81.2000	82.3500	82.3500	80.9000	74.7500	67.4500	62.2000
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731
Liquid Bulk Temperature (deg. R):	532.0025	532.0025	532.0025	532.0025	532.0025	532.0025	532.0025	532.0025	532.0025	532.0025	532.0025	532.0025
Tank Paint Solar Absorptance. (Shell):	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700
Tank Paint Solar Absorptance. (Roof):	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700
Daily Total Solar Insulation Factor (Btu/sqft day):	1,027.6375	1,272.2527	1,607.9244	1,961.6804	2,034.6525	1,931.2225	1,843.0214	1,733.2460	1,548.9121	1,408.3615	1,130.4330	970.5289
Vapor Space Expansion Factor												
Vapor Space Expansion Factor:	0.0343	0.0366	0.0402	0.0448	0.0438	0.0383	0.0362	0.0351	0.0341	0.0369	0.0363	0.0337
Daily Vapor Temperature Range (deg. R):	19.1476	20.3119	22.1257	24.3856	23.8689	21.1446	20.0768	19.5543	19.0368	20.4558	20.1409	18.8757
Daily Vapor Pressure Range (psia):	0.0309	0.0338	0.0398	0.0472	0.0499	0.0462	0.0443	0.0430	0.0408	0.0404	0.0360	0.0313
Breather Vent Press. Setting Range(psia):	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0954	0.0987	0.1080	0.1174	0.1286	0.1352	0.1369	0.1363	0.1324	0.1205	0.1071	0.0984
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.0810	0.0831	0.0896	0.0959	0.1057	0.1138	0.1163	0.1162	0.1134	0.1018	0.0904	0.0838
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.1119	0.1169	0.1294	0.1431	0.1556	0.1600	0.1606	0.1592	0.1542	0.1422	0.1264	0.1152
Daily Avg. Liquid Surface Temp. (deg R):	527.9123	528.9448	531.6176	534.1607	536.9427	538.4978	538.8854	538.7379	537.8524	534.9576	531.3724	528.8476
Daily Min. Liquid Surface Temp. (deg R):	523.1254	523.8669	526.0862	528.0643	530.9755	533.2117	533.8662	533.8494	533.0932	529.8437	526.3372	524.1287
Daily Max. Liquid Surface Temp. (deg R):	532.6992	534.0228	537.1491	540.2571	542.9100	543.7840	543.9046	543.6265	542.6116	540.0716	536.4076	533.5665
Daily Ambient Temp. Range (deg. R):	19.8000	19.8000	20.1000	20.9000	19.7000	16.6000	15.7000	15.7000	16.2000	19.1000	20.5000	19.8000
Vented Vapor Saturation Factor												
Vented Vapor Saturation Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0954	0.0987	0.1080	0.1174	0.1286	0.1352	0.1369	0.1363	0.1324	0.1205	0.1071	0.0984
Vapor Space Outage (ft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

TANKS 4.0
Emissions Report - Detail Format
Detail Calculations (AP-42)- (Continued)

Working Losses (lb):	1.5558	1.6108	1.7613	1.9155	2.0975	2.2056	2.2333	2.2227	2.1602	1.9662	1.7470	1.6056
Vapor Molecular Weight (lb/lb-mole):	104.1500	104.1500	104.1500	104.1500	104.1500	104.1500	104.1500	104.1500	104.1500	104.1500	104.1500	104.1500
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0954	0.0987	0.1080	0.1174	0.1286	0.1352	0.1369	0.1363	0.1324	0.1205	0.1071	0.0984
Net Throughput (gal/mo.):	6,578.4167	6,578.4167	6,578.4167	6,578.4167	6,578.4167	6,578.4167	6,578.4167	6,578.4167	6,578.4167	6,578.4167	6,578.4167	6,578.4167
Number of Turnovers:	9.8680	9.8680	9.8680	9.8680	9.8680	9.8680	9.8680	9.8680	9.8680	9.8680	9.8680	9.8680
Turnover Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Maximum Liquid Volume (cuft):	8,002.0302	8,002.0302	8,002.0302	8,002.0302	8,002.0302	8,002.0302	8,002.0302	8,002.0302	8,002.0302	8,002.0302	8,002.0302	8,002.0302
Maximum Liquid Height (ft):	13.6200	13.6200	13.6200	13.6200	13.6200	13.6200	13.6200	13.6200	13.6200	13.6200	13.6200	13.6200
Tank Diameter (ft):	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000
Working Loss Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total Losses (lb):	1.5558	1.6108	1.7613	1.9155	2.0975	2.2056	2.2333	2.2227	2.1602	1.9662	1.7470	1.6056

TANKS 4.0
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: January , February , March , April , May , June , July , August , September , October , November , December

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Styrene	23.08	0.00	23.08

Fiberglass Reinforced Plastics: Indiana's Section 112(g) Experience

99-910

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ABSTRACT

The U.S. Environmental Protection Agency (EPA) promulgated the rule implementing Section 112 (g) of the 1990 Clean Air Act (CAA or Act) at the end of 1996.[1] Sec. 112(g) requires new major sources of hazardous air pollutants (HAP) to install maximum achievable control technology (MACT). If no MACT standard applicable to the type of source exists (yet), state or local agencies must determine the MACT on a case-by-case basis. Indiana had the opportunity to explore this new authority fully in the first half of 1998 with a number of proposed new constructions in the reinforced plastics composite industry, also referred to as fiber reinforced plastics (FRP) manufacturers.

This paper describes the step-by-step process of that MACT determination pursuant to Sec. 112(g) and the many technical and policy considerations that presented themselves. Ramifications of the final decision and observations of needs for future Sec. 112(g) MACT determinations are discussed. It is hoped that this case study will be instructional for other agencies that may have to perform a Sec. 112(g) determination for this or any other source category. Also as MACT standard development by EPA lags further or possibly ceases, this paper is intended to demonstrate the need for all agencies to collect and share information on a proactive basis to cope with this significant and resource-intensive new requirement.

INTRODUCTION

Indiana is home to one of the largest concentrations of FRP manufacturers in the United States. Located in the northern part of the state, the large presence is recognized by the industry's main trade association, which typically holds its Mid-west annual conference in northern Indiana to accommodate its membership. The predominant FRP parts fabrication is in support of the manufacture of recreational vehicles (RV) and towable trailers, but boats, storage tanks, cultured marble, and other miscellaneous FRP products manufacturing are numerous too.

The FRP industry's contribution to the state and local economy is certainly recognized, but the industry's presence is environmentally evident also. The main HAP associated with FRP manufacturing is styrene (CAS: 100-42-5). Styrene monomer is used as a reactive diluent for the polyester resin binder in FRP. As a diluent, it makes the resin flowable enough to be poured or sprayed. Then because it is reactive, it cross-links the polyester resin to give parts hardness and strength along with the fiber reinforcement, which is usually chopped fiberglass. During application and until the resin cures, a portion of the free styrene monomer is emitted evaporatively.

The level and contribution of emissions from FRP manufacturing is very high. Figure 1 shows relative toxic chemical releases in Indiana according to the 1995 Toxic Release Inventory (TRI).[2] The largest circle in the state, representing the largest amount of toxic chemical releases, is in Elkhart County. Elkhart County leads Indiana in total releases; it also has twice as many TRI reporters as any other county in the state. Methylene chloride topped Elkhart County's reported chemical list in 1995;

styrene was second at 1.4 million pounds (lbs). In Elkhart County and Indiana as a whole, more than 90% of all styrene emissions are from FRP manufacturing.

Indiana had therefore already recognized FRP manufacturing for its high emissions, although the regulatory focus had been more over styrene's status as a volatile organic compound (VOC) than as a HAP. Then, in late 1997 U.S. EPA Region V notified the Air Permits Branch of the Indiana Department of Environmental Management (IDEM) of new emission factors for certain FRP operations.[3] These new emission factors indicated that styrene emissions were actually about twice what was originally thought, i.e., twice the emissions predicted using factors for the source category published in EPA's AP-42 document, *Compilation of Air Pollutant Emission Factors* . This would make styrene the highest emitted toxic chemical in Elkhart County or at least tied with methylene chloride.

By the start of 1998, several FRP manufacturers in northern Indiana had submitted construction permit applications. The applicants expressed strong concerns when informed of the requirement to use the new emission factors instead of AP-42 since the new emission factors halved their proposed increased production rates. IDEM's Office of Air Management (OAM) was concerned over the prospect of permitting several new large sources and their attendant VOC emissions in counties that appeared headed back to non-attainment status due to the new National Ambient Air Quality Standard (NAAQS) for ozone . Certainly it seemed contradictory for these areas to have to design VOC reduction strategies and then for new VOC loads to be added to the areas.

As final background, by 1998 styrene's status as a HAP and case-by-case MACT determinations were already important considerations for these new applications. The final Sec. 112(g) rule, encoded as Subpart B–Requirements for Control Technology, of 40 CFR Part 63, required states to adopt the program for performing case-by-case MACT determinations by June 29, 1998. Indiana installed its program on July 27, 1997, almost a year early, as 326 IAC 2-1-3.4–New Source Toxics Control (recently re-encoded as 2-4.1-1). Indiana was eager to adopt the new authority due to the state's priority on reducing toxics, but the program would be a state-only requirement until June 1998 after which time it would officially implement Sec. 112(g). So, Indiana actually began doing case-by-case MACT determinations prior to June 1998.

The first few Indiana MACT determinations were performed similarly to top-down BACT determinations, using information that had been gathered over the previous couple of years. Using such established review procedures from an existing preconstruction permit program was actually envisioned and suggested by EPA. However, MACT and BACT determinations are different in that case-by-case MACT determinations should not take cost into consideration except under certain circumstances. Indiana (and as it turns out, other states) did not understand this distinction fully at first. Also, even two years ago much less information on control techniques for the FRP industry had been developed. As a result, some of the early MACT determinations did not require as stringent control as can be required now with additional information.

IDEM, OAM began to question just how significant an authority Sec. 112(g) could be for toxics reductions. With the new group of applications from FRP sources, Air Permits management wanted to ensure that the determinations were made consistent with a strict interpretation of the rules. The determinations also needed to incorporate information newly available from EPA and IDEM's pollution prevention office. Furthermore, management challenged staff to improve the stringency of determinations so as not to further exacerbate the ozone situation in northern Indiana counties.

The remainder of this paper describes the disposition of these new FRP source applications through which Indiana's understanding of the Sec. 112(g) process improved such that today it represents an important tool in the arsenal for improving air quality.

THE MACT DETERMINATION PROCESS

Several meetings and discussions early in the spring of 1998 helped the agency resolve growing questions–and create new ones–about the Sec. 112(g) MACT determination process. By March, sources' objections over the new emission factors provided by EPA had reached not just IDEM, but also the industry association and a state-chartered pollution prevention institute (the Indiana Clean Manufacturing Technology and Safe Materials Institute, CMTI), both of which came to meet with IDEM, OAM over this issue.

At the same time, Air Permits staff were questioning how cost is supposed to be taken into consideration in case-by-case MACT determinations. Information from the meetings with these two organizations had to be checked with EPA and other states. Thus, March 1998 marked the time the MACT determination for the FRP industry really began in earnest. The principles of a MACT determination are summarized first, and the important steps and concepts of the process are discussed from the standpoint of how they were realized in this case study.

General Principles for MACT Determinations

Sec. 112(g) prescribes in detail the process for performing MACT determinations.[4] The process begins with a MACT analysis by the owner and operator, which must be consistent with general principles described in the rule. The owner or operator provides an application for a MACT determination to the permitting authority. This application for a MACT determination is then reviewed according to the permitting authority's own review procedures (so long as they provide for public participation in the determination), the administrative procedures outlined in Title V, or the administrative procedures described in the Sec. 112(g) rule. Indiana is approved to use its existing preconstruction review program for Sec. 112 (g). If the determination is acceptable, the permitting authority will issue approval under its own procedures, revise the part 70 or part 71 permit, or issue a Notice of MACT Approval. Indiana's Part 70 permitting program is well-established, so approvals can be issued via a Part 70 permit revision or through the construction permit approval process.

General principles for MACT determinations under the Sec. 112(g) rule are stated in Sec. 63.43(d). The rule requires that the technology selected by the owner or operator be consistent with what would have been required under Sec. 112(d) of the Act. For new major HAP sources, the minimum requirement is the level of control that is achieved in practice by the best controlled similar source anywhere in the U.S. The term "similar source" is an important concept that will be discussed later. Sources and permitting authorities are expected to consider controls on sources across the U.S., as opposed to considering just those controls used on sources in a particular state. Another important general principle stated in the rule is the requirement to consider available information for determining the appropriate level of control.

Available information

As stated before, before 1998 IDEM took the position that BACT equaled MACT. The already established procedures for BACT review were followed as the MACT determination procedure. When instructed to do MACT determinations, the applicants submitted analyses that ruled out add-on controls as not cost-effective. Usually, little mention was made of the sources of information investigated. Meetings and discussions with various organizations in early Spring 1998 revealed how important the role of "available information" was in the Sec. 112(g) process.

The second general principle of MACT determinations stated in Sec. 63.43(d) [all references to code are to 40 CFR Part 63 unless otherwise stated] begins with:

> "Based upon available information, as defined in this subpart, the MACT emission limitation and control technology recommended by the applicant and approved by the permitting authority shall achieve the maximum degree of reduction in emissions of

> HAP which can be achieved by utilizing those control technologies that can be identified from the available information . . . ."[5]

Innocuous at first glance, "available information" actually defines the extent of review for permitting authorities and applicants. Sec. 63.41 of the rule defines "available information" as:

> ". . . for purposes of identifying control technology options for the affected source, information contained in the following information sources as of the date of approval of the MACT determination by the permitting authority:
>
> (1) A relevant proposed regulation, including all supporting information;
>
> (2) Background information documents for a draft or proposed regulation;
>
> (3) Data and information available for the Control Technology Center developed pursuant to Sec. 113 of the Act;
>
> (4) Data and information contained in the Aerometric Informational Retrieval System including information in the MACT data base;
>
> (5) Any additional information that can be expeditiously provided by the Administrator; and
>
> (6) For the purpose of determinations by the permitting authority, any additional information provided by the applicant or others, and any additional information considered available by the permitting authority."[6]

Meetings with the two organizations introduced before are described because they represented valuable sources of available information. Another group, IDEM's Office of Pollution Prevention and Technical Assistance (OPPTA), was involved in these meetings, too. Together with CMTI, OPPTA had already been working to encourage new lower-emitting technologies and techniques for Indiana's FRP industry.

From the meetings with these organizations, the agency learned or became convinced of the following:

- New emissions data for the FRP industry that had been generated independently by EPA, the FRP industry association, and the boat manufacturers association all confirmed each other to a high degree. Therefore, there was little risk in using data from the FRP industry association, which had been rendered into a highly user-friendly format;
- Several types of pollution-prevention based emission reduction techniques were already in use and being considered in the federal FRP MACT standard being developed.
- Cost is not a prime consideration in determining new source MACT except under certain circumstances; and
- New source MACT for the industry might be add-on controls to an overall destruction efficiency of 95%.

In general, from this exercise IDEM realized the need to obtain up-to-date information from as many sources as possible for a comprehensive Sec. 112(g) MACT determination. This is especially important when information could change quickly. The agency also realized how useful pollution prevention organizations and other branches of IDEM were in performing specific permitting tasks. One observation or ramification of this case study was to recognize how useful these other organizations could be in prospectively determining MACT for other source categories, namely surface coating of plastic and metal parts. Finally, these discussions began to show just how resource-intensive MACT determinations could be in the future.

Cost Considerations

Indiana took the position at first that MACT equaled BACT and allowed cost to be taken into consideration early in the MACT determinations. It is acknowledged now that cost is not necessarily a prime consideration in the Sec. 112(g) process, but Indiana found it was a widespread misunderstanding. Several states contacted were under the same impression after a plain reading of the rule. The same section of the rule, Sec. 63.43(d)(2), which specifies available information as the basis for determinations, restates the definition of MACT:

> ". . . the maximum degree of reduction in emissions of HAP which can be achieved by utilizing those control technologies that can be identified from the available information, taking into consideration the costs of achieving such emission reduction and any non-air quality health and environmental impacts and energy requirements associated with the emission reduction."[7]

Sources, their consultants, and colleagues in other state agencies who were consulted invoked this section and the definition of MACT in the Act and in Sec. 63.41 of the rule. This definition of MACT is virtually identical to the definition of best available control technology (BACT) as well.

Guidance from EPA's Office of Air Quality Planning and Standards (OAQPS) and Region V and even the industry association finally settled the issue that new source MACT is intended to be the "best of the best" whether for MACT standard development by EPA or for case-by-case determinations at the state and local level. However, the guidance also clarified the circumstances under which cost can be a consideration, which is when control technologies on similar sources are being compared to transfer the technology. The concept of a "similar source" is important primarily in regards to how and when cost can be taken into consideration.

Similar Source

After the early spring meetings, IDEM learned that a FRP source in Ohio was recently required to control to 95% and would likely be the basis for the new source MACT in the FRP rule. The EPA provided this and more information for a number of other sources controlled to various degrees. The indication that new source MACT for the FRP industry might be capture and control to an overall efficiency of 95% was of great concern to sources. The industry association was quick to suggest, however, that not all sources in the industry were similar sources, i.e., similar to the source in Ohio, and if not similar, based on cost comparisons other sources should not be held to the 95% control standard.

"Similar source" is another basis for MACT determinations specified (actually, the first principle stated) in Sec. 63.43(d):

> "The MACT emission limitation or MACT requirements recommended by the applicant and approved by the permitting authority shall not be less stringent than the emission control which is achieved in practice by the best controlled similar source, as determined by the permitting authority."[8]

The preamble to the final Sec. 112(g) rule represents the most up-to-date guidance for implementing the rule. The preamble discusses "similar source" to a great extent:

> "The EPA believes . . . that Congress intends for transfer technologies to be considered when establishing the minimum criteria for new sources. EPA believes that the use of the word "similar" provides support for this interpretation.

> * * * The use of the term "best controlled similar source" rather than "best controlled source within the source category" suggests that the intent is to consider transfer technologies when appropriate."[9]

"Similar Source" is defined in Sec. 63.41 to mean:

> ". . . .a stationary source or process that has comparable emissions and is structurally similar in design and capacity to a constructed or reconstructed major source such that the source could be controlled using the same control technology."[10]

In response to commenters afraid that the definition of "similar source" was too broad, EPA responded:

> "The EPA believes that the practical use and effectiveness of any transfer technology should be generally comparable across emission units. While the particular pollutants emitted need not be the same, the following factors may be considered: the volume and concentration of emissions, the type of emissions, the similarity of emission points, and the cost and effectiveness of controls for one source category relative to the cost and effectiveness of those controls for the other source category, as well as other operating conditions. The uninstalled cost of controls should not be a factor in determining similarity across emission units. What should be a factor is the uninstalled cost of controls plus the costs associated with installation and operation of those controls."[11]

The guidance received from both EPA OAQPS and Region V at the beginning of this MACT determination was that cost need only be a factor if IDEM wanted to evaluate transferring control technology from some other source category to the FRP industry. But, because the full range of controls and emission reduction techniques, some unique to the industry, appeared to be in use already, such technology transfer did not seem necessary, and therefore cost comparisons should not be necessary.

Even faced with the knowledge of these controlled sources in their industry, applicants argued that the cost of add-on controls alone equaled or even exceeded the total capital budget of proposed projects. The applicants and their industry association maintained instead that subcategories existed within their industry, and controls on one source only established MACT for that subcategory, not others. So, if they could demonstrate sufficient dissimilarity between them in comparison the other type of controlled FRP operations, cost could be used to eliminate controls as their MACT. The agency responded that it could be amenable to this line of reasoning if a strong case was made.

By Summer 1998, EPA's FRP MACT standard development had progressed far enough to indicate that small- to medium-sized new sources would probably be distinguished from large ones. EPA indicated that a cutoff of 100 tons per year (TPY) of potential HAP emissions would likely be established. If a source had the potential to emit greater than 100 TPY HAP, 95% overall control would be MACT. If the source's potential could be shown to be less, either by design or by an enforceable limit, add-on controls would not be required, much to the relief of all the parties involved.

About this same time Indiana had already decided that the MACT for its new, mostly small- to medium-sized FRP sources did not have to be add-on controls. EPA had identified to Indiana a few small- to medium-sized facilities with add-on controls. However, unlike the very large sources controlled to 95% overall efficiency, these smaller sources did not have 100% capture. Only some of their operations were enclosed or were using capture hoods routed to incinerators. Hence, the overall control for these few smaller controlled sources was only about 40 to 50%. Indiana decided that a combination of low-emitting application guns and low styrene materials offered a level of emission reduction equivalent to that of the similar controlled sources. Hence, Indiana was content with its determination of no add-on control for smaller FRP sources, especially relative to a FRP MACT concept EPA published in the summer of 1998.

The decision by EPA to recognize two categories of new sources and not require add-on controls across the board resolved one of the thorniest issues of this determination. The rapid development of the FRP MACT standard during the time Indiana was performing this determination was a boon to the effort. At the same time, information from EPA was changing sometimes on a weekly basis, which introduced complications as well. EPA as a source of available information is discussed next.

Available information: EPA

Contacting EPA is the first step an applicant or agency should take when commencing a Sec. 112(g) MACT determination. Indiana had consulted EPA for a FRP BACT determination about a year prior to these 1998 cases, and at that time the MACT standard development was not as advanced. Much information had not been collected yet or simply was not available; for instance, the controlled source in Ohio did not exist yet. After BACT was determined for an FRP source, it was assumed to still be applicable a year later.

Since early on Indiana considered MACT to be equal to BACT, further information on MACT was not sought initially for these new proposed FRP sources. However, the spring meetings and discussions revealed how rapidly the status of information could change. Now it is realized that continual periodic contact with EPA during MACT standard development is always advisable, even crucial.

Information from EPA is not always available or not yet in a form that is usable, however. For example, the Miscellaneous Plastic and Metal Parts Coating MACT standards are now in development, but information collection has only recently commenced. Neither of these efforts can say exactly which processes and operations they will target or what MACT will be for new and existing sources. About the only available information is the general range of control techniques that are currently in place. For these two source categories, the available information from EPA is not too enlightening.

In early 1998, the FRP MACT standard was a little further along in development than the Miscellaneous Plastic and Metal Parts Coating efforts are today. Information collection for the FRP MACT standard had been completed for the most part, and EPA and the industry association were in the midst of digesting the numbers to determine the existing source MACT floor, which is the average of the control the top 12% of the category are achieving. When Indiana began checking with EPA about information it was gathering, EPA's answers were often, "In one more week, that data may be available," and "This is not finished yet, but here's what we're thinking of doing . . . ." The EPA was also actively negotiating with the industry association, and sometimes Indiana would find that EPA's "thinking" had changed in just one week's time.

From March to June 1998, the issue of whether add-on control to a 95% overall efficiency was new source MACT was a significant one. If EPA had given Indiana the indication that 95% control would be new source MACT regardless of size, the MACT determination would have been completed quickly, and applicants would have likely either canceled their applications or filed suit or both. However, EPA was more concerned with the more difficult task of determining MACT for existing sources, and by June 1998 had been persuaded that small- to medium-sized FRP sources need not have to install add-on control devices. Instead sources with PTE below 100 TPY HAP could meet the existing source MACT. Again, as EPA was actively negotiating with the industry association, the information flow Indiana was receiving from both parties was extremely dynamic.

RESULTS

New Source FRP MACT

By July 1998, the Indiana MACT determination was finalized. The MACT was determined to be either overall control to 95% or an emission limitation and the requirement for specific equipment, materials, and work practices. If a source accepts an enforceable limit of 100 TPY HAP, they are required to use flow-coating resin application guns only for unfilled resins. The maximum HAP content for resins is 35 weight % on an unfilled ("neat") basis, and a maximum of 37 weight % HAP for gel coats.

Flexibility is provided by allowing emissions averaging whereby a quantity of resin with higher HAP content than 35% can be used if its higher emissions are offset by emission reductions from use of some quantity of a lower emitting resin or gel coat. With agency approval, other emission reduction techniques such as vapor suppression may be used instead of flow coat guns or the low HAP resins and gel coats. However, an emission reduction technique referred to as controlled spraying is not allowed for credit except in some special situations.

This agrees with the MACT concept for this source category published by EPA in September 1998.[12] The MACT concept represents a sort of presumptive MACT (P-MACT). As such, it is assumed that other states would use EPA's FRP MACT concept for Sec. 112(g) determinations. However, since Indiana's MACT determination agrees closely with EPA's MACT concept, Indiana does not feel the need to adjust its MACT further. Because indications are that the MACT concept will remain essentially intact until rule proposal, Indiana will probably not alter its decision until the FRP MACT standard is proposed. After this time, the proposed rule will be used for new FRP sources subject to Sec. 112(g). However, IDEM, OAM will continue to keep the information up-to-date, and changes in information could affect future MACT determinations.

Modification/Process or Production Unit

Mention should be made of other difficulties encountered in Sec. 112(g) determinations stemming from definitions. These have to do with the definitions of "modification" and "process/production unit." It is already recognized by EPA that surface coating is a type of operation that poses unique problems of interpretation in these regards.

Sec. 112(g) only applies to new source construction or reconstruction, not modifications. "Modification" is actually not defined in the rule. "Construct" and "reconstruct a major source" are defined instead. If a proposed source does not meet the definition of construction or reconstruction, it is a modification and not subject to Sec. 112(g). The guidance in the preamble discusses this in great detail. In fact, several examples cited in the preamble for instruction have to do with FRP fabrication.[13]

A new major HAP source constructed on a greenfield site is subject in its entirety to Sec. 112(g). For new construction at an existing source to be subject is more involved. The subject source in this case is the new process or production unit, which in and of itself is a major HAP source. Hence, one way to avoid Sec. 112(g) applicability is to accept an enforceable limit of less than 10 TPY of any HAP or 25 TPY of any combination of HAP. But this limit applies to the proposed process or production unit. In surface coating, it can be argued that individual spray booths are also individual process or production unit. For FRP fabrication (which is a kind of surface coating activity) the question was whether sources could take individual 10/25 TPY limits on individual booths to avoid Sec. 112(g)?

The answer seems to be that they can. This issue is discussed extensively in the rule preamble, which makes the definition of "process or production unit" dependent on whether an intermediate or final product is produced. The discussion is too extensive to repeat here, and this is a generic issue in any Sec. 112(g) determination. Indiana's MACT determination did not offer any new or unique perspective on this issue. The main observation Indiana made regarding the difficulty of establishing what is a process or production unit was how true is the following statement in the preamble:

> "Because this rule is generic to all industries, the definition of 'process or production unit'' and the use of the terms 'intermediate or final product' in this rule are necessarily generic. As a result, in applying this definition to individual plant sites, permitting authorities will need to exercise their reasonable judgment in determining the 'collection of structures and/or equipment that * * * produce(s) an intermediate or final product.'"[14]

One applicant has appealed the MACT determination required of them, arguing that their new FRP operation is a modification of an existing source, and as such not a construction or reconstruction. They base their argument that Indiana has misinterpreted what constitutes a "process or production unit." Indiana predicts this will be only the first of many challenges to this permitting authority's "reasonable judgment" in regards to Sec. 112(g).

Other Results and Ramifications

By the time of this writing, Indiana had concluded several Sec. 112(g) MACT determinations. Only one is on appeal, and that on rule applicability, not on the merits of the technical determination. Indiana and other states are reporting a slowdown in MACT determination applications because sources seem to be opting for the 10/25 TPY HAP limit to avoid Sec. 112(g)applicability. So, similar to the PSD/NSR program, it seems that the Sec. 112(g) rule has its greater beneficial effect reducing future emissions by limiting PTE rather than requiring more stringent control. However as stated above, the stipulation of regulating the process or production unit represents a sort of "loophole." If a source can be defined to be several separate process or production units, a new source can still have a sizeable HAP PTE by the accumulation of several 10/25 TPY HAP limits. This seems especially possible for surface coating operations.

Indiana has realized other benefits from this exercise. For new sources, there are, of course, no emission reductions; instead, the benefit is in emissions avoided. The MACT that was implemented reduces emissions by about 40% from what is typical in the FRP industry without incurring any additional fuel use and secondary pollution from combustion control devices. This reduction is mainly attributable to the requirement for the lower-emitting flow coating application guns. The lower HAP content requirements for resins and gel coats contribute significant percentage reductions also.

Indiana has also found that its FRP industry has been proactive in implementing elements of the new MACT as awareness heightens in the industry that business cannot be conducted as usual. Technology in the industry is changing quickly also; for example, flow coating guns are continually being improved and may be available for use with filled resins soon. Even lower styrene/HAP content or at least lower emitting resins and gel coats are being formulated. If such further technology development is incorporated, the FRP MACT may become even more stringent by the time the federal rule is proposed.

Probably the greatest result of this exercise was the recognition of how its principles could be used in permitting existing sources through Title V. When the new emission factors were issued, one of the first realizations was that some FRP sources could be out of compliance with their existing emission limits. Indiana decided to allow limits to be increased if sources desired, to reflect new PTEs calculated with the new emission factors. However, along with the permit limit increase, sources were required to adopt the MACT conditions too. This was pursuant to a state rule requiring BACT for sources of VOC with PTE greater than 25 TPY. In effect, the decision was to reevaluate sources' BACT due to a change in information that increased emissions. The reevaluated BACT is the MACT, which is a reversal of the earlier attitude that MACT equals BACT!

This decision for existing sources will achieve measurable emission reductions. The FRP industry in

Indiana is large enough that a state MACT rule has been suggested to require all sources to install MACT and even the playing field. However, it is only a suggestion at this point. A decision on whether a state FRP MACT rule would be adopted is well down the line, and it would be necessary to collect much more information before embarking on such a course of action.

Final ramifications from this exercise are that there is a much greater appreciation of the roles different areas of agency and the state pollution prevention group can play in future MACT determinations. Air Permits has also recognized the need for creating a more organized system of information retrieval for controlled sources in the state, a sort of state clearinghouse for control technology determinations that permit reviewers, sources, and consultants can all access.

CONCLUSIONS

Indiana believes the Sec. 112(g) rule represents a significant new authority for requiring stringent emission controls. At the same time, the determination process can be as resource-intensive as traditional BACT determinations. Most sources are not used to the process yet, MACT determinations that are submitted will often be deficient on arrival, and the agency will be left with a great deal of work confirming information submitted and finding more information on its own. Issues of trust in applicants and the information they submit are similar to those same issues in the BACT review process.

Indiana found that the difficulty of the MACT determination depends on the source category and the status of the MACT standard effort. If the source category is relatively homogeneous, new source MACT will probably be apparent regardless of the MACT standard development status. That is, in homogeneous industries, the best controlled similar sources are probably already well-known. On the other hand, if the source category is diverse, unless EPA has made decisions already, sources will likely oppose the stringency of the MACT determination and use the dissimilar source argument to avoid MACT. The Miscellaneous Metal and Plastic Parts Surface Coating categories both promise to pose difficult problems similar to FRP for future Sec. 112(g) determinations.

Other states are urged to build clearinghouses or to fully populate EPA's several databases of information on control technologies. More networking will be valuable to share interesting, stringent control technologies. States can be proactive in looking at remaining listed MACT source categories. If they believe they have good or the best controlled sources in a category in their states, they should find opportunities to publicize them to others.

The primary conclusion Indiana came to is that EPA must make the information collected for MACT standards that are being developed available readily and immediately now that states are required to develop and implement MACT before MACT standards are promulgated. Otherwise, Sec. 112(g) determinations will likely be misinformed, with the potential for significant under- or over-control being required instead of what is appropriate for a particular source category.

ACKNOWLEDGEMENTS

This kind of work with such far-reaching implications requires all levels of an agency to accomplish. Hence, I acknowledge all IDEM management and staff who were involved in formulating and executing the policy described here. In particular, I thank the following whose roles in performing this Section 112(g) MACT determination were instrumental: Paul Dubenetzky, Chief, Air Permits Branch; Doug Wagner, Chief, Air Permits Policy & Guidance Section; Greg Wingstrom, Sr. Env. Manager, Air Compliance Branch; and Karen Teliha, Env. Manager, IDEM Office of Pollution Prevention and Technical Assistance. The quality, timeliness, and effectiveness of this work, of which I was merely the chronicler, could not have been achieved without their experience, direction, and intrinsic involvement.

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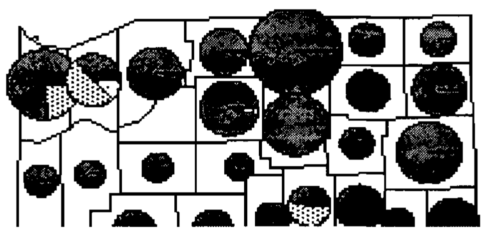
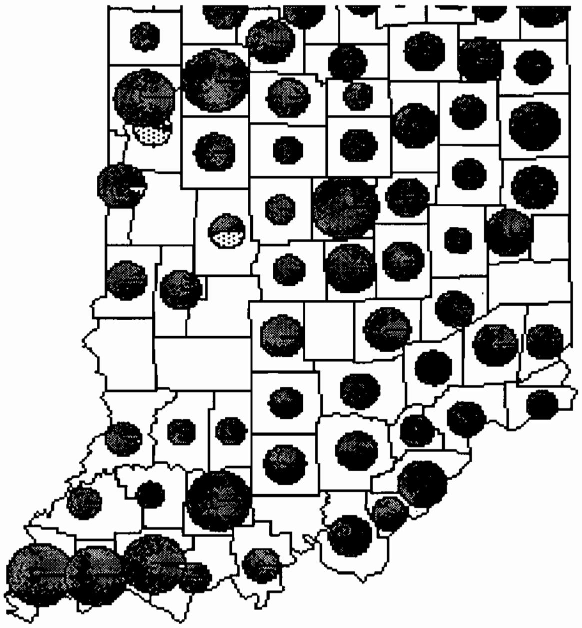
Figure 1. Relative Toxic Chemical Releases to the Environment in Indiana, by County





The large dark sector is air releases; the medium darkness is land releases.